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EXPLORING THE PERCEPTIONS OF WORKING-AGE DISABLED PEOPLE ON THE INCLUSIVITY OF PUBLIC TRANSPORTATION IN GAUTENG, SOUTH AFRICA

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Abstract: Despite efforts towards accessible public transportation, there is sparse knowledge that reviews the impact or perception of these efforts from the voice of individuals with various types of impairments on various types of available transport modes. This limits the development of user needs-led interventions and subsequently impacts their socio-economic participation. The perceptions of working-age users with impairments on each land-based public transport mode, (i) Mini-bus Taxi, (ii) E-hailing or App-based taxi services, (iii) Bus Rapid Transit (BRT), (iv) Gautrain-rail, were co-created through a phenomenological lens. To manage the scope of the study, the views of persons who are Deaf and those with hearing, physical and visual impairments were only considered for this study. In-depth interviews were the tools that were used to generate data from the respondents. Respondents had a common view that they still feel excluded in communication, physical infrastructure, and personnel and co-passenger attitudes. Participants observed positive traits, indicating what is working while also shredding their regular commuting challenges, thus frustrating their socio-economic participation. In conclusion, participants demonstrated a keen interest in sharing concrete ideas for improvements on each transport mode, with key measures highlighting subsidies for extra costs due to financial inequities, improved communication through technology, over and above continuous monitoring that is inclusive of user voices.

Keywords: disability, inclusivity, impairments, public transport, Gauteng, South Africa

Introduction

Background

Despite increasing recognition of the positive impact of accessible public transport on the livelihoods and economic participation of disabled people (Park & Chowdhury, 2022) (Cepeda, Galilea, & Raveau, 2018); (Stanley & Stanley, 2021), (Blais & El-Geneidy, 2014), (Grisé, Boisjoly, Maquire, & El-Geneidy, 2019) assert that there is a discrepancy between public transportation planning and reality, thus limiting the ability of people with disabilities to access employment opportunities. In practice, public transportation providers offer varying levels of service to urban residents but maintain physical barriers that hinder access for disabled people (Grisé, Boisjoly, Maquire, & El-Geneidy,

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2019). (Wahyuni, Murti, & Joebagio, 2016) determined the public transport accessibility for disabled people and the provision of alternative solutions. Furthermore, (Cepeda, Galilea, & Raveau, 2018) investigated the perceived worthiness of making public transportation accessible to disabled people. Although transport accessibility and inclusion became topical among scholars in the 2000s (Verlinghieri & Schwanen, 2020), there remains a scarcity of knowledge on the barriers encountered by disabled people (Duri & Luke, 2022), particularly in African countries, where disabled people are hardly included in transport policies (Vanderschuren & Nnene, 2021), even though this region has a higher disability prevalence (Mitra & Sambamoorthi, 2014). South Africa, however, was found to be the most inclusive in planning and designing transportation facilities and services (Vanderschuren & Nnene, 2021) Research in other parts of South Africa has highlighted the need for more reliable transport for youth (Rivasplata and Le Roux), shown that mobility barriers increase dependency and isolation for wheelchair users (Visagie et al.), and revealed that challenges with mini-bus taxis limit community participation for wheelchair users (Fredericks et al.). This study qualitatively explored disabled users' transport experiences to define inclusive public transport, improve local contexts, and inform evidence-based transport planning, reducing their exclusion. This study focused on South Africa, renowned for its inclusive infrastructure and legislative frameworks aimed at accommodating disabled people. (Makuyana & Dube, 2023) (Vanderschuren & Nnene, 2021) in South Africa, the constitution of 1996 protects the rights and participation of individuals with impairments, stating that 'no person or body, including the State and private companies, may unfairly discriminate directly or indirectly against any person on one or more grounds including race, gender, colour, age or disability'. In addition, South Africa signed and ratified the United Nations Convention on the Rights of Persons with Disabilities (United Nations, 2006), which called for disability inclusion and full and equal enjoyment of all human rights by persons with disabilities (United Nations, 2006). South Africa launched the White Paper on the Rights of Persons with Disabilities (WPRPD) in 2015 to align with the UNCRPD (Department of Social Development, 2015). The author aligns this study with South African laws promoting inclusion in the country's public transport system. After ratifying the UNCRPD, South Africa advanced policies and infrastructure to boost disabled people's socio-economic participation, including key initiatives such as: 1) The National Development Plan, which aims to eliminate poverty and reduce inequality by 2030; 2) The Public Transport Strategy of 2007, which mandated that new public transport systems be universally accessible; 3) The Implementation Strategy to Guide the Provision of Accessible Public Transport Systems, which provides guidelines for achieving universal access. The country observed inclusive transport solutions such as the Bus Rapid Transit (BRT) system of the Gauteng province, which came into effect in 2009 (Adewuni & Allopi, 2013). In addition, the Bus Rapid Transit (BRT) System in Gauteng has accessibility features to cater for disabled people (Chakwizira, Bikam, Dayomi, & Adeboyejo, 2011). In the past decades, the province has offered other transport solutions, such as e-hailing-based assistance, to individuals/passengers with impairments and those with access needs (Businesstech, 2017). The Gautrain caters for the needs of disabled people safely and affordably (Thomas, 2013). The study examines how post-UNCRPD policies and solutions are perceived and experienced by disabled users.

Disability in this study

Globally, disability and impairments are sometimes regarded and used interchangeably in various academic platforms (Makuyana, du Plessis, & Chikuta, 2022). Global North and South have not agreed on a single definition of disability (Mitra, 2006); therefore, defining disability is complicated

as it is ‘complex, dynamic, multidimensional and contested’ (World Health Organisation, 2011). The UN Convention on the Rights of Persons with Disabilities (UNCRPD) recognises disability as an evolving concept (United Nations, 2006). It defines persons with disabilities as those who have long-term physical, mental, intellectual or sensory impairments in interaction with various barriers that may hinder their full and effective participation in society on an equal basis with others on the Rights of Persons with Disabilities (UNCRPD) recognises disability as an evolving concept (United Nations, 2006). The fluid definition accommodates different understandings of disability or impairment (Schulze, 2016), but defining disability as an interaction makes clear that disability is not an attribute of the person (World Health Organization, 2001). Al Ju’beh (2015) alludes that impairment alone would not lead to a disability should there be a completely inclusive and comprehensively accessible environment (Al Ju’beh , 2015). It implies that disability can be regarded as a social construct; hence, addressing external societal barriers can reduce disabling experiences (Schulze, 2016). UNCRPD’s definition incorporates this Social Model perspective (Schulze, 2016). The study is rooted in the Social Model perspective, differentiating impairments and disability, whereby impairments are regarded as an attribute of one's physical, mental, intellectual or sensory functional limitations, while disability is participation restriction that results in the experiences or interaction of a person with impairments and the environmental factors. Thus acknowledging the definition provided by the World Health Organisation's International Classification and Functionings (2001) whereby disability results from a dynamic interaction between health conditions, limitation in performing activities and contextual factors (World Health Organisation, 2001), as the ICF also recognises the valuable insights of the `social model regarding environmental barriers (Kazuo, 2017). The article further nurtures the principles of self-representation of individuals (Barnes, 1991)). In this article, the 'voices' of people who are Deaf, people with hearing and physical impairments whose impairments in interaction with the environmental barriers hinder their social participation and are herein referred to as `disabled people` as per social model or `persons with disabilities` as aligned by the UNCRPD.

Aims and Questions

The goal is to complement existing literature by providing insights that enhance the transportation system's overall capability. This aligns with various national and provincial policy frameworks and programs, ultimately supporting the socio-economic participation of individuals with impairments on an equal basis with others (UNCRPD, 2006) to the greatest extent possible (Story, Mueller, & Mace, 1998). The study upholds the principles of self-representation for individuals who are Deaf, have hearing impairments, and have physical impairments in Gauteng. It aims to understand how disabled people perceive the inclusivity of available public transport in Gauteng, their transport preferences, and the barriers they encounter.

Public transport modes in this study

In this article, land-based modes of public passenger transportation fall into the following categories, which offer services in the study area:

Mini-bus taxis carry "between 9 and 16 seated persons, including the driver, and it is an unscheduled service operating on pre-determined route(s)" (Organisation for Economic Co-operation and Development, 2022).

E-hailing/App-based taxi services refer to online platforms which enable drivers to source passengers through Global Positioning Systems (GPS) technology and then connect drivers to that passenger requiring the service. (Organisation for Economic Co-operation and Development, 2022). Within South Africa, this study refers to services provided by Uber and Bolt.

Bus Rapid Transit (BRT), which in Gauteng refers to the one in Johannesburg named the `*ReyaVaya*` as well as the one in Tshwane (Pretoria) known as `*A Re Yeng*`, which is a scheduled, "high-capacity public transport service that runs on dedicated lanes on consistent journey times" (The World Bank, 2022)

Gautrain rail service is an 80 km long mass rapid transit railway system which connects a key economic hub, Johannesburg, Pretoria and OR Tambo International Airport in the Gauteng province of South Africa. "It provides two types of commuter rail services, namely: (1) General Passenger Services ("GPS") and (2) Airport Passenger Service ("APS"). Gautrain is a private-public partnership mostly utilised by the middle-income." (Organisation for Economic Co-operation and Development, 2022).

Significance and contributions

(Kett, Cole, & Turner, 2020) Moreover, (Verlinghieri & Schwanen, 2020) highlight that the exclusion of diverse population groups from transportation policymaking and research often impedes their socio-economic participation. There is thus a need for more probing into the transportation barriers faced by disabled people, particularly in developing countries, when commuting to and from work (Duri & Luke, 2022). While some qualitative research has been conducted in South Africa, these are mainly outside the Gauteng province. Most existing data is quantitative and does not adequately capture the daily experiences of disabled people who face access and inclusivity challenges (Pot, Koster, & Jorritsma, 2020) (Hwangbo, Stetten, Wandenkolk, & Classen, 2024). This article provides further insights to help policymakers in the public transport sector make transportation more inclusive, which is crucial given that over 35% of workers in South Africa use public transport to commute (StatsSA, 2021). Incorporating perspectives which are missing from academic research complements existing studies that seek to amplify the voices of disabled people towards their socio-economic participation (Park & Chowdhury, 2022).

Theoretical framework

This paper upholds the Social Model of disability viewing disability as a "social creation based on the relationship between people with different access needs and a disabling society and environment" (Oliver, 1996) (Barnes, 1991). These limiting factors in transportation encompass vehicle, infrastructure and information inaccessibility(König, Seiler, Alčiauskaitė, & Hatzakis, 2021). König, Seiler and Alčiauskaitė (2021), further argued that for transport systems to be inclusive and accessible to everyone, "it is important to consider all barriers that people with disabilities may experience along the transport chain". Therefore, access and accessibility to all modes of transport can determine the extent to which persons with disabilities fully and effectively participate in societal socio-economic activities as citizens with social justice and human rights holders (Urry, 2010). According to Oliver (2013), the social model calls for the need to identify and eradicate the disabling barriers, at the same time, making the public change their images of persons with disabilities such as (i) the transport

providers open their services to persons with disabilities; (ii) the legal system reforms to make it illegal to discriminate against persons with disabilities. The social model is considered to enable the theoretical understanding that despite individual-specific interventions in dealing with impairments, there is a need to have an inclusive transport system to reduce or curb disabling factors. (Aldred & Woodcock, 2008), in `Transport: challenging disabling environments`, used the social model to argue how car-dominated transport systems can be disabling to population groups beyond those conventionally recognised as "disabled people/ persons with disabilities". The environmental barriers to transport accessibility have also been emphasised by other scholars as a disabling factor (Blais & El-Geneidy, 2014) (Darcy & Burke, 2018), suggesting the social model can help lead to "demand for greater accessibility of transport" (Burchardt, 2004). In this context, the reader is encouraged to regard the inclusion of disabled people in all modes of public transport as an enabler towards participating in society. People (Park & Chowdhury, 2022) (Cepeda, Galilea, & Raveau, 2018); (Stanley & Stanley, 2021) (Blais & El-Geneidy, 2014). Societal barriers were thus found in this study and categorised accordingly, where participants offered solutions to curb these.

South African context

In the South African Context, a study by Lister (2016) investigated the financial regulations of the taxi industry and its impact on providing inclusive transportation (Lister & Dhunpath, 2016), this was however, an investigation focusing on EThekwini Municipality in KwaZulu Natal Province. In the Western Cape (Rivasplata & Le Roux, 2018) studied the perceptions of youth and their participation in cultural activities on public transportation and concluded the need for more reliable transport for youth, while (Visagie, Visagie, & Fredericks, 2023) described the psychological consequences of stroke survivors using wheelchairs on transport barrier and found that hat community mobility barriers led to wheelchair users` increased dependency and isolation. Frederick et al. explored a cooperative enquiry of wheelchair users' usage of mini-bus taxis as having barriers that hinder their community participation (Fredericks, Visagie, & van Niekerk, 2024). Though some of the studies have been conducted within the Gauteng Province, these draw from household surveys and captains of transport industries (Chakwizira, Bikam, Dayomi, & Adeboyejo, 2011). While Duri et al. (2022) used leading questions through quantitative surveys, the study further emphasised structural barriers such as architecture and design ((Duri & Luke, 2022) and not qualitative experiences and perceptions. There has been consistently limited accessibility and inclusion within the public transport system (Khuzwayo, 2011) as observed in the Department of Women, Youth and Persons with Disabilities report, including limitations observed based on experiences of disabled people, which reflected limited mobility centred around accessibility of and to public transport in South Africa (Department of Women, Youth & Persons with Disabilities, 2021). In this report, participants may have shared their lived experience-based discrimination towards access to employment, education, and health facilities due to inaccessible and unsafe public and costly transportation, which, in turn, affects the employment of disabled people; however, as it was not the primary objective, this study did not delve into barriers faced by disabled people against each transport mode, (i) Mini-bus Taxi; (ii) E-hailing or App-based taxi services; (iii) Bus Rapid Transit (BRT); (iv) Gautrain- rail, as well as their preferences and requests for ideas on improvements from the voices of users with impairments. Furthermore, although there have been studies that attempted to gather passengers` views (Raza, Koele, Makhafola, & Monyemangene, 2022) on experiences with public transport in Gauteng, such as the Gautrain railway services, reporting does not disaggregate the data according to

disability, thus providing limited or no directives for specific needs of disabled people. While the Department of Transport (DOT) administered a study that aimed to describe the impact of transport on students with disabilities in South Africa based on the complaints received by the department between 2010 and 2020 (Gibberd & Hankwebe, 2022), this study was done via an online survey which used responses from 24 complainants. Though studies such as these uncovered emerging issues, they acknowledged limitations in the scope, which led authors to call for further probing. Authors such as Duri et al. (2022) called for testing in a practical environment to understand the extent of barriers encountered from users' experiences. Therefore, this study aims to fill this gap by providing insights into the perceptions of disabled people about public transport in the Gauteng Province, which has been reported to have put inclusive transport measures in place after the ratification of the UNCRPD. The study shows the preferences of commuters with impairments for specific transport modes while highlighting the barriers encountered in each transport mode as they contribute to this limited body of knowledge. Therefore, study focuses on experiential aspects of disabled individuals in Gauteng, offering qualitative insights that contrast with the predominantly quantitative data available in existing research.

Methods

Study Design

The study followed an exploratory mixed method. A qualitative design (Poth & Creswell, 2017) allowed the study to use semi-structured interviews to gather data from the participants, and further data was collected through a survey targeting a different cohort of participants.

Data gathering

According to the General Household Survey (2022), Gauteng province had the highest percentage of households who make use of public transport, where 43,4% used mini-bus taxis, 2,7% used Mini-bus, and 3,7% used the train (StatsSA, 2022). "Trips to the workplace were the second most common purpose for household members to travel" (StatsSA, 2021), particularly in Gauteng, which is also the province with the highest employment levels amongst disabled people. Individuals with seeing difficulties showed the highest numbers of employment, followed by those with hearing and communication difficulties and then walking difficulties. (StatsSA, 2014).

Participants included Individuals who are Deaf or with hearing impairments, Visual impairments and physical impairments, who are working age between 20 and 60 years, which is within South Africa's economically active population ((StatsSA, 2023), travelling regularly within Gauteng Province in Urban and peri-urban areas to a place of employment, internship or learnerships. Participants were recruited through the National Council of and for Persons with Disabilities (NCPD), e-Deaf and Access Human Solutions(AHS). Convenience and snowballing sampling techniques were used because the respondents have hard-to-reach characteristics (Marpsat & Razafindratsima, 2010)). Through these channels, Individuals who were available (convenience) to participate constituted those with visual impairments, hearing impairments and/or Deaf as well as those with physical impairments, which is aligned with the Statistics South Africa (StatsSA) trends of employment levels amongst persons with difficulties. (Morse, 1994) recommends a minimum of six participants during qualitative interviews, while (Cresswell, 1998) recommended between five and twenty-five participants and

(Kuzel, 1992)recommended between six to eight to be sufficient in reaching data saturation (Morse, 1995). Therefore, this study interviewed 13 participants individually and 47 through three group interviews, upholding saturation and adequate opinions without unnecessary repetition among the targeted population. Furthermore, a survey was distributed, and 35 responses were received. However, only 26 of those were usable and included.

Results

Participants were asked about their general perceptions of various transport services, namely: (i) Mini-bus taxis, (ii) E-hailing or App-based taxis, (iii) Bus Rapid Transit (BRT), (iv) Private cars, and (v) Gautrain railway service. Table 1 depicts the identified themes, categories, and codes, indicating which categories were applicable to each mode of transport and expressed by individuals representing different types of impairments. The themes observed depicted a contrast between Preferred transport versus Used transport for regular transport modes versus actual usage, categorised by reliability, affordability, support, comfort, and safety. Gautrain was the most preferred mode of transport by participants (51.6%), followed by E-hailing/App-based taxis (35.5%), with only 6.5% preferring Mini-bus taxis and buses (6.5%). However, in terms of actual usage, participants reported that they most regularly used Mini-bus taxis (37.5%), followed by E-hailing/App-based taxis (33.3%), buses (16.7%), and lastly, the Gautrain (12.5%). See figure1.

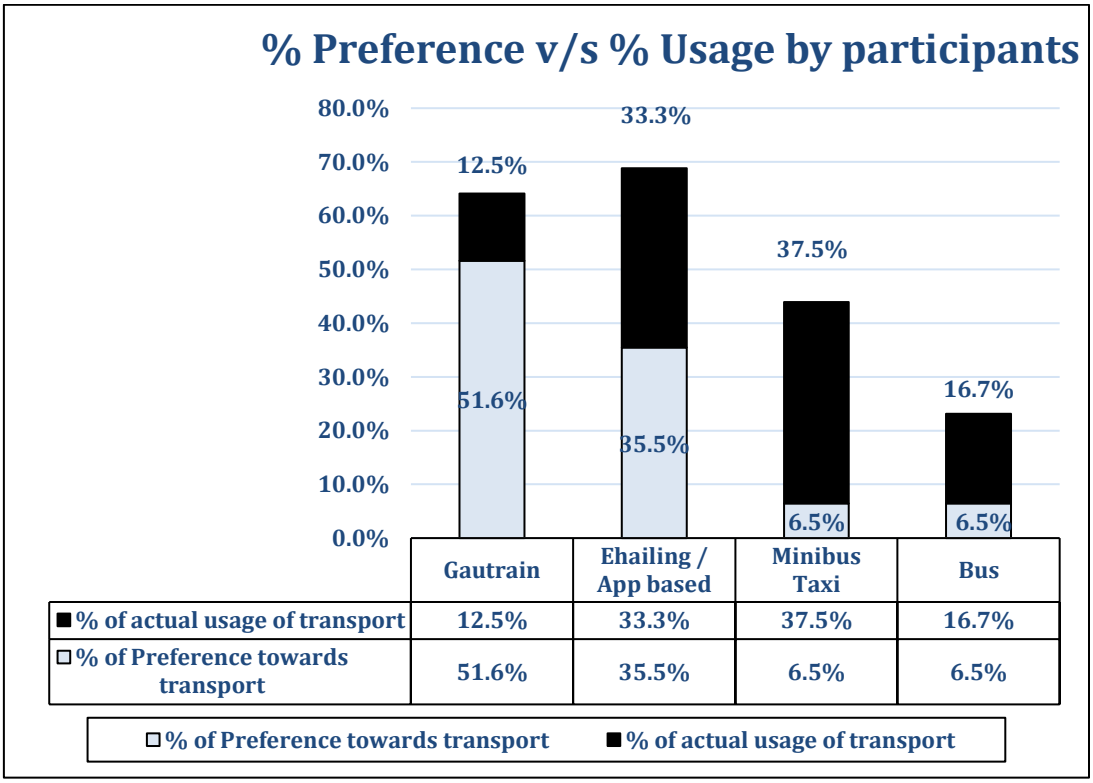

Figure 1: % Preferred v/s % Usage by participants

Another theme highlighted societal barriers as reported by participants (See table 1), categorised as attitudinal (e.g. attitudes, stigmas and perceptions), physical (e.g. such as those from the physical

environment and structures preventing physical access) and communication (such as those limiting the manner in which people access information or communicate (United Nations, 2018) (UNICEF, 2020) (AFDO, n.d.). Most participants expressed frustrations due to the physical barriers in public transportation, particularly those with physical and visual impairments, followed by communication challenges cited by individuals with visual and hearing impairments. Other prevalent issues included attitudinal barriers from impatient drivers and passengers and concerns about the additional costs of using public transportation.

Table: Thematic presentation and suggested solutions by participants

Theme	Categories	Codes	Transport	Impairment	Summary of suggested solutions
Preference of transport vs Actual usage	Preferred	Reliability "for my bladder management, Gautrain and Uber are reliable", "Not worried about Communicating in Gautrain", "sometimes I arrive late at work by taxi", "getting assistance from bus driver takes time", "someone needs to help with the bus", "convenient", "some taxis pass us." Comfort & Safety "feel safe", "Reduced inaccessibility in Gautrain", "Wait for long in a taxi." "vulnerable for robberies, have to push me for a distance to reach the station", "no need to explain me in Gautrain."	Gautrain e-hailing	Visual Hearing/Deaf Physical	*All Gautrain feeder buses to be accessible to reduce waiting time
	Used	Affordability “preferred option is expensive", "uber assist is expensive", "Gautrain is expensive." Availability "Only one available ", "don't feel safe walking alone to the station", "only use bus or taxi", "majority is not designed for us", and "some Gautrain buses will pass because they are not accessible ones." Support "When I use the same route, passengers know me", "Drivers already know me", some drivers are friendly."	Mini-bus Taxi, Bus	Visual, Hearing/Deaf, Physical	*Subsidies to offset additional costs incurred and barriers *all transport to be accessible for options * using modern technology like developing an app to reduce communication frustrations

Theme	Categories	Codes	Transport	Impairment	Summary of suggested solutions
Barriers	Attitudinal	<u>Driver:</u> "impatient driver", "Drivers attitudes", "Ignorant drivers", "cannot communicate", "make fun of my English", "not friendly", "Pay for wheelchair, "Pay for the caregiver", "operators lack awareness", "we need respect" "passengers ask why tapping on shoulders" <u>Passengers:</u> "people starring`, "passengers show discomfort", "waiting in long queues", "not friendly" "Being undermined", a wheelchair will make them dirty." <u>Limited support</u> "I need assistance", "waiting in long queues, "someone always has to help me get off."	Mini-bus Taxi Bus	Physical Hearing/Deaf Visual	*Awareness raising in communities *Training of driver *Basic sign language training *Installing PA system for stop announcements *Introducing voice commands *visible support staff for support
	Communication	Explaining to drivers/passengers /operators "Cannot communicate with driver", "not user friendly", "make fun of my English." <u>Being informed</u> "Can't see where I'm going", "Don't know when arriving at my stop", "no need to explain myself in Gautrain."	Bus e-hailing	Visual Hearing /Deaf	*Awareness raising in communities *Training of drivers *Basic sign language training *Installing PA system for stop announcements *Introducing voice commands *Visible signage at taxi rank and stations *Accessible signage at taxi rand and station *employing more attendants
	Physical	Infrastructure “Bus steps”, “gap between platform and train”, “Not user friendly”, “Not accessible”, “inaccessible” "slope steep", "some Gautrain buses will pass because they are inaccessible." Limited support "I need assistance", "Need extra space for my wheelchair", "majority is not designed for us", "someone always has to help me get off."	Bus Gautrain Minibus taxi	Physical Visual	*Ramps between gap and platform *wheelchair hoists * Subsidy for additional wheelchair *Subsidy for travelling with caregiver/assistant *Visible and trained staff for support

Mini-bus Taxi

Preference vs. Actual Usage

Preference vs. Actual Usage: Mini-bus taxis were participants' most regularly used transport mode (37.5%) despite being the least preferred (6.5%).

Barriers

Attitudinal Barriers: Participants expressed concerns regarding the attitudes of both drivers and passengers when using Mini-bus taxis. For example:

"*Taxis are impatient. They are not willing to wait for someone who may need support as they are chasing daily targets. They sometimes pass me by as a wheelchair user, which affects my punctuality at work."* (Participant with physical impairment)

"Drivers become concerned about the space that would be taken by the chair. I would be asked to pay extra for the wheelchair while passengers worry that the wheels of my wheelchair will make them dirty." (Participant with physical impairment).

Some participants suggested that raising awareness and training drivers and related staff on these challenges and their impacts could help. On the other hand, some drivers were reported to be friendly; establishing a relationship with the driver often led to a preference for the same taxi to and from work, providing a sense of safety.

Communication Barriers: Participants shared various challenges related to communication:

"It's difficult to inform the driver where you wish to get off. I sometimes get dropped off at the wrong place, despite trying to communicate with passengers next to me to alert the driver." (Deaf participant)

"One time, I tried to show the driver a map on my phone, but there was a misunderstanding, and the driver and passengers *made fun of me."* (Participant with visual impairment)

"I missed getting my change because I didn't hear when the driver called out. I sometimes avoid asking for my change to prevent the struggle of communicating, fearing that my English will be laughed at." (Deaf participant)

"It's confusing to see or get the taxi to where you intend to go, independently without relying on asking someone, because of poor signage at taxi pick up points and taxis do not have signage on their route and destination" (Participant with visual impairment)

*"Some hearing people will ask "Why are you touching me" "why are you tapping on my shoulder", and sometimes I end up missing my stop" (*Deaf participant)

Participants suggested solutions such as installing buttons for passengers to indicate their drop-off points, using voice commands or a PA system to announce stops, and providing basic sign language training for drivers.

Physical /structural Barriers: Participants also reported physical barriers, such as:

"I have to pay for a care worker and empty seats to get to my destination." (Participant with physical impairment)

"A taxi is inaccessible for my wheelchair." (Participant with physical impairment)

Individuals with physical impairments suggested improvements, including introducing automated hoists to lift wheelchairs into Mini-bus taxis and providing separate transportation dedicated to individuals with impairments or employers offering transportation services.

E-hailing or App-Based Taxi

Preference vs. Actual Usage

E-hailing services were the second most used (33.5%) and preferred (35.5%) transportation mode. They were perceived as comfortable and less frustrating, particularly for users of Uber Assist. However, they were found to be less affordable than Mini-bus taxis, and even within Uber services, Uber Assist was more expensive than standard Uber.

Barriers

Communication Barriers: Participants noted challenges with drivers who were not sensitised or trained to meet the needs of diverse passengers:

"I am often unaware of my surroundings, especially if I have arrived at my destination. Communication from the driver about where we are and assistance in getting into the car is a consistent challenge." (Participant with visual impairment)

On the other hand, Deaf participants emphasised the advantages of being dropped off near their destination when using a taxi, giving a sense of safety and comfort.

Bus Rapid Transit (BRT)

Preference vs. Actual Usage

Buses were the third most used transportation mode (16.7%) but considered the least preferred (6.5%). Participants with hearing impairments appreciated the availability of a button to indicate where they wanted to get off, which reduced communication frustrations. However, participants noted that buses do not provide a viable alternative during taxi strikes, highlighting the need for inclusive transport options.

Barriers

Attitudinal Barriers: sentiments shared resembled the below:

"Some bus drivers become annoyed when they must come out and physically place the ramp, which also annoys other passengers. It's better to have automated ramps." (Participant with physical impairment)

Communication Barriers: Communication challenges and suggestions were recorded below:

"I can't see where I'm going and don't know when I've arrived." (Participant with visual impairment)

Participants suggested the use of PA systems at bus stations with voice commands to keep visually impaired passengers informed.

Physical /Structural Barriers: Excerpts of some issues raised are as follows:

"The steps are steep, and even if the bus has a slope, I still need support because of the steep slopes, which affects my independence." (Participant with physical impairment)

"I don't use the bus because it has limited routes, and I have to walk long distances that are inaccessible and leave me vulnerable to crime when travelling alone." (Participant with visual impairment)

Participants recommended employing more attendants at bus stations to ensure safety and support for those who need assistance.

Gautrain Rail

Preference vs. Actual Usage

The Gautrain was the least used transportation mode (6.5%) but the most preferred (51.6%). Participants viewed it as the safest and most convenient, with facilities that foster communication and reduce physical/built-environmental barriers.

Barriers

Physical Barriers: Participants highlighted the issue of safety for wheelchair users due to:

“..gaps between trains and platforms” (Participant with physical impairment)

Thus, ramps could resolve the gap problem. Suggestions were made for the visibility and availability of trained staff or attendants to ensure order, safety, and support for passengers who need assistance.

Discussions

Mini-bus Taxi: The most used but least preferred

Most respondents (32%) reported using a Mini-bus taxi. This information follows a similar pattern identified by the Department Of Transport (DOT), showing that Mini-bus taxis accounted for 80% of

public transport trips cited. "The number of households who use taxis increased from 9.8 million in 2013 to 11.4 million in 2020." As mentioned by respondents, one of the positive reasons for using this transport is the affordability of the taxi as opposed to other modes, particularly for users who need more reliable and convenient options such as the Gautrain or e-hailing. With that being said, it's interesting to observe that most of the department's expenses were geared to commuter rail and developing the Gautrain and rapid bus transport systems. At the same time, heavy reliance on these systems decreased, and low-capacity modes of transport and mini-bus taxis grew (Businesstech, 2022)

Although the Mini-bus- taxi was the most used, participants preferred this transport the least due to the various barriers. Barriers included difficulties in boarding and disembarking due to the lack of necessary modifications to accommodate assistive devices for individuals with physical impairments. Communication barriers were prevalent amongst participants with hearing impairments who faced difficulties conveying their messages to drivers and passengers. Participants expressed frustrations from the impatience of drivers and passengers, including lack of understanding, which created a disabling environment for participants overall. These findings align with a study by Risvaplata and Leroux (2018), which concluded that transport, mainly the mini-bus taxi, played a critical role in facilitating participation in society for disabled youth in the Western Cape. Similarly, they observed that mini-bus taxis and buses were the most used transport modes, particularly in underprivileged areas. However, the train system in the Western Cape context, distinct from the Gautrain in this study, was seen as the least expensive in contrast with Gautrain, which was seen as the most expensive and thus less accessible due to costs. The challenges associated with the mini-bus taxi are further supported by Fredericks et al. (2024), who concluded that the inaccessibility of mini-bus taxis in the western Cape restricted the participation of wheelchair users in community activities.

Interestingly, this study revealed inconsistencies in the attitudes of drivers towards disabled people. While some participants shared their negative experiences, others reported positive interactions; however, this was possible after the participants established relationships with the driver due to regular commuting. In this instance, participants would also experience positive attitudes from other passengers, who would be travelling with them regularly for daily work trips. This suggests that familiarity can mitigate the attitudinal barriers in the mini-bus taxi system. Visagie (2003) observed a similar trend in the Western Cape, where participants noted goodwill from mini-bus taxi drivers; the reason here is, however, not apparent. It was also apparent that participants are disproportionately affected depending on the impairment. Deaf participants or those with hearing impairments reported fewer challenges compared to individuals with visual and physical impairments. For example, wheelchair users were additionally concerned about paying double for their mini-bus seats or travelling with someone to assist them. These individuals called for subsidies to offset these obstacles. Such transport concessions are not unique in South Africa, although participants demonstrated no awareness. The city of Tshwane introduced free rides on the Bus Rapid Transit system for disabled people. However, this service was only available during off-peak hours, from 08:30 am to 3:00 pm, and was limited to 20 trips per month (News24, 2021). This policy presents a significant challenge for the typical commuting hours of an average working South African.

These individuals would still need to travel to work during peak hours. This situation aligns with the Department of Public Works plans, announced in 2022, to ensure that subsidies are applied to mini-bus taxis ((Businesstech, 2022). However, progress on this initiative had yet to be reported at the

time of writing this paper. The department's action plan also intended to implement an electronic ticketing system by 2023/ 2024, but its status remains to be determined.

E-Hailing or App-Based Taxi: A safe but costly alternative

The e-hailing service Uber Assist was launched in the Gauteng province (Johannesburg) and is specifically geared towards individuals/riders with impairments and those who may need access (Businesstech, 2017). This was the second most used transportation mode by participants and considered the second safest mode of commuting needs, although it still poses some communication challenges amongst Deaf or users with hearing impairments and the driver. They indicated that Uber Assist is even more expensive than the regular Uber for persons with physical impairments. This validates the subsidy request imposed by participants.

Bus Rapid Transit System (BRT): Accessibility with remaining challenges

As part of South Africa's transport strategy, it aimed to make public transport accessible to over 85% of the population by 2020, focusing on disabled users. It is noteworthy that participants, particularly those Deaf and with hearing impairments, were pleased to highlight buttons that allow them to indicate their stop without communicating with anyone verbally as an enabling feature. However, the system is still seen to be concerning due to other physical and infrastructural barriers at bus stations and within the bus, as well as attitudinal barriers. The effects of the inaccessibility of the buses led to participants with physical impairments being late for work. At the same time, the trip to the station made them feel vulnerable to being crime targets, particularly in the early hours and late hours of commuting to and from work. Participants further noted that the BRT cannot be an ideal alternative even during Taxi strikes. This emphasises the need for inclusive transport across the board to provide options even in unforeseeable events. There is consistency in the findings of this study to those by Chakwizira et al. (2021), who observed study waiting times and the feeling of being vulnerable and unsafe. These barriers impede the ability of disabled people to use the BRT effectively and participate in society on an equal basis with others.

Regarding solutions proposed by participants (See Table 1), some are similar to those modelled in Santiago, Chile, where authors performed preference experiments using accessibility elements in the urban public transport bus system. Attributes of these accessibility features included "audio-visual information" (Cepeda, Galilea, & Raveau, 2018), bus elevation "access ramps" (Cepeda, Galilea, & Raveau, 2018). These were, however, based on leading questions through surveys, nonetheless revealed, "that individuals with

reduced mobility value at least twice the accessibility elements than people without reduced mobility." (Cepeda, Galilea, & Raveau, 2018). Such thus, highlights similarities found internationally.

Gautrain: The safest but inaccessible cost-wise

Considering that The Gautrain aimed to cater to the needs of individuals with impairments safely and affordably (Thomas, 2013), it was the most preferred transport amongst participants who favoured it for its safety, convenience and reliability. However, it was the least used for commuting in practice, primarily due to its high costs. Therefore, its expenses make it inaccessible to many disabled people

who otherwise prefer it due to its limited disabling features compared to other modes. These features, though valued, are insufficient to overcome the financial barriers that prevent broader usage, reflecting a broader issue of cost versus accessibility. Therefore, the economic burden outweighed the benefits. This critical finding further highlights the need for transport concessions, acknowledging that the playing field is not level as disabled users currently have limited inclusive options. The Gautrain is said to have expansion plans coordinated with a national rail master plan. (Businesstech, 2022). With these plans in place, it is an opportune time to evaluate based on the voices of the marginalised users for improvement and, in particular, highlight demand-side subsidies since the Department of Transport gazetted the National Public Transport Subsidy Policy in February 2024 (Department of Transport, 2024).

Concluding remarks

Despite existing policy instruments and strategies and ongoing independent research to inform practice, there needs to be more documented evidence of implementation progress. This research aimed to contribute to such; however, one would expect to find knowledge of tangible results, such as the action plan that was intended to be completed by 2023. The limited evidence of progress is further supported by the recent resolutions from the transport summit held in April 2024 in Gauteng, where the Department of Transport acknowledged the existence of barriers. The summit, however, pledged that universally accessible transport would be included in the 2024-2029 medium-term strategic framework, raising concerns about the potential regurgitation of older policies and plans as outlined earlier above, some of which date back to 2007. This is a concerning challenge as the recently gazetted policy on transport subsidy is said to be anchored on objects of the White paper on Transport policy, which further cites earlier policies confirming the importance of ensuring that transport is inclusive. Such incentives are also encouraged towards operators to cater for the needs of disabled people.

Conclusion

This study explored the perceptions of individuals who are deaf and those studying with physical and visual impairments on the inclusivity of public transport, including their preferred transportation mode and reasons thereof against what they use for their regular commuting. The study used the backdrop of existing policies that intended to ensure inclusivity in transport and highlighted the gap between the intended inclusivity of the public transport system in Gauteng and the actual experiences of working-age disabled people. Despite efforts to be inclusive, persistent physical, attitudinal and communication barriers continue to frustrate participants' socio-economic participation. The detailed exploration of user experiences across various transport modes revealed an interesting paradox, showing the disparity between preferred and actual transport usage, which highlighted the urgent need for more affordability schemes to be explored. At the same time, disabled people still have limited options while the need to commute regularly persists. This is particularly important because of the findings that although the most inclusive transport option with less physical, attitudinal and communication barriers is there, participants were compelled to use the mini-bus taxi, as the one which poses more of these barriers though the most affordable. This inverse relationship further brings to the surface economic challenges faced by disabled people who find themselves having to make compromises due to their financial limitations and limited inclusive transport options. The

research contributes to understanding public transport inclusivity in Gauteng by capturing the voices of disabled users and highlighting their unique challenges and needs.

Policy Implications

The findings suggest the following policy and strategy implications. Firstly, the study accentuates that the users know the solutions required to address their challenges; therefore, intentional inclusive transport planning actively engages disabled people in planning and decision-making, including continuous monitoring and evaluation of implementation. Secondly, the study points to the additional costs incurred by disabled people over and above study barriers. It is commendable that the transport subsidy policy has been gazetted. The policy highlights that contextually, in South Africa, public transport subsidies provide financial support to both users and operators.. However, evidence suggests that supply-side subsidies have been found to be more regressive than demand-side subsidies, which have been found to be redistributed better. It needs to be made clear how the policy implementation will be guided and implemented. However, regarding these prevailing issues highlighted in this study and by other authors, demand-side subsidy should be urgently considered. Key Recommended measures include making all feeder buses and transport options accessible, providing subsidies for additional costs, and using technology like apps to reduce communication barriers. Driver training, basic sign language skills, and community awareness campaigns are recommended to enhance understanding and support. Practical improvements include PA systems, voice commands, visible signage, ramps, wheelchair hoists, and trained support staff to assist passengers. This study does not mean current initiatives to curb existing barriers shouldn't continue. Reviews of the subsidy against whether the transport system has become enabling can be done, and adjustments can be made accordingly. Thirdly, there is a need for continuous education and sensitisation of transport providers, drivers, the public, and staff to create an empathetic service culture that recognises the dignity, as well as rights and of disabled people.

For academicians, the study had limitations inclusion biases of associated with qualitative interpretation, and snowballing method. The study also explored the perceptions of only individuals who participated in the research such as those with hearing impairments, as well as those with physical and visual impairments. Therefore, there is a need for wider and further probing in other provinces, encompassing all types of transport. For generalisability and effective implementation, the study informs leading questions for quantitative studies and encourages such. Additionally, the future studies could be enhanced through longitudinal and mixed methods. By addressing these gaps and implementing recommendations, policymakers and transport providers can create a more inclusive transport environment that enables disabled people in Gauteng to participate effectively and with dignity in socio-economic activities. This approach aligns with the South African constitution and other commitments under the UNCRPD on inclusion, underscoring the need for sustained efforts to translate policy into practice.

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Disclosure of Interest

The author reports that there are no competing interests to declare.

Data Availability Statement

The data supporting this research are available upon reasonable request, due to privacy from the corresponding author, Z.Y.Z Nzo.

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