

**TOWARDS A DISABILITY-INCLUSIVE URBAN TRANSPORT
SYSTEM IN ACCRA AND NAIROBI: A POLICY PRACTICE AGENDA
(SITUATE)**

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Prepared by:

Enoch F. Sam

Michael Munene

Esther Yeboah Danso-Wiredu

Samuel K. Hayford

Adams Osman

Elizabeth Kanini Wamuchiru

Edwin Oyaro Ondieki

Prince Kwame Odame



UNIVERSITY OF
EDUCATION, WINNEBA



UNIVERSITY OF NAIROBI

Executive Summary

Introduction

Disability is a significant global public health, human rights, and development issue—persons with disabilities (PWDs) experience relatively worse socioeconomic outcomes and poverty than their counterparts without disabilities. Available data indicates that an estimated 15% of the world's population (i.e., 1 billion people) live with some form of disability, with 2-4% experiencing significant difficulties in functioning. Nearly 80% of these people live in the world's low-income countries. In the context of Ghana and Kenya, about 3% (737,743 Ghanaians) and 2.2% (900,000 Kenyans) are PWDs, respectively. The population of PWD in urban areas will increase with the current urbanisation trends and advancements in science and technology, leading to a longer life expectancy.

Many PWDs lack equal access to health care, education, and employment opportunities, do not receive the necessary disability-related services, and experience exclusion from everyday activities. The 2006 United Nations (UN) Convention on the Rights of Persons with Disabilities (CRPD) provides a guiding framework for action towards an equitable world for PWDs. Although the CRPD does not have a specific Article on transport, it recognises the centrality of transport for PWDs to access a range of services, including homes, schools, healthcare facilities, workplaces, and leisure. Consequent to the CRPD, the United Nations has prioritised disability as a cross-cutting issue in the 2030 Agenda for Sustainable Development (i.e., the sustainable development goals- SDGs) with the aim of equity for all by 2030.

Ghana and Kenya are signatories to the UN Convention on the Rights of People with Disabilities, indicative of both countries' commitment to protecting the rights of PWDs and empowering them to guarantee participation. There are also legal and constitutional provisions (including the Persons with Disability Act 2006 (Act 715) and Disability Act 29 of the 1992 Constitution in the case of Ghana, and Article 54 of the Constitution of Kenya, 2010 and the Persons with Disability Act 2003 (Act 14 in the case of Kenya) meant to protect socially disadvantaged people.

Research has shown that (physical) mobility and accessibility are crucial for building and sustaining the social relations (social inclusion) critical for survival in (African) cities. Likewise, lack of mobility and accessibility are essential components of social exclusion. Diaz Olvera et al. (2013) contend that user needs and behaviour have rarely, if ever, been considered in transport (and in particular road infrastructure) planning in African cities. Sietchiping et al. (2012) argue that urban planning and transport infrastructure should be (re)designed with a particular focus on the wellbeing of the socially disadvantaged (PWDs inclusive). Several

authors have demonstrated that inaccessible environments create disability by creating barriers to social participation and inclusion, contrary to the basic tenets of the bio-psychosocial model of disability and, subsequently, the need to adopt universal design principles for the design of environments.

There is evidence in the literature on patterns of travel behaviour, types of travel and journey experiences of PWDs in higher-income countries. However, there is little evidence of the same in low-income African countries from a participatory perspective, a gap the SITUATE project seeks to fill.

Objectives

The study addresses *User Needs and Practices, Equity Issues, Safety, Health and the Urban Environment* with a broad objective of assessing the daily mobility patterns, needs, experiences and challenges of PWDs in accessing the urban transport systems in Accra, Ghana and Nairobi, Kenya comparatively. Further, the study examines the impact of the PWDs' mobility challenges and experiences on their social inclusion and participation in society. Along this line, the study addressed the following specific objectives and associated research questions:

- Assess the design of the urban transport system and form of Accra and Nairobi vis-à-vis the needs of PWDs.
 - a. How accessible are Accra and Nairobi's urban transport systems and forms to PWDs?
- Examine the mobility patterns and needs, experiences and challenges of PWDs in the two cities
 - a. What are the mobility patterns and needs (i.e., travel behaviour) of PWDs in Accra and Nairobi?
 - b. How do the existing urban transport system and form impact the mobility patterns and choices of PWDs in the two cities?
 - c. What are their experiences and challenges as they seek to interact with the urban transport system and form?
 - d. What factors represent the most significant impediment in their quest to be socially mobile and inclusive?
 - e. How best do they manage the challenges they face in the urban environment?

- f. How best do stakeholders (e.g., city authorities, planners and policymakers in the Metropolitan/Municipal/District Assemblies (MMDAs), public transport officials/staff including drivers etc.) know and understand the (mobility) needs, experiences and challenges of PWDs?
- Enumerate the views and recommendations of PWDs and the relevant local stakeholders on an inclusive urban transport agenda for Accra and Nairobi
 - a. What does this hold for the rest of Africa?
 - b. How transferrable is this knowledge to the other cities in Africa?

Methodology

The study sampled participants in Accra and Nairobi, the capital cities of Ghana and Kenya, respectively. A total of 229 (comprising 65 visually impaired, 68 deaf and 96 physical/mobility impaired) and 210 PWDs (69 visually impaired, 56 deaf and 85 physical/mobility impaired) were engaged in the study in Accra and Nairobi, respectively.

Apart from PWDs, the study also engaged drivers/transport operators and stakeholders in the regulations and management of transport services and disability organisations in Accra and Nairobi. The project adopted four research instruments: (1) an auditing instrument, (2) questionnaires for PWDs, (3) Journey Assess Tool (JAT) for an accompanied walk of PWDs on routine trips and (4) an Interview guide and Focus group discussions (FGDs) for key-informants and transport operators.

Before the pilot-testing of the instruments, stakeholder meetings were held between the project team and local stakeholders in Ghana and Kenya to discuss the developed research instruments. Several revisions were made to the research instruments (content validity) and pilot-tested in both countries to assess their validity and feasibility for official deployment in the field.

Verbatim transcription of the in-depth interviews and FGDs were done to capture the participants' words and the context of these words. The MaxQDA was employed for transcription, developing the coding framework (that categorised common ideas into discrete themes or categories) and applying the codes to various sections of the transcript. The coding allowed for two types of analysis: a direct and relational content analysis.

For quantitative analysis, the data collected with the questionnaire were coded within the SPSS Version 26 and screened to ensure no missing data or wrong data entry. The study generated descriptive statistics mainly; means, standard deviations, frequencies and percentages per the responses to the questionnaire and the results using bar charts and tables.

The study mapped roads in both cities using handheld GPS devices and assessed PWDs' accessibility per the roads. It also evaluated routes PWDs used in their daily mobility. The daily routes of PWDs tracked the accompanied walks of PWDs. We performed data interoperability to convert the formats of the collated spatial data by transforming their data formats to the ERSI Geodatabase feature class and later converting their coordinates to the World Geodetic System 84/ Universal Transverse Mercator 30N. Analysis performed for the facilities data and the road data was a Euclidean distance function which estimated the distance from these facilities. We produced maps to present the outputs from the Euclidean distance function and the route used by the PWDs on their routine trips/walks.

Findings

Policies and Institutional Framework

- Ghana and Kenya are signatories to the UN Convention on the Rights of People with Disabilities. This move indicates both countries' commitment to upholding international standards and guaranteeing the human rights of persons with disabilities.
- The spirit of the constitutional provisions has been reflected in Acts of Parliament, legalising mainstreaming disability issues in specific legal statutes and establishing specific institutions to oversee the mainstreaming of disability issues. Ghana's Persons with Disability Law (Act 715) of 2006 and Kenya's Persons with Disability Act of 2003 (Revised 2010). In addition, the Acts have transport-related and other key provisions; the transport infrastructure of both countries has specified provisions to enhance access and promote the inclusion of persons with disabilities. Specifically, the Disability Acts of both countries have a tax exemption for importing specialised vehicles for persons with disabilities. Besides, the laws required relevant state institutions to factor the needs of persons with disabilities into their respective transport system's design, construction, and operation.
- The data revealed that the ministries and institutions have been less effective in incorporating disability issues in their transport systems' planning, design, construction, and operation. Hence, the transport infrastructures in the cities of Accra and Nairobi fail to meet the needs of persons with disabilities to foster access, safety, and comfort of these individuals.
- Furthermore, institutions and agencies involved in the urban transport systems have not been applying universal design principles to ensure that the transport environments are

accessible to all people, to the greatest extent possible, without needing adaptation or specialised design (i.e., retrofitting). Consequently, the mobility of persons with disabilities is still hampered in Accra and Nairobi, curtailing the full participation of persons with disabilities in daily activities.

- Key cross-cutting issues which emerged from the data were: weak implementation and enforcement of the policies and legal provisions; non-compliance of public transport operators to standards provided in the law; lack of mainstream public transport systems, which are composed of poorly coordinated private and semi-public arrangements; inadequate physical infrastructure and poorly designed transport networks that do not incorporate needs of PWDs; weak capacity building and low level of awareness of universal design principles among key agencies dealing with disability issues; lack of public awareness and education on legal transport-related provisions of persons with disability; and lack of inspection and monitoring of the operation of urban transport systems.

Design and Form of Urban Transport

- From the individual case analysis, Accra and Nairobi have dense roads connecting different points of the cities. However, the empirical findings indicate that despite the dense street networks, some sections of the cities are not adequately served, posing accessibility challenges, especially for persons with disabilities. In summation, the physical design of the urban transport network in the two cities does not largely respond to the needs of people with disabilities.
- Regarding access to facilities, the data revealed that in Nairobi, religious places are more accessible while health facilities present the least accessible institutions. On the contrary, in Accra, religious and financial facilities recorded the least level of accessibility while all other social facilities recorded a moderate accessibility rating.

Mobility Patterns of PWDs

- There were notable similarities in the mobility patterns of persons with disabilities in both cities. For instance, most PWDs interviewed in Accra and Nairobi revealed that most of their journeys were for religious purposes, followed by healthcare services. Work-related trips were mostly weekly, while health-related journeys were made less frequently, mostly yearly, by persons with disabilities in both cities. In terms of

education (schooling), the study revealed that persons with disabilities in both cities undertook weekly journeys (90% in Accra and 54% in Nairobi). However, it was also evident that daily trips to leisure activities recorded the least frequency in both cities; the same patterns were recorded weekly and yearly for PWDs in Accra and Nairobi. Also, in Nairobi, the study's highest frequency of daily trips by persons with disabilities was undertaken for shopping purposes, while in Accra, daily journeys to shopping presented the least frequency of trips among PWDs.

- It was also the case that most PWDs in both cities experienced moderate to high impact of Covid-19 on their mobility.

Mobility Needs of PWDs

- Walking constituted the highest mode of transport for live-work trips for PWDs in Accra and Nairobi. In both cases, proximity to workplaces was the main reason for walking.
- In accessing health facilities, the most preferred means of transport for PWDs in Accra was the taxi because of convenience. In Nairobi, however, the preferred mode of transportation was the bus because of its affordability.
- Regarding the choice of transport, most of the PWDs interviewed in Nairobi cited the moderate to high influence of Covid-19 on the choice of transport. In contrast, most PWDs in Accra cited a lower influence of Covid-19 on their transportation choice as they continued to use similar modes pre-and during the Covid pandemic. Also, most PWDs in Accra preferred to use trotro to school, while their counterparts in Nairobi again preferred the buses for their affordability and space.
- To access leisure places, most PWDs in Nairobi resorted to walking due to nearness to leisure places and the convenience of walking, while those in Accra preferred to use taxis and trotro. The desire to enjoy 'distance' services unfamiliar to their daily living situations informed the use of taxis and trotro.
- Most PWDs in Nairobi resorted to walking to shopping areas because of proximity. At the same time, PWDs in Accra preferred trotro and taxis, especially on return journeys when inundated with shopping items. The taxis were more convenient, although relatively expensive. The use of buses followed by matatus to social events was preferred by PWDs in Nairobi, while those in Accra settled for trotro and taxis. In both instances, long distances to social events determined the choice of transport.

- Concerning religious facilities, the most preferred mode of transport in Nairobi was walking due to the short distances to such facilities. At the same time, taxis were dominant among PWDs in Accra for their lesser usage on transit compared to trotro and the convenience of being sent to their doorsteps.

Mobility Challenges of PWDs

- The lack of assistive devices constituted a major challenge experienced in urban transport systems in Accra and Nairobi.
- Also, both cities observed high-floor vehicles without ramps, especially among public transport vehicles such as trotros, matatus, taxis and buses. The height of vehicles and the non-availability of ramps or other assistive technologies hampered access to public vehicles for individuals with mobility problems, such as persons using wheelchairs, crutches, callipers and tricycles as compared to those with hearing or visual impairment.
- Poorly maintained or non-availability of sidewalks constituted a major accessibility challenge to PWDs, especially within residential areas compared to the city centre of both cities.
- Most PWDs in both cities cited the absence of traffic control measures such as traffic signals and dedicated pedestrian crossing lanes as a major challenge that poses difficulties in crossing urban roads. As a result, they cross the streets at undesignated points or seek help from well-wishers.
- Surprisingly, PWDs did not consider reading or understanding signs or lack of information as a major problem in both cities.
- The study further observes that most PWDs struggle to access designated bus stops in both cities, impinges their ability to access public transport. Regarding boarding or exiting public vehicles and the distance to the bus stop, these challenges affected some forms of disabilities more than others.
- The challenge of inadequate spaces for wheelchairs/crutches/walkers and generally those with mobility problems was more pronounced in the transport systems of both cities.
- Attitudes of bus drivers, conductors and other passengers presented some challenges for PWDs and impinged on access to the urban transport systems in Accra and Nairobi.
- Moreover, the absence of dedicated seat or any inscription that offered reserved seats to PWDs on public transport vehicles were prevalent in Accra and Nairobi. Most

PWDs in both cities considered the careless/reckless behaviours of motorists in traffic as a major challenge to accessing the urban transport system.

Level of Satisfaction with Urban Transport System

- Whereas all categories of PWDs interviewed in Nairobi were not satisfied with the scheduling of public transport, waiting time, travel time, comfort, and safety, there were variations of satisfaction among the PWDs in Accra.
- For instance, most PWDs in Accra were satisfied with the reliability of urban public transport and moderately satisfied with drivers' conduct. Notwithstanding, most PWDs were not satisfied with other indicators of satisfaction assessed.

Coping Strategies by PWDs

- The PWDs in both cities adopted various coping mechanisms to navigate the inaccessible, non-inclusive urban transport systems.
- The data revealed that PWDs in both cities adopted similar strategies depending on the issue at stake. Seeking assistance from others, especially in crossing streets, boarding and alighting from public vehicles, walking on poorly designed or maintained sidewalks or surfaces without ramps, and reading signage, was a common coping strategy.
- Taking a motorcycle is common where the distance to the bus stop is far. Ignoring and sometimes confrontation were strategies adopted in dealing with negative attitudes from drivers, conductors and other passengers.

Policy and Practice Recommendations

Given these challenges, the study specifically stressed the following policy and practice recommendations:

- The Ministry of Transport and the city councils (AMA and Nairobi city council, NCC) institutions responsible for transportation infrastructure and operation of the transport system should effectively incorporate disability issues guided by the universal design principles in the planning, design, construction, and operation of the transport system. As a result, the transport infrastructures in Accra and Nairobi will meet the needs of PWDs to foster access, safety, comfort, and inclusion.

- The National Council on Persons with Disabilities in Accra and Nairobi should be involved in decisions relating to the planning, design, construction and operation of the urban transport systems.
- Under all circumstances, the authorities mentioned above should apply the universal access design principles to ensure that the transport environments are accessible to all people to the greatest extent possible, with the possibility for adaptation and deployment of specialised design for PWDs. Doing so will allow the full participation of PWDs in the daily activities of the urban lives in Accra and Nairobi.
- Ghana and Kenya have Ministries of Transport and institutions such as the National Highways Authority, Urban Roads Authorities, and National Transport and Road Safety Authorities. These institutions have highly trained personnel who would benefit from regular sensitisation, through induction courses, on the mobility needs of PWDs. Such a constant reminder could guarantee appropriate planning and design of the urban transport network that responds to the needs of PWDs in the two cities and beyond.
- The study observed that regulation of urban public transport operations lies with the local government systems (e.g., Accra Metropolitan Authority (AMA) in the case of Accra and Nairobi City Council (NCC) in the case of Nairobi). These institutions should be responsible for managing the operations of the transport system and duly ensure that the transport unions or operators provide ramps, priority reserve seats, and ample space to keep mobility aids and other assistive technologies. Thus, comply with the local disability Acts and laws to facilitate easy mobility access to public transport vehicles such as trotros, matatus, taxis and buses.
- AMA and NCC should continuously maintain existing sidewalks and construct more to increase coverage within their jurisdictions (residential areas inclusive) to reduce the accessibility challenges of PWDs.
- AMA and NCC should ensure traffic control measures such as traffic signals and dedicated pedestrian crossing lanes to reduce the challenges their absence poses to PWDs in crossing urban roads. Further, the two entities should ensure that bus stops across the cities are designed and constructed to universal standards.
- National Transport and Road Safety Authorities and National Council on Persons with Disabilities in both cities should educate the public to change the attitudes of bus drivers, conductors, and other road users toward PWDs. This discrimination impinges PWDs' access to the urban transport systems in Accra and Nairobi.

TABLE OF CONTENTS

Executive Summary	i
LIST OF TABLES	xiii
LIST OF FIGURES	xiv
1.0 INTRODUCTION.....	1
1.1 Background and Motivation for the Project	1
1.2 Objectives	5
1.3 Significance of the Project	6
2.0 STATE-OF-THE-ART-REVIEWS.....	8
2.1 Introduction to Transport Infrastructures.....	8
2.2 Social Inclusion and Persons with Disabilities	10
2.3 The Concept of Disability and Theoretical Framework for the Study	11
2.4 Disability-Inclusive Transport and Legislations.....	13
2.5 Urban Transport System	15
2.6 Agencies and Institutions Responsible for Disability-Inclusive Transport Systems in Accra and Nairobi	18
3.0 METHODOLOGY	19
3.1 Study Areas.....	19
3.2 Target Population and Sample.....	19
3.3 Research Instrument	22
3.4 Pilot-Testing and Fieldwork	24
3.5 Data Processing and Analysis.....	25
3.6 Fieldwork Challenges	26
3.7 Ethical Considerations	27
4.0 RESULTS FOR ACCRA METROPOLIS, GHANA	28
4.1 General Description of Study Settings and Sample in Accra	28
4.2 Accra's Transport Design and Form.....	30
4.3 Urban Mobility Patterns and Needs of PWDs in Accra	33
4.4 Mobility Challenges of PWDs in Accra	39
4.5 Level of Satisfaction with Accra's Transport System	44
4.6 Assessment of the Disability Friendliness of Accra's Transport Systems	46
4.7 Coping Mechanisms of PWDs in Accra	49
5 ROLE OF KEY STAKEHOLDERS IN URBAN TRANSPORT IN ACCRA ..	50
5.1 Ghana Private Road Transport Union (GPRTU).....	50

5.2	Accra Metropolitan Assembly	55
5.3	National Council on Persons with Disability (NCPD), Ghana	57
6	CASE STUDIES ON PWDS' MOBILITY EXPERIENCES AND CHALLENGES IN ACCRA.....	59
6.1	Case Study 1 of PWDs Experiences in Accra	59
6.2	Case Study 2 of PWDs Experiences in Accra	61
6.3	Case Study 3 of PWDs Experiences in Accra	64
7.0	RESULTS FOR NAIROBI CITY, KENYA.....	66
7.1	General Description of Study Settings and Sample	66
7.2	Nairobi's Transport Design and Form	67
7.3	Accessibility Analysis	68
7.4	Urban Mobility Patterns and Needs of PWDs	69
8	EXPERIENCES OF PWDS IN NAIROBI, KENYA	74
8.1	Mobility Challenges of Urban Transport Systems in Nairobi	74
8.2	Level of Satisfaction with Nairobi's Transport System.....	78
8.3	Assessment of the Disability Friendliness of Nairobi's Transport Systems.....	79
8.4	Coping Mechanisms by PWDs	81
9	ROLE OF KEY STAKEHOLDERS IN URBAN TRANSPORT	83
9.1	Matatu Operators	83
9.2	Focus Group Discussions with Other Road Users.....	84
9.3	The National Transport Safety Authority (NTSA), Nairobi.....	86
9.4	The National Council of Persons with Disabilities (NCPWD), Nairobi	87
10	CASE STUDIES ON PWDS' MOBILITY EXPERIENCES AND CHALLENGES IN NAIROBI.....	89
10.1	Case Study 1 of PWDs Experiences in Nairobi.....	89
10.2	Case Study 2 of PWDs Challenges in Nairobi	91
10.1	Case Study 3 of PWDs Challenges in Nairobi	92
11	COMPARATIVE ANALYSIS (ACCRA AND NAIROBI)	94
11.1	Introduction.....	94
11.2	Policies and Institutional Framework	94
11.3	Design and Form of Urban Transport.....	96
11.4	Mobility Patterns of PWDs.....	96
11.5	Mobility Needs of PWDs.....	97
11.6	Mobility Challenges of PWDs.....	97

11.7	Level of Satisfaction with Urban Transport System.....	98
11.8	Coping Strategies by PWDs	99
11.9	Conclusion on Comparative Analysis of Accra and Nairobi Transport System	99
12	POLICY AND PRACTICE RECOMMENDATIONS	100
13	BIBLIOGRAPHY	103

LIST OF TABLES

Table	Page
1 Sample distribution in Accra and Nairobi	20
2 Demographic information about PWDs interviewed with the general questionnaire	28
3 Accessibility of facilities and activities in Accra to PWDs	33
4 Change in mode of transport because of Covid-19.....	37
5 Effect of challenges of the transport system on desire to travel more for various activities	38
6 Effect of Covid-19 on desire to travel more for various activities	38
7 Summary of urban transport challenges faced by PWDs in Accra per disability type.....	40
8 Challenges faced by PWDs in accessing transport system in Accra-Ghana per gender	41
9 Vehicle audit results	42
10 Level of satisfaction with transport system in Accra.....	45
11 Challenges and coping strategies	49
12 Demographic information about PWDs interviewed with the general questionnaire in Nairobi	66
13 Desire of PWDs to travel in Nairobi curtailed.....	73
14 Effect of Covid-19 on Desire to Travel More for Various Activities.....	73
15 Challenges faced by PWDs in Nairobi	74
16 Challenges faced by PWDs in accessing transport system per gender.....	77
17 Level of satisfaction with transport system in Nairobi.....	78
18 Challenges and coping strategies of PWDs in Nairobi.....	82

LIST OF FIGURES

Figure	Page
1 Kwame Nkrumah Circle (A), 37 Lorry Station (B), Kaneshie Lorry Station (C) and Tema Station in Accra (D)	21
2 Main bus station (A), Matatu station (B) and Kencom bus stop (C) in Nairobi	22
3 Road network of Accra Metropolis	30
4 Accessibility index based on distance	32
5 Frequency of access to service facilities	34
6 Average time to access services	34
7 Routes taken with PWDs on accompanied walk in Accra	35
8 Preferred mode of transport for activities and trips	36
9 Disability friendliness of transport system at the community level	46
10 Disability friendliness of transport system in entire city (Accra)	47
11 Stress levels of PWDs navigating transport system at the community level	48
12 Stress level of PWDs navigating transport systems in the entire city	48
13 Priority seating positions for PWDs	53
14 Ayalolo Buses (BRT buses)	56
15 Nairobi Road Network	68
16 A network analysis of key institutions in Nairobi	69
17 Frequency of access to service facilities in Nairobi	70
18 Average time to access services in Nairobi	71
19 Preferred mode of transport for activities and trips in Nairobi	72
20 Status of sidewalks in residential areas	76
21 High staircases on Public Service Vehicles	76
22 PWDs crossing the roads	76
23 Disability friendliness towards PwDs at the community level	79
24 Disability friendliness towards PwDs at the city level	80
25 Stress Level of the PWDs on their Journeys in their community	80
26 Stress Level of the PWDs on their Journeys in the entire City	81

1.0 INTRODUCTION

1.1 Background and Motivation for the Project

Disability implies impairment, activity limitation and participation restriction (Leonardi et al., 2006). Disability is a major global public health, human rights, and development issue. As a development issue, persons with disabilities (PWDs) experience relatively worse socioeconomic outcomes and poverty than their counterparts without disabilities (Quinn & Degener, 2002a; World Health Organization, 2011). Given its complex, dynamic and multidimensional nature, there seems to be little agreement on definitions and internationally comparable information on the incidence, distribution, and trends of disability (World Health Organization, 2011). Likewise, perspectives on disability have changed from a focus on the individual in respect of the health condition (medical model) to a structural, social viewpoint (social model) where a person is deemed disabled by society rather than by the body or health condition (Oliver, 1990). Currently, there seems to be a drift towards the bio-psycho-social model, which represents a balanced approach (combining all models) to viewing disability given the different aspects of disability (Shakespeare, 2006; Forsyth et al., 2007).

Available data indicates that an estimated 15% of the world's population (i.e., 1 billion people) live with some form of disability, with 2-4% experiencing significant difficulties in functioning. Nearly 80% of PWDs live in low-income countries (WHO, 2011, 2020). In the context of Ghana and Kenya, about 3% (737,743 Ghanaians) and 2.2% (900,000 Kenyans) are PWDs, respectively. However, of the total number of PWDs in Kenya, 2% are said to experience mobility difficulties (Ghana Statistical Service, 2012; Kenya National Bureau of Statistics, 2020; Picton, 2011). It is important to note that the population of PWDs will increase (especially in the urban areas) as the world continues to urbanise and witness advancements in science and technology, leading to longer life expectancy. As people age, they develop different problems and difficulties leading to some form of disabilities—mobility problems, hearing and vision malfunctioning due to old age.

It is factual that many PWDs lack equal access to health care, education, and employment opportunities, do not receive the necessary disability-related services, and experience exclusion from everyday life activities (World Health Organization, 2011). The 2006 United Nations (UN) Convention on the Rights of Persons with Disabilities (CRPD) provides a guiding framework for action towards an equitable world for PWDs. Article 9.1 of the CRPD states:

"To enable persons with disabilities to live independently and participate in all aspects of life, States Parties shall take appropriate measures to ensure to persons with disabilities access, on an equal basis with others, to the physical environment, to transportation, to information and communication, including information and communications technologies and systems, and to other facilities and services opened or provided to the public, both in urban and in rural areas" (p.9).

Although the CRPD does not have a specific Article on transport, it recognises the centrality of transport for PWDs to access a range of services, including homes, schools, healthcare facilities, workplaces, and leisure (Kett et al., 2020).

Consequent to the CRPD, the United Nations has prioritised disability as a cross-cutting issue in the 2030 Agenda for Sustainable Development (i.e., the sustainable development goals-SDGs) with the aim of equity for all by 2030. All the 17 SDGs are relevant for PWDs. However, SDG 11, 'Making cities and human settlements inclusive, safe, resilient and sustainable,' has a specific target (11.2) *'By 2030, provide access to safe, affordable, accessible and sustainable transport systems for all, improving road safety, notably by expanding public transport, with special attention to the needs of those in vulnerable situations, women, children, persons with disabilities and older persons;* and an indicator (11.2.1): *'Proportion of population that has convenient access to public transport, by sex, age and persons with disabilities'.*

Accessible (public) transport system gives PWDs access to education, employment, and healthcare, as well as contacts with family and friends (social inclusion) with implications for other SDGs: Goals 1 (No Poverty), 2 (Zero Hunger), 3 (Good Health and Well-Being) and Goal 10 (Reduced Inequalities). Moreover, the New Urban Agenda also commits to improving road safety and sustainable mobility and transport infrastructure for PWDs (UN HABITAT, 2016). It is worth noting that moving and travelling independently is fundamental to breaking the downward spiral of dependence and poverty. On the individual level, as well as allowing for greater social inclusion, an ability to travel implies the individual is independent and capable of participating fully in society. The opportunity for social interaction thus inspires social inclusion (DETR, 2001; Kenyon et al., 2002).

Ghana signed and ratified the UN Convention on the Rights of People with Disabilities in 2007 and 2012 to become the 119th and 32nd country globally and in Africa, respectively, to

do so. This move indicates the country's commitment to protecting the rights of PWDs and empowering them to guarantee participation. Ghana has several legal and constitutional provisions (including the Persons with Disability Act 2006 (Act 715) and Disability Act 29 of the 1992 Constitution) that protect socially disadvantaged people. Besides these, disability mainstreaming reflect in several other Acts of Parliament and policies. There is a 10-year moratorium within which all public buildings should comply with the accessibility criteria provided in law (Ocran, 2019). Kenya, on the other hand, has also made progress toward protecting and promoting the rights of PWDs via constitutional provisions and laws such as Article 54 of the Constitution of Kenya, 2010 and the Persons with Disability Act 2003 (Act 14).

Research has shown that (physical) mobility and accessibility are crucial for building and sustaining the social relations (social inclusion) vital for survival in (African) cities (Porter, Abane & Lucas, 2020). Likewise, lack of mobility and accessibility are important components of social exclusion. Wixey et al. (2005) argue that social groups (including PWDs) differ according to the need to access different goods and services and their ability to do so, their physical condition, psychological state, the resources at their disposal, and the local availability of suitable transport and land use facilities. They further argue that whilst socially disadvantaged groups may have different activity needs; they share a common experience of social exclusion due to low incomes and the associated effects of poverty.

Diaz Olvera et al. (2013) contend that user needs and behaviour have rarely, if ever, been considered in transport (and in particular road infrastructure) planning in African cities. On their part, Porter et al. (2020) maintain that the practice in African cities, over the years, has been to implement plans that focus on auto-mobility and their fit within the wider urban management agenda, reflecting what King (2000) describes as "a technocratic approach to administration". Porter et al. (2020) contend that a technocratic approach to planning is often problematic in transport sector decisions. Given this, Sietchiping et al. (2012) argue that urban planning and transport infrastructure should be (re)designed with a particular focus on the wellbeing of the socially disadvantaged (PWDs inclusive). They also reiterated the need for a better understanding of the user needs of different socially excluded groups amongst transport professionals and policymakers/stakeholders. Consequent to this technocratic approach to planning and administration, the physical and spatial configuration of much of the built environment in African cities (Accra and Nairobi inclusive) does not reflect nor cater for the

needs of PWDs (Imrie, 2000; Adam et al., 2017, Danso, Ayarkwa & Dansoh, 2011; Tudzi, Bugri, & Danso, 2017). King (2000) reasons that this apparent neglect of the needs of "special needs" road users (i.e., older road users, school children, and PWDs) in transport and road infrastructure planning and implementation stems from the fact that the problems of these road users are as the "tip of the iceberg" (i.e., insignificant to warrant special attention).

Several authors have demonstrated that inaccessible environments create disability by creating barriers to social participation and inclusion (Hine & Mitchell, 2001b; Davies, 1999; Tyler, 1999), which is contrary to the basic tenet of the social model of disability and subsequently the need for universal design principle. On the other hand, the universal design principle advocates for products, communication and a built environment that is user-friendly and sustainable (Vandebelt, 2001). King and King (2014) observed that the road environment in many low- and middle-income countries (LMICs) is often inaccessible for PWDs because these infrastructures lack footpaths and often blocked by vehicles, rubbish, vendors or roadside furniture. They also lack essential mobility features that would assist PWDs. Coupled with this are the unsafe traffic environments, which compromise the safety and accessibility of vulnerable road users and present further challenges to PWDs. The SDGs' achievement concerning PWDs requires addressing these issues (King & King, 2014). King (2000) and Whitzman et al. (2013) maintain that improved accessibility for PWDs may go a long way to benefit other vulnerable road users (including the aged, children and cyclists).

A study by the Global Alliance on Accessible Technologies and Environments (GAATES) Transport Committee (2013) offers additional perspectives on the accessibility and inclusion needs of PWDs. The study reported that PWDs face two important challenges: inaccessible public transport vehicles and drivers and transport operation staff attitudes. The study recommended, "technical guidance on inclusive design solutions aimed at civil engineers, planners, etc.; guidance/information aimed at transport providers/senior management in transport companies; guidance/information aimed at people with disabilities to empower them; and guidance/information aimed at politicians about the UN Convention" (GAATES, p. 7, quoted in Kett et al., 2020).

There is evidence in the literature on patterns of travel behaviour, types of travel and journey experiences of PWDs in higher-income countries. Yet little evidence of the same from low-income countries and in Africa exists, from a participatory perspective, a gap the SITUATE project seeks to fill. Kett et al. (2020) suggest that "to deliver an inclusive transport system

requires a joined-up approach that focuses not only on the what, but also on the how" (p.5) – i.e., the type of transport provided and how it is delivered. Much of the existing research around accessible transportation have tended to compare transport use between PWDs and non-PWDs, rather than between the different categories of PWDs (as project SITUATE seeks to do), culminating in a paucity of evidence on what works for specific groups. This tends to promote a one-size-fits-all solution to the varied mobility needs, experiences and challenges of the different categories of PWDs (i.e., the hearing impaired; visually impaired; physically impaired; and mentally impaired) (Kett et al., 2020) as well as the aged. The varied perspectives of the different categories of PWDs can help understand their varied transport and mobility needs (and rights), which is key to an inclusive transport agenda. This study proposes the inclusiveness of cities and human settlements for PWDs – in line with SDG 11.2. As Kett et al. (2020) rightly advocate, the time has come for a paradigm shift from a focus on just accessible urban transport system and form for PWDs to an inclusive urban transport system and form for PWDs (and by extension to all socially disadvantaged groups).

1.2 Objectives

The study addresses *User Needs and Practices, Equity Issues, Safety, Health, and the Urban Environment* with a broad objective of assessing the daily mobility patterns, needs, experiences and challenges of PWDs while accessing the urban transport system in Accra, Ghana and Nairobi, Kenya comparatively. Further, the study examines the impact on the PWDs' mobility challenges and experiences on their social inclusion and participation in society. Along this line, the study addressed the following specific objectives and associated research questions:

Assess the design of the urban transport system and form of Accra and Nairobi vis-à-vis the needs of PWDs

- a. How accessible are Accra and Nairobi's urban transport systems and forms to PWDs?

Examine the mobility patterns and needs, experiences and challenges of PWDs in the two cities

- a. What are the mobility patterns and needs (i.e., travel behaviour) of PWDs in Accra and Nairobi?

- b. How do the existing urban transport system and form impact the mobility patterns and choices of PWDs in the two cities?
- c. What are their experiences and challenges as they seek to interact with the urban transport system and form?
- d. What factors represent the most significant impediment in their quest to be socially mobile and inclusive?
- e. How best do they manage the challenges they face in the urban environment?
- f. How best do stakeholders (e.g., city authorities, planners and policymakers in the Metropolitan/Municipal/District Assemblies (MMDAs), public transport officials/staff including drivers etc.) know and understand the (mobility) needs, experiences and challenges of PWDs?

Enumerate the views and recommendations of PWDs and the relevant local stakeholders on an inclusive urban transport agenda for Accra and Nairobi

- a. What does this hold for the rest of Africa?
- b. How transferrable is this knowledge to the other cities in Africa?

1.3 Significance of the Project

The study has provided in-depth knowledge and understanding of how the existing urban transport systems and forms in Accra and Nairobi shape the travel/mobility patterns, needs, and experiences of persons with disabilities (PWDs) in the two cities.

The study has revealed to the team and stakeholders in both countries the restrictions imposed by the urban transport systems on PWDs' participation in daily activities of life and how these restrictions have induced varying levels of social exclusion of PWDs in the two cities.

The project outcomes have culminated in producing articles to be published and disseminated at different fora, including relevant conferences, to share the knowledge produced through the study.

The project team members have started using the knowledge gained from the study to re-shape course/resource materials on disability studies, research, policy and practice issues. For instance, a member of the team that the Ministry of Education currently engages in reviewing the National Inclusive Education Policy has used the study's outcome to make a case for an inclusive transport system to contribute to the implementation of inclusive education in Ghana

The project team anticipates that the project outcomes would contribute to a better understanding of PWDs' access to transportation in urban Ghana and Kenya, culminating in a policy and practice paradigm shift; disability-inclusive urban transport systems and forms in Accra and Nairobi, and the rest of Africa.

Policymakers and urban transportation planners in the two countries would have a rich reference resource to inform decisions on the design and construction of urban transport infrastructure to meet different mobility patterns of PWDs. Further, the insights would help to develop valid, precise measures toward more sustainable forms of mobility. Along these lines, the project team hopes to collaborate with identifiable stakeholders in further research, advocacy and funding search to actualise the project outcomes beyond this project.

The study recommendations are the project team's modest contributions toward the efforts to realise SDG 11, specifically, 11.2.

2.0 STATE-OF-THE-ART-REVIEWS

2.1 Introduction to Transport Infrastructures

Transport infrastructure and systems play critical roles in the everyday lives of individuals in every country, including those with disabilities. Globally, individuals without and those with disabilities use the transportation system to access schools, health facilities, markets, and workplaces. However, PWDs have continued to experience many barriers in accessing transport systems in their countries over the years. Barriers to transport severely limit the life of many PWDs. Some PWDs willing and able to work cannot do so because of inadequate accessible transport systems (Baris & Uslu, 2009). Others cannot shop, socialise, enjoy recreational or spiritual activities, or even leave their homes for the same reason. Some individuals with disabilities must live in institutions solely because of transport constraints; otherwise, they cannot attend medical appointments (Baris & Uslu, 2009). Kirschbaum et al. (2001) suggested that transportation policies focus on motorists' needs but forget pedestrians'. However, the Scottish Executive Social Research (2006) posits that the quality of the pedestrian environment is key to facilitating equal access to the public transport network for persons with disabilities, who usually encounter many obstacles in the street environment (Eck, 2004).

Literature shows limitations to accessing public spaces and transportation systems stand out as the most crucial physical exclusion (Danso, Atuahene & Agyekum, 2019) of PWDs. Fears of crime and intimidation increase the likelihood of PWDs re-evaluating what constitutes an essential trip, which results in shrinking journey prisms and increases social isolation. Inability to travel freely can seriously restrict the ability of PWDs to carry out activities in daily living. For example, 25% of PWDs (and 50% without a car) report that inaccessible transport restricts their leisure pursuits (Tyler, 2002). The University of Westminster's Transport Studies Group (2005) reported that the ability of a person with a disability to complete a journey successfully depends on the accessibility of the street and bus stop infrastructure and system.

In many cases, the absence of a safe road crossing close to the bus stop provides a sufficient deterrent. The Group, therefore, argues that applying more stringent parking controls around bus stops, raising the height of the kerbs, and improving access to the bus stop facilities

and accessible information, can promote the creation of an inclusive transport system. The researchers argue that PWDs experience more travel restrictions in countries like

Studies from the United States, India, Malaysia, and Japan have reported that PWDs experience challenges such as inaccessible bus stops and stations, issues with intersections, street crossing and lighting (Bezyak, Sabella & Gattis, 2017; Devi et al., 2013; Erin, 2011; Soltani et al., 2012; Stevens, 2007). In the United States, lack of accessible transport is the greatest factor affecting the employment, education, healthcare, and overall social inclusion of persons with disabilities (Aldred & Woodcock, 2008; Casner-Lotto & Sheard, 2009; Lubin, 2012). In 2002, 6 million PWDs in the United States experienced difficulties accessing the transport system. These individuals were part of 15 million people in the United States who experienced difficulties accessing the required transport system. Of that figure, 3.5 million never left their homes, including 1.9 million PWDs. Consequently, more than a million people with disabilities never left their homes during that period because of transportation difficulties (U.S. Department of Transport, 2003). In Malaysia, Soltani et al. (2012) posited that persons with disabilities experience insecurity when boarding and alighting from inaccessible vehicles.

Other transport challenges that persons with disabilities encounter are related to the absence of functioning transportation equipment such as ramps (Sheer, Kroll, Neri & Beatty 2003, Rapengo & Ravaud, 2017; Naami, 2019), lack of safety facilities (Sheer, Kroll, Neri & Beatty 2003), inaccessible information for scheduling reservations, and lengthy waiting and travelling times (Bezyak et al., 2017; Church & Marston, 2003; Zambia-Banda-Chalwe & De Jonge, 2013); cost of services (Church & Marston, 2003; Zambia-Banda-Chalwe & De Jonge, 2013); as well as reliability of services (Bezyak et al., 2017; Lubin, 2012; Rapengo & Ravaud, 2017; Wu, Gan, Cevallos, & Shen, 2011). These barriers are more profound in low- and middle-income countries. Indeed, unlike pertains in high-income countries, accessible public transport systems are not adequate or unavailable in low- and middle-income countries (Bezyak, Sabella & Gattis, 2017; Naami, 2019, 2014; Tijm, Cornielje & Edusei, 2011; Vergunst et al., 2015; Wu, Gan, Cevallos & Shen, 2011), including Ghana and Kenya. Consequently, in low- and middle-income countries, persons with disabilities are compelled to use private transportation such as door-to-door transport and taxi services, which are more expensive (Banda-Chalwe & De Jonge, 2013; Naami, 2019; Sheer, Kroll, Neri & Beatty; 2003).

As stated earlier, lack of access to the transport system adversely impacts the well-being of persons with disabilities and greatly limits their full and effective participation in mainstream

society (Hurd, Morrow, Kaufman & An, 2009). Barriers to the transport system also negatively affect the economic, educational, political and social lives of persons with disabilities (Naami, 2019). These erode governments' efforts to equalise opportunities for such people as championed by the United Nations Standard Rules for the Equalisation of Opportunities for Persons with Disabilities. Katzmman (2010) has therefore cautioned governments to provide accessible transportation infrastructure to citizens with disabilities. On their part, Axelsson and Barrett (2009) have argued that a good transport system must provide mobility and accessibility to ensure both safety and efficiency in its usage.

In Ghana and Kenya, although laws guaranteeing the rights of persons with disabilities to disability-inclusive transport systems exist, limited specialised vehicles for persons with disabilities and vehicles imported for commercial purposes are mostly not disability-friendly. These vehicles do not have adequate space or mechanism to facilitate boarding by persons with disabilities, particularly those with mobility impairments and blindness (Ngnenbe, 2020). Also, some transport operators, such as drivers and their mates, regard persons with disabilities as a burden and subsequently charge an extra fee to convey their accessories and mobility aids such as crutches and wheelchairs to their destinations (Ngnenbe, 2020).

2.2 Social Inclusion and Persons with Disabilities

Persons with disabilities are discriminated against and systematically excluded from day-to-day activities due to deeply entrenched cultural beliefs and practices (Hayford & Avoke, 2018). These deeply rooted cultural beliefs and practices play out at different levels. For instance, persons with disabilities and other vulnerable people experience exclusion within the household and through family power dynamics, which replicate the structure of the wider society. Practices of exclusion continue at the community level and translate into formal and informal institutions (World Bank 2013, see Bordia Das et al., 2017).

Social inclusion encompasses the process of improving how individuals and groups participate in societal activities; it focuses on improving the ability, opportunity, and dignity of disadvantaged people based on their identity to participate in society (Kelly Luke, 2019). Social inclusion guarantees certain rights to everyone in a society, such as the right to employment, adequate and appropriate housing, quality health care, education, training, right to vote, right to give opinions, and right to free movement (Adhikari, 2016). Social inclusion describes how a society includes all its citizens, addresses differences, provides basic needs, safeguards

fundamental human rights and engenders full participation in day-to-day activities (Adhikari, 2016). A change toward social inclusion is about addressing the political economy and power relations at both local and national levels.

It is noteworthy that excluded groups, such as persons with disabilities, often lack a voice and the power to influence decisions (Bordia Das et al., 2017). To address this systemic exclusion of persons with disabilities, the project evoked the saying, 'nothing about us without us' (Charlton, 2000). Subsequently, persons with disabilities engaged in the project phases as key stakeholders. Also, aware of the heterogeneity of persons with disabilities, the project deployed various means of consultations and involvement of stakeholders to guarantee full participation. For instance, there were initial stakeholders' meetings, workshops on literature review, research tools development, data collection and reporting of findings. These processes are consistent with practice elsewhere. For example, in developing a guide on community engagement with persons with disabilities in New Zealand, the Ministry of Health (2016) assumed that persons with disabilities were experts in their own lives and their experience of disability. Subsequently, the Ministry adopted a strategy to ensure persons with disabilities were informed about and involved in decision-making regarding matters that affected them. Based on the New Zealand experience, the current project informed persons with disabilities and involved them in decision-making regarding the design and construction of disability-inclusive urban transport systems in Accra and Nairobi. This study on inclusive urban transport systems, whose central thrust was policy agenda, was intended to promote the social inclusion of persons with disabilities in the cities of Accra and Nairobi.

2.3 The Concept of Disability and Theoretical Framework for the Study

Disability refers to long-term physical, mental, intellectual or sensory impairment, which in interaction with various barriers, may lead to the inability to effectively participate in society on an equal basis with others (United Nations, 2006). In line with the Convention, the researchers reasoned that individuals with short and long-term conditions might become disabled in the use of the transport systems in Accra and Nairobi by barriers emanating from the design and construction of the transport system as well as the attitudes of individuals involved in the operation of the transport system.

This standpoint is consistent with the International Classification of Function (ICF), which explains that problems with human functioning in three interconnected areas, namely;

impairments being problems in body function or alterations in body structure- for example, paralysis or blindness; *activity limitations* being difficulties in executing activities- for example, walking or eating; and, *participation restrictions* are problems with involvement in any area of life-for example, facing discrimination in education, employment or transportation (WHO 2010). According to the ICF, disability refers to difficulties encountered in all three areas of functioning. Subsequently, disability arises from interacting health conditions with contextual factors such as the environment and personal factors. These standpoints reflect the combination of Social and Medical Models of Disability, as explained later, to guide the execution of the project. The combination of the two models, termed the "bio-psycho-social model", as the World Health Organization explains, represents a workable compromise between medical and social models of disability (WHO, 2010).

The ICF helps to understand and measure the positive aspect of functioning, such as body functions, activities, participation and environmental facilitation, which are key elements of the current research project. Based on the "bio-psycho-social model", we conjectured that if the design and construction of transport infrastructure and systems are universally-designed, individuals with disabilities in Accra and Nairobi could access and utilise the transport infrastructure on an equal basis as their counterparts without disabilities. Universal design, according to the UN Convention, implies designing products, environments, programmes and services to be usable by all people, to the greatest extent possible, without the need for adaptation or specialised design (UN, 2006). Thus, the researchers strongly believe that if policymakers, engineers who design and construct the transport infrastructure, operators of the transport systems and the public recognise the needs and take measures to remove barriers to persons with disabilities, there will be disability-inclusive transport systems in the cities of Accra and Nairobi.

Besides, there are variations in disability which results from the interaction of health conditions, personal factors, and environmental factors (World health Organisation (WHO), 2010). Persons with disabilities are diverse and heterogeneous and may include: blindness and low vision, deafness and hard of hearing, intellectual and developmental disabilities, specific learning disabilities, physical disabilities such as loss of limbs from motor accidents, a congenital condition such as cerebral palsy, deaf-blindness and other health conditions, among many others. Disability can be visible or invisible; temporary or long-term; static, episodic, or degenerating; painful or inconsequential (WHO, 2010). Disability is "an evolving concept"; it

results from the interaction between persons with impairments and attitudinal and environmental barriers that hinder their full and effective participation in society on an equal basis with others (UN, 2006). The variations in disability place different difficulties on PWDs regarding access to transport infrastructure. Thus, the barriers imposed by inaccessible transport systems to persons with blindness may differ from those experienced by the deaf or those with mobility problems (using crutches or wheelchairs). It is critical to add that the current study focused on three major disabilities thus, deafness, blindness, and persons with mobility challenges in Accra and Nairobi.

2.4 Disability-Inclusive Transport and Legislations

In pursuance of the UN Convention and the Sustainable Development Goal (SGD) 11, Ghana and Kenya have enacted Laws and policies to ensure the rights of PDWs and, in particular, their access to transport systems. In Ghana, Article 29 of the 1992 Constitution of Ghana outlines general provisions to safeguard the rights and foster the inclusion of persons with disabilities in all aspects of life in the country (GoG, 1992). Although the 1992 Constitution did not provide specific clauses on disability and transport, it set the stage for legislation and policies to promote the needs of persons with disabilities, including access to the transport system. Regarding transportation, the 2006 Persons with Disability Law (Act 715) have eight sections (23-29) that focus on: (23) integration of needs of persons with disabilities; (24) Importation of non-conventional vehicles; (25) A person with a disability as a pedestrian (26) Parking places for persons with disabilities; (27) Ownership of driving license; and 1(29) Reservation of seats on vehicles (GoG, 2006).

Specifically, Act 715, Section 23 provides that the Ministers of Local Government and Transport must ensure that the needs of persons with disabilities feature in the transport system's design, construction and operation (GoG, 2006). The law recognises the need for inter-ministerial collaboration between Local Government and Transport to address the needs of persons with disabilities, which are complex and multifaceted. Section 24 provides for the importation of specialised adapted vehicles for the use of persons with disabilities and includes tax exemption for the importation of such specialised vehicles. Section 25 mandates motorists to create a way for persons with disabilities to cross roads at designated areas such as pedestrian crossings (GoG, 2006). Again, Section 26 authorises the reservation of areas at car parks for persons with disabilities; Section 27 provides for the issuance of a license to a person with hearing impairment who passes and satisfies conditions for the award of a driving license.

Additionally, the law mandates the reservation of seats for persons with disabilities on buses at all times, prohibits bus operators' failure to reserve seats for persons with disabilities, and states a fine or conviction to a prison term (GoG, 2006).

Kenya, on the other hand, ratified the UN Convention on the rights of persons with disabilities on 19th May 2008 and consequently pledged to promote, protect and ensure the full and equal enjoyment of all human rights and fundamental freedoms by all persons with disabilities and to promote respect for their inherent dignity (GOK, 2016). As stated earlier, Article 35 of the CRPD requires that each State Party submit to the Committee a comprehensive report of measures taken to give effect to its obligations under the Convention and the progress made in that regard (UN, 2006). The Constitution of Kenya, 2010, under Article 27(4), states that "the State shall not discriminate directly or indirectly against any person on any ground, including race, sex, pregnancy, marital status, health status, ethnic or social origin, colour, age, *disability*, religion, conscience, belief, culture, dress, language or birth". Further, Article 54 of the Constitution of Kenya states that a person *with any disability* is entitled, among other things, to access educational institutions and facilities to enhance their integration into society to the extent compatible with their interests. Persons with disabilities must enjoy reasonable access to all places, public transport and information; use Sign language, Braille or other appropriate means of communication; and access materials and devices to overcome constraints arising from the person's disability. The Kenyan Constitution thus upholds the inclusivity of persons with disabilities in urban transport and society in general.

Besides, the Persons with Disability Act of 2003 (Revised 2010) provides inclusivity for people with disabilities in different spheres of life. Among them is their inclusion in the transport system. Furthermore, Section 11 of the Act states that the Government shall take steps to maximise the utilisation of available resources to realise the rights of persons with disabilities fully. The Persons with Disability Act requires all employers to provide facilities and effect modifications in the workplace, whether physical, administrative or otherwise, to accommodate persons with disabilities under Section 15(5). In addition, Section 16(2) also provides incentives to a private employer who improves or modifies his physical facilities or avails special services to provide reasonable accommodation for employees with disabilities. On accessibility and mobility, Section 21 of the Act states that persons with disabilities are entitled to a barrier-free and disability-friendly environment to enable them to have access to buildings, roads and other social amenities, and assistive devices and other equipment to

promote their mobility. Section 23 states that public service vehicle operators shall adapt them to suit persons with disabilities as specified by the Council within two years after the section comes into operation. While Section 25 states that no person shall, on the ground of disability alone, deny a person with a disability the provision of any services or amenities to which members of the public are entitled.

To encourage the inclusion of PWDs in Kenyan society, Section 35 of the Act exempts materials, articles, and equipment, including motor vehicles, that are modified or designed for the use of persons with disabilities from import duty, value-added tax, port and demurrage charges and any other government levy which would increase their cost to disadvantage persons with disabilities. The provisions of this Act aim not only to uphold the spirit of inclusivity for the persons with disabilities in the transport system but also to give incentives to individuals, institutions and agencies who incorporate universal design principles in their service provisions.

2.5 Urban Transport System

The road transport sector dominates all trips undertaken in most developing countries. In Ghana, the road transport sector accounts for about 96% of all freight and human movement in Ghana (Ghana Investment Promotion Centre, 2012). The dominance of motorised vehicles in urban cities in Africa results from the rise of the middle-income population, the use of the car as a status symbol, the availability of financing options for the acquisition of cars as well as the desire to escape the inefficiencies associated with the use of public transport services (Ghana Investment Promotion Centre, 2012).

For most low-income earners, public transport mode dominates their transportation usage. These are seen in commonly shared buses loosely referred to as *trotro* in Ghana, *matatu* in Nairobi, *gbaka* in Abidjan and *sotrama* in Bamako. Key factors that attract people to public transport include the lower fares, flexibility in schedules and wide coverage. On the other hand, walking constitutes a dominant transport mode in urban areas of developing countries, especially among the urban poor and persons with disabilities. For instance, Sietchiping et al. (2012) postulate that 70% of urban settlers in Conakry (Guinea) and Douala (Cameroon) are poor and rely on walking rather than public transport.

The study further reported that many bus stops were inconvenient places and, therefore, not accessible to persons with mobility disabilities. The bus stops lacked curb cuts to enable

persons with mobility disabilities to use sidewalks/stops to avoid the danger of being run over by buses or motor bicycle riders. In addition, some of the bus stops did not have shelters, and those which had shelters were not accessible due to steps. Further, drivers usually did not pay attention to where and how they parked for passengers to board their vehicles; often, they parked in unauthorised parking spots. All these factors harmed the safety of persons with mobility disabilities (Naami, 2019). The study further observed that sidewalks were virtually non-existent; the few existing sidewalks were not thorough. Sometimes, the sidewalk began at one side of the road and ended in the middle, while another started from the centre. In addition, evidence from the study indicated that the few existing sidewalks were broken and full of obstacles such as poles, gutters and potholes, making them extremely difficult to use (Naami, 2019).

The study reiterated the need for Ghana to implement measures to ensure that the built environment and transport systems are user-friendly and inclusive for persons with disabilities. This development could ensure that persons with disabilities can fully enjoy their basic human rights and fundamental freedoms and participate freely in society. These are necessary to achieve the Sustainable Development Goals' overarching aim of leaving no one behind. After the Persons with Disability Act 715, Ghana developed the Accessibility Standard for the Built Environment and a Building Code in 2016 and 2018, respectively.

Key reasons for most African governments' delay in meeting the travel needs of the disability community include the lack of a general standard or definition of an accessible or inclusive transport sector. Little evidence exists in the literature about accessibility issues persons with disabilities encounter daily in the Accra Metropolis of Ghana (Naami, 2019). In the case of Ghana, the Disability Act 715 is the only legislative instrument adopted in response to the UNCRPD. Specifically, Sections 23 to 30 outline details of transport provisions.

However, Munyi (2012) argues that creating an inclusive environment will not be guaranteed if we ignore the social and behavioural factors that influence the acceptance of persons with disability. Odame et al. (2020) and Šiška and Habib (2013) argue that the attitudes of transport operators and other members of society are key factors that significantly determine the status and acceptance of PWDs in their use of transport services. For example, Odame et al. (2020) reported that transport operators use derogatory words and physical force to prevent students with disabilities from using campus shuttles at the University of Cape Coast in Ghana.

Ngnenbe (2020) also intimated that there is an abject disregard for the rights of persons with disabilities to access the transportation infrastructure in Ghana. Transport operators in the country, such as mates, conductors and agents who manage lorry parks and other facilities, do not pay any attention to the needs of persons with disabilities, which contradicts the law. Ngnenbe (2020) revealed that persons with disabilities are sometimes denied access to commercial vehicles because they are considered burdens to drivers and mates. Those who use clutches struggle to board commercial vehicles and encounter hostile reactions from other passengers. Even the state-owned Intercity State Transport Corporation (STC) Coaches are not disability friendly. Metro Mass Transit (MMT), on their part, make provision for PWDs in their buses, but other passengers often abuse the arrangement.

Contrary to Section 23 of Act 715, the country's transport infrastructure has been poorly designed and remains a herculean barrier for PWDs. Buses and trotros (private buses that ply routes within the cities) have inaccessible entrances that make it difficult for persons with mobility disabilities to board such vehicles. Persons with mobility disabilities who do not have assistive devices virtually crawl into vehicles or are carried by others very dehumanisingly. On the other hand, PWDs who move with wheelchairs are denied access by some drivers because they cannot guarantee their safety. Additionally, bus stops that serve as resting places for prospective passengers are inaccessible for persons with mobility disabilities, especially users of wheelchairs and clutches. Importantly, a disability-inclusive transport system includes safe navigation of the pedestrian environment, adequate and good condition sidewalks, broad, gentle slopes without obstructions, and accessible bus stops, among others (Naami, 2019).

A study in Western Kenya found that more than three-quarters of respondents had trouble using washroom entrances in bus terminals in the study area (Ochieng, Onyango, & Wagah, 2017). The study noted that respondents' barriers were either high thresholds or ramped access with no stairs. Regarding access to transportation, PWDs are excluded from consultation in the transportation planning processes and from developing solutions to the current problems they face in the transportation sector. (Nyaura & Ngugi, 2017).

Karani and Pido (2019) reported that professionals engaged in urban transport projects have limited knowledge of accessible transport, specifically the universal design principles. This lack of knowledge has resulted in the transport infrastructure that is universal design compliant to accommodate the needs of all people and PWDs. According to Karani and

Pido, public consultation on planning and design is relatively low and not institutionalised. Although policy documentation is available, implementation is challenging due to ignorance, negative perceptions, and lack of political will. For their part, Nyaura and Ngugi (2017) concluded that the whole public system lacks resources to cater to the needs of persons with disability.

2.6 Agencies and Institutions Responsible for Disability-Inclusive Transport Systems in Accra and Nairobi

There are institutions and agencies in Ghana and Kenya whose primary responsibility is guaranteeing disability-inclusive transport systems. The agencies include the National Councils for Persons with Disabilities, established in 2006 and 2004, respectively, by the Persons with Disability Act of 2006 of Ghana and 2003 of Kenya. These Councils have members who represent various disability organisations and ministries. The Council's role is to oversee the implementation of measures to promote the rights of persons with disabilities and mainstream these rights in all aspects of national development.

Also, the city of Nairobi has the Nairobi County Board for Persons with Disabilities established by the Nairobi City County Persons with Disability Act, No 9 of 2015. The Board oversees the formulation and development of measures and policies to achieve equal opportunities for persons with disabilities in education and employment.

Again, Ghana and Kenya have National Transport and Safety Authorities, which regulate, advise, and implement road transport and safety policies to ensure a safe, reliable and efficient road transport sector. The authorities are responsible for, among other things, inspecting vehicles, developing and implementing road safety strategies, educating the public on road safety, and conducting research and audits on road safety.

Besides, both countries have Highways Authorities and Urban roads authorities responsible for the management, development, rehabilitation, and maintenance of national and urban roads, respectively. The Authorities also construct and upgrade roads under their control, control urban road reserves, and access roadside developments. They also implement road policies concerning urban roads, ensure the quality of road works, oversee the management of traffic on urban roads, monitor and evaluate the use of urban roads, and collect and collate data related to the use of urban roads for efficient planning.

3.0 METHODOLOGY

3.1 Study Areas

Accra and Nairobi were selected as the study areas in Ghana and Kenya, respectively. In Ghana, Accra has the highest urban disability and vehicular population, both private and public vehicles (Ghana Statistical Service, 2012). Accra is Ghana's national capital and hub of all transport activities.

On the other hand, Nairobi is Kenya's capital city and the largest urban area in the country. Nairobi covers a total area of 696.1 km². The city is an international, regional, national, and local hub for commerce, transport, regional cooperation, and economic development with over 100 major international companies and organisations, including the United Nations Environment Programme (UNEP) and UN's headquarters in Africa and the Middle East.

3.2 Target Population and Sample

Given the contextual nature of the disability, the study engaged three disability groups: the visual, hearing, and mobility/physically impaired or challenged. According to the Ghana Statistical Service (2021), Greater Region has 2882,719 people aged five and above with difficulty functioning, as described by the Washington Group on Disability. Out of that figure, 117,557 were and 165,162 females. The Accra Metropolitan Assembly has 36,177 PWDs comprising 21,101 visually impaired, 4,435 hearing impaired, and 10,641 physical/mobility problems. These groups constitute more than three-quarters of Ghana's disability population (Odame, 2017) and about sixty-five per cent of the disability population in Kenya. The 2019 Kenya population census reported 38,679 PWDs comprising 18,788 individuals with visual impairment, 5,342 hearing impairment, and 14,549 physical/mobility problems.

The key participant selection criteria included:

- Age: at least 16 years (the minimum consent age).
- Public transport use: the participant must have used public transport (trotro/matatu etc.) at least once a month in the last year (2021).
- Residence: the participant must be a resident of one of the study cities- Accra or Nairobi.

A total of 230 (69 blind, 63 deaf, 94 physically challenged and four others) and 208 PWDs (69 blind, 53 deaf, 84 physically/mobility challenged and two others) were engaged in the study in Accra and Nairobi, respectively.

While the above constitute the demand side of transport services, the supply side comprises the selection of public transport operators from both cities. In Accra, the study engaged public transport operators from four (4) popular transport terminals (with the highest vehicular and human traffic), namely the Kwame Nkrumah Circle, Kaneshie Lorry station, 37 Station, and Tema Station (Figure 1). Transport operators from various unions, including the Ghana Private Road Transport Union (GPRTU), occupy these terminals. The GPRTU controls over 70% of the intra-city transport movements in Accra and is the most preferred by low or middle-income earners, of which PWDs are well represented (Ghana Statistical Service, 2014d; Hotor, 2016). We engaged 24 GPRTU drivers'/transport operators (6 from each terminal).

In Nairobi, the focus group discussion (FGD) involved transport operators from 3 different stations, namely the Kencom stage, the Main bus station (Afya centre station), and the Tea room station (Figure 2). Twelve (12) transport operators were engaged in the FGD. Table 1 presents the sample distributions for the two cities.

Table 1: Sample distribution in Accra and Nairobi (**Source:** Author's Construct, 2022)

Items	Accra				Nairobi			
	Blind	Deaf	MI	Others	Blind	Deaf	MI	Others
Population of PWD	21,101	4,435	10,641		18,788	5,342	14,549	
Sample for Questionnaire	69	63	94	4	69	53	84	2
Sample for JAT	7	7	10		3	5	5	
Transport operators		24				12		
Stakeholders		5				3		
Total		283				236		

***Key: MI** – Physical/Mobility Impaired

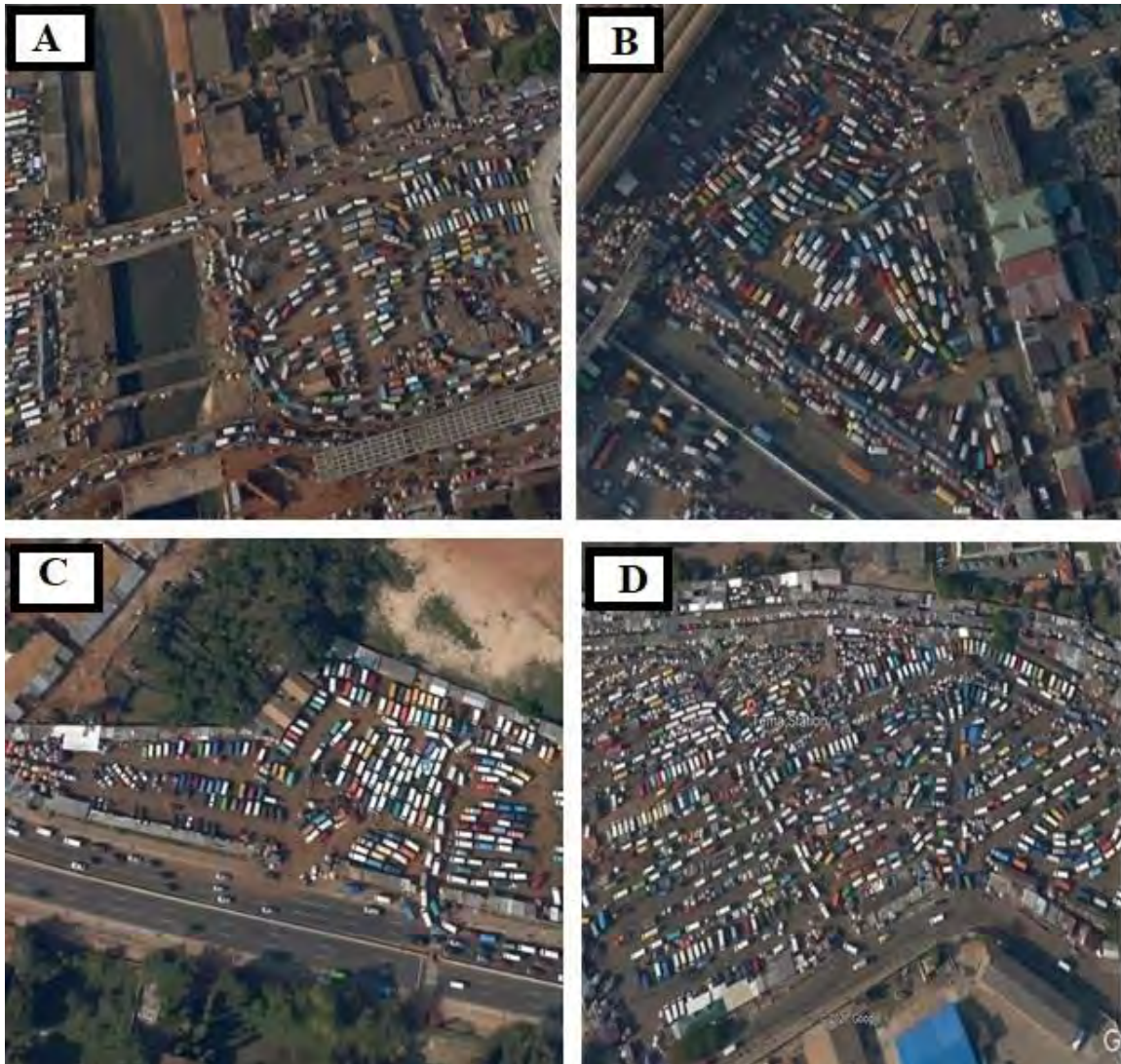


Figure 1: Kwame Nkrumah Circle (A), 37 Lorry Station (B), Kaneshie Lorry Station (C), and Tema Station in Accra (D)

Source: Google Earth, 2021

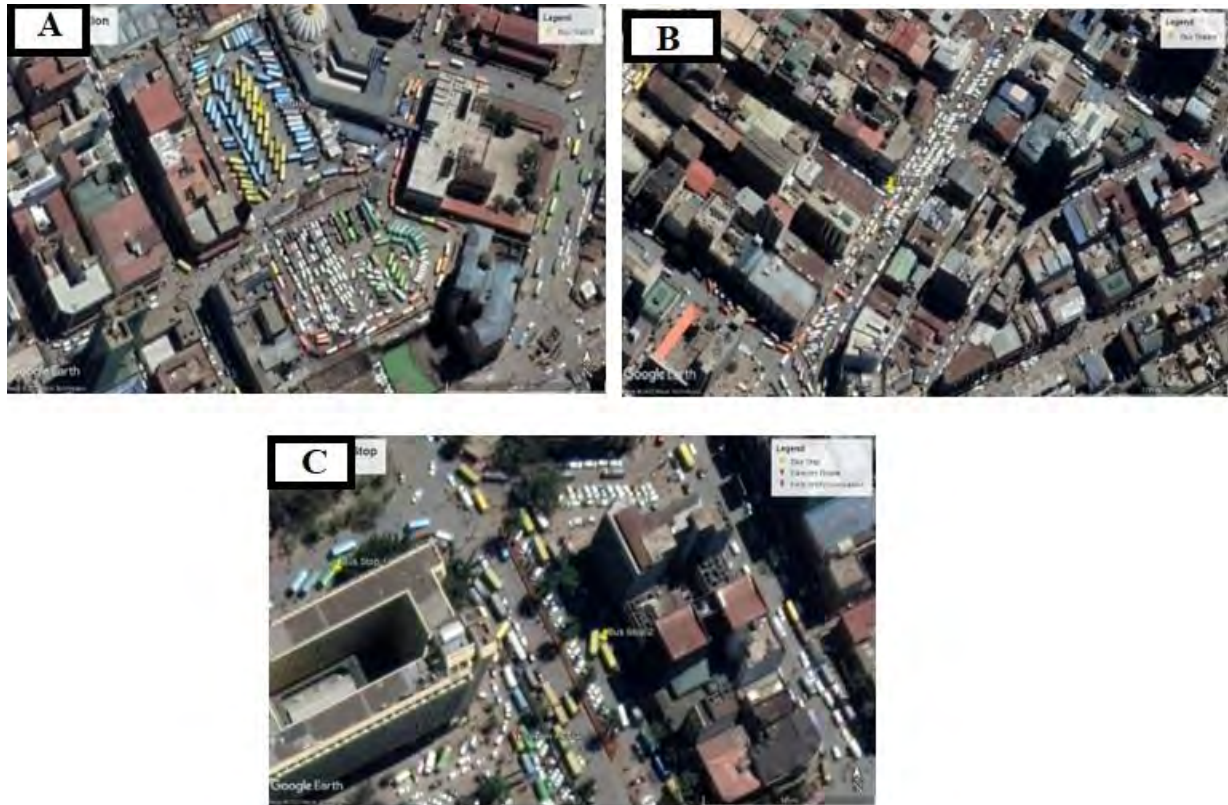


Figure 2: Main bus station (A), Matatu station (B), and Kencom bus stop (C) in Nairobi

Source: Google Earth, 2021

The final target group comprised stakeholders in the regulations and management of transport services and disability organisations in Accra and Nairobi. We engaged a representative each from the following in Accra (5): Ghana Private Road Transport Union (GPRTU), National Council on Persons with Disability (NCPWD), Accra Metropolitan Assembly (AMA), Ghana Federation of Disability Association, and other road users; while in Nairobi, representations from the following stakeholders were engaged: National Transport and Safety Authority, the National Council of People with Disabilities and the Chairperson of the Matatu Owners Association.

3.3 Research Instrument

The project adopted four research instruments: (1) an auditing instrument, (2) questionnaires for PWDs, (3) a Journey Assess Tool (JAT) for an accompanied walk of PWDs on routine trips, and (4) an Interview guide for key-informants and transport operators.

Auditing instrument

The project employed an auditing scheme to observe vehicular conditions at all selected transport terminals. The variables of interest included availability, conditions, and dimensions of selected facilities like vehicle floor height, disability signage on the bus, the width of bus entrance, ramp or boarding platforms, handrails at bus entrance and interior, dedicated seats or space, availability of travel concession as well as other audio-visual disability-friendly tools (assistive technology). We applied the instrument to audit 15 conveniently sampled vehicles from the selected transport terminals.

Questionnaires

As the main instrument, the questionnaire addressed the first four research questions centred on PWDs' travel issues. The questionnaire was coded electronically using the Kobo toolbox and deployed using smartphones and tablets. The questionnaire reflected an extensive review of literature that reflects the Ghanaian, Kenyan, and international contexts. The questionnaire comprised four broad sections. Section A captures PWDs biodata which focuses on variables like sex, type of disability, religion, educational background, and others. Section B centres on PWDs' mobility patterns which offers a backdrop to their daily/weekly travel history. Key variables in this section comprised questions on various opportunities or places PWDs visit and the frequency of such visits. Section C focused on PWDs' mobility needs which involve their preferred transport mode for each of the trips identified in Section C, and highlights the influence of COVID-19 on these mobility patterns and needs. Finally, Section D highlights mobility challenges associated with public transport use, coping strategies adopted to withstand these challenges, and PWDs' overall satisfaction with the current state of transport services in both cities. On average, it took a respondent 30 minutes to respond to the questionnaire.

Journey Access Tool (JAT)

We sought to obtain first-hand, participatory experiences of the mobility patterns, needs, experiences, and challenges of PWDs in the two cities by utilising the recently developed *Journey Access Tool (JAT)* (King et al., 2018) via mobile ethnography/follow-along participant observation. The JAT was designed specifically to access personal journeys taken by PWDs. It incorporates both road safety and accessibility audits. The JAT provides an important guide to accessing disability-inclusive environments.

Administering the JAT involved an accompanied walk/trip with the PWDs on a routine trip beginning from the PWD's place of abode. The JAT had five sections that reflected different sections of a travel chain (getting to the transport stop, accessing the transport stops, intersections and crossings, boarding and de-boarding, and from the transport stop to the destination). Beginning with Section A and B, the study captured PWDs' biodata and other geographical attributes of their homes since this constituted the point of origin for all accompanied trips. Section C captured the attributes of the walking environment that connects one's home to the closest bus stop or transport terminal (i.e., getting to the transport stop). Here, we assessed attributes like the presence and conditions of the sidewalk. Section D centred on PWDs' experiences in accessing transport stops and services, including boarding, payment of fares, suitability of the buses to PWD's needs, and the attitudes of public transport staff (i.e., drivers and conductors).

Section E captures PWDs' lived experiences in commuting to their destination from the bus stop. Variables in this section were the same as in section C since they also involved a description of the walking environment. Finally, Section F captured PWDs' general impression about the ease associated with each trip and solicited PWDs' suggestions on key facilities needed to improve their travelling experience in the urban landscape. On average, it took 50 minutes to complete an accompanied trip.

Interview Guide for Key-Informants and Transport Operators

The study conducted in-depth interviews with transport operators and other stakeholders. The interviews were unstructured to offer flexibility and probe (further questioning). For transport operators, the instrument covered drivers' knowledge of the local Disability Act and laws (Ghana and Kenya) and its transport provisions, including existing physical transport services to PWDs and intangible support services, including drivers and commuters' reception to PWDs. For stakeholders, the focus of each interview centred on policy actions and regulations adopted to ensure the compliance of the transport agents to the dictates of the local Disability Act and laws. The interview sessions ranged from 23 to 65 minutes.

3.4 Pilot-Testing and Fieldwork

Before the pilot-testing of the instruments, a stakeholder meeting was held between the project team and local stakeholders in Ghana and Kenya to discuss the developed research instruments. Several revisions were made to the research instruments (content validity) and pilot-tested in both countries to assess their validity and feasibility for official deployment in

the field. In two phases in Ghana, we pilot-tested the instruments at the University of Education, Winneba (UEW). UEW was selected for convenience because it had students with disabilities. The first phase occurred on 14 June 2021. It involved assessing the compliance of the transport operators in terms of the availability, conditions, and dimensions of selected disability-friendly facilities on campus (including campus shuttle services and environment) using the auditing scheme. The second phase involved administering questionnaires and the JAT to sample students with disability from 15-17 June 2021. The instruments were administered to three (3) visually impaired, three (3) physically challenged, and two (2) hearing impaired student-respondents. The team followed similar pilot-testing activities in Kenya. The first phase occurred on 11 June 2021 and involved administering the PWDs questionnaire to a small sample of PWDs in the Mukuru Kwa Njenga neighbourhood in Nairobi. The team administered the instruments to seven (7) visually impaired, eight (8) physically challenged, and Six (6) hard of hearing respondents. The second phase involved the JAT to sample Three people with disabilities on 14 June 2021.

The pilot testing outcome helped evaluate the feasibility and usability of the research instruments and the efficacy of the Kobo Toolkit as a data collection and analysis tool. The pilot-testing exercise allowed the project team to assess the software's effectiveness in skip logic, ease, and accuracy of taking geolocation of each study site. Finally, the pilot testing also helped to appreciate the duration of each engagement and develop strategies to promote shorter but effective interactions.

3.5 Data Processing and Analysis

The team performed verbatim transcription of the in-depth interviews to capture the participants' words and the context of these words. To reduce systemic errors and ensure output efficiency, we employed the MaxQDA for transcription, developed the coding framework (that categorised common ideas into discrete themes or categories), and applied the codes to various sections of the transcript. The coding allowed for two types of analysis: a direct and relational content analysis. In the case of the direct content analysis case, we prioritised variables like the word or phrase count and the frequency of use of a concept or theme. On the other hand, we employed relational content analysis to establish relations between the codes for inferences.

We employed the SPSS Version 26 software for quantitative analysis to code the questionnaire. We cleaned and screened the data to ensure no missing data or wrong data entries. We generated descriptive statistics, mainly means, frequencies and percentages per the responses to the questionnaire. The results presented were in the form of bar charts and tables.

The study mapped roads in Accra and assessed PWDs' accessibility per the roads. It also evaluated routes PWDs used in their daily mobility. Roads were spatially represented using the data from the Ghana Survey Department.

Also, we secured facility data of institutions/facilities such as banks, hospitals, markets, schools, religious, and security from the Centre for Remote Sensing and Geographic Information Systems, University of Ghana. We mapped the daily routes of PWDs using handheld GPS, which tracked their accompanied walks. We also performed data interoperability to convert the formats of the collated spatial data by transforming their data formats to the ERSI Geodatabase feature class and later converting their coordinates to the World Geodetic System 84/ Universal Transverse Mercator 30N. Analysis performed for the facilities data and the road data was a Euclidean distance function which estimated the distance from these facilities. We used maps to present outputs from the Euclidean distance function and the route used by PWDs for daily activities.

3.6 Fieldwork Challenges

Notwithstanding the success with field data collection, some challenges limited the data collection exercise.

- The field team had difficulty interacting with the hearing impaired, with only one sign interpreter on the team. The inadequate sign interpreters in the field for data collection resulted in significant delays in the flow of work given a large number of hearing-impaired participating in the study.
- Despite gaining support from the leadership of the various disability organisations in recruiting the participants, we had fewer participants on some days, which also prolonged the data collection exercise. To overcome this, the field team made alternative arrangements to interact with such participants in their preferred locations, resulting in significant travels by the field team.
- There were also challenges interacting with participants who spoke dialects (e.g., Hausa, Nzema, and Frafra) unknown to the field team. The team sought the services of interpreters who could speak the dialects.
- Locating the residence of PWDs for the JAT also presented some challenges. Most of the participants could not provide an accurate description of their location to the team resulting in significant delays in locating them and, in the process, affecting the start of the accompanied trips.

- Bad weather also affected the data collection exercise in two ways. Firstly, cloudy days presented difficulties in obtaining GPS points of key landmarks and routes for the JAT. Secondly, heavy downpours also halted data collection exercises for some days forcing the field team to reschedule those appointments.
- The team also encountered difficulties engaging transport operators during peak hours. The team had to resort to off-peak hours only, sometimes during late hours in the day.
- Obtaining permission from transport operators to assess their vehicles' compliance with the local disability Act and laws via the auditing instrument/scheme proved difficult. Continuous engagement with the leadership of the GPRTU resulted in some transport operators consenting to the assessment via an auditing scheme. Notwithstanding, some operators still restrained the field team from taking pictures of their vehicles.
- The field assistants encountered difficulty in making appointments with the key informants. Some key informants were not easily available for an interview, especially those in government offices, and the team had to follow up on the interview appointment regularly.

3.7 Ethical Considerations

Compliance with ethical principles of anonymity, confidentiality, and safety was upheld before, during, and after the data collection exercise. The project team complied with the University of Education Winneba Research Ethics Policy (2018) which “provides an overarching framework regarding ethical conduct and research of UEW involving human and non-human subjects” (p.1). Potential participants were informed about the purpose of the study and the benefit (small incentive) of participating in the exercise. The team sought participants' verbal consent before participation. Participants had the right to terminate or not respond to questions they didn't feel comfortable answering. Additionally, the team informed participants about the estimated duration required to complete a questionnaire or interview ahead of each interaction, offering the research team and participants an opportunity to plan.

4.0 RESULTS FOR ACCRA METROPOLIS, GHANA

4.1 General Description of Study Settings and Sample in Accra

The study sampled 230 PWDs in Accra, involving 129 males (56.08%) and 101 females (44.92%). The dominant disability category was the physically challenged (i.e., persons using wheels/crutches/ scooters (38.93%), followed by the deaf and hard hearing (29.10%) and the blind (27.87%) (see Table 2).

Table 2: Demographic information about PWDs interviewed with the general questionnaire

Background of PWDs	Frequency	Per cent
Gender		
Male	129	56.08
Female	101	43.92
Disability type		
Blindness	64	27.80
Blindness & Physical impairment	3	1.30
Blindness & Hearing difficulty	2	0.9
Deaf & Hard of hearing	63	27.40
Physical impairment	89	38.70
Physical impairment & Hearing difficulty	5	2.20
Other	4	1.7
Ethnicity		
Akan	62	26.96
Ewe	54	23.48
Ga/Dangme	85	36.96
Gruma/Bimoba	5	2.17
Guang	3	1.30
Mole Dagbani	15	6.52
Others	6	2.61

Table 2: Continued

Religion		
Catholic	14	6.09
Pentecost/Charismatic/Methodist	185	80.43
Muslim	23	10.00
No Religion	8	3.48
Education		
No formal education	38	22.9
Basic	44	26.5
Secondary/High/Technical	74	44.6
Tertiary	10	6.0
Employment		
Employed in the public sector	16	6.96
Employed in the private sector	35	15.22
Self-employed	58	25.22
Unemployed	96	41.74
Student	18	7.83
Retired	7	3.04
Income		Cedis Dollars (¢1=6.06)
Mean	342	56.33
Median	300	49.41
Household size		
Mean	4	
Median	4	

The dominant ethnicity was Ga/Dangme (37%), with the least being Guang (1.30%). Most PWDs were Christians, with over 80 per cent affiliated with the Pentecostal/Charismatic/Methodist faith. Most PWDs had Senior/High/Technical education (44.6%), with the lowest educational attainment level being tertiary (6.0%). Less than 4 per cent of the PWDs did not ascribe to any religion. Nearly 42 per cent of the PWDs were unemployed. Of the employed, the majority (25.22%) were self-employed. Income levels

were low among the PWDs, with monthly earnings of about \$56.33 (i.e., GHS 342) to support an average household size of four (4) people.

4.2 Accra's Transport Design and Form

Spatial analysis of the design of the urban transport system in Accra

Accra Metropolis has an extensive transport system in terms of the number of routes and nodes than other parts of the country (Figure 3). The metropolis has over 12,611 routes and about 23,500 nodes or intersections. The few areas not well covered are the wetlands and salt production areas of Pambros east of the metropolis. Routes in the metropolis can range from a minimum of 0.1 miles to a maximum of 1.53 miles. The road weighs on average 40 feet for single carriageways and 60 feet for multi-carriage roads.

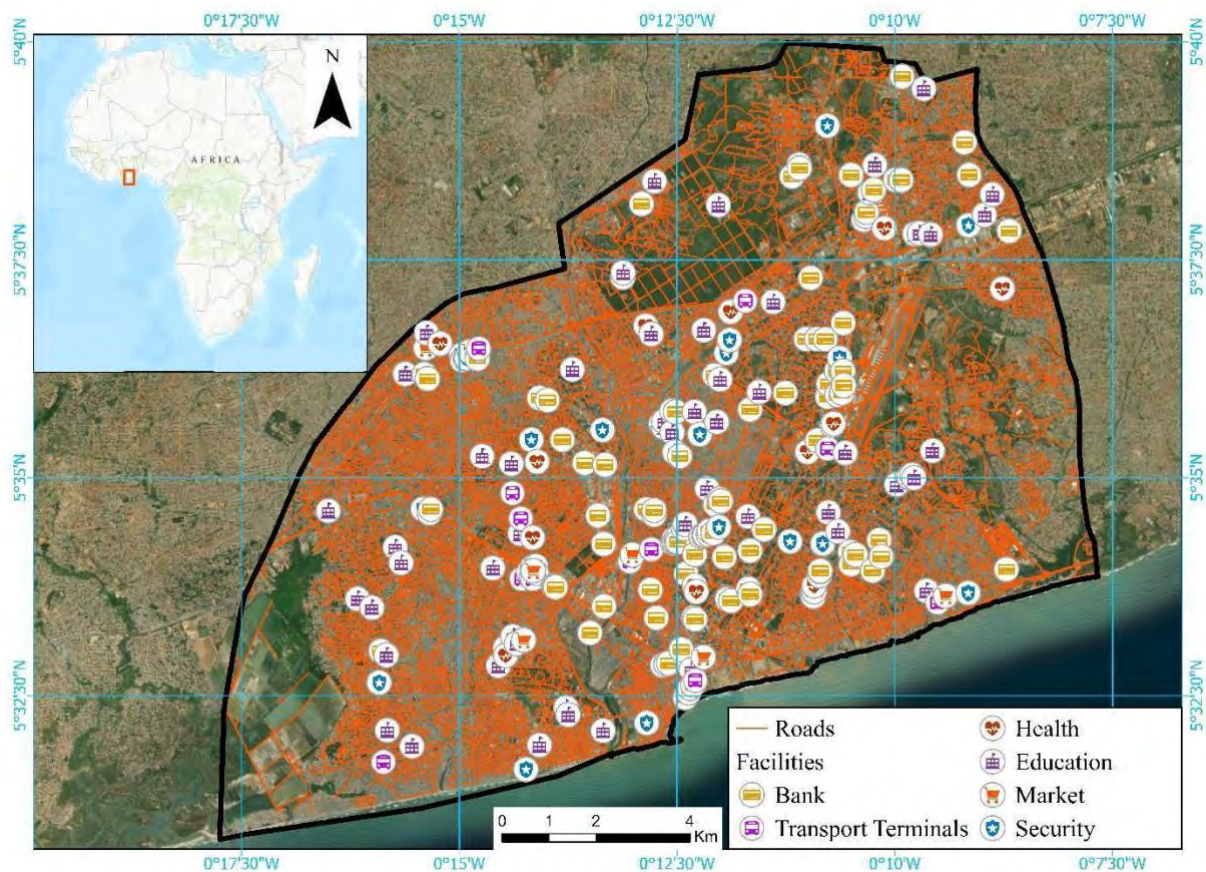


Figure 3: Road network of Accra Metropolis

The road pattern is irregular, with patches of grids and curvilinear patterns. Areas with grid patterns are mainly Ridge, Cantonment, Tesano, and the greater part of Dansoman. High regular patterns exist at La, Abeka, Darkuman, Odorkor, and parts of Osu. However, all the roads converge at Accra Central, which has the majority of government offices, such as the

Ministry of Finance, Ghana Statistical Service, Population Council, Ghana Revenue Authority, Land Use and Spatial Planning Authority, High Court, etc. Further, Accra Central, the core of the metropolis, has most of the financial and commercial activities, attracting many commuters daily.

Accessibility Analysis / Index

The project generated an accessibility index for Accra based on the distance to facilities. Facilities considered were financial, health, market, religion, school, security, and distance. Using a Euclidean distance measure, the study estimated that accessibility to the above services was 0.0 to 2.9 miles (Figure 4). A composite analysis indicated that about 49% of the road network was in the accessibility range of 0.0-0.09 miles to all facilities. About 34% were within a range of 1.0-1.9 miles.

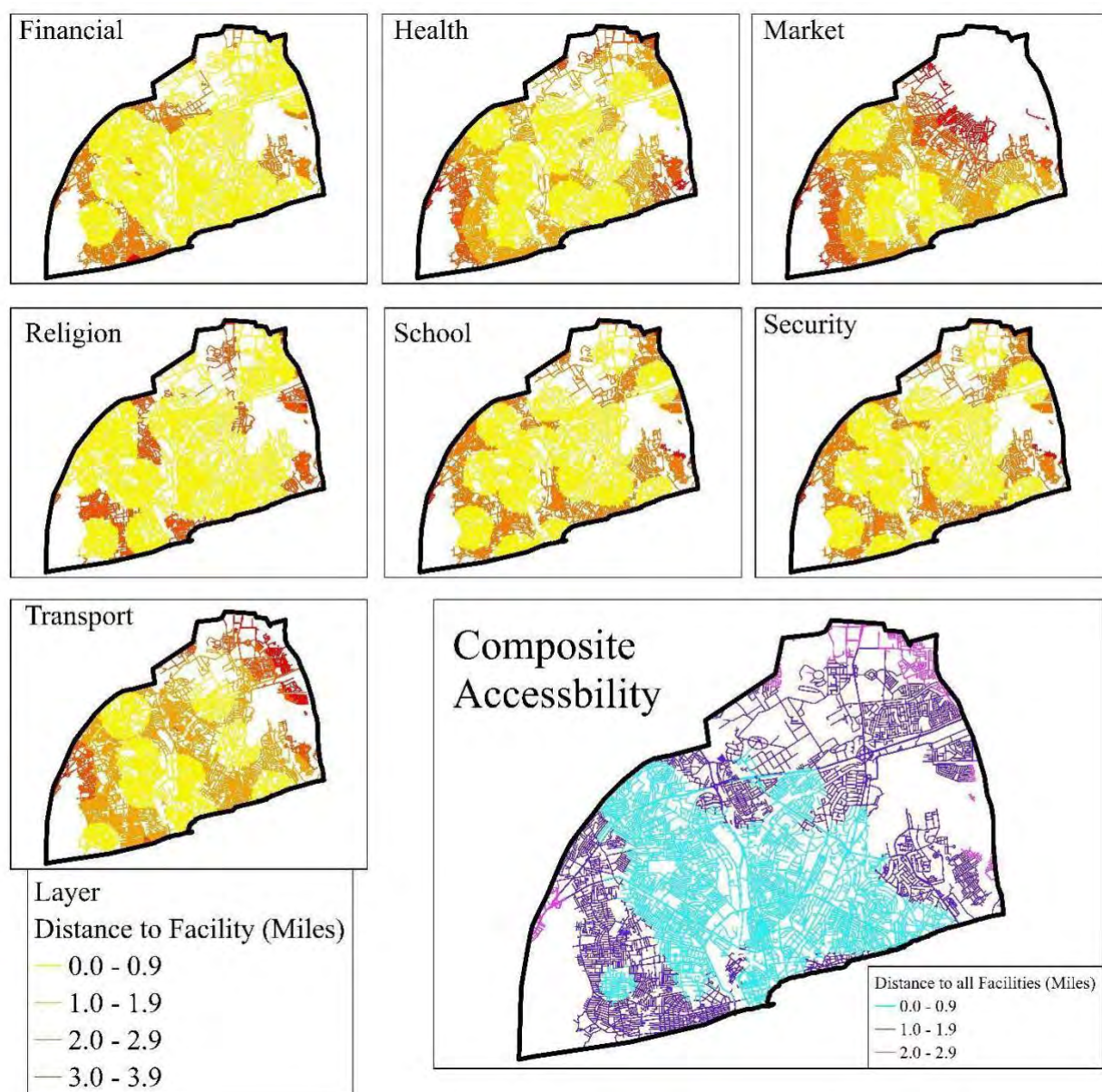


Figure 4: Accessibility index based on distance

The facilities with the least access were religious and financial, with about 81.34% and 81.11%, respectively, within the range of 0.0 to 0.9 miles. The market was the facility with only 29.22% of the road network in the range of 0.0 to 0.09 miles.

Based on participants' responses, the study categorised the transport system in Accra as moderate for all the activities and facilities. But per disability type, the individuals with blindness and blindness and physical impairment categorised access to schools and leisure as low (Table 3). Health facilities were deemed moderately accessible to all PWD categories.

Table 3: Accessibility of facilities and activities in Accra to PWDs

Activities	Blindness & Hearing Difficulties			Blindness & physical impairment		Deaf & Hard hearing		Physical impairment		Physical impairment t & Hearing difficulties		Other	All PWDs
	Blindness	Blindness	Hearing	Blindness	Physical	Deaf &	Hard	Physical	Physical	Physical	Hearing		
Work	Moderate			High	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate	Low	Moderate
Health	Moderate	Moderate		Moderate	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate	Low	Moderate
School	Low			Low	High	Moderate	Moderate	Moderate	Moderate	Very high	High	High	Moderate
Leisure	Low	Low		Low	Moderate	High	Low	Low	Low	Low	Low	Low	Moderate
Shopping	Moderate	Low		High	Moderate	Moderate	Moderate	Moderate	Moderate	High	Moderate	Moderate	Moderate
Social activities	Moderate	Moderate		Moderate	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate
Religion	Moderate	Low		Moderate	Moderate	High	Moderate	Moderate	High	Moderate	Moderate	High	Moderate

Also, accessibility to social activities was classified as moderately accessible by all PWDs. The physically impaired considered accessibility to leisure and religion as high. At the same time, individuals with physical impairment & difficult hearing classified accessibility to school as very high (Table 3).

4.3 Urban Mobility Patterns and Needs of PWDs in Accra

Mobility Patterns

The study assessed PWDs' mobility patterns (i.e., trips) for work, health care, school, leisure, shopping, and other social and religion-related activities. The data reveals that the majority of the PWDs' trips were for religion-related activities (a cumulative 222 of the 230 PWDs), followed closely by health care (a cumulative 197 of 230 PWDs) and social activities (a cumulative 187 of the 230 PWDs) including funerals, naming, and wedding ceremonies. The data indicates that most PWDs tend to access the services weekly. Religion (91.89%), school (90.48%), and work (86.24%) were the most accessed services weekly (Figure 5). The PWDs'

access to healthcare (55.84%) and leisure (37.23%) was very low yearly.

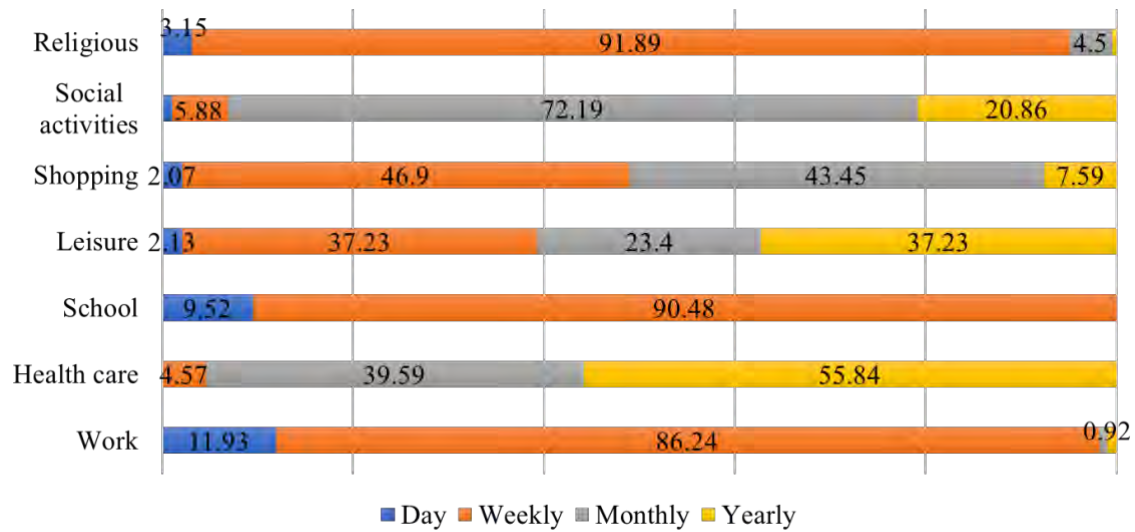


Figure 5: Frequency of access to service facilities

On average, PWDs spent 35.5 minutes from their residence (places of abode) to service points to access the activities. Figure 6 reveals that PWDs spent more time (55.6 mins) on social-related trips than on leisure (24.8 mins) and work (26.3 mins)-related trips.

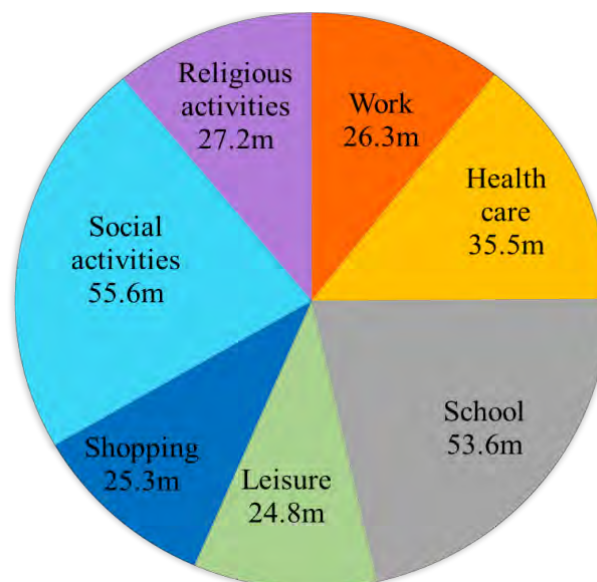


Figure 6: Average time to access services

Most of the PWDs (71.5%) revealed that Covid-19 had a moderate (34.2%) to high (37.3%) effect on the number of trips they made in respect of the above activities/services.

Spatial Route Analysis

The spatial route analysis and mapping accessed the daily routes of 20 PWDs engaged in the accompanied walk using the JAT. The analysis revealed a route distance between 0.41 and 40.15 miles, with a mean of 7.89 miles (Figure 7).

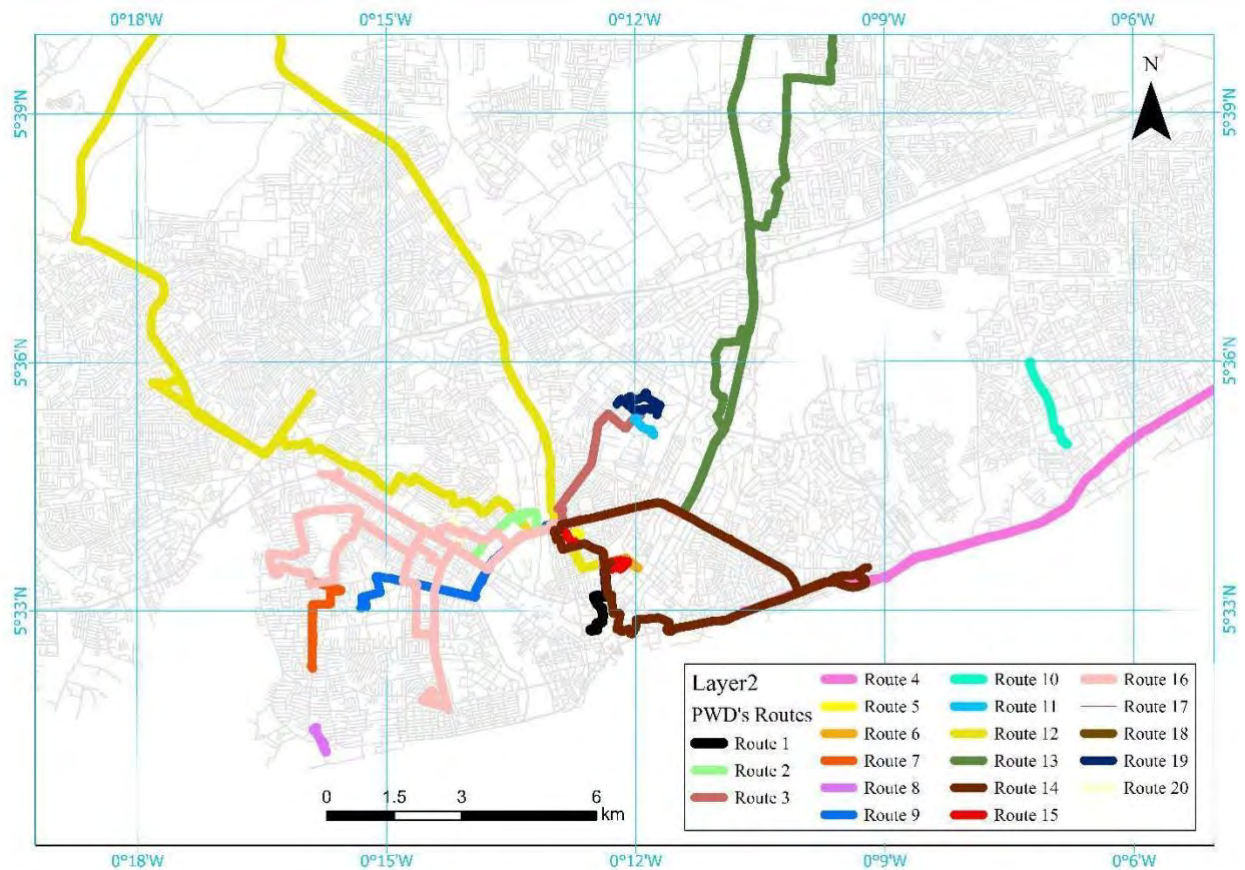


Figure 7: Routes taken with PWDs on the accompanied walk in Accra

The farthest escort route was from Amasaman to Abossey Okai and back to Amasaman (Route 5). Escorting PWD on Route 5k about 55 minutes for a distance of 40.15 miles. The greater part of the routes (Route 1-20) all converged at the central part of the metropolis.

Mobility Needs

This section assessed the mobility needs (activities and trips) and transport mode choice. The data revealed that the transport mode choice depends on the nature of the activity and trip in question (i.e., the mode choice is activity-specific), including the distance to be covered and ease of use of the mode/convenience. Figure 8 shows that the three (3) dominant transport modes across the various activities and trips were trotro, walking and taxi. For

instance, the taxi is the dominant mode for religious and health-related activities and trips among the PWDs for convenience (see Figure 8). Walking is prevalent for work-related activities and trips for proximity reasons, as illustrated in Figure 6. Trotro use dominated shopping, leisure, and school-related trips for reasons of distance and cost (affordability) (Figure 8).

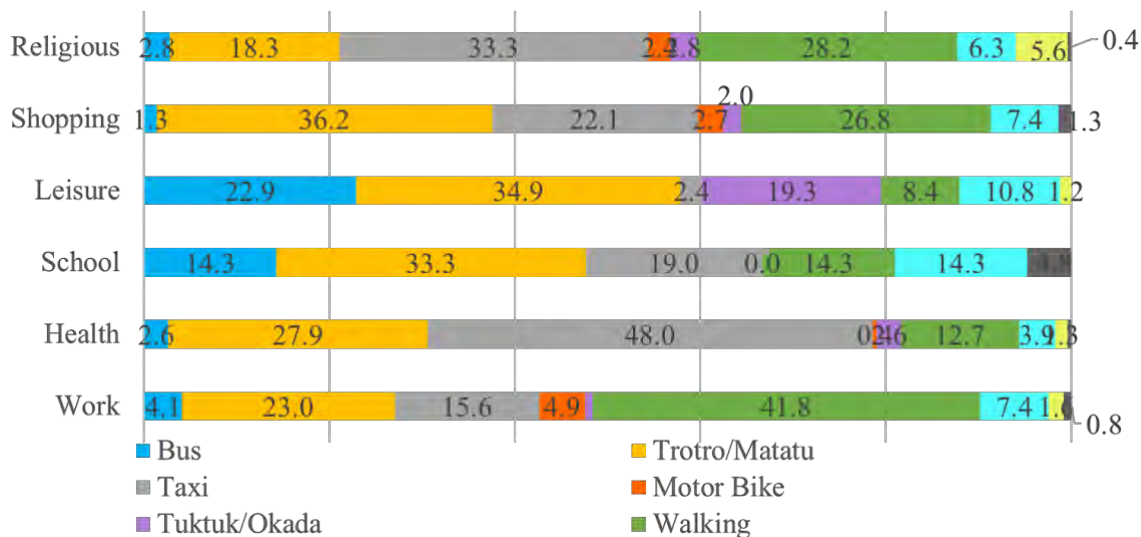


Figure 8: Preferred mode of transport for activities and trips

Table 4 presents the mode share changes arising from the impact of the covid-19 pandemic for the various PWD categories engaged in the study. Table 4 reveals that the covid-19 pandemic had a major influence on the mode choice of the blind/hard in hearing in respect of work (M=4.0, SD=0.0), social activities (M=4.0, SD=0.0), and shopping (M=3.0, SD=1.4). The covid-19 pandemic had less influence on mode choice for the respondents with physical impairment and hearing difficulties in accessing healthcare (M=1.0, SD=0.0) and leisure activities (M=1.0, SD=0.0). Covid-19 influenced PWDs to change their mode of transport when attending school (M=2.0, SD=1.0).

Table 4: Change in Mode Of Transport Because of Covid-19

Services	Blindness		Blindness & Physical impairment		Blindness & Hearing difficulties		Deaf & Hard hearing		Physical impairment		Physical impairment & Hearing difficulties		Other		Total	
	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD
Work	1.8	0.9	2.5	2.1			1.5	1.0	1.7	0.8	1.0	0.0	3.0	1.4	1.7	0.9
Healthcare	1.8	0.9	1.7	1.2	4.0	0.0	1.3	0.7	1.8	0.9	1.0	0.0	2.5	1.3	1.7	0.9
School	2.3	0.5					2.0	1.2	1.6	0.7	2.0	0.0	3.0		2.0	1.0
Leisure	1.8	0.9	3.0	0.0	2.0	1.4	1.1	0.4	2.0	0.9	1.0	0.0	1.0	0.0	1.6	0.8
Social activities	2.1	1.1	1.7	1.2	4.0	0.0	1.6	1.0	1.8	0.8	1.2	0.4	2.5	1.0	1.9	1.0
Shopping	2.0	1.0	1.7	1.2	3.0	1.4	1.3	0.6	1.9	0.9	1.3	0.6	2.0	1.0	1.7	0.9
Religious activities	2.0	1.1	1.0	0.0			1.4	0.7	1.8	0.9	2.2	1.3	2.0	0.0	1.7	0.9

***Key:** 1-No influence, 2- Less influence, 3- Moderate influence, 4- Major influence

The study also assessed the effect of the challenges of the transport system on the desire to travel more for various activities (Table 5). The data reveals that the participants desire to travel more than they currently do (except for school-related trips with fixed schedules) if not for the challenges they face accessing the city's transport system. For instance, about 54% and 53% were more likely to travel more for religious and shopping-related activities if not for the challenges they experienced with the transport system.

Table 5: Effect of Challenges Of The Transport System On Desire To Travel More For Various Activities

Activity	Desire to travel more (%)				
	Extremely unlikely	Unlikely	Neutral	Likely	Extremely likely
Work	7.34	33.03	6.42	49.54	3.67
Health	11.17	28.93	12.69	45.18	2.03
School	30.00	26.67	6.67	23.3	13.33
Leisure	17.02	14.89	14.89	52.13	1.06
Shopping	10.34	19.31	15.86	53.10	1.38
Social activities	8.02	26.20	10.16	51.34	4.28
Religious activities	8.56	23.42	7.21	54.05	6.76

The study also assessed the effect of Covid-19 on the PWDs' desire to travel more for various activities (i.e., work, school, shopping, health, etc.). As expected, the Covid-19 pandemic greatly influenced PWDs' desire to travel beyond what they currently do for their various activities (see Table 6). For example, more than 69% of the PWDs were extremely unlikely (46.7%) or unlikely (22%) to travel more for work due to the Covid-19 pandemic. In the same vein, nearly 68% were also extremely unlikely (45.1%) or unlikely (22.3%) to travel more to access health care because of the current Covid-19 pandemic.

Table 6: Effect of Covid-19 on Desire To Travel More For Various Activities

Response	Activity					
	Work	Health	School	Leisure	Social activities	Religious activities
Extremely unlikely	46.79	45.18	40	44.68	36.36	33.33
Unlikely	22.02	22.34	23.33	17.02	21.39	14.41
Neutral	21.1	23.86	16.67	24.47	16.58	17.12
Likely	7.34	7.61	13.33	8.51	16.58	18.02
Extremely likely	2.75	1.02	6.67	5.32	9.09	17.12
Total	100	100	100	100	100	100

4.4 Mobility Challenges of PWDs in Accra

Mobility Challenges of Urban Transport Systems in Accra

Having explored PWDs' mobility needs and travel mode choice, the study moved further to examine their mobility challenges. The study enumerated 18 key challenges impeding PWDs' accessibility to the transport systems in Accra. These challenges were mainly related to the road environment (e.g., sidewalks/walkways, pedestrian crossing, distance to the bus stop, etc.), vehicle conditions and configuration (e.g., lack of assistive devices, stairs/ramps, and floor level, priority seats, etc.), quality of public transport services, transport operators and passengers' attitudes/behaviour toward PWDs, and traffic behaviour of other road users.

Table 7 presents these challenges per disability type and as an aggregate. Below we report the top three (3) faced by each disability category accessing the transport systems in Accra. The blind's top three (3) challenges in accessing the transport system in Accra were busy pedestrian crossings ($M=3.3$, $SD=1.0$) and poor or no sidewalks/walkways ($M=3.1$, $SD=1.1$), and lack of assistive devices ($M=3.0$, $SD=1.0$). The blind and physically impaired had challenges with the carelessness/recklessness of motorists and other road users ($M=3.7$, $SD=0.6$), busy pedestrian crossings ($M=2.7$, $SD=1.5$), and attitudes of bus drivers and conductors ($M=2.7$, $SD=1.5$).

The deaf/hard of hearing also reported challenges with the carelessness/recklessness of motorists and other road users ($M=2.4$, $SD=1.1$), communication with vehicle operators ($M=2.3$, $SD=1.1$), and attitude of bus drivers and conductors ($M=1.5$, $SD=0.8$). The respondents with blindness/hearing difficulties were constrained by the poor or no sidewalks/walkways ($M=3.0$, $SD=1.4$), busy pedestrian crossings ($M=3.0$, $SD=1.4$), and reading or understanding signs/ lack of information ($M=3.0$, $SD=1.4$). For the physically impaired, boarding or exiting bus ($M=3.0$, $SD=1.2$), poor or no sidewalks/walkways ($M=3.0$, $SD=1.2$) and lack of reserved seats in vehicles ($M=3.0$, $SD=1.2$) presented challenges to them when accessing Accra's transport systems. Last but not least, the physically impaired and hearing difficulties reported challenges with the carelessness/recklessness of motorists and other road users ($M=3.8$, $SD=0.4$), missing the bus stop ($M=2.2$, $SD=1.3$), and poor or no sidewalks/walkways ($M=2.0$, $SD=1.4$). Finally, the other disability types, including wheelchair users and the physically impaired's top three (3) challenges included boarding or exiting bus

(M=3.0, SD= 1.2), poor or no sidewalks/walkways (M=3.0, SD= 1.1), and carelessness/recklessness of motorists (M=3.0, SD= 1.1).

Table 7: Summary of Urban Transport Challenges Faced By PWDs In Accra Per Disability Type

	Blindness		Blindness & Physical impairment		Blindness & Hearing difficulties		Deaf & Hard of hearing		Physical impairment		Physical impairment & Hearing difficulties		Other		Total	
	S		S		S		S		S		S		S		S	
	M	D	M	SD	M	SD	M	D	M	SD	M	SD	M	D	M	D
Lack of assistive devices hearing/visual/walking	3.0	1.0	2.3	1.5	2.5	2.1	1.3	0.7	2.6	1.3	1.8	1.3	1.8	1.5	2.3	1.3
Stairs, lack of ramps, uneven ground	2.5	1.3	2.0	1.7	1.0	0.0	1.0	0.3	2.9	1.3	1.6	0.9	2.8	1.3	2.2	1.4
Poor or no sidewalks/walkways	3.1	1.1	2.3	1.5	3.0	1.4	1.1	0.3	3.0	1.1	2.0	1.4	2.5	0.6	4.4	1.3
Busy pedestrian crossings	3.3	1.0	2.7	1.5	3.0	1.4	1.1	0.2	2.9	1.1	1.6	1.3	0.0	0.0	5.5	1.3
Reading or understanding signs/ Lack of information	2.6	1.4	1.3	0.6	3.0	1.4	1.1	0.5	1.3	0.8	1.0	0.0	0.0	0.0	6.1	1.1
Getting to a bus stop	2.2	1.2	2.3	1.5	3.0	1.4	2.1	0.5	2.4	1.2	1.2	0.4	0.0	2.0	0.1	1.1
Distance to the bus stop	2.5	1.2	1.3	0.6	2.5	2.1	3.1	0.4	2.2	1.2	1.2	0.4	0.0	0.0	0.1	1.1
Boarding or exiting bus	2.6	1.1	2.0	1.7	2.5	2.1	0.0	0.0	3.0	1.2	2.0	1.4	0.0	4.3	3.3	1.1
Lack of accessibility equipment	2.7	1.3	2.0	1.7	1.5	0.7	4.1	0.6	2.5	1.4	2.0	1.2	3.3	5.3	3.3	1.1
Personal attendant required to pay fare	1.4	0.8	1.0	0.0	1.0	0.0	3.1	0.7	1.1	0.4	1.8	0.8	0.0	0.0	2.6	1.1
Inadequate space for wheelchair/crutches/ walkers	1.1	0.2	2.0	1.7	1.0	0.0	1.1	0.5	2.8	1.3	1.6	1.3	0.0	0.0	8.2	1.1
Attitudes of Bus drivers and conductors/mates	2.5	1.1	2.7	1.5	2.5	0.7	5.1	0.8	2.6	1.2	2.0	1.2	0.0	2.3	3.2	1.1
Attitudes of other passengers	2.0	1.2	1.0	0.0	3.0	1.4	1.1	0.5	1.9	1.1	2.0	1.4	3.3	5.7	7.1	1.1
Lack of reserved seat in vehicles	2.7	1.3	2.3	1.5	3.0	1.4	1.1	0.4	3.0	1.2	1.8	1.3	8.8	5.3	3.3	1.1
Paying the fare	2.0	1.3	1.0	0.0	1.0	0.0	4.1	0.7	1.7	1.2	1.4	0.5	3.3	5.7	7.2	1.1
Missing the Stop	2.0	1.2	1.3	0.6	2.5	0.7	3.1	0.7	1.9	1.1	2.2	1.3	3.3	5.8	8.1	1.1
Communicating with vehicle operators)	1.1	0.6	2.0	1.7	1.0	0.0	3.1	1.1	1.0	0.3	2.0	1.0	0.0	0.0	5.9	1.1
Carelessness/recklessness of motorists and other road users	2.9	1.2	3.7	0.6	3.0	1.4	4.2	1.1	3.0	1.1	3.8	0.4	3.3	5.1	8.1	1.1

1- No challenge, 2- Less a challenge, 3- Moderate challenge, 4- Major challenge

However, as an aggregated group, the majority of PWDs had challenges with the carelessness/recklessness of motorists and other road users (M= 2.8, SD= 1.1), busy pedestrian crossings (MD=2.5, SD=1.3), and poor or no sidewalks/walkways (M=2.4, SD=1.3) (Table 7).

Table 8: Challenges Faced By PWDs in Accessing Transport System in Accra-Ghana Per Gender

Challenges	Male		Female		Total	
	M	SD	M	SD	M	SD
Lack of assistive devices, hearing/visual/walking	2.4	1.3	2.2	1.3	2.3	1.3
Stairs, lack of ramps, uneven ground	2.3	1.4	2.2	1.4	2.2	1.4
Poor or no sidewalks/walkways	2.5	1.3	2.3	1.3	2.4	1.3
Busy pedestrian crossings	2.6	1.3	2.3	1.3	2.5	1.3
Reading or understanding signs/ Lack of information	1.7	1.2	1.5	1.1	1.6	1.1
Getting to a bus stop	2.1	1.2	1.9	1.1	2.0	1.1
Distance to the bus stop	2.1	1.2	1.8	1.1	2.0	1.1
Boarding or exiting the bus	2.4	1.3	2.3	1.3	2.3	1.3
Lack of accessibility equipment	2.3	1.3	2.2	1.3	2.3	1.3
Personal attendant required to pay the fare	1.3	0.7	1.2	0.6	1.2	0.6
Inadequate space for wheelchair/crutches/ walkers	1.8	1.2	1.7	1.2	1.8	1.2
Attitudes of Bus drivers and conductors/mates	1.5	0.8	1.4	0.7	1.4	0.8
Attitudes of other passengers	1.8	1.1	1.6	1.0	1.7	1.1
Lack of reserved seats in vehicles	2.4	1.3	2.2	1.4	2.3	1.3
Paying the fare	1.6	1.1	1.8	1.2	1.7	1.2
Missing the Stop	1.7	1.1	1.9	1.1	1.8	1.1
Communicating with vehicle operators)	1.4	0.8	1.5	1.0	1.5	0.9
Carelessness/recklessness of motorists and other road users	3.0	1.1	2.6	1.1	2.8	1.1

1-No challenge 2- Less a challenge 3- Moderate challenge 4- Major challenge

Based on gender, Table 8 reveals that both males (mean= 3.0, SD= 1.1) and females (mean= 2.6, SD= 1.1) had similar challenges with the carelessness/recklessness of motorists and other road users. The least challenge for the male (M=1.3, SD=0.7) and female (M= 1.2, SD= 0.6) PWDs was the personal attendant required to pay the fare.

Public Transport Vehicle Audits

Given the PWDs' vehicle-related mobility challenges, the study assessed public transport operators' compliance with the transport-related provisions of the local disability Act and laws. The team conducted a special audit of forty-five (45) vehicles using the auditing scheme (discussed in 3.3.1 Auditing instrument in the Methodology section). Table 9 presents

the observed items (variables) and the findings (availability/observation) with some pictorial evidence.

We observed that the vehicle floor height of the observed vehicles ranged between 320 and 520mm above the UN recommended floor height of 230mm. The “above-range” floor heights were typical of old models of Toyota Haica, Hyundai Grace, and Mercedes-Benz 207 Sprinter buses. None of the 45 audited vehicles had disability signages, ramps or boarding platforms, handrails at the vehicle entrance or in the interior, assistive devices, clearly labelled signage indicating vehicle routes, fare policy in favour of PWDs, or priority seats or designated areas for PWDs. However, we observed that the drivers/conductors call out major stops for the information of commuters and wait for passengers to alight before they take off (in 90% of the cases) (see Table 9).

Table 9: Vehicle audit results

Variable	Availability (observation)	Condition/ Type	Dimension (mm)	Pictorial evidence
1. Floor height			320 to 520 mm	
2. Disability signage on bus	Yes – 0% No – 100%			

3.	Ramps or boarding platforms	Yes – 0% No – 100%				
4.	Handrails at entrance	Yes – 0% No – 100%				
5.	Interior handrails	Yes – 0% No – 100%				
6.	Priority seats or designated areas	Yes – 0% No – 100%	Behind driver	[]		
			First seat after the entrance	[]		
			Anywhere in vehicle	[]		
7.	Assistive technology	Yes – 0% No – 100%	Bell pushes	[]		
			Audio Transmitters	[]		

			Pictogram/ Smart Screen tablets	[]	
			Other	[]	
8.	Clearly labelled signage on bus	Yes – 0% No – 100%			
9.	Fare policy	Yes – 0% No – 100%	Full fare Subsidized fare No fare		
10.	Driver/conductor calls out major stop	Yes – 100% No – 0%			
11.	Drivers wait for all to alight before they take off	Yes – 90% No – 10%			

4.5 Level of Satisfaction with Accra's Transport System

The study explored participants' level of satisfaction (LoS) with Accra's transport systems based on the following indicators: scheduling procedures, waiting times, travel time, comfortability, safety from accidents and crime, affordability, reliability, and drivers and conductors/mates' conduct.

A general observation of the data (Table 10) reveals that the respondents were more satisfied with the safety of transport from accidents (M=3.7, SD=1.2) and crime (M=3.6, SD=1.2) and reliability of transport (M= 3.0, SD= 0.) than the rest of the indicators of

satisfaction of the transport systems assessed. Table 9 further shows that the PWDs were least satisfied with the transport cost (affordability issues) (M=2.9, SD=1.1) and conduct of conductors/mates (M= 2.6, SD= 1.1).

Table 10: Level of satisfaction with transport system in Accra

Variables	Blindness		Blindness & Hearing difficulties		Blindness & Physical impairment		Deaf & Hard hearing		Physical impairment		Physical impairment & Hearing difficulties		Other		Total	
	M	SD	M	SD	M	SD	M	S	M	SD	M	SD	M	S	M	S
Scheduling procedures	3.2	1.0	3.5	0.7	2.3	0.6	3.3	1.3	3.2	1.0	4.2	0.8	5.2	1.0	2.3	1.1
Waiting time	3.0	1.0	3.5	0.7	4.0	0.0	3.2	1.2	3.3	0.9	3.0	0.7	8.3	1.3	2.3	1.0
Travel time	2.8	1.1	4.0	0.0	4.0	0.0	3.3	1.3	3.4	0.8	3.6	0.9	5.3	0.6	2.3	1.1
Comfort	3.0	1.2	2.5	0.7	3.3	1.2	6.3	1.2	3.1	1.1	4.0	1.4	3.3	1.0	2.3	1.2
Safe from accidents	3.4	1.2	2.5	0.7	4.7	0.6	9.3	1.4	3.8	1.1	5.0	0.0	5.3	0.6	7.3	1.2
Safe from crime	3.5	1.0	3.0	1.4	3.7	1.5	8.3	1.5	3.6	1.1	4.8	0.4	3.2	0.5	6.3	1.2
Affordability	2.7	1.0	3.0	1.4	2.7	1.2	3.3	1.1	2.8	1.1	3.4	1.1	3.3	1.3	9.3	1.1
Reliability	3.6	0.7	2.5	2.1	4.0	0.0	9.3	0.9	3.5	0.9	4.0	0.7	5.3	0.6	6.3	0.9
Drivers Conduct	3.3	0.8	3.5	0.7	3.3	0.6	0.2	1.0	3.1	0.8	3.4	0.5	5.1	0.6	2.2	0.9
Conductor/mate conduct	2.7	1.1	2.0	0.0	3.0	1.7	6.1	1.1	2.6	1.0	3.2	1.1	8.1	0.5	6.1	1.1

Aggregating the data by disability categories, the study observed that the blind and physically impaired reported high satisfaction with safety from accidents (M=4.7, SD=0.6), bus reliability (M= 4.0, SD= 0.0), waiting time (M=4.0, SD=0.0), travel time (M=4.0, SD=0.0) and safety from crime (M= 3.7, SD= 1.5). The respondents with physical impairment & hearing difficulties were highly satisfied with safety from accidents (M=5.0, SD=0.0), safety from crime (M=4.8, SD=0.4), and scheduling procedures (M=4.2, SD=0.8). For the blindness & hearing difficulties category, the study observed satisfaction with the conductor/ mate conduct (M=2.0, SD=0.0) and comfort (M=2.5, SD=0.7). PWDs with physical impairment had a moderate level of satisfaction with conductor/mate conduct (M=2.6, SD=1.1) and affordability (M=2.8, SD=1.1) of transport fares.

4.6 Assessment of the Disability Friendliness of Accra's Transport Systems

This section presents PWDs' assessment of the disability friendliness of Accra's transport systems. It begins by assessing the PWDs' respective communities and the entire city. Further, it considers the stress PWDs go through navigating their communities and city.

At the community level, most PWDs (particularly the blind and hearing difficulties (50%), deaf and hard hearing (42.9%), and blind (25%) described the transport systems in their respective communities as highly disability friendly. Despite this, the blind (29.7%) had contrary views; they claimed the transport systems in their communities are disability unfriendly (i.e., very low disability friendly) (Figure 9). In addition, 14.3% and 10.1% of the deaf and hard hearing and physically impaired, respectively, categorised the transport systems at the community level as very low disability friendly.

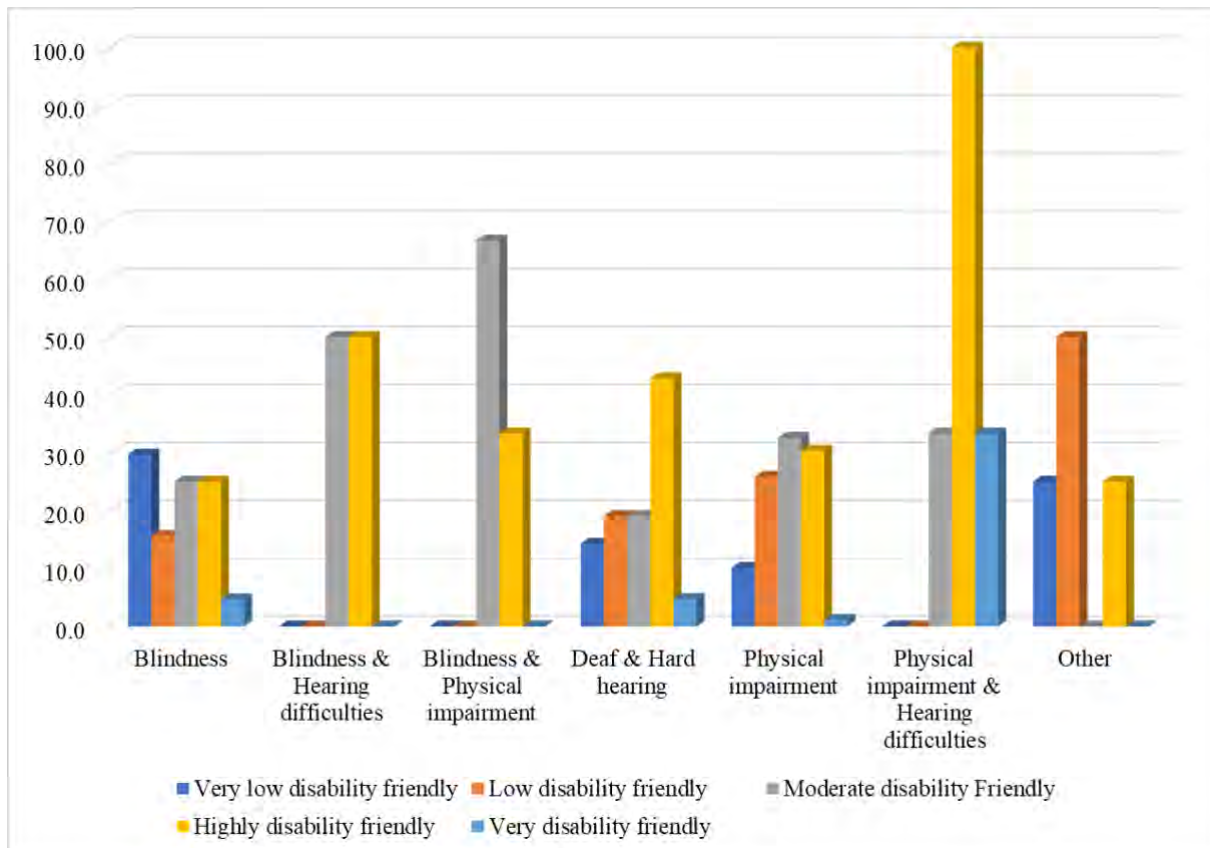


Figure 9: Disability friendliness of transport system at the community level

Figure 10 shows that the participants appraised the transport systems at the city level as moderate to low disability friendly. For instance, about 50% of the blind and hearing difficulties group considered the city moderately disability friendly, while the remaining 50% considered it as low disability friendly. Some PWDs with blindness (37.5%), blindness and

physical impairment (33.3%), and physical impairment (30.3%) considered Accra's transport systems as disability unfriendly.

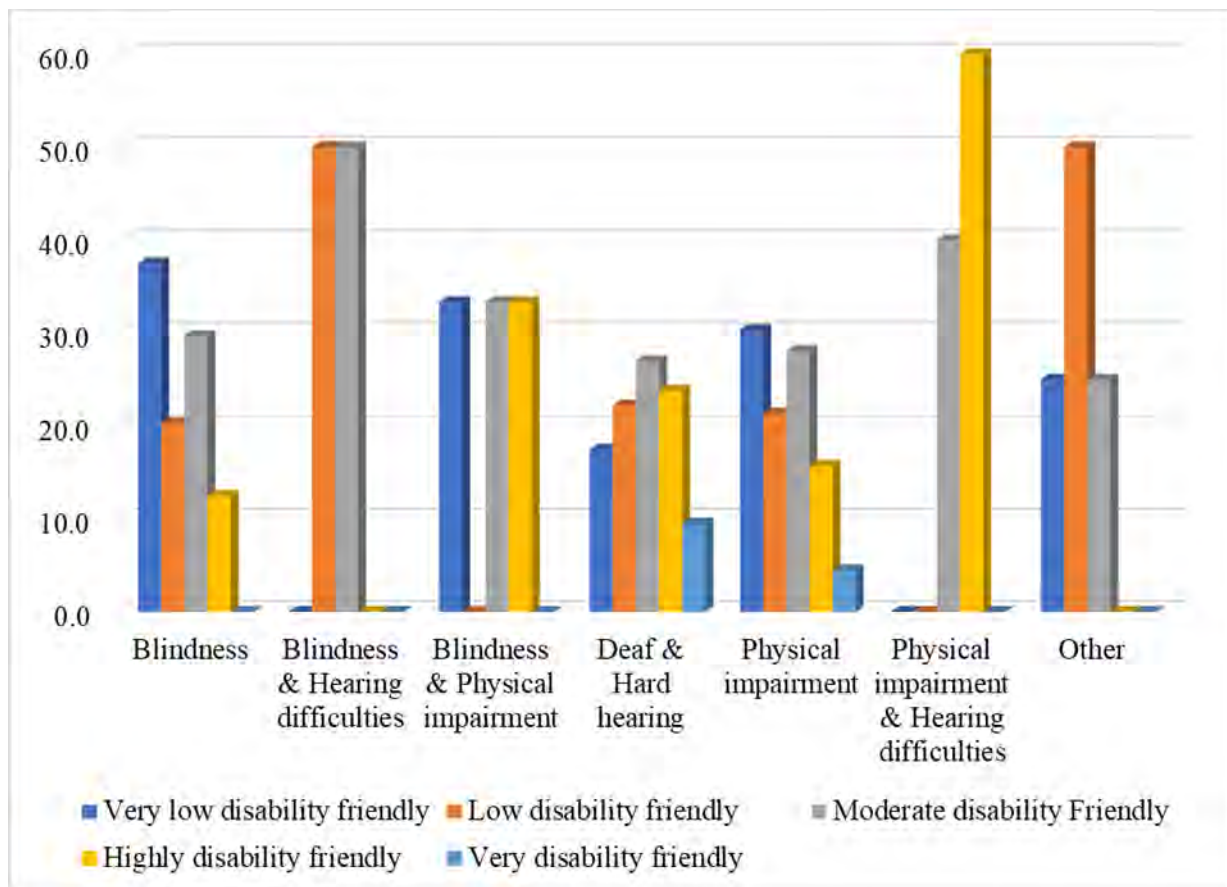


Figure 10: Disability friendliness of transport system in the entire city (Accra)

Furthermore, the study sought PWDs' views (by disability category) on the stress associated with movement in their communities and the entire city. At the community level, the blind and hard hearing (50%) and blind (42.2%) reported high levels of stress navigating the transport systems and urban landscape (Figure 11). The deaf and hard hearing reported less stress navigating their communities' transport systems, with over 66.7% claiming they experience low stress.

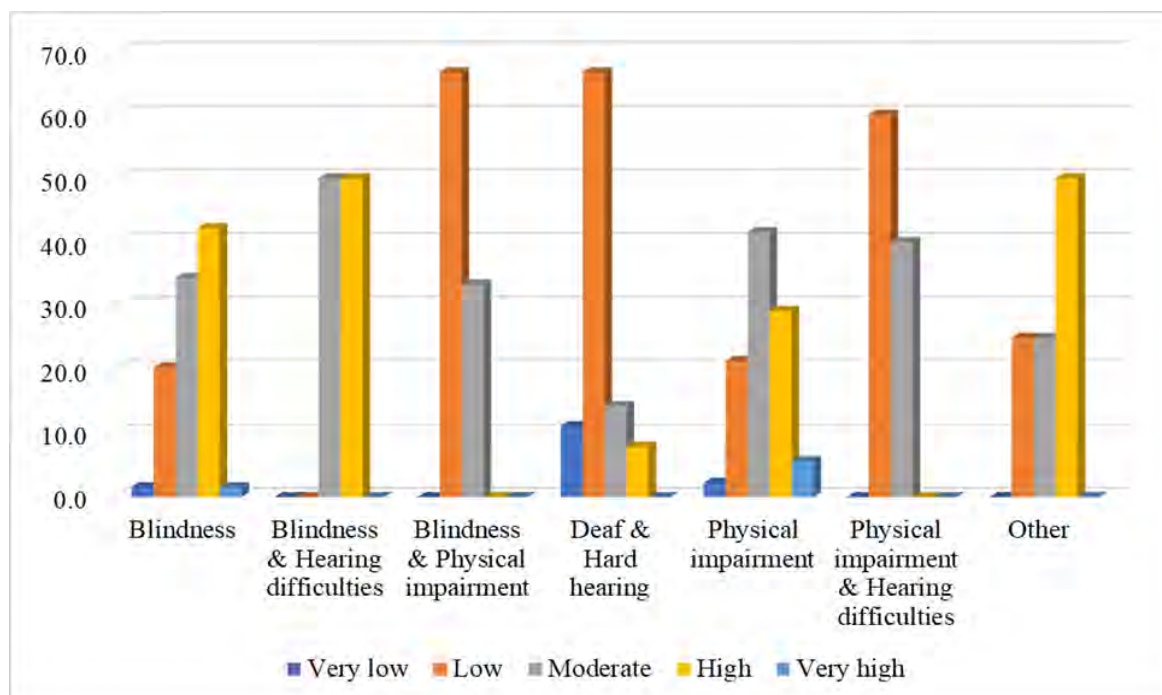


Figure 11: Stress levels of PWDs navigating transport system at the community level

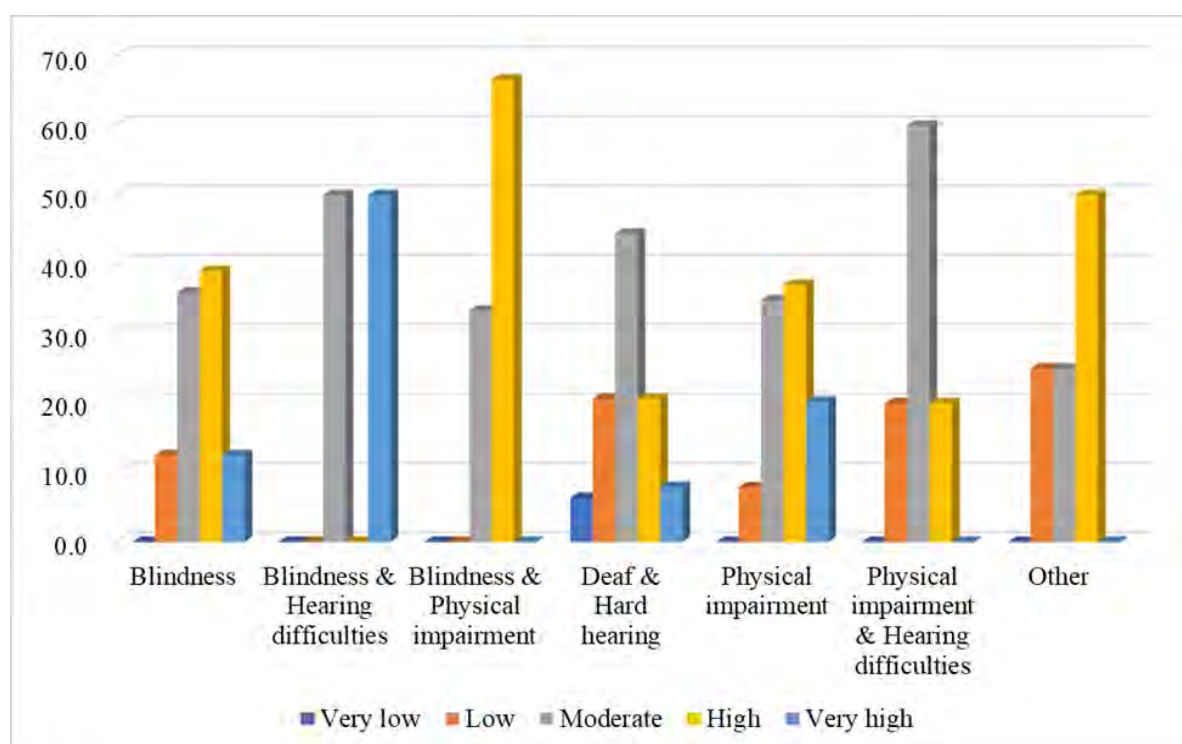


Figure 12: Stress level of PWDs navigating transport systems in the entire city

At the city level, the PWDs reported stress levels ranging from moderate to very high. Generally, the blind/hard hearing (50%) reported very high levels of stress navigating the urban

transport systems than the other disability types (Figure 12). Further, respondents with physical impairment (20.2%) considered stress associated with navigating in Accra very high.

4.7 Coping Mechanisms of PWDs in Accra

Section 1.3 highlights 17 challenges PWDs face navigating Accra's transport systems. The study observed that the PWDs had adopted certain coping mechanisms in response to these challenges, notably seeking assistance (see Table 11). It also came to light that some PWDs limit their movement by mainly staying at home to avoid the troubles of the transport system. In response to the lack of assistive devices, stairs/ramps/uneven ground, reading or understanding signs, and accessibility equipment, the PWDs' major coping mechanism was seeking assistance from aids or strangers. At the least, they depended on a motorcycle, walked slowly or cautiously, or struggled alone.

In dealing with the attitude of drivers, conductors, and other passengers, most PWDs adopted the strategy of ignoring them/keeping quiet. They also cautioned careless motorists and other road users or reported them to the police.

Table 11: Challenges and Coping Strategies

Challenges	Major coping strategy	Least coping strategy
Assistive devices	Assisted/sought help (68.9%)	Depend on Motorcycle (0.8%)
Stairs, lack of ramps, uneven ground	Assisted/sought help (61.1%)	Walk slowly/cautiously (1.7%)
Reading or understanding signs	Assisted/sought help (89.1%)	Struggle alone (6.9%)
Accessibility equipment	Assisted/sought help (62.8%)	Walk slowly/cautiously (0.8%)
Space for wheelchair/crutches	Pay for another seat/boot (39.7%)	Keep it under the seat/boot (2.7%)
Attitudes of Bus drivers and conductors/mates	Ignore them/Keeping quiet (48.8%)	Use Taxi/Dropping (0.8%)
Attitudes of other passengers	Ignore them/Keeping quiet (33.8%)	Confront them (6.7%)
Motorists and other road users	Caution drivers (69%)	Report to the police (0.5%)

5 ROLE OF KEY STAKEHOLDERS IN URBAN TRANSPORT IN ACCRA

This section provides an overview of existing practices by various stakeholders to meet the mobility needs of PWDs. Key stakeholders in this section include the national representative of the Ghana Private Road Transport Union (GPRTU), transport operators, the Accra Metropolitan Assembly, and the National Council on Persons with Disabilities. The following highlight the roles of these stakeholders.

5.1 Ghana Private Road Transport Union (GPRTU)

The GPRTU operators acknowledged the important role of transport services in connecting people to various life-enhancing opportunities like schools and hospitals. However, the focus on delivering inclusive transport services appeared to be secondary as most of GPRTU's activities did not conform to the dictates of Ghana's disability Act.

The study observed that none of the transport operators had knowledge of the actual content of Ghana's disability Act and its transport-related provisions even though this legislative instrument has existed for over 14 years, as seen in the following excerpts:

‘‘Yes, we have heard of it, but we have not had the chance to go through it properly and know all that is inscribed in the law’’. (National Representative of GPRTU)

‘‘Actually, I have not heard any law like that, but naturally, when you see a person with a disability, you have to offer the person the best services available, which may require you to assist them into the bus or find them a place to sit’’ (Local Transport operator at Kwame Nkrumah Circle).

Further investigation also revealed the absence of local by-laws or operational guidelines that enjoin public transport vehicle drivers to offer dedicated services to PWDs. Unlike the aviation industry in Ghana, which specifies key disability services as a requirement for airline operators, no such thing exists among public transport operators as membership. Additionally, transport operators mentioned that all engagements with PWDs, in particular, were guided by common sense or the use of one's discretion in offering various dedicated

services like a free ride for PWDs, enjoyment of priority seats, and the acquisition of ramps or assistive devices.

Vehicle Floor Height

The vehicle floor height is the vertical distance between the ground and the first entry-level into a bus. This level significantly influences the degree to which PWDs and other commuters join or alight from the bus. Further engagement with the transport operators revealed their appreciation of how such high-floor vehicles limit wheelchair users from enjoying a barrier-free entry or exit, as found in the following excerpts from the interviews:

‘‘...To be frank, they suffer a lot when they come to board the cars, especially those using a wheelchair. The car is very high for them, and it’s difficult for them to board the car since there is no lift. Because of that, some of the drivers don’t like picking them because it will delay their movement’’ [Local Transport operator at Kwame Nkrumah Circle]

‘‘the most challenging issues they face as PWDs from my point of view include the affordability of transport fares and the high nature of floor heights of the buses’’ [Local Transport operator at 37 Lorry terminal]

Here, the only support service mentioned facilitating the entry or exit of wheelchair users was reliance on the conductor or drivers in lifting PWDs or allowing them to crawl into the buses. The strenuous effort required to lift PWDs was a disincentive to transport operators since they preferred to channel this effort into other perceived productive use like scouting for prospective passengers or taking enough rest before a trip. Alternatively, the study found that drivers perceived wheelchair users to spend considerable time joining buses, resulting in drivers’ aggression towards wheelchair users. In some cases, drivers ignore PWDs who show clear indications to enter their vehicle.

Concerning the possibility of providing low-floor vehicles to cater to wheelchair users, transport operators were reluctant despite the numerous benefits associated with this endeavour. The study found that drivers’ apprehension in this regard was because of perceived economic loss related to the acquisition of a ramp or new buses with a kneeling effect. The drivers also reasoned that the low population of Ghana’s disability community does not warrant

making such huge investments into providing assistive devices, which will not yield many returns, hence their reluctance to offer such inclusive services.

Priority Seating Areas / Dedicated Space

Section 29 of Ghana's disability Act explicitly enjoins all transport operators to reserve at least two seats for persons with disability. Unfortunately, findings from the field revealed a gross disregard for this legislation, as seen in the following narratives. The transport operators revealed where PWDs sit when they join their buses;

‘ ‘They sit at any place in the car they want; sometimes they take a front seat or join others inside’ ’ [Local Transport operator at 37 Lorry terminal]

‘ ‘There are seats, so wherever they choose to sit, that’s all’ ’ [Local Transport operator at Tema Station]

‘ ‘When a PWD gets to my bus, I always try my best to get a space that would be comfortable for them. Mostly, I prefer they sit in the front seat or any seat where other passengers will not disturb them on the journey’ ’ [Local Transport operator at Kaneshie Terminal]

As indicated above, seats in public transport buses are on a *first-come, first-served* basis leaving no room for PWDs to enjoy such support services. Even without knowledge of Section 29, transport operators occasionally reserved specific seats for PWDs to reduce their stress when joining their buses. As seen in Figure 13, these seats comprised: the one beside the driver and the seat right after the driver.

In the wake of identifying preferred seating positions for PWDs, the National Representative of the GPRTU disagreed with the decision of local transport operators to reserve the seat beside the driver (Figure 13), especially when the visually impaired are concerned. To him, the seat beside the driver is for principal witnesses to a driver in the event of an accident. In this case, keeping a visually hearing or persons with any impairment on such seats may not serve that purpose. Unfortunately, the discussant failed to identify any dedicated seats for PWDs but only admonished local transport operators to offer seats with the least obstruction to PWDs.



Figure 13: Priority seating positions for PWDs

It came to light that the transport operators were not keenly interested in reserving seats for PWDs since such actions did not yield any benefit to transport operators, especially as priority/reserved seats don't connote high fares. However, the study observed some exemptions for wheelchair users or persons perceived to have severe forms of disability. In most cases, the wheelchairs are kept in the trunk for a fee in the absence of a dedicated space for wheelchairs.

Assistive Technology for PWDs

Section 23 of the Ghana disability act enjoins transport operators to provide assistive aids (e.g., audio-visual or brail tools) that offer information on fares, travel routes, and location attributes. While these tools are critical to the visually or hearing impaired, observations from the study sites/ bus terminals revealed the absence of any assistive aids for PWDs. Additionally, interviews sessions with the selected transport operators also confirmed the findings of the observations made:

“Most blind and wheelchair users who come to this station are accompanied by an aid. For the blind who come here unaccompanied, I approach and direct them to their destination bound vehicles since there is no avenue for them to do so on their own” [Local Transport operator at Kwame Nkrumah Circle]

“I don't have any device like that, and I think there is no vehicle in Ghana that has such device” [Local Transport operator at 37 Lorry terminal]

Without assistive devices, conductors or ‘mates’ assist unaccompanied PWDs in identifying the right vehicle to their destinations. As observed in the study, conductors’ willingness to help PWDs find the right vehicle is an attempt to attract prospective commuters, given the competition for passengers among the transport operators and not a sign of inclusive service for PWDs.

Regarding ascertaining one’s location while a bus is en route, transport operators also cited their reliance on call out from conductors as the key conduit in helping PWDs make various travel decisions. While this confirms the absence of audio-visual tools for the blind and hearing impaired, the reliance on callouts from conductors appears to be a long-held tradition, as seen in other empirical studies by Odame et al. (2020). However, this reliance on callout seems ineffective. Previous engagement with some blind persons confirms many cases of missing an intended destination while replying to calls from conductors.

While such support services come in varying degrees of sophistication and pricing, transport operators appeared indifferent to acquiring these audio-visual tools. Though drivers’ hesitation largely informed this decision in increasing their cost of operations, some drivers considered the loudness and frequency of such audio transmitters to be a nuisance to other commuters who may require some degree of solitude or quietness while on board.

Driver Training on PWDs’ Travel Needs

The study sought to examine whether the public transport operators had received any training on support services to the disability community. The study revealed that none of the transport operators engaged had ever received any training on how to cater to the needs of PWDs, as seen below:

“No! We have never held a meeting to discuss anything that concerns persons with disability. In fact, this does not come to our consideration at all” [Local Transport operator at 37 Lorry Station]

“...We don’t receive any training like that, but when we see all passengers by the roadside, we are admonished to give them some time to cross the road. Sometimes, we go out of our way to help them cross the street” [Local Transport operator at Tema Lorry Station]

“There has been no training for drivers on how to cater to the needs of PWDs. We only use our discretions to assist them” [Local Transport operator at Kaneshie Lorry Station]

5.2 Accra Metropolitan Assembly

The Accra Metropolitan Assembly (AMA) operates as a local administrative body that regulates all activities within its three (3) sub-metros. Interactions with the AMA’s Head of Transport (herein referred to as discussant) confirmed that the AMA has design guidelines that regulate the development, modification, and construction of all facets of the physical environment. While confirming the Builders Code of 2018 as the key policy instrument, the discussant revealed that *“this design guideline does not succinctly refer to the concept of Universal Design, especially in the transport sector.”* Here, the focus of this policy instrument hinged on the attainment of international standards for building designs without focusing on the transport environment which connects PWDs to such facilities.

While expressing the need to address the travel concerns of PWDs, the discussant indicated that the decision to develop or modify a transport terminal rests on collaboration from other state agencies like the Ghana Highway Authority, Department of Urban Roads, and Ministry of Transport. Unfortunately, this collaboration does not appear to yield any disability-inclusive results as existing transport facilities at the various study sites did not offer any indications of inclusive transport infrastructure. As earlier indicated, these terminals lacked assistive devices like wayfinding aids or tactile signage. The discussant identified financial constraints as the reason for neglecting the mobility needs of the disability community when developing the transport infrastructure.

According to the discussant, the absence of city by-laws that categorically ensures the provision of inclusive transport services also accounts for the non-responsiveness of the physical transport infrastructure to the mobility needs of PWDs in the city. Notwithstanding, the in-depth interview with the discussant revealed that the AMA had initiated several transport programmes and interventions to address other key transport issues like traffic congestion, road crashes, and pollution. Examples of such transport programmes include the introduction of commuter mass transit projects like the Bus Rapid Transit (BRT). The recent AMA document titled *‘Pedestrian Road Safety Action Plan for The Accra Metropolitan Assembly 2018-2022’* contains other road safety-related interventions.

The BRT (Figure 14) was the only transport option that meets the mobility needs of the disability community. Specifically, the BRT had low floor height for wheelchair users and ambulant travellers, contrasting colours for the partially blind, dedicated spaces and seats, audio-visual devices, and spacious seats. Unfortunately, this is insufficient since the BRT services account for less than 1% of all trips undertaken in the Accra Metropolitan Assembly.



Figure 14: Ayalolo Buses (BRT buses)

Another key factor hindering the AMAs' effort to ensure the provision of inclusive transport services is the absence of an operational guideline that spells out key entry requirements into the transport sector. According to the discussant, the lack of a strict public transport operations entry also reflects the monopoly the private sector enjoys in public transport operations. For instance, the GPRTU has also established itself as a key political agent that stands to influence public opinions, as evident in the following narrative.

Somebody buys a vehicle and puts it on the road. When you intercept it as a public servant, you get a call from a political office holder telling you to release the culprit since they belong to the same party. And so, the political interference in the public sector is even more pronounced in the transport sector because the regulation for market entry is not tough.

Further engagement with the discussant revealed that this monopoly the GPRTU enjoys had propelled them to refuse previous recommendations to upgrade its public transport fleets to meet modern operational standards. The GPRTU had always cited the huge financial

commitment associated with the procurement and operation of modern transport vehicles, especially as they receive no funding from the state.

5.3 National Council on Persons with Disability (NCPD), Ghana

The Persons with Disability Act of 2006 established the NCPD to propose and develop policies that mainstream the activities of PWDs. By this, the NCPD has been instrumental in key programmes related to livelihood options for PWDs and the school feeding programme, with very little engagement or activities in the transport sector. The Executive Secretary (discussant) revealed that the governing board of the NCPD has no representatives from the Ministry of Transport and other related agencies as the current disability law makes no provision for their inclusion.

Though this inclusion would have offered the needed opportunity for the NCPD to echo the mobility needs of PWDs, the discussant, however, opined that the mandate of the Disability Act allows them to sensitise the relevant agencies on the need to ensure an inclusive transport environment. The discussant revealed that *'the council necessarily do not need to have the presence of every ministry, department, and agency to ensure inclusion. Instead, the council is supposed to collaborate to ensure that the activities of Metropolitan, Municipal, and District Assemblies (MMDAs) and the private sector has a component on disability'*. It came to light that the NCPD's previous collaboration with the transport stakeholders resulted in the inclusion of the current transport-related provisions in the Ghana Disability Act and Law. Unfortunately, the discussant remarks and field observations reveal little progress for public transport operators to adhere to the transport-related provisions in the Act despite their earlier pledges to do so.

The discussant revealed that despite the NCPDs' persistent efforts to promote inclusive transport for PWDs, the absence of a dedicated resource person or 'transport schedule officer' accounts for the little progress made in the transport sector. While this development impairs the NCPDs' effort to intensify its outreach programme with transport operators and city managers, the discussant also observed that the academic and research community's low interest or publicity on disability issues is also a critical factor. The discussant opines that the contributions of the academic community may induce a national discourse that would propel the NCPD's efforts to ensure disability-inclusive urban transport systems.

The discussant further cited the lack of an implementing agency (i.e., enforcers) for the disability Act as another factor weakening the efficacy of NCPD's transport advocacy programmes. The reluctance of transport operators to ensure disability-friendly services results from the absence of such enforcement agencies in respect of the provisions of the disability act. In some cases, PWD organisations/associations had secured court injunctions on projects that do not reflect nor cater to their needs. For example, the Ghana Federation of Disability Association sought a court injunction in 2006 to halt the commissioning of a highway that did not meet their mobility needs.

However, the discussant hinted at plans to amend the existing Disability Law to provide a wider legal framework for its operations. According to the discussant, parliament will pass the re-enactment bill this year. This bill will not only specify an implementation agency of the disability act but also compel all agencies to engage the NCPD when planning or executing projects or programmes.

6 CASE STUDIES ON PWDS' MOBILITY EXPERIENCES AND CHALLENGES IN ACCRA

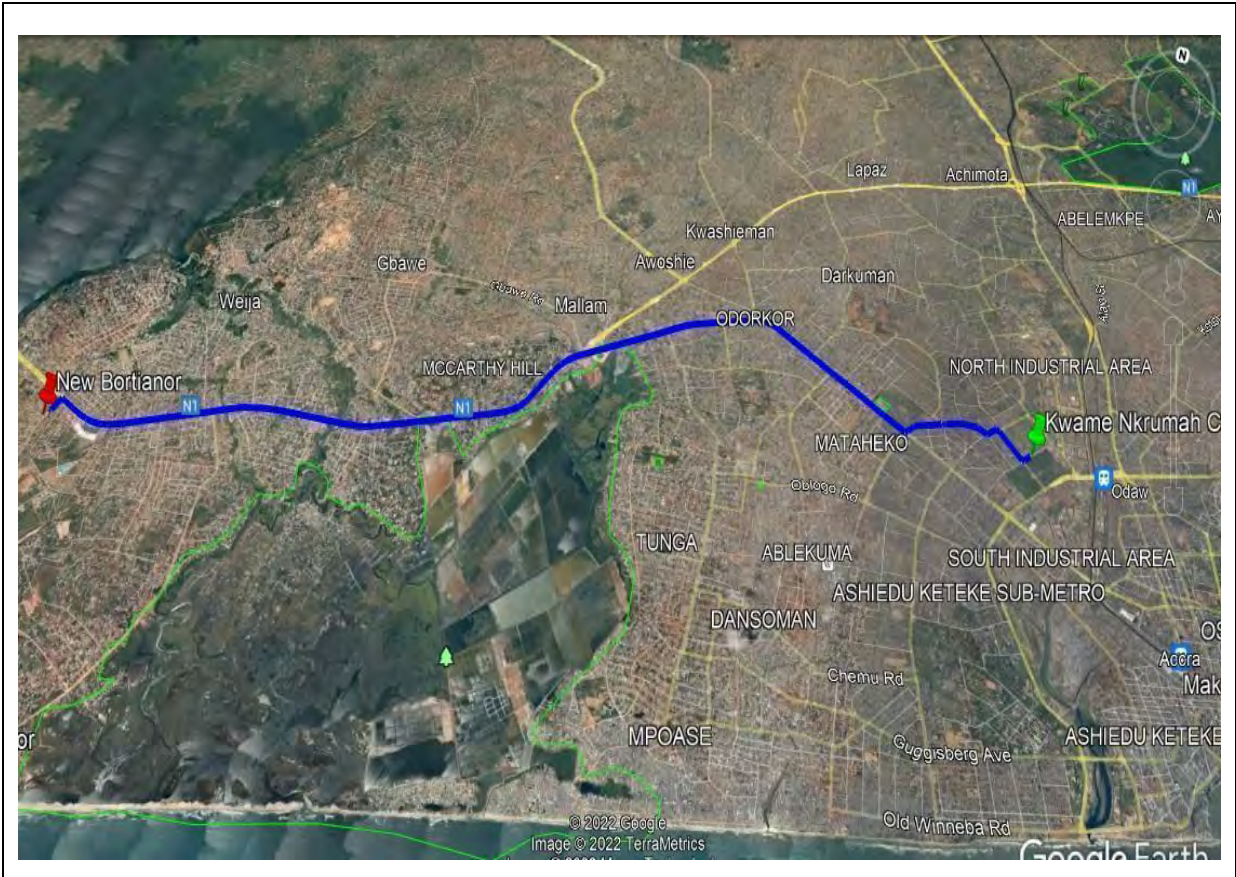
6.1 Case Study 1 of PWDs Experiences in Accra

I am Mrs Ama Baidoo¹, a 55-year-old visually impaired woman. I live in a rented apartment in New Bortianor (Accra) with my husband and two children. [To understand the coping mechanisms, Mrs Baidoo adopts to go to the market (at Kaneshie), where she buys her household supplies and other basic needs for her basket weaving craft at home. The researcher followed her and her aide (husband) to the market on 16 September 2021. This trip is one of her usual (twice a week) trips].

Anytime I leave my house to the bus stop, the walking environment becomes a barrier since most parts of the route do not have sidewalks. The situation always exposes me to the risk of injury. I always walk on the shoulders of the road because of the lack of a sidewalk. [Conditions of the road were also rated poorly by the researcher as the surface was uneven with dirt or sand]. I am not happy with the situation; things even become worst during the rainy season. [The condition of the bus stop was not the best because there was the absence of shelter or any disability-friendly facility to reduce the effort of visually impaired passengers in identifying and joining the right vehicle]. [At the bus stop, the conductor asked if Mrs Baidoo was going in his direction; this appeared to be the commonly used practice in Accra and Ghana. She responded in affirmative and joined the bus (trotro). While onboard, further observations revealed the absence of any disability-friendly facility on the bus. Mrs Baidoo confirmed that she usually relies on conductors or her husband for basic services like payment of fares, identification of current location, and assistance in joining or disembarking from trotro]. My brother, trotro is my least preferred option, but financial constraints compel me to use it continuously despite the poor rating on safety, convenience, access to information, dedicated seating position, and the attitude of transport operators. [After about 25 minutes, Mrs Baidoo signalled to the mate that she would alight at Kaneshie. At the Kaneshie bus stop, the walkway to the Kaneshie market conditions was slightly different from the earlier account]. You notice a sidewalk here, but these sidewalks are also inaccessible since street hawkers and other traders had extensively encroached on the walkways. So, I again walk on the shoulders of the road, risking my life all the time.

¹ All names used in the work are fictitious names





6.2 Case Study 2 of PWDs Experiences in Accra

[On 2 July 2021, at 8.07 am, the research team accompanied Mr Kwame Ofori, a 52-year-old man, from his residence at Adabraka to Kwame Nkrumah Circle to a friend that he regularly visits. Mr Ofori uses a wheelchair, is married with three children, is unemployed, and usually visits his friend alone].

I have lived in Adabraka for many years; I am here with my senior brother; this is his house. Usually, I wouldn't say I like going out because of the difficulties I go through when I leave the house. But sometimes, when I feel very lonely, I visit a friend at Kwame Nkrumah Circle. The route connecting my house to the bus stop had sidewalks, yet I see them as a significant barrier because I struggle to use my wheelchair. [While explaining his rating and observing from the study area, the sidewalks had dislodged bricks or potholes, gutters, and path obstructing objects like dustbins and parked cars. At a point, the researcher pushed the wheelchair at specific portions of the sidewalk since Mr Ofori would have found it difficult to manoeuvre his way through such poor conditions]. So to avoid all these challenges, I often

share the road with vehicles despite the fear of being knocked down by cars. [When the researcher and Mr Ofori got to a junction to pick up the bus], Mr Ofori lamented....., I sometimes get disappointed on how drivers refuse to stop for me to cross the street despite clearly indicating my intention to do so [this was however not witnessed at the time of the interaction]. You can see there is no police officer, traffic warden, or crossing facilities that increase safety while crossing the street. I don't think this bus stop is good since there are no stop signs, ramp, or shelter. Sometimes, I wait for about 15 minutes while exposed to the harsh weather conditions. While waiting for a vehicle, the long exposure to the scorching sun offered an unfriendly reality to the daily living conditions, I tell you.

Depending on my income and need, I usually rely on trotro and taxi services. However, because of the cost involved, I mostly use trotro. I am not so bothered about the absence of wayfinding aids since I can easily determine my location and notify the mate early enough. [On reaching the bus station], one problem I always face is the high floor height of buses, which makes it difficult for me to join or alight from a bus independently. In the absence of ramps at transport terminals, transport operators must lift me into the bus, which I consider dehumanising and degrading. Also, the lack of space for wheelchair users and board makes me worry a lot when I travel. There are instances where some drivers have refused to stop for me to join their bus because they were uncomfortable handling my wheelchair. Such acts project people like us as less valuable and incapable of executing simple tasks like joining a bus; I believe strongly that single technology would reduce this challenge in joining trotro. [The trip to Circle lasted about 30 minutes].

[On alighting, the conditions of the walkway to the Kwame Nkrumah Circle were also rated poor though there was a sidewalk present]. The encroachment by traders and hawkers has reduced the space for manoeuvrability, limiting my ability to use the sidewalk.

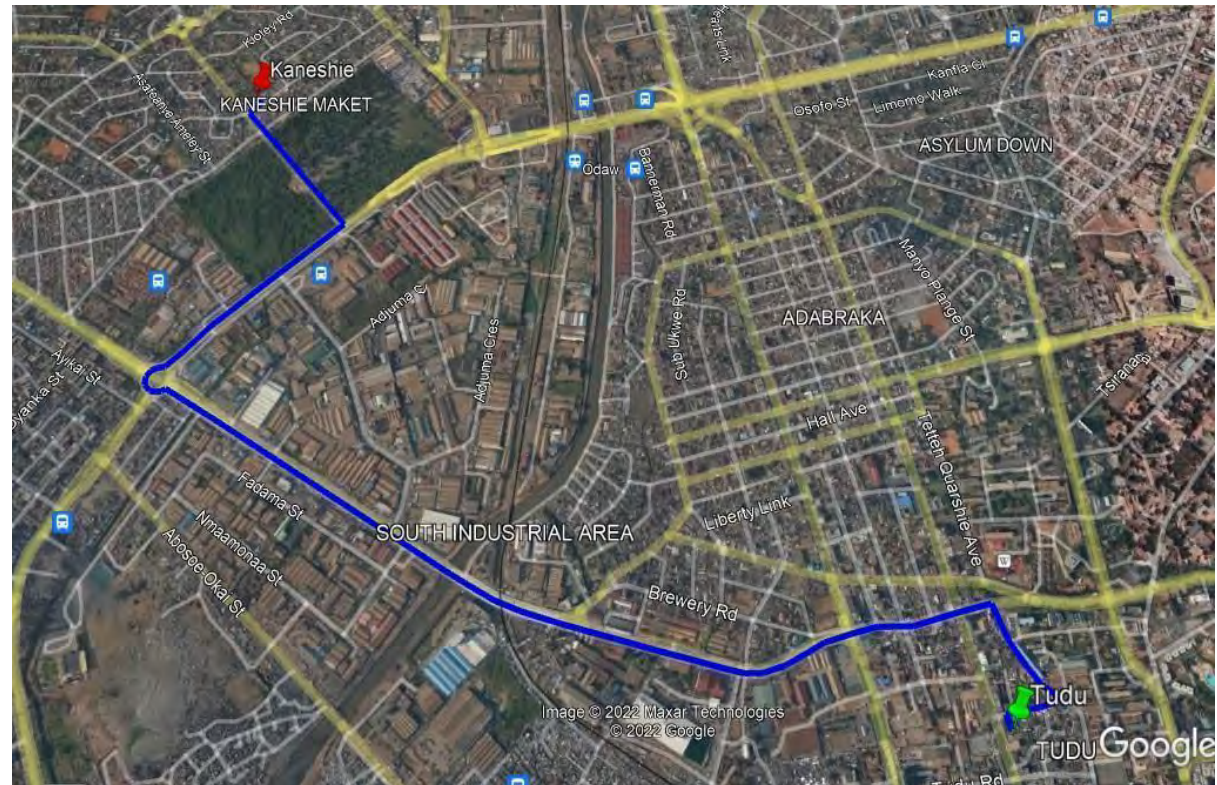




6.3 Case Study 3 of PWDs Experiences in Accra

[On 1 July 2021, at 10.55 am, the researcher (who understands sign language) met with Ama Abba Attah, a hard-of-hearing 44-year-old woman]. I live in a rented apartment at Kaneshie with my husband and child and engage in petty trading at Accra Central. I go to work five times a week. Every morning, I walk about 12 minutes from my house to the bus stop where I take the trotro to Accra. Walking from my house to the bus stop is a significant barrier despite a sidewalk. The poor conditions of the sidewalk compel me to always walk on the road. Instead, despite being aware of the dangers associated with such an action, I have no choice because of the trading activities on the sidewalks. You see, the bus stop has no shelter? Things are much better in the morning when the weather is cool enough; in the afternoon, we are left to the mercies of the scorching sun, and on the days it rains, you can imagine. [On getting a bus after 15 minutes of waiting, Ama did not struggle to join the bus because her disability does not prevent her from undertaking activities like joining or disembarking]. By the grace of God, I do not struggle to notice my cars to take; my only challenge is my inability to communicate with transport operators since trotro operators and their conductors do not understand sign language. I am therefore used to hand gestures in communicating my intended bus stop to the

conductors]. Including adaptive technology like push bells and visual platforms at bus stops and on the buses would significantly improve my travel challenges. The trip to the market took about 45 minutes.



7.0 RESULTS FOR NAIROBI CITY, KENYA

7.1 General Description of Study Settings and Sample

The study sampled 208 PWDs in Nairobi City, with 57% (118) males and 43% (90) females. The dominant disability category was persons with physical impairments (40%). Generally, about 48% of all the respondents involved in data collection required assistance moving from one place to another (Table 12).

Table 12: Demographic Information About PWDs Interviewed With The General Questionnaire In Nairobi

Background of PWDs	Frequency	Per cent
<i>Gender</i>		
Male	118	57
Female	90	43
<i>Disability type</i>		
Blindness	69	33
Deaf & Hard of Hearing	53	26
Physical Impairment	84	40
Other	2	1.5
<i>Ethnicity</i>		
Gabra	1	0.5
Gikuyu	3	1
Luo	1	0.5
Kalenjin	1	0.5
Kamba	48	23
Kikuyu	58	28
Kisii	17	8
Others	79	38
<i>Religion</i>		
Catholic	72	34.6
Pentecost/Charismatic/Methodist	109	52.4
Muslim	16	7.7

Table 12 continued

No Religion	11	5.3
<i>Education</i>		
No formal education	30	14.42
Secondary/High/Technical	88	42.31
Tertiary	33	15.87
<i>Employment</i>		
Employed in the public sector	12	5.8
Employed in the private sector	8	3.9
Self-employed	32	15.4
Unemployed	138	66.3
Student	10	4.8
Retired	8	3.8
<i>Income</i>	Kshs	Dollars (Ksh1=0.0088 dollars)
Mean	17371.79	152.87
Median	15,000	132
<i>Household size</i>		
Mean	5	
Median	5	

The dominant ethnic group represented in the study was Kikuyu (27.8%), the dominant tribe in Kenya. Most of the PWDs were Christians (87%) (Catholic / Pentecostal / Methodist / Charismatic). Less than 6 per cent of the PWDs did not ascribe to any religion. The majority of the PWDs had Secondary/High/Technical education (42.3%) and were either unemployed (67%) or self-employed (15.4%). Income levels were relatively low among the PWDs, with monthly earnings of about \$152.87 to support an average household size of five (5) people.

7.2 Nairobi's Transport Design and Form

Spatial Analysis of the Design of the Urban Transport System in Nairobi

Nairobi has a dense and extensive road network of different classes and hierarchies based on function. Most of the roads in the city are motor vehicle-oriented, with very few having provisions for pedestrians and cyclists. Nairobi has more than 80,000 routes connecting different parts of the city, other towns, and adjacent rural areas (Figure 15). The city has a

trunk, primary, and secondary routes with 249 cycle routes and 99 pedestrian walkways. Most of the routes serve the residential neighbourhoods of the city.

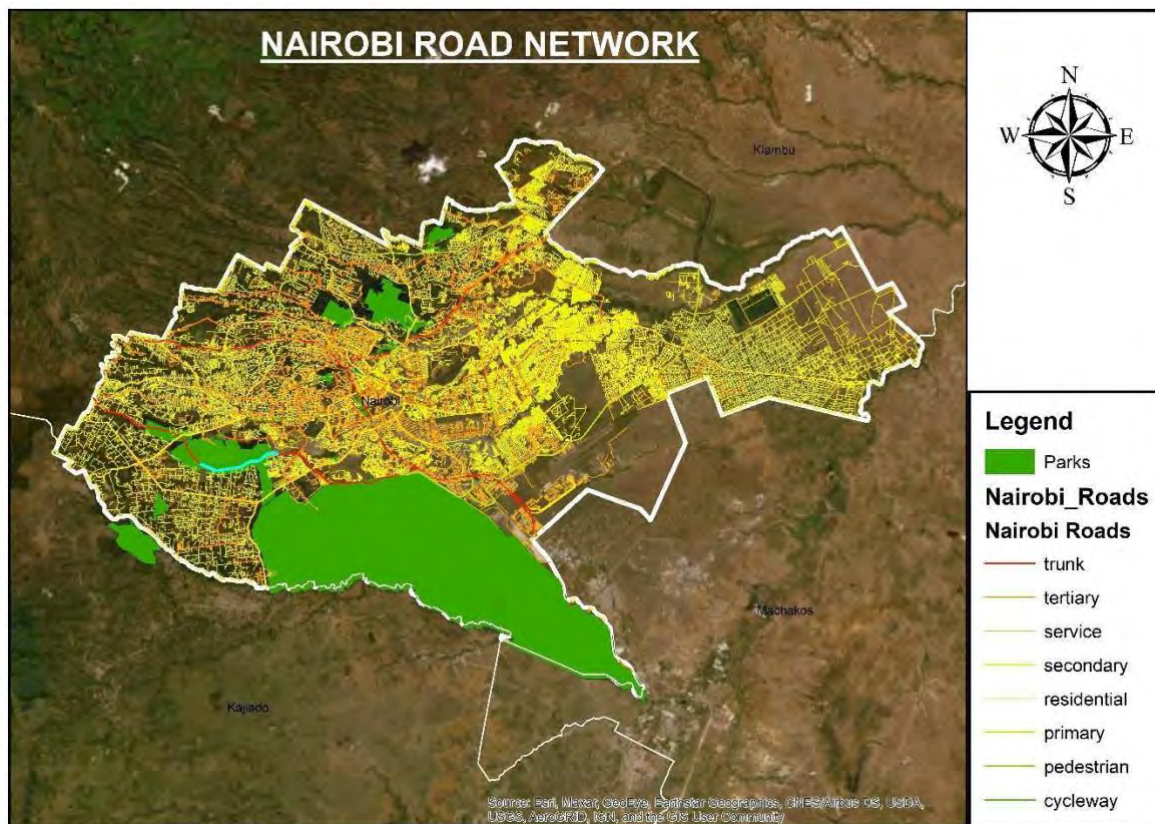


Figure 15: Nairobi Road Network

Despite the vast network of roads in the city, most of the roads, especially those serving residential areas, are poorly maintained and inadequately adhere to universal design principles making it difficult for people with disability to travel, especially during the rainy seasons.

7.3 Accessibility Analysis

The study conducted a network analysis to establish the accessibility of various institutions, including but not limited to health facilities, bus stops, security facilities and religious facilities.

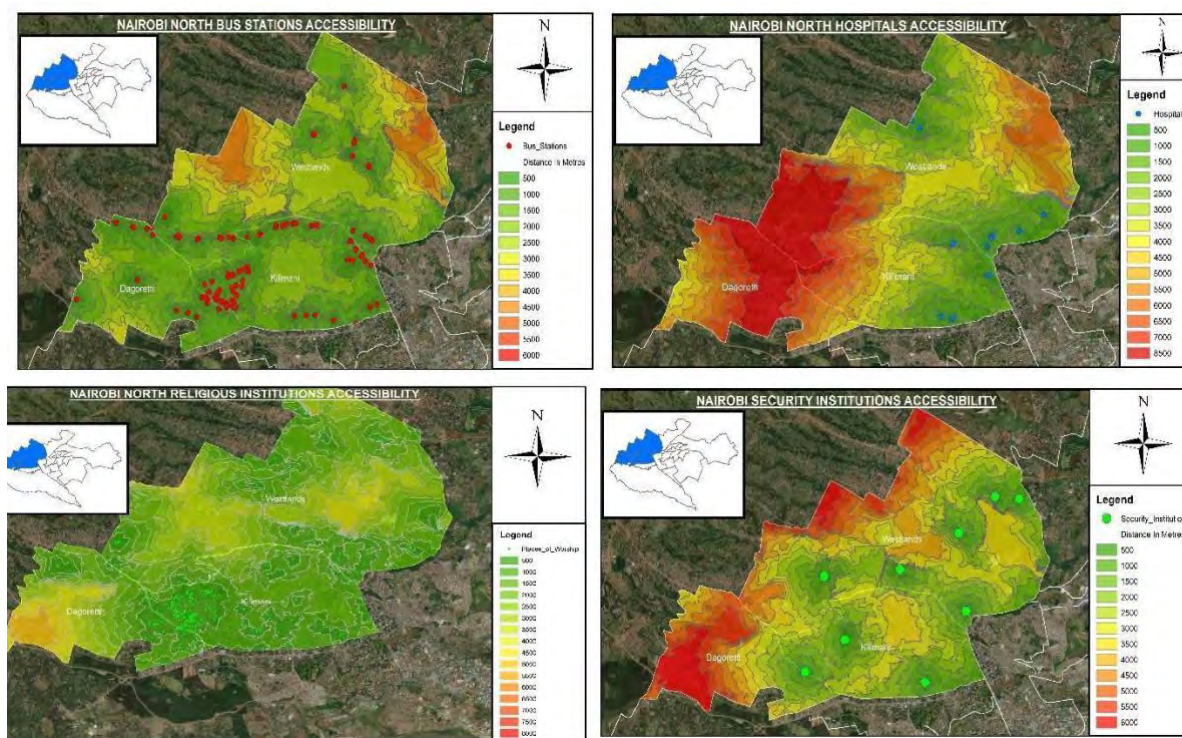


Figure 16: A network analysis of key institutions in Nairobi

Religious places are the most accessible institutions in the city, while hospitals are the least accessible. As shown in Figure 16 above, all the residents are within 5km of a religious institution, unlike hospitals. Some residents are more than 8km away from a health facility.

7.4 Urban Mobility Patterns and Needs of PWDs

Mobility Patterns

The study assessed PWDs' mobility patterns (i.e., trips) for work, health care, school, leisure, shopping, and other social and religion-related activities. The data reveals that the majority of the PWDs' trips were for religion-related activities (a cumulative 163 of the 208 PWDs), followed closely by health care (a cumulative 132 of 208 PWDs) and shopping activities (a cumulative 98 of the 208 PWDs). The least trips were for leisure activities (a cumulative of 26 of the 208 respondents). The data indicates most of the PWDs tend to access services weekly. Religious institutions (94 %), workplaces (55%) and Schools (54%) were the most accessed services weekly (Figure 17). Social services (63%), health care (42%) and leisure were the least accessed services, with the majority accessing them yearly.

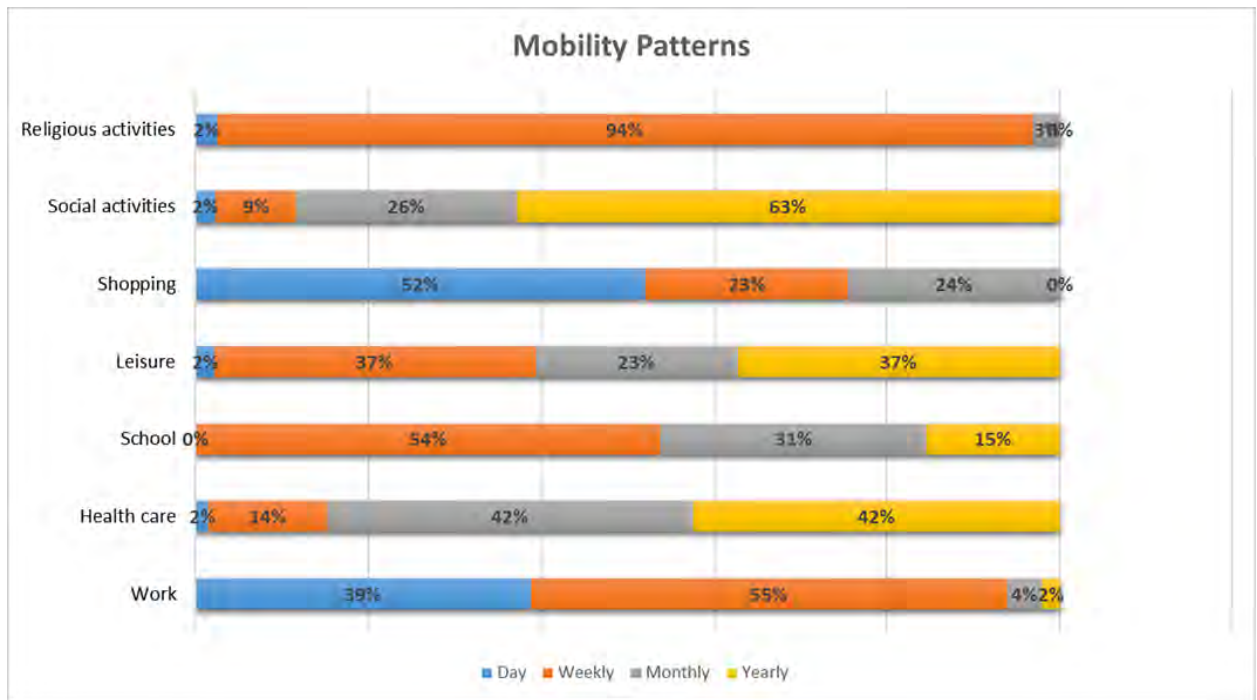


Figure 17: Frequency of access to service facilities in Nairobi

Time to Access Services

On average, PWDs spent 65.99 minutes from their residence to service points to access the activities. The figure below reveals that PWDs spent more time on the social activities-related trip (165.2minutes) and Schooling services (83.1minutes). On average, shopping activities took the least time (18.3 minutes) to access.

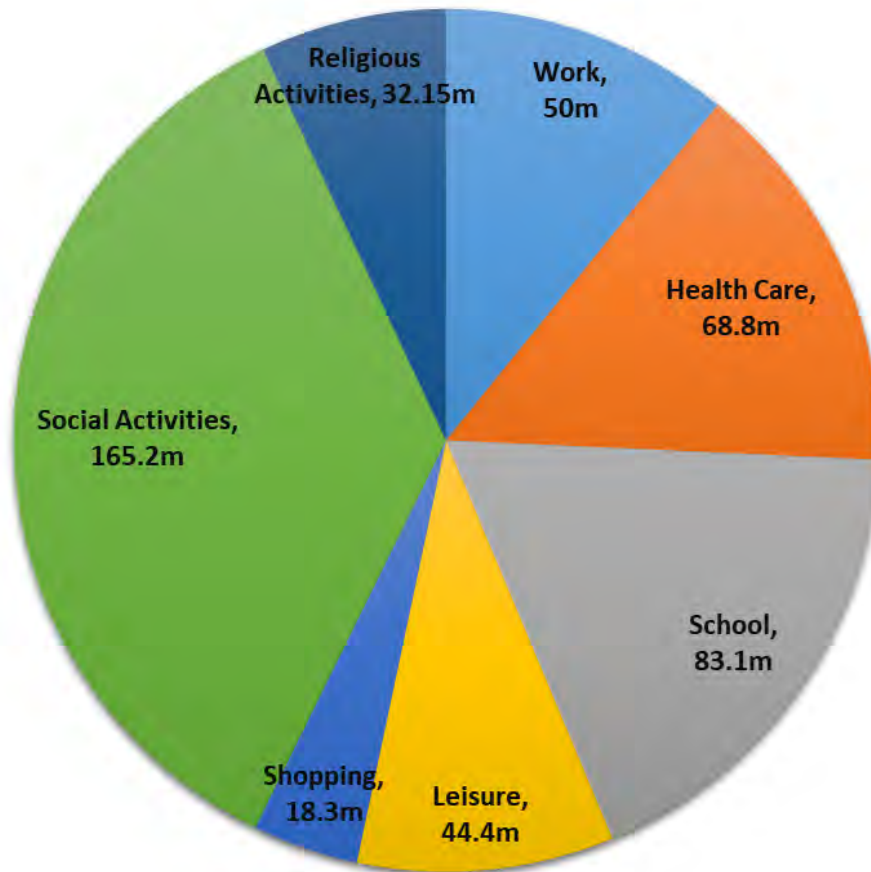


Figure 18: Average time to access services in Nairobi

Most of the PWDs (66.35%) revealed that covid-19 had a high effect on the number of trips they made in respect of the above activities (Figure 18). However, 20.6% of the PWDs claimed covid-19 had a moderate effect on their trip frequency.

Mobility Needs

This section assessed the mobility needs (activities and trips) and transport mode choice. The data revealed that the transport mode choice depends on the nature of the activity and trip in question (i.e., the mode choice is activity-specific), including the distance to be covered and ease of use of the mode/convenience. Figure 19 shows the three (3) dominant transport modes across the various activities and trips, including walking, bus and bike.

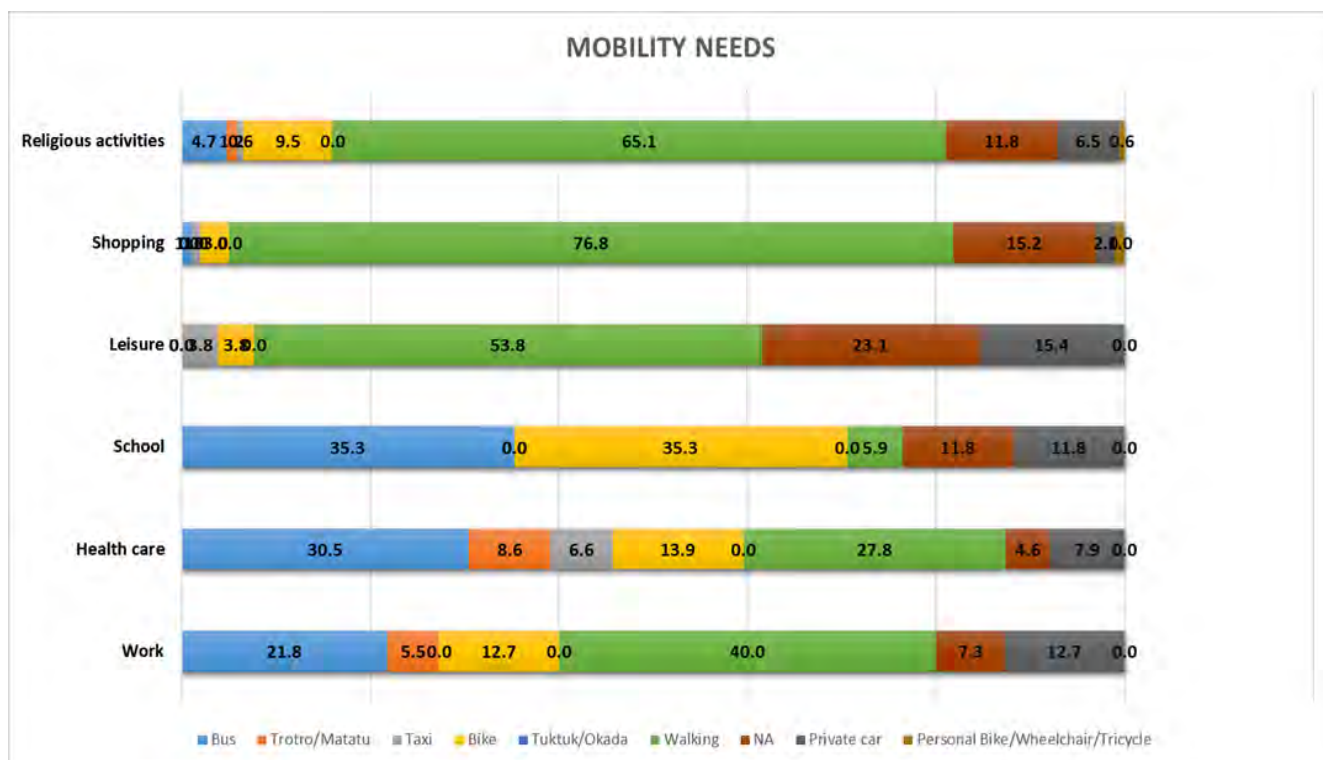


Figure 19: Preferred mode of transport for activities and trips in Nairobi

Walking was the most dominant choice for most activities, especially for shopping (76.8%), religious activities (65.1%) and leisure (53.8%). The bus was a dominant mode for activities like health care (30.5%) and school (35.3 %) (Figure 19).

Effect of Challenges of the Transport System on Desire to Travel More for Various Activities

The study also assessed the effect of the challenges of the transport system on the desire to travel more for various activities (Table 13). The data reveals that the participants generally desire to travel more (be more mobile) than they currently do if not for the challenges they face accessing the city's transport system.

Table 13: Desire of PWDs to travel in Nairobi curtailed

Activity	Desire To Travel Curtailed				
	Extremely unlikely	Unlikely	Neutral	Likely	Extremely likely
Work	14.29	8.16	10.20	18.37	48.98
Health	32.58	5.30	17.42	13.64	31.06
School	23.08	15.38	0.00	15.38	46.15
Leisure	19.23	0.00	19.23	26.92	34.62
Shopping	36.73	1.02	12.24	11.22	38.78
Social Activities	18.60	4.65	6.98	25.58	44.19
Religious Activities	24.54	4.29	12.27	14.72	44.17

The majority of the respondent felt that the challenges in the transport system curtailed their travel desire. However, shopping trips carried out within shorter and longer distances had mixed responses (extremely unlikely (36.73%) and extremely likely (38.78%). The data revealed that the Covid-19 pandemic greatly influenced PWDs' desire to travel more for various activities (see Table 14). Most PWDs felt that it was extremely likely (50%) that Covid 19 curtailed their desire to travel for leisure. It was the same for religious (44.79%) and social activities (41.86%).

Table 14: Effect of Covid-19 on Desire to Travel More for Various Activities

	Work	Health	School	Leisure	Social activities	Religious
Extremely unlikely	18.37	34.09	30.77	15.38	20.93	17.18
Unlikely	6.12	4.55	7.69	3.85	6.98	3.07
Neutral	18.37	20.45	15.38	11.54	16.28	9.20
Likely	24.49	21.21	30.77	19.23	13.95	25.77
Extremely likely	32.65	19.70	15.38	50.00	41.86	44.79

8 EXPERIENCES OF PWDS IN NAIROBI, KENYA

8.1 Mobility Challenges of Urban Transport Systems in Nairobi

Having explored PWDs' mobility needs and travel mode choice, the study moved further to examine their mobility challenges. The study enumerated 18 key challenges impeding PWDs' accessibility to the transport systems in Nairobi. These challenges were mainly related to the road environment (e.g., sidewalks/walkways, pedestrian crossing, distance to the bus stop etc.), vehicle conditions and configuration (e.g., lack of assistive devices, stairs/ramps and floor level, priority seats etc.), quality of public transport services, transport operators and passengers' attitudes/behaviour toward PWDs, and traffic behaviour of other road users. Table 15 presents these challenges per disability type and as an aggregate.

Table 15: Challenges faced by PWDs in Nairobi

Challenge	Blindness		Blindness & Hearing difficulties		Blindness & Physical impairment		Deaf & Hard hearing		Physical impairment		Physical impairment & Hearing difficulties		Total	
	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD
Lack of assistive devices, hearing/visual/walking	2.60	1.41	3.70	0.57	1.00	0.00	2.50	1.42	2.20	1.36	4.00	0.00	2.60	1.08
Stairs, lack of ramps, uneven ground	3.10	1.13	3.70	0.58	4.00	0.00	1.70	1.18	3.70	0.74	4.00	0.00	3.30	0.88
Poor or no sidewalks/walkways	3.30	1.16	3.00	1.73	4.00	0.00	2.20	1.31	3.30	1.04	4.00	0.00	3.30	0.68
Busy pedestrian crossings	3.50	1.00	3.30	1.15	4.00	0.00	2.70	1.28	3.20	1.20	4.00	0.00	3.40	0.50
Reading or understanding signs / Lack of information	3.50	0.95	2.00	1.73	4.00	0.00	1.70	1.07	1.20	0.80	1.00	0.00	2.20	1.24
Getting to a bus stop	3.20	1.21	4.00	0.00	4.00	0.00	1.90	1.25	2.30	1.30	4.00	0.00	3.20	0.94
Distance to the bus stop	2.60	1.38	3.30	0.58	4.00	0.00	2.10	1.35	2.90	1.26	4.00	0.00	9.80	16.76
Boarding or exiting the bus	3.00	1.24	4.00	0.00	4.00	0.00	2.10	1.28	3.40	1.07	4.00	0.00	3.40	0.77
Lack of accessibility equipment	2.20	1.30	3.30	0.58	1.00	0.00	1.80	1.17	2.20	1.30	4.00	0.00	2.40	1.07
Personal attendant required to pay the fare	3.00	1.12	3.00	1.73	4.00	0.00	2.10	1.41	1.50	1.06	4.00	0.00	2.90	0.99
Inadequate space for wheelchair /crutches/ walkers	1.70	1.10	2.70	1.52	4.00	0.00	1.80	1.25	2.70	1.30	4.00	0.00	2.80	1.01
Attitudes of Bus drivers and	2.20	1.26	3.70	0.58	1.00	0.00	2.40	1.39	2.20	1.26	3.00	0.00	2.40	0.90

conductors/mates														
Attitudes of other passengers	1.8	1.1	3.7	0.5	1.0	0.0	1.8	1.2	1.6	1.0	4.00	0.0	2.3	1.23
	0	3	0	8	0	0	0	3	0	5		0	2	
Lack of reserved seats in vehicles	2.0	1.3	3.7	0.5	4.0	0.0	1.8	1.1	3.0	1.2	4.00	0.0	3.0	0.99
	0	2	0	8	0	0	0	8	0	7		0	8	
Paying the fare	2.9	1.2	4.0	0.0	4.0	0.0	2.2	1.3	1.4	0.9	4.00	0.0	3.0	1.11
	0	6	0	0	0	0	0	4	0	0		0	8	
Missing the Stop	2.9	1.3	3.0	1.0	4.0	0.0	1.7	1.1	1.7	1.1	1.00	0.0	2.3	1.11
	0	3	0	0	0	0	0	1	0	2		0	8	
Communicating with vehicle operators)	1.7	1.3	2.7	1.5	4.0	0.0	3.0	1.2	1.2	0.7	4.00	0.0	2.7	1.16
	0	3	0	2	0	0	0	7	0	5		0	7	
Carelessness/recklessness of motorists and other road users	2.8	1.3	2.7	1.5	1.0	0.0	2.8	1.3	2.9	1.3	4.00	0.0	2.7	0.96
	0	7	0	2	0	0	0	6	0	0		0	0	

Not a challenge = 1, Minor challenge = 2, Somewhat/Moderate Challenge = 3, Major challenge = 4

The study observed that the blind's top three (3) challenges in accessing the transport system in Nairobi were busy pedestrian crossings (M=3.5, SD=1.0) and poor or no sidewalks/walkways (M=3.3, SD=1.1) and lack of assistive devices (M=3.5, SD=0.95). The deaf/hard of hearing also reported challenges with the carelessness/recklessness of motorists and other road users (M=2.80, SD=1.3), communicating with vehicle operators (M=3.0, SD=1.3) and Busy pedestrian crossings (M=2.7, SD=1.3). The respondents with blindness/hearing difficulties were constrained by getting to a bus stop (M=4.0, SD=0), lack of assistive devices (M=3.7, SD= 0.57) and paying fares (M=4.0, SD=0). For the physically impaired, Stairs, lack of ramps, uneven ground (M=3.7, SD=0.74), Boarding or exiting bus (M=3.30, SD=0.74) and Poor or no sidewalks/walkways (M=3.30, SD=1.04) presented challenges to them when accessing Nairobi's transport systems. The physically impaired and hearing difficulties reported challenges all the stated challenges at a mean of 4; this is because he was only one respondent and found using the transport system a major challenge.

Overall, for all disability categories, busy pedestrian crossings were the main challenge at M=3.45, SD=0.5, followed by stairs, lack of ramps, uneven ground (M = 3.37, SD = 0.88) and third, poor or no sidewalks/walkways (M= 3.30, SD= 0.68).



Figure 20: Status of sidewalks in residential areas



Figure 21: High staircases on Public Service Vehicles



Figure 22: PWDs crossing the roads

Based on gender, male respondents faced major challenges on poor or no sidewalks/walkways ($M=3.19$, $SD= 1.1$), while female respondents had major challenges on busy pedestrian crossings ($M = 3.26$, $SD = 1.17$). Both genders had the least challenge with attitude of other passengers, male respondents ($M = 1.73$, $SD = 1.13$) and female respondents ($M = 1.86$, $SD = 1.223$) (Table 16).

Table 16: Challenges faced by PWDs in accessing transport system per gender

Challenge	Male		Female		Total	
	Mean	SD	Mean	SD	Mean	SD
Lack of assistive devices, hearing/visual/walking	2.48	1.42	2.49	1.37	2.49	1.39
Stairs, lack of ramps, uneven ground	3.08	1.24	2.9	1.32	3.0	1.27
Poor or no sidewalks/walkways	3.19	1.16	2.87	1.31	3.05	1.24
Busy pedestrian crossings	3.13	1.20	3.26	1.16	3.18	1.18
Reading or understanding signs/ Lack of information	2.05	1.37	2.2	1.37	2.12	1.37
Getting to a bus stop	2.58	1.33	2.51	1.42	2.55	1.37
Distance to the bus stop	2.61	1.35	2.64	1.34	2.63	1.34
Boarding or exiting the bus	2.94	1.27	3.0	1.32	2.97	1.29
Lack of accessibility equipment	2.06	1.28	2.24	1.32	2.14	1.30
Personal attendant required to pay the fare	2.15	1.31	2.28	1.41	2.21	1.35
Inadequate space for wheelchair/crutches/ walkers	2.25	1.34	2.12	1.32	2.19	1.33
Attitudes of Bus drivers and conductors/mates	2.76	1.19	2.96	1.09	2.84	1.15
Attitudes of other passengers	1.73	1.13	1.86	1.22	1.78	1.17
Lack of reserved seats in vehicles	2.42	1.39	2.44	1.33	2.43	1.36
Paying the fare	2	1.28	2.39	1.39	2.17	1.34
Missing the Stop	2.14	1.32	2.16	1.33	2.14	1.32
Communicating with vehicle operators)	1.83	1.27	2.01	1.33	1.91	1.29
Carelessness/recklessness of motorists and other road users	2.86	1.34	2.88	1.33	2.87	1.33

Not a challenge = 1, Minor challenge = 2, Somewhat/Moderate Challenge = 3, Major challenge = 4

8.2 Level of Satisfaction with Nairobi's Transport System

The study explored participants' level of satisfaction with Nairobi's transport systems based on the following indicators: scheduling procedures, waiting times, travel time, comfortability, safety from accidents and crime, affordability, reliability, and drivers and conductors/mates' conduct (Table 17).

Table 17: Level of satisfaction with transport system in Nairobi

Variables	Blindness		Blindness & Hearing difficulties		Blindness & Physical impairment		Deaf & Hard hearing		Physical impairment		Physical impairment & Hearing difficulties		Total	
	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD
Scheduling procedures	1.20	0.70	1.00	0.00	1.00	0.00	1.20	0.74	1.60	1.14	3.00	0.00	1.50	0.70
Waiting time	2.20	1.40	1.00	0.00	4.00	0.00	1.80	1.29	2.40	1.43	2.00	0.00	2.23	0.90
Travel time	2.50	1.40	2.33	2.30	1.00	0.00	2.30	1.50	2.80	1.35	3.00	0.00	2.32	0.64
Comfort	2.50	1.50	1.00	0.00	1.00	0.00	2.30	1.44	1.70	1.28	2.00	0.00	1.75	0.59
Safe from accidents	1.40	0.97	2.00	1.70	4.00	0.00	1.80	1.29	1.60	0.98	1.00	0.00	1.97	0.96
Safe from crime	1.70	1.16	1.00	0.00	4.00	0.00	1.60	1.09	2.00	1.35	3.00	0.00	2.22	1.00
Affordability	1.80	1.26	1.33	0.60	1.00	0.00	1.60	1.20	1.50	1.03	2.00	0.00	1.54	0.32
Reliability	2.30	1.40	1.00	0.00	4.00	0.00	2.00	1.26	2.80	1.40	3.00	0.00	2.52	0.92
Drivers Conduct	2.40	1.40	1.00	0.00	4.00	0.00	2.50	1.50	2.60	1.43	3.00	0.00	2.58	0.89
Conductor/mate conduct	2.10	1.32	1.00	0.00	1.00	0.00	2.40	1.58	2.30	1.33	3.00	0.00	1.97	0.74

Not at all satisfied = 1, Slightly satisfied = 2, Moderately satisfied = 3, Satisfied = 4, Extremely satisfied = 5

The PWDs were barely satisfied with any of the indicators, with the highest scoring indicator being moderate satisfaction with the drivers' conduct (M=2.58, SD=0.89). The respondents were least satisfied with the scheduling procedures (M=1.50, SD=0.70), which were non-existent. They were also slightly satisfied (M = 1.54, SD = 0.32) with the affordability of the transport services claiming that Covid 19 had caused the fare price to shoot up and become unpredictable (Table 17).

8.3 Assessment of the Disability Friendliness of Nairobi's Transport Systems

This section presents PWDs' assessment of the disability friendliness of their communities and the city. It begins by assessing the PWDs' respective communities and the entire city. Most PWDs felt their communities were very low disability friendly (Figure 23), attributed to the fact that most PWDs are considered a social burden.

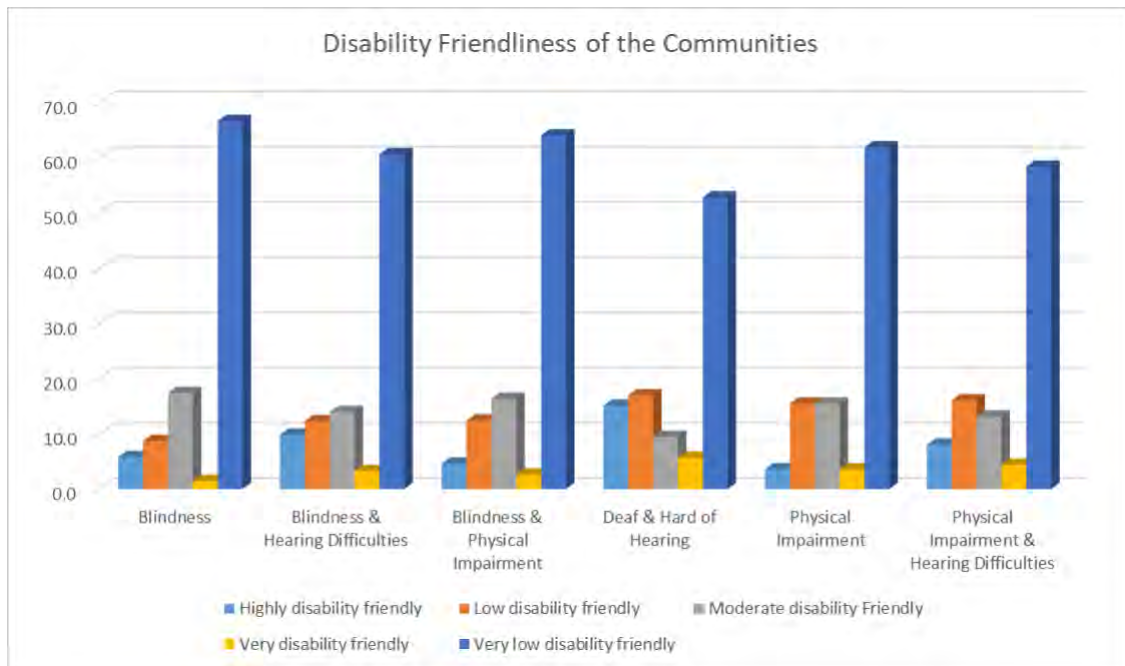


Figure 23: Disability friendliness towards PWDs at the community level

The low disability friendliness of the community continues at the city level, with 68 % of the visually impaired considering the city very low disability friendly. The PWDs opined that the city is very low disability friendly, have the smallest percentage of the respondents who believe so and the highest per cent of the respondents who felt the city is very disability friendly (Figure 24).

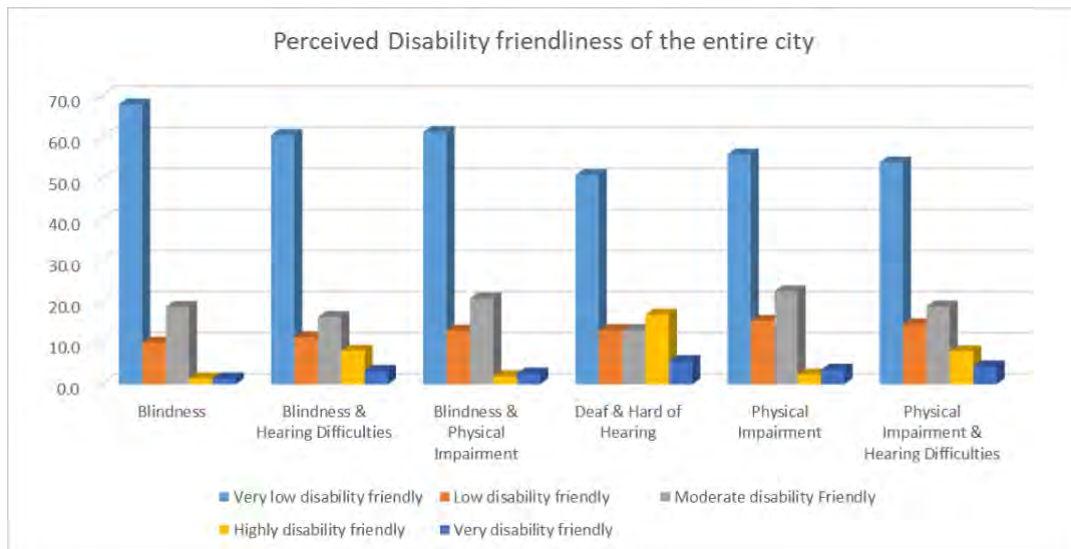


Figure 24: Disability friendliness towards PWDs at the city level

The study also sought PWDs' views on the stress associated with movement within their communities and the entire city. At the community level, the physically impaired reported the highest percentage (34%) of high-level stress navigating their communities compared to other categories (Figure 25). The highest percentage of the visually impaired (31%) and Visually & Physically Impaired reported high-stress levels in their community-level movements.

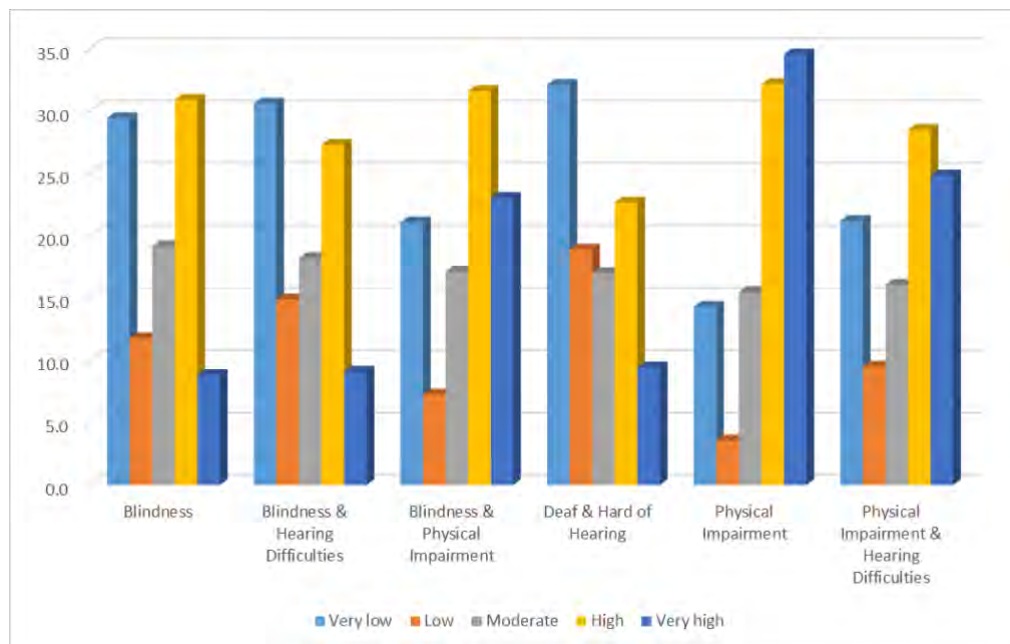


Figure 25: Stress Level of the PWDs on their Journeys in their community

At the city level, the physically impaired reported a higher percentage (42%) of very high-stress levels (Figure 26). The percentage of the visually impaired reporting very high-stress levels also increased significantly to 26%. The highest percentage of the hearing impaired (41%) also reported high-stress levels in their city movements.

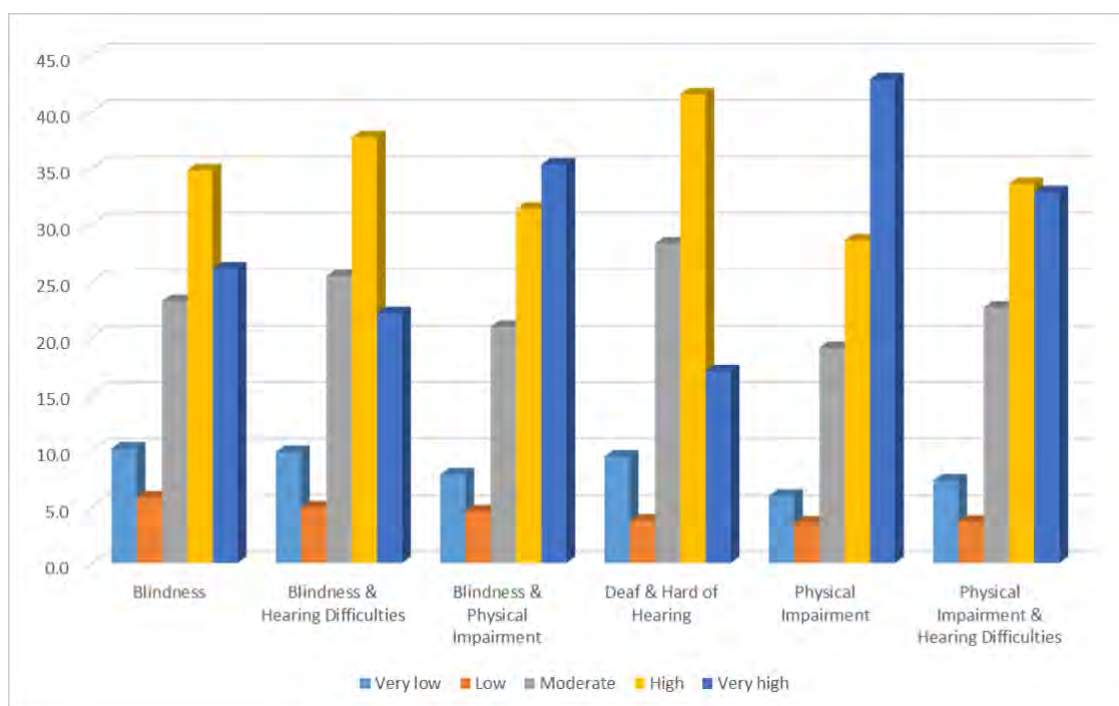


Figure 26: Stress Level of the PWDs on their Journeys in the entire City

The high-stress levels experienced by PWDs in their daily movement were attributed mostly to the conditions of the roads. These conditions include a lack of pedestrian walkways, a high degree of conflict between motorists, especially motorcyclists and Pedestrians, unmarked crossing points, bad road surfaces and many others.

8.4 Coping Mechanisms by PWDs

Seeking assistance was the coping mechanism employed by most of the PWDs (Table 18). Staying at home was also a common coping mechanism which denied the PWDs a chance to utilise their abilities fully. Their dependency on motorcycles and bigger taxis compared to the smaller ones other people could use made their lifestyle more expensive for them and the people around them.

Table 18: Challenges and Coping Strategies of PWDs in Nairobi

Challenges	Major coping strategy	Least coping strategy
Lack of Assistive devices	Assisted/sought help (51.9%)	Depend on Motorcycle (1.2%)
Stairs, lack of ramps, uneven ground	Assisted/sought help (52.7%)	Rest Often (0.78%)
Busy pedestrian crossings	Assisted/sought help (64%)	Use other routes (0.68%)
Poor or no sidewalks/walkways	Assisted/sought help (46 %)	Depend on Motorcycle (0.78%)
Reading or understanding signs	Assisted/sought help (78.7%)	Struggle alone (1.6%)
Getting to a bus stop	Assisted/sought help (41.4%)	Live Close to The Terminal (1.22%)
Boarding or exiting the bus	Assisted/sought help (82.4%)	Avoid High Buses (0.80%)
Accessibility equipment	Assisted/sought help (58.33%)	Prefer To Stay at Home (16.6%)
Space for wheelchair/crutches	Hold Them Crutches (31.6%)	Keep it under the seat/boot (3.23%)
Attitudes of Bus drivers and conductors/mates	Ignore them/Keeping quiet (32.5%)	Use Taxi/Dropping (0.8%)
Attitudes of other passengers	Ignore them/Keeping quiet (61.5%)	Being Cautious myself (4.5%)
Lack of reserved seats in vehicles	Use Seats with adequate Space (35.9%)	Use a Taxi (1.1%)
Motorists and other road users	Walk slowly and Cautiously (40.1%)	Walking on the edge of the road (0.7%)

9 ROLE OF KEY STAKEHOLDERS IN URBAN TRANSPORT

The study established that key institutions were not cooperating in the construction and management of the transport system; therefore, efforts toward making the transport system inclusive were minimal, a consequence of the lack of PWDs representation in the various transport authorities. The authorities responsible for road construction and management neglect the significance of PWDs and therefore fail to involve them in various projects or consider their opinions. The National Transport and Safety Authorities and The National Council of People with Disabilities are not fully involved in road designing, planning and Implementation. Although the two institutions carry out various audits to assess different aspects of the road, their input is not significant enough to make the transport system as inclusive as it should be.

9.1 Matatu Operators

The Matatu Operators involved in the Focus Group discussion were unaware of any legal provisions for Persons with disabilities. They also did not make any provisions for people with disabilities in their vehicles. All the respondents had at some point experienced an instance where they needed to cater for a person with a disability, and they stated that in most cases, they listen to their needs and cater for them with empathy. Although none of the operators had received training in dealing with persons with disabilities, they claimed they understood their needs very well. The matatu Operators felt the main challenging issues were: completely inaccessible walkways, Disability unfriendly vehicles and very high buses without ramps.

Focus Group Discussions with Matatu Operators

The Matatu Operators were unaware of any Legal Provisions for PWDs and stated that they did not make any provisions for PWDs in their vehicles. They also said that they frequently encounter PWDs on their journeys. They used different means to assist the PWDs, including listening to them and, attending to their needs, treating them with Kindness and respect. They stated that passengers mostly have trouble boarding and alighting but generally don't have any other challenges. They also said they must be patient with them in most cases as sometimes they consume a lot of time, especially in boarding and alighting. The Matatu Operators felt that they understood the needs of the PWDs but also claimed that listening to the PWDs offers a better understanding. The Matatu operators did not have any training to cater to people with disabilities. Although rare, one of the operators had experienced a conflict between a road user and a disabled PWD about the sitting location.

“PWDs always want to sit on certain seats, but the other road users sometimes don’t understand them and end up arguing. But we try to intervene and make the other passengers understand the needs of the Person with a disability.”

Some operators felt that some parts of the city are accessible to PWDs while others are not.

“Some parts of the city are okay, for example, the uptown sections where there are better walkways and crossings, the downtown, however, is completely inaccessible for people with any impairment. Our vehicles are not also designed to accommodate people with disabilities.”

They identified the main challenges for the PWDs in the transport system as boarding and alighting the vehicle and communicating, especially for the hearing impaired. Another challenge identified is the lack of space to store their equipment like Wheelchairs.

The Matatu Operators recommended the following for an inclusive transport system:

- i. Building boarding platforms at every stop
- ii. Government to come up with a separate transport system dedicated to PWDs
- iii. Government to ensure every infrastructural development is accessible to PWD, Financial support from the government, educating the public on the needs, challenges and how to deal with PWDs
- iv. Vehicles to have enough space
- v. Height to be accommodative
- vi. Reserve seats for PWDs
- vii. Be given jobs and a separate transport system accessible to PWD.

9.2 Focus Group Discussions with Other Road Users

Most road users that use public transport claimed to have frequently come across PWDs in their trips. They also identified various challenges in the journey of the PWDs. Those challenges include problems Communicating (The hearing impaired), difficulties boarding and alighting the vehicles, difficulty crossing the road, and difficulty navigating poorly maintained

roads. The road users identified a security concern as one of the main challenges and discrimination. Dependency was also a major challenge for the visually impaired as sometimes there may be no one to help them accomplish their obligations.

The main causes of lack of inclusion identified in the discussions include the following: the PWDs are despised and disrespected; the roads are not designed and built with facilitating infrastructure for the less abled; the public is uneducated on the importance of learning sign language to enable communication with the persons with hearing impairments; lack of infrastructure to assist them in crossing the road such as audio signals on pedestrian crossing points alerting the blind on the appropriate time to cross and negligence by public service vehicles. Sixty per cent of the road users were unaware that there are laws on inclusivity for PWDs, while the rest could not specifically state the laws, although they were aware that they existed.

“I haven’t heard of any from the government or lawmakers. I, however, know that the Bible instructs to help the needy, which applies to the PWDs.” Road user.

The road users gave the following recommendations as a method of ensuring inclusivity:

- i. Use technology to help them, for example, apps that the PWDs can use to ask for the specific services they need, for example, a taxi when they need to go somewhere.
- ii. Build dedicated lanes for PWDs where they can exclusively use the lanes without interruption from other users with bikes and motorbikes.
- iii. Provide ramps for them where there are stairs.
- iv. Design transport infrastructure with facilities that enhance access by all PWD categories.
- v. The government should ensure that all PSV vehicles are accessible by PWDs before issuing the NTSA certificate.
- vi. Educate the public on the needs of PWDs, and introduce sign language in the education curriculum from an early age.

- vii. Involve all the various stakeholders in the industry, disability groups included, in a purpose-driven meeting to come up with solutions that specifically suit the needs of the people that fall under this group.

9.3 The National Transport Safety Authority (NTSA), Nairobi

The Authority is not involved in the designing and planning stages of the transport system. The Authority only audits a road after completion or during rehabilitation. NTSA can also audit a road based on the number of accidents or public outcry. The current board does not have any representative of PWDs. There is a road safety committee which sometimes touches on the matters of the safety of the PWDs and a committee for disability mainstreaming. The NTSA representative also claimed that the staff recruitment process prioritises PWDs. Their facilities include ramps and lifts. The NTSA, in collaboration with the NCPWD, provided special classes in the driving curriculum that offer lessons to PWDs who want to be drivers. The NTSA representative also remarked that there is a very high risk of accidents on major highways, especially due to the lack of disability-inclusive footbridges and, sometimes, ignorance.

“Accidents are frequent, especially on high-risk roads such as Waiyaki way. Some footbridges are not inclusive to PWDs are they have no choice but to try and cross the highway itself. Some ignore the bridges as they deem it a lot of work to climb up.”

The Authority also educates the public on the issue of disabilities via sensitization programs and remembrance holidays.

“We have sensitization campaigns to educate people on the issue of disability. We also have a special month (November) where we remember accident victims and educate the public on the importance of road safety.”

The NTSA representative identified ignorance from other transport Authorities as one of the key challenges in ensuring an inclusive transport system. The Authorities did not listen to the NTSA because they felt they did not have the technical capacity to advise the authorities.

“The Authority (NTSA) had to hire civil engineers to get other authorities (KURA, KERRA and KENHA) to listen to us on matters of inclusive road design. The authorities are trying to make more inclusive roads, but they need to improve. The road designers

are very motor vehicle oriented despite most people in Nairobi being pedestrians. The Boda-boda are also becoming a big safety concern and challenge.”

The representative also identified a lack of empathy as an obstacle to an inclusive transport system.

“Some PWDs have to beg to be catered for as the car operators don’t bother to help them. I once witnessed a situation where a physically disabled person had to cling to the bus to avoid being left behind, which might have resulted in serious injuries.”

Among the challenges identified by the representative in ensuring inclusive road transport were lenient sentences on traffic offences that do not disincentivise reckless driving, lack of cooperation between transport authorities and reluctance of the NCPD to provide an inclusive urban transport system. He also felt that the regulatory framework in the Authority is very weak as the Authority could not prosecute anyone for offences committed on the road.

9.4 The National Council of Persons with Disabilities (NCPWD), Nairobi

The involvement of NCPWDs in designing roads is mostly reactive and only done after various challenges in a transport system.

“In the design and planning stages, we have an Accessibility Audit Team that liaises with the Construction Authorities and advises them on where to install Zebra crossings, footbridges and different types of signage.” NCPWD representative

The NCPWD also promotes various policies to help include PWDs in the transport system.

“In the policy-making process, we cooperate with the NTSA through various driving schools mandated to assess PWDs who qualify to drive and issue them with Class H licences (Licences for PWDs).”

The council does not have any representatives in the transport government authorities. There are, however, PWDs employed in those institutions as part of the inclusivity driven by the government. However, these PWDs are not considered very helpful by the NCPWD as they don’t directly fight for their grievances.

“These people have not helped at all because of greed. When they want to be in those positions, they pretend to care, but once they become powerful and prominent enough, they start enriching themselves and only come back when they need our support again.”

The NCPWD also felt that there was negligence and lack of communication from the transport authorities, which ultimately led to road designs that were not inclusive. There is also a communication barrier, especially for PWDs who use sign language. The transport authorities do not have any sign language interpreters; therefore, it's difficult for people who use sign language to communicate with the authorities. Funding was also identified as a major problem as the council does not receive enough money to meet its obligations.

“Lack of disability-friendly venues is also a very big concern. Most of our buildings are not equipped to handle PWDs. For example, you may find that authority is carrying out an important meeting on the third floor of a building that does not have any ramp or lift. That means anyone using a wheelchair cannot access that venue.”

The transport authorities do not also take the PWDs seriously, and they, therefore, ignore the needs of the PWDs even when they are aware of them.

“And finally, there is stigmatisation from both organisations and individuals. Some authorities do not consider the NCPWD an important institution when making major decisions. This means we will not be invited to the decision-making process, or our comments and opinions will not be taken seriously. We also face stigmatisation as PWDs where other people are inconsiderate of our opinions and needs, which leads to a system that excludes us.”

For inclusion, the NCPWD is trying to cooperate with lawmakers to represent PWDs in the parliament and develop laws that ensure inclusivity in all spheres of life, not just in the transport system. The NCPWD identifies greed as a barrier to this process. In response to an accusation that the NCPWD neglects the PWDs, the NCPWD representative remarked that there is a legal team that offers legal services to PWDs for free. However, it is impossible to know about cases that need such intervention since most PWDs mostly don't report cases of such incidences to the NCPWD.

10 CASE STUDIES ON PWDS' MOBILITY EXPERIENCES AND CHALLENGES IN NAIROBI

10.1 Case Study 1 of PWDS Experiences in Nairobi

Linnet is a 22-year-old partially Blind who lives in the Riara area in Mukuru Kwa Njenga, Nairobi. The journey undertaken was from her home to the medical centre to understand her challenges when visiting the hospital on foot. The medical centre was within walking distance. She, however, always needed to be accompanied when taking the journey.

The journey began from her home. She needed help getting out of the house and going to the road. Linnet stated that one of the main challenges she experiences is obstructing the road by people and objects. During the journey, she bumped into people severally. One of the main causes of the phenomenon is the presence of different activities on the road like trading and the lack of clearly demarcated walkways. Another challenge during the journey is the presence of uncovered water channels traversing some sections of the road, making it difficult for Linnet to navigate even with a person accompanying her. There were also cases of parked vehicles on the road. She also stated that there were cases where she would be verbally harassed on the road whenever she took a short journey alone within her residence. She said there is a security concern; therefore, she is incapacitated to go anywhere without being accompanied (refer to the figures below).



10.2 Case Study 2 of PWDs Challenges in Nairobi

Dominic is a PWDs representative who works in the Olympic neighbourhood in Kibera. A research assistant accompanied Dominic from Town to his place of work.

One of his biggest challenges is the lack of a well-demarcated bus stop. In addition, the buses do not stop to let the passengers board the vehicles; therefore, he has to ask for help or try to hang onto the bus, which is extremely risky. Dominic says that he feels the conductors see him as a burden and, therefore, may try to avoid him in most cases. Dominic's friend, Charles, also accompanies him. Charles always needs help while boarding the buses and has to ask someone to lift him since the bus steps are too high.

Dominic says he is okay once he gets into the bus despite the unavailability of reserved seats. Dominic says he faces the previously mentioned challenges while alighting, too, since there is no designated place for the buses to drop passengers. While walking, Dominic states that the lack of good pedestrian walkways is a major issue as it leads to conflict between pedestrians and motorists. Other activities like business, car parking, etc., have also taken over the available walkways.

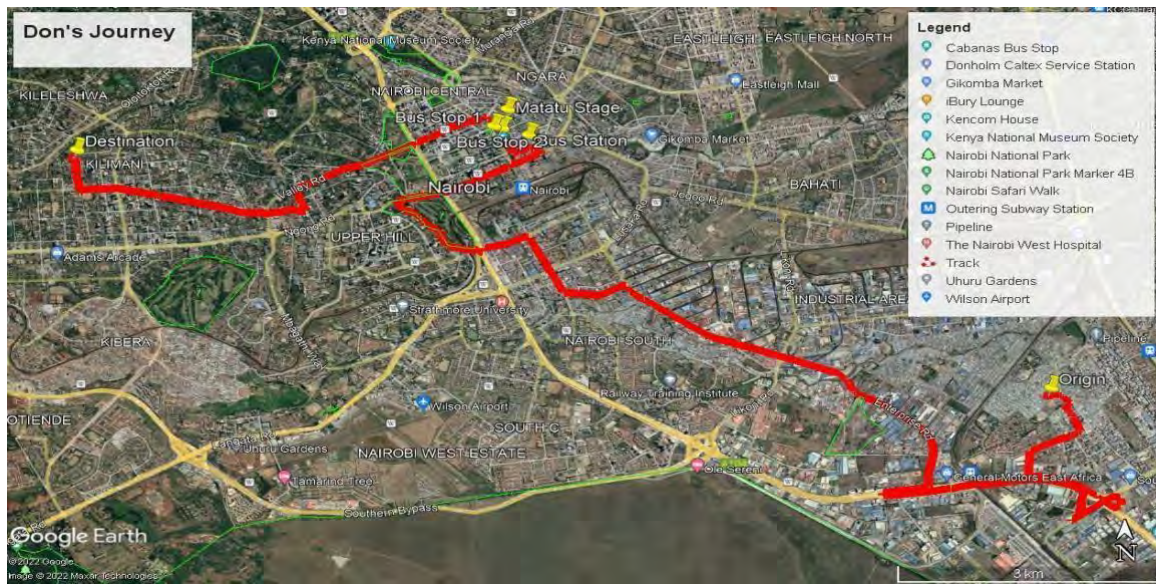




10.1 Case Study 3 of PWDs Challenges in Nairobi

Don is a deaf person who lives in Mukuru Kwa Njenga and goes to work in Yaya Centre, Kilimani. He uses public means of transport and has to take two buses to get to his workplace.

He starts his journey at his house. He first walks up to the Bus stop for about 500m. He indicates that the only issue he has with the walking trip is the risk of being hit by a speeding motorcycle or vehicle since he can't hear anything. At the bus stop, he tries to enquire about the fare using gestures and 'writing' on the bus with his fingers. He then boards the Bus and comfortably finds a seat. He then texts, *"We as deaf persons and PWDs living within urban slums we face many challenges in transport sector even we fight with touts when they cone us or terminate us halfway our journey n miss understanding each other."* When we alight in town, he points to cars parked in pedestrian walkways and business activities taking place in similar areas. He also cautiously inspects the road before crossing and gestures that due to his lack of hearing, he has to be very observant when crossing the road



11 COMPARATIVE ANALYSIS (ACCRA AND NAIROBI)

11.1 Introduction

This chapter comparatively analyses the urban transport systems in Accra (Ghana) and Nairobi (Kenya). The chapter discusses the state of the transport infrastructure of the two cities, highlighting the extent to which these cities' transport infrastructures meet the needs of persons with disabilities (PWDs), thereby promoting their participation and inclusion in daily life activities. The key observations from the main variables investigated in Accra and Nairobi using the methods as outlined in the methodology chapter are grouped into the following sub-categories: policies and institutional framework for mainstreaming disability issues in public transport; the design and form of urban transport in Accra and Nairobi; mobility patterns of PWDs; mobility needs of PWDs; mobility challenges of PWDs; level of PWDs' satisfaction of the urban transport system; and coping strategies of PWDs. A brief conclusion is offered to wrap up the comparative analysis.

11.2 Policies and Institutional Framework

Ghana and Kenya are signatories to the UN Convention on the Rights of People with Disabilities, indicative of their commitment to upholding international standards and guaranteeing the human rights of PWDs. In contrast, Ghana ratified the UN Convention on 12th March 2012, while Kenya, on the other hand, ratified the Convention on 19th May 2008. The Constitutions of Ghana (1992) and Kenya (2010) laid out provisions which focus exclusively on the human rights of persons with disabilities. Specifically, Article 29 of the 1992 Constitution of Ghana highlights general provisions to safeguard the human rights of persons with persons. In Kenya's Constitution, Article 27 (Section 4) prohibits discrimination against persons with disabilities, while Article 54 outlines the entitlement of persons with disabilities.

The spirit of the constitutional provisions reflects in the Acts of Parliament, legalising mainstreaming disability issues in specific legal statutes and establishing specific institutions to oversee the mainstreaming of disability issues. Ghana's Persons with Disability Law (Act 715) of 2006 and Kenya's Persons with Disability Act of 2003 (Revised 2010). In addition, the Acts has transport-related provisions to enhance access and promote the inclusion of persons with disabilities. Specifically, the Disability Acts of both countries have a tax exemption for importing specialised vehicles for persons with disabilities. Besides, the laws required relevant state institutions to factor the needs of persons with disabilities into their respective transport

system's design, construction, and operation (GoG, 2006; GoK, 2016). Suffice to state that both countries have legislations guaranteeing the human rights of persons with disabilities in general as well as specific legal provisions intended to ensure disability-inclusive transport infrastructure in towns and cities of the countries. Further discussion will reveal whether these legal provisions have indeed translated into implementation to guarantee inclusive urban transport systems in the cities in the study.

Concerning institutional frameworks, Ghana and Kenya have National Council for Persons with Disabilities mandated to implement measures to guarantee the human rights of PWDs to engender their full participation in daily activities. Apart from the National Council in Kenya, the Nairobi City County Persons with Disability Act, No. 9 (2015) has established Nairobi the City-County Board for Persons with Disabilities, which by law focuses on ensuring the implementation of legislative provisions within the city of Nairobi.

Furthermore, Ghana and Kenya have Ministries designated for (Road) Transport and institutions such as the National Highways Authority, Urban Roads, and National Transport and Road Safety Authorities. While the ministries and institutions coordinate to ensure that the transport infrastructures of both countries meet international standards, data from the study revealed that the ministries and institutions have been less effective in incorporating disability issues in the planning, design, construction, and operation of the transport system. Hence, the transport infrastructures in the cities of Accra and Nairobi fail to meet the needs of persons with disabilities to foster access, safety and comfort of these individuals.

It is instructive to add that the National Transport and Road Safety Authorities and National Council for Persons with Disabilities are not involved in decisions relating to the design, planning, construction and operation of the transport system. Furthermore, data from the field revealed that institutions and agencies involved in the urban transport systems have not been applying universal design principles to ensure that the transport environments are usable by all people without needing adaptation or specialized design. Consequently, the mobility of persons with disabilities is still hampered in Accra and Nairobi, curtailing the full participation of persons with disabilities in daily activities.

Key cross-cutting issues which emerged from the data were: weak implementation and enforcement of the policies and legal provisions; non-compliance of public transport operators to standards provided in the law; lack of mainstream public transport systems, which are

composed of poorly coordinated private and semi-public arrangements; inadequate physical infrastructure and poorly designed transport networks that do not incorporate needs of PWDs; weak capacity building and low level of awareness of universal design principles among key agencies dealing with disability issues; lack of public awareness and education on legal transport-related provisions of persons with disability; and lack of inspection and monitoring of the operation of urban transport systems.

11.3 Design and Form of Urban Transport

From the individual case analysis, Accra and Nairobi have dense roads connecting different points of the cities. However, the empirical findings indicate that despite the dense street networks, some sections of the cities are not adequately served, posing accessibility challenges, especially for persons with disabilities. This is evident in wetlands and salt production areas of Pambros East of the Accra metropolis and residential quarters in Nairobi. In summation, the physical design of the urban transport network in the two cities does not largely respond to the needs of people with disabilities.

Regarding access to facilities, the data revealed that in Nairobi, religious places are more accessible while health facilities present the least accessible institutions. On the contrary, in Accra, religious and financial facilities recorded the least level of accessibility while all other social facilities recorded a moderate accessibility rating.

11.4 Mobility Patterns of PWDs

There were notable similarities in mobility patterns of persons with disability in both cities. For instance, most PWDs interviewed in Accra and Nairobi revealed that most of their journeys were for religious purposes, followed by healthcare services. Work-related trips were weekly, while health-related journeys were made less frequently, mostly yearly, by persons with disabilities in both cities. In terms of education (schooling), the study revealed that persons with disabilities in both cities undertook weekly journeys (90% in Accra and 54% in Nairobi).

However, it was also evident that daily trips to leisure activities recorded the least frequency in both cities; the same patterns were recorded weekly and yearly for PWDs in Accra and Nairobi. Also, in Nairobi, the study's highest frequency of daily trips by persons with disabilities was undertaken for shopping purposes, while in Accra, daily journeys to shopping

presented the least frequency of trips among PWDs. It was also the case that most PWDs in both cities experienced moderate to high impact of Covid-19 on their mobility.

11.5 Mobility Needs of PWDs

Walking constituted the highest mode of transport for live-work trips for PWDs in Accra and Nairobi. In both cases, proximity to workplaces was the main reason for walking. In accessing health facilities, the most preferred means of transport for PWDs in Accra was the taxi because of convenience. In Nairobi, however, the preferred mode of transportation was the bus because of its affordability. Regarding the choice of transport, most of the PWDs interviewed in Nairobi cited the moderate to high influence of Covid-19 on the choice of transport. In contrast, most PWDs in Accra cited the low influence of Covid-19 on their transportation choice as they continued to use similar modes pre-and during the Covid pandemic. Also, most PWDs in Accra preferred trotro to school while their counterparts in Nairobi again preferred the buses for their affordability and space.

To access leisure places, most PWDs in Nairobi resorted to walking due to nearness to leisure places and the convenience of walking, while those in Accra preferred to use taxis and trotro. Most PWDs in Nairobi resorted to walking to shopping areas because of proximity. At the same time, PWDs in Accra picked trotro and taxis, especially on the return journey when having shopping items. The taxis were more convenient, although they were relatively expensive. The use of buses followed by matatus to social events was preferred by PWDs in Nairobi, while those in Accra settled for trotro and taxis. In both instances, long distances to social events determined the choice of transport. The most preferred mode of transport in Nairobi for religious facilities was walking due to the short distances to such facilities. At the same time, taxis were dominant among PWDs in Accra for their lesser usage on transit compared to trotro and the convenience of being sent to their doorsteps.

11.6 Mobility Challenges of PWDs

The lack of assistive devices constituted a major challenge experienced in urban transport systems in Accra and Nairobi. This challenge affected all categories of disability. Also, the study observed high-floor vehicles without ramps in both cities, especially among public transport vehicles such as trotros, matatus, taxis and buses. The height of vehicles and non-availability of ramps or other assistive technologies hampered access to public vehicles for individuals with mobility problems, such as persons using wheelchairs, clutches, callipers

and tricycles compared to those with hearing or visual impairment. Poorly maintained or non-availability of sidewalks constituted a major accessibility challenge to PWDs, especially within residential areas compared to city centres. Most PWDs in both cities cited the absence of traffic control measures such as traffic signals and dedicated pedestrian crossing lanes as a major challenge that poses difficulties in crossing urban roads.

Surprisingly, PWDs did not consider reading or understanding signs or lack of information to be a major problem in both cities. The study further observes that most PWDs struggle to access designated bus stops in both cities, which impinges their ability to access urban public transport. As concerns boarding or exiting public vehicles and distance to the bust stop, these were considered challenges which affected some forms of disabilities. The challenge of inadequate spaces for wheelchairs/crutches/walkers and generally those with mobility challenges was more pronounced in both cities' transport systems. Interestingly, the availability of accessibility equipment and fare payment did not pose major challenges in public transport for PWDs; participants in the study did not find them to be of priority.

Attitudes of bus drivers, conductors and other passengers presented some challenges for PWDs and impinged on access to the urban transport systems in Accra and Nairobi. Moreover, the absence of dedicated seat or any inscription that offered reserved seats to PWDs on public transport vehicles were prevalent in Accra and Nairobi. The majority of the PWDs in both cities considered the careless/reckless behaviours of motorists in traffic as a major challenge to accessing the urban transport system.

11.7 Level of Satisfaction with Urban Transport System

Whereas all categories of PWDs interviewed in Nairobi were not satisfied with the scheduling of public transport, waiting time, travel time, comfort and safety. However, there were variations in the level of satisfaction among the PWDs in Accra. For instance, most PWDs in Accra are satisfied with the reliability of urban public transport and moderately satisfied with drivers' conduct. Notwithstanding, most PWDs were unsatisfied with the other indicators of satisfaction assessed.

11.8 Coping Strategies by PWDs

The PWDs in both cities adopted various coping mechanisms to navigate the inaccessible, non-inclusive urban transport systems. The data revealed that PWDs in both cities adopt similar strategies to cope with their mobility challenges, including seeking assistance from others, especially in crossing streets, boarding and alighting from public vehicles. Ignoring and sometimes confrontation was a major strategy to dealing with negative attitudes from drivers, conductors and other passengers.

11.9 Conclusion on Comparative Analysis of Accra and Nairobi Transport System

From the analysis, international and national conventions, legislations and policies guide the transport infrastructures of both cities (Accra and Nairobi). State institutions with the exclusive mandate for planning, designing, constructing, and maintaining the transport systems have been established and supported by relevant laws and policies; however, these institutions do not comply fully with the guidelines of the universal design principles. Transport operators were unaware of the laws and transport-related provisions for persons with disabilities. There is a general weakness in implementing laws and policies to guarantee disability-inclusive transport systems in the cities of Accra and Nairobi.

12 POLICY AND PRACTICE RECOMMENDATIONS

The research project conducted had the following objectives:

- Assess the design of the urban transport system and form of Accra and Nairobi vis-à-vis the needs of PWDs
- Examine the mobility patterns, needs, experiences and challenges of PWDs in the two cities
- Enumerate the views and recommendations of PWDs and the relevant local stakeholders on an inclusive urban transport agenda for Accra and Nairobi

The study revealed that Ghana and Kenya have the requisite laws and policies and relevant institutions to factor the needs of persons with disabilities into the design, construction and operation of their respective transport systems. However, the study found lapses and challenges in implementing these laws and policies. Specifically, the study observed in both countries: weak implementation and enforcement of the policies and legal provisions; non-compliance of public transport operators to standards provided in the law lack of mainstream public transport systems composed of poorly coordinated private and semi-public arrangements. There are also inadequate physical infrastructure and poorly designed transport networks not reflecting the needs of PWDs; weak capacity building and low level of awareness of universal design principles among key agencies dealing with disability issues; lack of public awareness and education on legal transport-related provisions of the disability Acts and laws; and lack of inspection and monitoring of the operation of urban transport systems.

Given these challenges, the study specifically stressed the following policy and practice recommendations:

- The Ministry of Transport and the city councils (AMA and Nairobi city council, NCC) should effectively incorporate disability issues, and the universal design principles in the transport system's planning, design, construction, and operation. This way, the transport infrastructures in the cities of Accra and Nairobi will meet the needs of persons with disabilities to foster access, safety, comfort and inclusion.

- The National Council for Persons with Disabilities in Accra and Nairobi should be involved in decisions relating to the planning, design, construction, and operation of the urban transport systems.
- Under all circumstances, the authorities mentioned above should apply the universal design principles to ensure that the transport environments are usable by all people to the greatest extent possible, with the possibility for adaptation and deployment of specialised design for PWDs. Doing so will allow the full participation of PWDs in the daily activities of the urban lives in Accra and Nairobi.
- Ghana and Kenya have Ministries of Transport and institutions such as the National Highways Authority, Urban Roads Authorities, and National Transport and Road Safety Authorities. These institutions have highly trained personnel who would benefit from regular sensitisation, through induction courses, on the mobility needs of PWDs. Such a constant reminder could guarantee appropriate planning and design of the urban transport network that responds to the needs of PWD in the two cities and beyond.
- The study observed that regulation of urban public transport operations lies with the local government systems (e.g., the AMA in the case of Ghana and Nairobi City Council in the case of Nairobi). These institutions should ensure that the transport operators provide ramps, priority seats, and ample space to keep mobility aids and other assistive technologies consistent with the local disability Acts and laws to facilitate access to public transport vehicles.
- The AMA and NCC should continuously maintain existing sidewalks (residential areas inclusive) and construct more to increase coverage within their jurisdictions to reduce the accessibility challenge to PWDs.
- AMA and NCC should ensure traffic control measures such as traffic signals and dedicated pedestrian crossing lanes exist to reduce the challenges their absence poses to PWDs in crossing urban roads. Further, they should ensure that bus stops across the city are designed and constructed to universal standards.
- National Transport and Road Safety Authorities and National Council for Persons with Disabilities in both cities should educate the public to change the attitudes of bus drivers, conductors, and other road users toward PWDs.

The research team believes that if the above recommendations are implemented, the general level of satisfaction with the urban transport system by all categories of PWDs in Accra and Nairobi regarding the scheduling of public transport, waiting time, travel time, comfort and safety will improve.

13 BIBLIOGRAPHY

- Adam, I., Boakye, K. A., & Kumi-Kyereme, A. (2017). Are we our own enemies? Leisure constraints of physically and visually disabled people in Ghana. *World Leisure Journal*, 59(4), 272-293.
- Adreon, D., & Stella, J. (2001). Transition to middle and high school: Increasing the success of students with Asperger syndrome. *Intervention in School and Clinic*, 36, 266-271.
- Aldred, R., & Woodcock, J. (2008). Transport: Challenging disabling environments' local environment. *The International Journal of Justice and Sustainability* 13(6), 485- 496. doi. 10.1080/13549830802259847
- American Psychiatric Association. (2000). *Diagnostic and statistical manual of mental disorders*. Washington, DC: American Psychiatric Association
- Axelsson, C and Barrett, D. (2009). Access to Social Services for persons with Disabilities in the Middle East. Multistakeholder Reflections for Policy Reform- Disability Monitor Initiative-Middle East, CBM and Handicap International, (pp. 17-65).
- Banda-Chalwe, M., Nitz, J. C. & De Jonge, D., (2013). 'Impact of inaccessible spaces on community participation of people with mobility limitations in Zambia'. *African Journal of Disability* 3(1), 3-17.
- Baris, M. E., and Uslu, A. (2009, September). Accessibility for the disabled people to the built environment in Ankara, Turkey. *Africa Journal of Agricultural Research*, 4(9), 801-814.
- Bascom, G. W. & Christensen, K. M. (2017). The impacts of limited transportation access on persons with disabilities social participation. *Journal of Transport & Health*, 7, 227-234.
- Bezyak, J. L., Sabella, S. A. & Gattis, R. H. (2017). Public transportation: an investigation of barriers for people with disabilities. *Journal of Disability Policy Studies*, 28(1), 52-60.
- Bezyak, J. L., Sabella, S. A., & Gattis, R. H. (2017). Public Transportation: An investigation of barriers for people with disabilities. *Journal of Disability Policy Studies*, 28 (1) 52 – 60. <https://doi.org/10.1177/1044207317702070>.
- Bombom, L. S. & Abdullahi, I., (2016). Travel patterns and challenges of physically disabled persons in Nigeria. *GeoJournal*, 81(4), 519-533.
- Casner-Lotto, J., & Sheard, W.W. (2009). *The hidden workforce*. Bridgeport, CT: The WorkPlace, Inc.

- Center for Universal Design (n.d). About the center, The center for universal design, NC State University. Available at http://www.ncsu.edu/ncsu/design/cud/about_us/usronmace.htm
- Church, R.L., & Marston, J.R. (2003). Measuring accessibility for persons with a disability. *Geographical Analysis*, 35(1), 83-96.
- Connell, B., Jones, M., Mace, R., Mueller, J., Mullick, A., Ostroff, E., Sanford, J., Steinfeld, E., Story, M., & Vanderheiden, G. (1997). The principles of universal design: Version 2.0. Raleigh, NC: The Center for Universal Design. Available at: http://www.ncsu.edu/ncsu/design/cud/about_us/usronmace.htm
- Creswell, J. W. (2014). *Research design: Qualitative, quantitative and mixed methods approaches (4th edition)*. Thousand Oaks: SAGE Publications, Inc.
- Danso, A. K., Atuahene, B.T., & Agyekum K. (2019). Accessibility of Built Infrastructure Facilities for Persons with Disabilities. *ANNALS of Faculty Engineering Hunedoara – International Journal of Engineering*.
- Danso, A. K., Ayarkwa, J., & Dansoh, A. (2011). State of accessibility for the disabled in selected monumental public buildings in Accra, Ghana. *The Ghana Surveyor*, 4(1), 1-19
- DETR (2001a) Older People: Their Transport Needs and requirements HMSO London.
- Devi, S., Goyal, S., & Ravindra, S. (2013). Evaluation of environmental barriers faced by wheelchair users in India. *Disability, CBR and Inclusive Development*, 24(3), 61-74. doi. 10.5463/DCID.v24i3.209
- Diaz Olvera L., Plat D., Pochet P. (2013), The puzzle of mobility and access to the city in sub-Saharan Africa, *Journal of Transport Geography*, 32, 56-64.
- Eck, R. W. (2004). Pedestrians. In M. Kutz (Ed.), *Handbook of Transportation Engineering* (pp. 21.1- 21.33). West Virginia: McGraw Hill
- Economic Times (2016) Why transport infrastructure is most important for a country's progress. Online m.economictimes.com
- Erin, J. N. (2011). Becoming commuters: Teaching students travelling to work using public transportation. *Journal of Visual Impairment and Blindness*, 262-265.
- Ferrari, L., Berlingiero, M., Calabrese, F. and Reades, J., 2014. Improving the accessibility of urban transportation networks for people with disabilities. *Transportation Research Part C: Emerging Technologies*, 45, 27-40.

- Forsyth R et al. (2007). Participation of young severely disabled children is influenced by their intrinsic impairments and environment. *Developmental Medicine and Child Neurology*, 49, 345-349. DOI:10.1111/j.1469-8749.2007.00345.x
- GAATES Survey of local transport needs and priorities. Analysis of results. Available online: <https://drive.google.com/file/d/1mDzAdxDhKPnqd0tltY4GtqbUvMIUV8da/view> (accessed on 13 August 2020).
- Ghana Statistical Service (GSS) (2012). *2010 Population and housing census report*. Accra: Ghana Statistical Service.
- Graham, D. (2014), Causal Influence for Ex-Post Evaluation of Transport Interventions, International Transport Forum, Paris.
- Grant, M. (2015). European healthy city network phase V: patterns emerging for healthy urban planning. *Health Promotion International*, 30(suppl_1), i54-i70.
- Hine, J. & Mitchell, F. (2001b). Better for everyone? Travel Experiences and Transport Exclusion. *Urban Studies*, 38 (2), 319-322.
- Hurd, W. J., Morrow, M. M. B., Kaufman, K. R., & An, K. N. (2009). Wheelchair propulsion demands during outdoor community ambulation. *Journal of Electromyography and Kinesiology*, 19 (5): 942-947
- Imrie, R. (2000). Disability and discourses of mobility and movement. *Environment and Planning A*, 32(9), 1641-1656.
- International Monetary Fund (IMF) (2015), IMF (2015), Making Public Investment More Efficient.
- Karr, V., Hayes, A. & Hayford, S. (2020): Inclusion of Children with Learning Difficulties in Literacy and Numeracy in Ghana: A Literature Review, *International Journal of Disability, Development and Education*, DOI: 10.1080/1034912X.2020.1792419
- Katzmann, R. (2010). *Institutional Disability: The Saga of Transportation Policy*. Washington, D.C: Brookings Institution Press.
- Kenya National Bureau of Statistics (2020). 2019 Kenya population and housing census results. <https://www.knbs.or.ke/?p=5621>
- Kenyon, S., Lyons, G. & Rafferty, J. (2002). Transport and social exclusion: Investigating the possibility of promoting inclusion through virtual mobility. *Journal of Transport Geography*, 10, 207-209.
- Kett., M., Cole, E., & Turner, J. (2020). Disability, mobility and transport in low-and middle-income countries: A thematic review. *Sustainability*, 12(2), 1-18

- King, J. A. & King, M. J. (2014). *The lived experience of families living with spinal cord disability in Northeast Thailand*. In: Soldatic K, Meekosha H, editors. *The global politics of impairment and disability: processes and embodiments*. UK: Routledge; p. 107–122.
- King, J. et al. (2018). Addressing transport safety and accessibility for people with a disability in developing countries: a formative evaluation of the journey access tool in Cambodia. *Global Health Action*, 11(1), 1538658
- King, M. J. (2000). The iceberg principle: The knock-on effects of addressing the safety of "special needs" road users. In *Proceedings Road Safety Research, Policing and Education Conference*, pages pp. 359-364, Brisbane, Queensland.
- Leonardi, M. et al. (2006). The definition of disability: what is in a name? MHADIE Consortium. *Lancet*, 2006,368:1219-1221. doi:10.1016/S0140-6736(06)69498-1 PMID:17027711
- Leonardi, M., et al. (2006). The definition of disability: what is in a name? *Lancet*, 368(9543), 1219-1221. DOI:10.1016/S0140-6736(06)69498-1
- Lubin, A. (2012). Persons with disabilities seeking employment and public transportation: Findings of a New Jersey Survey. Research Report for John J. Heldrich Center for Workforce Development and the Kessler Foundation, New Jersey.
- McFarlene, C. & Silver, J. (2017). Navigating the city: the dialectics of everyday urbanism. *Transactions of the Institute of British Geographers*, 42, 458-471
- Naami (2019). Access Barriers Encountered by Persons with Mobility Disabilities in Accra, Ghana. *Journal of Social Inclusion*, 10(2), 68-84
- Ngnenbe, T. (2020). Access to transportation facilities: PWDs deserve better. Graphic Online Aug - 16 – 2020.
- Ocran, J. (2019). Exposing the protected: Ghana's disability laws and the rights of disabled people. *Disability & Society*, 34(4), 663-668
- Oliver, M. (1990). *The politics of disablement*. Basingstoke: Macmillan and St Martin's Press
- Penfold, C., Cleghorn, N., Creegan, C., Neil, H., & Webster, S. (2008). *Travel behaviour, experiences, and aspirations of disabled people*. London, England: National Centre for Social Research.
- Picton, A. (2011). Denying Ghana's disabled their rights. *The Disability Act: 5 Years on*. Accra, Ghana: CHRI Africa. <http://chriafrika.blogspot.no/2011/06/denying-ghanas-disabled-their-right>

- Porter, G., Abane, A. & Lucas, K. (2020). User needs and practices: A position paper 2019. VREF Program Mobility and Access in African Cities: Future Urban Transport.
- Porter, G., Hampshire, K., Abane, A., Robson, E., Munthali, A., Mashiri, M., & Tanle, A. (2010). Moving young lives: mobility, immobility and inter-generational tensions in urban Africa. *Geoforum*, 41 (5), 796-804.
- Quinn, G. & Degener, T. (2002a). A survey of international, comparative and regional disability law reform. In: Breslin ML, Yee S, eds. Disability rights law and policy - international and national perspectives. Ardsley: Transnational
- Rapegnio, N., & Ravaud, J. (2017). Disability, residential environment and social participation: factors influencing daily mobility of persons living in residential care facilities in two regions of France BMC Health Services Research (2017) 17 (683), 2- 15. doi: 10.1186/s12913-017-2602.
- Reagan, J. (1998). A perspective on universal design. Excerpt of a presentation made by Ronald L. Mace, FAIA, at Designing for the 21st Century: An International Conference on Universal Design, June 19, 1998, Hofstra University, Hempstead, New York. Available at http://www.ncsu.edu/ncsu/design/cud/about_us/usronmacespeech.htm
- Scheer, J., Kroll, T., Neri, M. T., & Beatty, P. (2003). Access barriers for persons with disabilities: the consumer's perspective. *Journal of Disability Policy Studies*, 13 (4), 221–230.
- Shakespeare, T. (2006). *Disability rights and wrongs*. London: Routledge.
- Sietchiping, R., Permezel, M. J., & Ngomsi, C. (2012). Transport and mobility in sub-Saharan African cities: an overview of practices, lessons and options for improvements. *Cities*, 29(3), 183-189.
- Soltani, S.H.K., Sham, M., Awang, M., & Yaman, R. (2012). Accessibility for Disabled in Public Transportation Terminal. *Procedia - Social and Behavioral Sciences*, Vol. 35, pp. 89-96.
- Stevens, C. S. (2007). Living with Disability in Urban Japan. *Japanese Studies*, Vol. 27, No. 3, 264-278.
- Tashakkori, A., & Teddlie, C. (Eds.). (2010). *SAGE handbook of mixed methods in social and behavioural research* (2nd ed.). Thousand Oaks, CA: Sage.
- Tijm M.M, Cornielje H, Edusei A.K (2011). ‘Welcome to my life!’ photovoice: Needs assessment of and by persons with physical disabilities in the Kumasi metropolis, Ghana. *Disability, CBR and Inclusive Development*, 22(1), 55- 72.

- Transport Studies Group (2005). Measuring Accessibility as Experienced by Different Socially Disadvantaged Groups. University of Westminster UK
- Tudzi, E. P., Bugri, J. T., & Danso, A. K. (2017). Human rights of students with disabilities in Ghana: Accessibility of the university built environment. *Nordic Journal of Human Rights*, 35(3), 275-294.
- Tyler, N., 2002, Accessibility and the bus system: Concepts to practice Avebury, Newcastle upon-Tyne.
- U.S. Department of Transport. (2003, April). Transportation Difficulties keep Over Half a Million Disabled at Home. Bureau of Transportation Statistics Issue Brief.
- United Nation (2015). Transforming our World: The 2030 Agenda for Sustainable Development. Geneva.
- United Nations (1998) Human Development Report: Changing today's consumption patterns - for tomorrow's human development United Nations Development Programme.
- United Nations Convention on the Rights of Persons with Disabilities. (2006). <https://www.un.org/development/desa/disabilities/convention-on-the-rights-of-persons-with-disabilities.html>
- United Nations Department of Economic and Social Affairs (2019). Disability and development report- Realizing the sustainable development goals by, for and with persons with disabilities 2018. <https://social.un.org/publications/UN-Flagship-Report-Disability-Final.pdf>
- United Nations Regional Meeting on Disability Measurement & Statistics in support of the 2030 Agenda for Sustainable Development & the 2020 World PHC Programme for Africa Kampala, Uganda, 15-17 November 2016
- University of Westminster, University College London, London School of Hygiene and Tropical Medicine (2003) Evaluating Measures to Enhance the Mobility of Older and Disabled Persons. Phase 1 Summary Report', produced for the DfT, December 2003.
- Vandebelt, D. (2001). Disabilities universal design (Waterloo Region Trends Research Project). Social Planning Council of Cambridge and North Dumfries, 1-11.
- Venter, C. (2011). Transport expenditure and affordability: The cost of being mobile. *Development Southern Africa*, 28(1), 121-140.
- Venter, C.J., Rickert, T. E., & Maunder, D. A. (2003). From basic rights to full access: Elements of current accessibility practice in developing countries. *Transportation Research Record*, 1848(1), 79-85.

- Vergunst, R., Swartz, L., Mji, G., MacLachlan, M., & Mannan, H. (2015). You must carry your wheelchair' barriers to accessing healthcare in a South African rural area. *Global Health Action*, 8, 2-8.
- World Health Organisation (WHO). (2011). *World Report on Disability*. Switzerland: World Health Organisation Press.
- World Health Organisation. (2011). *World report on disability*. http://www.who.int/disabilities/world_report/2011/en/; 2011.
- World Health Organization (WHO) (2010). *Understanding Disability*. United Nations Educational, Scientific and Cultural Organization, International Labour Organization, International Disability and Development Consortium. Community-based rehabilitation: CBR guidelines. Geneva, World Health Organization.
- Wu, Gan, Cevallos, & Shen, 2011). Wu, W., Gan, A., Cevallos, F., & Shen, D. (2011). Selecting bus stop for accessibility improvement for persons with physical disabilities. *Journal of Public Transportation*, 2(14), 133-149.
- Yates, K. (2007). Understanding the experiences of mobility-disabled tourists. *International Journal of Tourism Policy*, 1(2), 153-166.