

**PHYSICAL MOBILITY EXPERIENCES AND ACCESS TO WORKSITES AMONG
SMALL SCALE TRADERS WITH SPECIAL NEEDS IN NAIROBI'S CENTRAL
BUSINESS DISTRICT**

BY

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T51/7227/2017

**A Research Project Submitted to the Institute for Development Studies, University of
Nairobi, in Partial Fulfillment of the Requirements for the Award of the Master of
Development Studies**

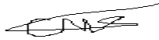
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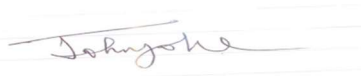
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DEDICATION

“To my dear wife Emma, daughter Natalie, and son Taji, thank you for inspiring me to take this challenge”.

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Firstly, I thank God for giving me life, good health of both body and mind as I pursue my education and career goals. Secondly, I thank my always dedicated supervisors Dr. Anne Kamau and Mr. John Njoka, for guiding me through this project. They mentored me to become a better professional and academician as I gradually completed the project. Besides, they set the bar high, which improved my writing and understanding of the research process.

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Finally, I acknowledge the traders with special needs and key informants in Nairobi County that participated in this project.

ACRONYMS AND ABBREVIATIONS

BRT	Bus Rapid Transit
CBD	Central Business District
COVID-19	Corona Virus Disease of 2019
IDS	Institute for Development Studies
KNBS	Kenya National Bureau of Statistics
KNSPWD	Kenya National Survey for Persons with Disabilities
MOH	Ministry of Health
MT	Motorized Transport
NACOSTI	National Commission for Science, Technology and Innovation
NCPWD	National Council for Persons With Disabilities
NMT	Non-Motorized Transport
NTSA	National Transport and Safety Authority
PWDs	Persons with Disabilities
SACCOs	Savings and Credit Co-operatives
SDG	Sustainable Development Goal
UN	United Nations
WHO	World Health Organization

TABLE OF CONTENT

DECLARATION	i
DEDICATION	iii
ACKNOWLEDGEMENTS	iv
ACRONYMS AND ABBREVIATIONS	v
LIST OF FIGURES	ix
LIST OF TABLES	x
ABSTRACT.....	xi
CHAPTER ONE: INTRODUCTION.....	1
1.1 Background of the study	1
1.2 Problem statement.....	4
1.3 Research Questions	5
1.4 Research Objectives.....	6
1.5 Justification of the Study	7
1.6 Limitations of the Study.....	8
1.7 Organization of the Research.....	9
CHAPTER TWO: PHYSICAL MOBILITY AND ACCESS EXPERIENCE.....	9
2.1 Introduction.....	9
2.1.1 Physical Mobility Experience in Urban Areas.....	9
2.1.2 Physical Mobility Experience of PWDS in Nairobi	12
2.1.3 Accessibility of Urban Areas and Costs of Mobility	13
2.1.4 Safety and Convenience.....	14
2.1.5 Effect of Physical Mobility Experience	15
2.1.6 Coping with Urban Access Challenges.....	16
2.1.7 Disability Policy in Kenya	18
2.2 Theoretical Framework.....	19
2.3 Conceptual Framework.....	21
CHAPTER THREE: RESEARCH METHODOLOGY	24
3.1 Research Design.....	24
3.2 Study Site	24
3.3 Study Population and Target population.....	26

3.4 Sample Size and Sampling Procedure	27
3.5 Data Sources and Collection Methods	28
3.6 Data Collection Methods	30
3.7 Data analysis	31
3.8 Ethical Consideration.....	32
CHAPTER FOUR: FINDINGS AND DISCUSSIONS	33
4.1.1 Respondent Characteristics	33
4.1.2 Trading Sites	35
4.2 Physical Mobility Options	35
4.3 Factors that influence Physical Mobility Choices	37
4.3.1 Time Taken to Access the Worksites.....	38
4.3.2 Worksite Access Time	40
4.4 Number of Days Traders Access Worksites	42
4.5 Obstacles during Worksite Access.....	42
4.6 Physical Mobility Experience	44
4.6.1 Safety	44
4.6.2 Convenience.....	49
4.6.3 Cost	51
4.7 Discussion on Findings of the Study	54
4.7.1 Traders Characteristics.....	55
4.7.2 Physical Mobility Options and Experiences	55
4.7.3 Key Barriers and Coping during Worksite Access	57
4.7.4 The Effect of Physical Mobility Experience.....	59
CHAPTER FIVE: SUMMARY, CONCLUSIONS AND RECOMMENDATIONS	61
5.1 Summary	61
5.2 Conclusions.....	63
5.3 Recommendations.....	65
5.4 Suggested Further Research.....	67
REFERENCES	68
APPENDICES	74
Appendix 1: Questionnaire	74
Appendix 2: Key Informant Interview Guide.....	81

Appendix 3: NACOSTI Authorization82

LIST OF FIGURES

Figure 1 Conceptual Framework	23
Figure 2 Map showing the study area	26
Figure 3 NMT forms used to Access Worksites within the CBD.....	36
Figure 4 MT forms used during Access of CBD Worksites	37
Figure 5: Time Traders take to Access Worksites	39
Figure 6: Start Time from different Locations.....	41
Figure 7: Worksite Arrival Time	41
Figure 8: Number of Days in a Week Traders Access Worksites	42
Figure 9: Traders that had been Victims of Crime	47
Figure 10: Number of Traders Adapting to Safety Issues	48

LIST OF TABLES

Table 1: Data Needs Table.....	29
Table 2: Respondent Characteristics.....	34
Table 3: Factors that influence Physical Mobility Choices	38
Table 4: Estimated Distance Travelled to Access Worksites	40
Table 5: Access Obstacles Present.....	44
Table 6: Safety issues that Affect Access (Motorized Transport Modes)	45
Table 7: Safety issues that Affect Access (Non-Motorized Transport Modes)	46
Table 8: Ways of Responding to Safety Issues.....	49
Table 9: Ways of Coping with Inconveniences During Access	51
Table 10: Different ways of Adapting to Cost Issues during Mobility.....	54

ABSTRACT

Most of the PWDs experience high levels of poverty and unemployment. Some work in city spaces that are not planned to meet their needs. While the Sustainable Development Goal (SDG) 11 aims at creating safe, resilient, and inclusive cities, persons with special needs face challenges participating in daily activities that include access to worksites in the city. This study explored the physical mobility experience of small-scale traders with special needs accessing worksites in Nairobi City County. Literature review showed a gap in the implementation of policies and planning of cities in low income countries. The objectives aimed at exploring the physical mobility options and experiences of traders with special needs (PWDs) in accessing worksites and their coping strategies. The study assessed their experiences relating to safety, convenience, and mobility costs by using a descriptive research design and a universal design theoretical framework. The findings showed an existing relationship between physical mobility experience and access to worksites. They took longer to access their worksites, experienced safety issues and found it inconveniencing when navigating to worksites. Small-scale traders with special needs adapted by changing the time they accessed their worksites, relying on guardians, or working fewer hours to respond to access challenges. The study recommends embracing a universal design for cities and mobility modes to make them safe, affordable and convenient for all users. Other recommendations include training drivers and conductors on ways to facilitate the physical mobility of persons with special needs in a better way, and designing safe markets within communities. There is also a need for further research on ways of making different forms of motorized transport disability-friendly.

CHAPTER ONE: INTRODUCTION

1.1 Background of the study

Disability definition varies across scholars and countries. The International Classification of Functioning Disability and Health notes that disability arises from the interaction of an individual's intrinsic capacity, personal, and environmental factors (WHO, 2001). As such, disability results from intrinsic or extrinsic factors. However, physical disabilities and disabilities associated with mental disorders are the broad categories advanced and studied by scholars. A physical disability refers to a condition that limits an individual from basic physical activities like physical mobility as one interacts with the environment (Smart, 2001)¹. An intellectual disability is one of the mental health disorders that can affect physical mobility choices and ability to cope with emerging mobility problems. Shree and Shukra (2016) define intellectual disabilities as impaired intelligence that reduces an individual's ability to cope independently.

Existing physical and social barriers lead to mobility and sensory limitations for persons with hearing impairments, visual impairments, muscular dystrophy, amputations, and quadriplegia, paraplegia, and spinal cord injuries. Chronic health conditions like cancer, mental health disorders, cardiovascular diseases, and diabetes are among the causes of disability. Other factors that cause disability include hereditary factors, ageing, injuries, and accidents (Krahn, Walker & Correa, 2015).

¹Physical mobility means movement by use of motorized and non-motorized forms to reach their worksites

Persons With Disabilities (PWDs) are also referred to as persons with special needs (Rutherford et al., 2019)². Traders with physical disabilities accessing worksites in Nairobi CBD will in this study be referred to as traders with special needs. From a social perspective, an individual is disabled by social and environmental factors that limit participation in daily activities. Such daily activities include access to worksite or participation in other socio-economic activities. Physical access to works supports livelihoods of traders directly and indirectly to the dependants but is often limited by environmental experiences that limit access.

This study uses a social perspective embraced in development studies to understand access issues for persons with special needs who are limited by social and physical factors when participating in socio-economic activities. PWDs often operate in a restrictive environment full of environmental barriers in the informal sector (Naidoo et al., 2014). They also operate and work in the context of regulatory challenges, lack of proper equipment, and limited support (Eichhorst et al., 2010). Like other small-scale traders, they often realize low levels of revenue and have worksites in fewer locations due to possible limitations in spatial access. Most studies on small scale traders in low income countries have mainly focused on technology and access to finance challenges that their business face (Ackah, & Vuvor, 2011) with little consideration on their experience to physically access the worksites.

The World Health Organization (WHO) shows that at least 15% of the world population is affected by disability (Bickenbach, 2011). At least one (1) billion people live with a form of disability, with 200 million people experiencing functional difficulties (WHO, 2011). In

² The term Persons With Disabilities (PWDs) is used interchangeably with the term persons with special needs in the study

Kenya, there were 349, 000 registered Persons with Disabilities (PWDs) in 2017 (MOH, 2017). The 2019 census conducted by the Kenya National Bureau of Statistics recorded 918,270 PWDs aged above five years. Nairobi City takes 24% of the Kenyan PWDs living in urban areas (KNBS, 2019).

The United Nations Department of Social and Economic Affairs (2021) notes that between 80% to 90% of PWDs in developing countries and 50% to 70% in industrialized countries is unemployed globally. Unemployment often results from employer attitudes towards disability and the unwillingness to bear the cost of making the workplace disability-friendly (Kaye, Jans, & Jones, 2011). In Kenya, KNBS' 2019 report showed PWDs had lower employment rates when compared with the general population (Rohwerder, 2020). Some resort to self-employment and form small and micro-enterprises. PWDs often rely on external support while accessing their small businesses (Acepis, 2018). Other studies show the population of employed PWDs is lower to other groups (Bonaccio et al., 2019; Mitra, Posarac, & Vick, 2011). Physical mobility services that could enhance better access are not fully available to PWDs since planning takes little consideration of their needs creating disparities in various spheres of life (Krahn, Walker and Correa, 2015). Many traders with disability have challenges accessing worksites due to the dynamic service experiences that they encounter.

While literature acknowledges the heterogeneity of different groups that work in the informal sector in Nairobi (Kinyanjui, 2014), few empirical studies show the effects of physical mobility experience among vulnerable groups accessing worksites within the county. Limited research exists on accessibility to worksites in urban areas for PWDs who also form part of the vulnerable groups operating small businesses in Kenyan urban areas.

Individual and environmental factors affect the ability of small scale traders to create self-employment (Cho, Robalino, & Watson, 2016). To respond to self-employment problems facing people with disabilities in urban areas, it is necessary to understand how they access spaces like worksites.

Physical mobility allows diverse groups to access job opportunities in Nairobi city (Salon, & Gulyani, 2019) and is an essential component for the integration of PWDs into the labour market (Eichhorst et al., 2010). The small-scale traders with special needs access the city worksites by using both motorized and non-motorized modes. Accessing worksites helps to integrate the traders into the labour market. This study focused on the access experience for individuals with physical disabilities working as small scale traders in Nairobi city. Persons with physical disabilities in this study were traders with hearing and mobility impairment.

1.2 Problem statement

This study sought to understand the effects of physical mobility experiences on worksite access by small scale traders with special needs in Nairobi City County. KNBS (2019) statistics showed Nairobi County had 18,790 persons with disabilities. Previous studies showed more than 80% of the unemployed population were persons with disabilities (Opoku et al., 2017). A small number of PWDs traded along city streets despite hawking being outlawed. Traders with disability were allowed trading spaces in the city upon registering with the National Council for Persons With Disabilities (NCPWD) and approval by the Nairobi city council authorities.

Traders with special needs in Nairobi City had diverse physical mobility experiences while accessing worksites that needed documentation and interventions provided to improve access. While accessing their worksites in the city, some traders with special needs used the existing para-transit transport in Nairobi city that would have hindered their efforts towards self-employment. PWDs also made use of physical mobility devices like wheelchairs, tricycles, walking sticks, and crutches while accessing worksites. There was limited information on outcomes of physical mobility experiences for traders participating in economic activities in Nairobi City County and the coping strategies that would improve access to their worksites.

There were limited studies on worksite accessibility for the traders with special needs in cities and how available physical mobility options created experiences affected their self-employment efforts, the number of days worked, their working time and commuting time. Further research was needed to understand the physical access experience for the population with special needs determined to create self-employment in urban areas. It was the intention of this study to address the empirical gap relating to worksite access experience for PWDs with small businesses in Nairobi City County.

1.3 Research Questions

The main research question for this study was: What are the effects of physical mobility options and experiences on accessing worksites in Nairobi CBD by small scale traders with special needs? The following specific research questions were proposed to help answer the question:

- a) What are the characteristics of Small Scale traders with special needs who work in Nairobi CBD?
- b) How do these traders access their CBD worksites and what are their physical mobility experiences?
- c) What are the key barriers in accessing worksites and how do they adjust to these challenges?
- d) How do physical mobility experiences affect traders with special needs in accessing worksites in Nairobi CBD?

1.4 Research Objectives

The main objective was to assess physical mobility options and experiences and how they affect the worksite access experience of small scale traders with special needs in Nairobi CBD. This was done by meeting the following specific objectives:

- a) To explore the characteristics of small scale traders with special needs who work in Nairobi CBD;
- b) To find out how these traders access their CBD worksites and their physical mobility experiences;
- c) To explore key barriers in accessing worksites and how they adjust to these challenges;
- d) To find out the effect of physical mobility experiences on access to worksites among traders with special needs in Nairobi CBD.

1.5 Justification of the Study

The purpose of this project was to explore the effect of physical mobility options and experiences on worksites access by traders with special needs in Nairobi City. Accessibility of urban areas and cities helps different groups to participate in socio-economic activities. Sustainable Development Goal (SDG) 11 calls for inclusivity by creating sustainable cities that can be realized by understanding and working to address the worksite access needs for diverse populations. Accessibility of learning institutions and the environment by PWDs has received scholarly attention over the years but worksite access as an outcome of physical mobility in urban areas is not the focus of the studies.

While acknowledging the role and opportunities cities create towards self-employment and development, this study also focused on understanding the safety, convenience and affordability of physical mobility options for traders working in Nairobi CBD. Since other studies mainly focus on the worksite experience of persons with disability in the formal sector (Bonaccio et al., 2019; Parker, Owen, & Gould, 2012), this study focuses on self-employed persons with small businesses that often are unregistered. Self-employed small-scale traders compete for space in the city and have to travel from different parts of the city to access their worksites. Fried, Tun, Klopp and Welle (2020) also observe that opportunities decrease exponentially as one moves away from the City Centre. As such, the CBD is likely to have a high demand of people seeking opportunities for self-employment through trading activities. PWDs have to make informed choices on the available physical mobility options to ensure safety, convenience and affordability as they navigate to access city worksites. Their experiences when navigating using different physical mobility options should be taken into consideration.

This study contributes to the understanding of how physical mobility experiences of PWDs accessing worksites make urban areas less inclusive. It is different from other studies targeting PWDs as it focusses on self-employed traders with special needs working in micro enterprises within Nairobi's Central Business District. An inclusive and sustainable Nairobi county can be realized through the creation of affordable, resilient, and safe transport systems (Fried et al., 2020). Understanding the effects of physical mobility experiences on worksite access can potentially inform the development and implementation of policies that make cities safer, more accessible and more resilient as advocated for in SDG 11. Students of development studies and urban planners will find the findings useful towards increasing their knowledge on the issues affecting the integration of PWDs into the labour market.

1.6 Limitations of the Study

This study area is limited to Nairobi County and the application of the findings is tied to the geographical area. It is essential therefore, to take caution while applying the findings to other urban geographical areas having different demographic dynamics. The traders interviewed were those living within the Nairobi metropolitan area which also limits the application of the results to urban areas.

The study is also limited to small scale traders with physical disabilities. Traders with physical disabilities included persons with hearing impairment and physical mobility impairment. The application of the findings does not apply to individuals with other physical and mental challenges. Although the findings can be inferred to access and participation in other activities, the study was mainly focused on traders with physical disabilities accessing their worksites.

1.7 Organization of the Research

The remaining chapters of this research help meet the objectives presented in the first chapter. Chapter two provides a literature review on the physical mobility experiences of traders with special needs and how they access spaces in urban areas. Chapter three outlines the methodology. Chapter four presents the findings and discussion of the study. Chapter five summarizes the findings and gives recommendations for improving the accessibility experience of Nairobi city by traders with special needs.

CHAPTER TWO: PHYSICAL MOBILITY AND ACCESS EXPERIENCE

2.1 Introduction

This section contains the empirical and theoretical literature respectively. The theoretical literature gives a model that helps to understand the environment within which the traders with special needs access their worksite. It forms the theoretical lens upon which the findings are analyzed. The empirical literature shows the studies that have been done on the accessibility of urban areas and physical mobility experiences of traders with special needs. It also shows the context within which traders with special needs respond to accessibility challenges in urban areas. Other areas covered under the literature review include policies aimed at enhancing access and the conceptual framework.

2.1.1 Physical Mobility Experience in Urban Areas

Literature on accessibility of urban areas found in low income countries shows varying experiences for different groups. Andreasen and Jensen (2017) found unequal access to opportunities, services, and social networks among residents living in the peripheral settlements of Dar-es-Salaam. Lack of access for all in cities leads to socio-economic

exclusion for some groups (Kenyon, Lyons, & Rafferty, 2002). The individuals with mobility challenges, women and children experience higher levels of exclusion while trying to participate in socio-economic activities in cities. Access to urban areas and cities help to support the socio-economic activities and the livelihoods of diverse groups (Chamseddine, & AitBoubkr, 2020). Traders, city workers, and other commuters in urban areas have different mobility patterns and needs that create disparities when not properly addressed.

Ashigbi et al., (2017) identify PWDs as a population experiencing disparities when accessing the built environment, which prevents them from full participation in daily living activities. City planners have the obligation to plan for traders working and passing through urban areas. Costa, Neto and Bertolde (2017) show that an increasing use of private vehicle fleets make planning for urban mobility difficult. Urban areas are often planned to accommodate vehicle fleets with little focus on commuters and different populations. Lack of proper planning to accommodate all users' needs leads to deteriorating mobility levels in urban areas (Peter, & Yang, 2019). Planners should particularly understand the access needs of traders with disabilities to create disability-friendly transport systems and an accessible built environment in urban areas. Equitable use, flexibility, and sufficient spaces for use and approach should guide mobility infrastructure planning and development to enhance accessibility (Loo & Comtois, 2015).

Members of society should have the ability to access the city's desired locations, make relationships, and communicate without sacrificing essential values relating to daily living (Costa et al., 2017). Traders with special needs should similarly manage to access their desired locations without sacrificing essential values relating to daily living. They should

manage to access worksites located in urban areas with dignity without sacrificing essential human values. Saiz and Donald (2017) observe that reducing inequalities is essential for the dignity of everyone and the realization of sustainable development. The dignity of PWDs is affected when they cannot access worksites with ease.

Dynamic access limitations exist in cities and informal markets that are not well planned to meet the needs of the vulnerable populations. These limitations exist due to non-compliance in the implementation of policies aimed at ensuring access for all (Naidoo et al. 2014)³. Access points in the informal markets and cities often lack key infrastructures like ramps, sidewalks, and bridges. An inaccessible public transport system, heavy human traffic, and discontinuous sidewalks lead to limited physical mobility in urban areas (Litman, 2017). The lack of appropriate designs increases the risk of falling for individuals with mobility impairments (Curl, Fitt, & Tomintz, 2020). Littered potholes, on the other hand, pose health care risk and make mobility difficult for persons in wheelchairs. Safety concerns emerge in the context of heavy human and vehicle traffic in urban areas. Often, persons with physical disabilities depend on other individuals to get into the train or move across poorly designed access points (Ryan, 2017). While the study by Naidoo et al. (2014) focused on an informal trading site, this study was located within the Nairobi CBD, where small scale traders with special needs are allowed access worksites.

³Naidoo et al., 2014 explore accessibility of informal Markets by PWDs with mobility impairment in Warwick, South Africa.

2.1.2 Physical Mobility Experience of PWDS in Nairobi

Non-motorized forms of transport are dominant in African cities (Mitullah, & Opiyo, 2012), and many workers and small scale traders in Nairobi walk to their workplaces (Salon, & Gulyani, 2019). While many households in Nairobi use mixed transportation modes, a large number depend on the use of non-motorized forms to access different places in Nairobi despite the inadequate infrastructure to support non-motorized modes in Nairobi (Odak, 2014). This consequently affects PWDs with limited alternatives in their modal choice of transport accessing worksites in the CBD.

Like most African cities, Nairobi has a market-driven and partially self-organized bus system (Klopp, & Cavoli, 2019). The use of motor-cycles is emerging as a common mode of transport in Nairobi supplementing walking and *matatus* that, for a long time, has been the primary means that connects people between towns, markets, and settlements⁴. The increasing use of motor-cycles has mixed implications that need further studies. While motor-cycles increase accessibility to remote areas, they are not well designed to meet the diverse needs of PWDs. There are also multiple plans aimed at enhancing mobility and access of Nairobi that should be coordinated (JICA, 2018). The existing plans have not managed to eliminate the inequalities emerging from the use of para-transit transport system. Studies by Klopp and Cavoli (2017) describe the Nairobi's para-transit system as "unfriendly" to women, children, and PWDs. This study brings out experiences of people

⁴*Matatu* refers to buses and vans used as public transport in Kenya. *Matatus* are privately owned.

with special needs while using existing para-transit system to access worksites in Nairobi CBD.

2.1.3 Accessibility of Urban Areas and Costs of Mobility

Accessibility to urban areas among all groups helps to improve participation besides ensuring equity. Caprotti et al. (2017) views accessibility as a collective good that should be incorporated into policies to enhance sustainable urban development as advocated for in the New Urban Agenda. Besides providing a means of socio-cultural participation, physical access of urban spaces, especially worksites, makes more people with disabilities achieve economic independence. There is need for development of inclusive policies in urban areas. The policies should be disability responsive as outlined in the New Urban Agenda which calls for the integration of services and transport facilities to make cities safe and resilient (Okraszewska et al., 2019). Effective integration of transport modes and urban spaces will enable continuity along the travel chains from the starting point to the final destination for traders with special needs who connect by different modes from their houses to worksites in the city.

The New Urban Agenda calls for the identification of gaps that affect costs and the accessibility of urban areas by marginalised groups. It presumes transport costs affect transport mode choices and the individual's active participation beyond their neighborhoods. A household survey assessing the travel patterns in West and Central Africa found that people preferred walking to using public transport due to transport costs (Olvera, Plat, & Pochet, 2013). Often, costs exacerbated challenges when making trips and affected participation in out-of-home activities like education and work. Beyond the

absence of integrated fares, were minimum coordination and an insufficient supply of public transport services. For traders with disability, they have to make trips to their worksites frequently irrespective of the physical mobility experiences, to gain economic independence through self-employment⁵. The road system in most African cities is poorly linked which consequently increases the cost of accessing different parts of the city.

Similarly, Sietchiping, Permezel, and Ngomsi (2012) note deteriorating transport infrastructure and services in Sub-Saharan cities in the context of rapid urbanization. They observe that transport cost is the main household expenditure taking 20% to 26% of monthly revenue. The low-income earners are affected since they also have other expenses beyond the transport costs at the household level. Small-scale traders with special needs have to incur transport costs while accessing worksites located outside their neighborhoods. High transport costs can affect the frequency and mode of accessing their worksites in the city.

2.1.4 Safety and Convenience

African cities, including Nairobi, are increasingly adopting new transport plans aimed at ensuring safe and convenient access to cities⁶. African cities are particularly embracing BRT (Bus Rapid Transit) systems based on success stories from Bogota and Brazil (Ndebele, & Aigbavboa, 2018). The adoption of BRT systems in African cities is aimed at ensuring convenient mobility in urban areas to help solve the transport problems that create inconvenience. Safety standards and convenience are key aspects of the BRT systems that

⁵Trips enable traders to access their worksites in the CBD

⁶Convenience refers to the ability to move to different destinations with ease and comfort

are aimed at solving accessibility problems in urban areas. While BRT systems are viewed as solutions that can enhance convenience during mobility for persons with disabilities over long distances, they are still likely to face challenges when making shorter trips in their neighborhoods. There are new development master plans aimed at integrating land use with transport services to solve mobility challenges. For instance, JICA (2018) developed a master plan that would help reduce the physical mobility challenges experienced by residents of Nairobi city by formulating a system that interlinks transport modes seamlessly at the city core. The JICA (2018) master plan recognizes reduced access as a limitation that persons with special needs face in the access of physical utilities in Nairobi.

2.1.5 Effect of Physical Mobility Experience

Literature shows that PWDs in both high and low-income countries are likely to face exclusion from daily socio-economic activities due to mobility challenges. The United Nations Convention on the Rights of Persons with disabilities has set up a framework enhancing the inclusion of PWDs in the development agenda. However, more should be done to ensure a positive experience and improved outcomes for persons with disabilities. In the US, access and mobility limitations result from fixed-route transportation, obstacles within pathways, and boarding challenges for PWDs (Bezyak, Sabella, & Gattis, 2017). In low and middle-income countries, the lack of footpaths, ramps, and poor repairs limit physical mobility for persons with special needs (King, & King, 2018). The physical mobility experience is worsened by the presence of vendors along paths and inadequate infrastructure in Nairobi city. Kett, Cole, and Turner (2020) observe that the existing literature fails to show the outcomes of the physical mobility limitations in both high and low-income countries.

There are few studies on the accessibility of different environments among persons with special needs and contexts. Yates (2007) studied the mobility experiences of tourists having different levels of physical mobility restrictions. The qualitative study found that tourists with disabilities experienced challenges of ill health, environmental barriers, and interactions with people around them. Most of the negative experiences could be eliminated by ensuring the availability of services. He observed that environmental barriers impacted on the activities that persons with disabilities participate in. Besides, traveling for PWDs created a platform for self-discovery as they encountered risks and challenges that demand self-confidence to overcome. Tudzi, Bugri, and Danso, (2020) studied the mobility experiences of students at the University of Ghana. They used a case study approach to show how the built environment in higher learning institutions creates unpleasant experiences for learners with physical impairments. Like in the study of Yates (2007) the environmental barriers reported by Tudzi et al., (2017) included obstacles around buildings and schools. While the studies exhibit the environmental obstacle that creates diverse experiences for persons with disabilities, they do not show the outcomes or effects on the participation among PWDs.

2.1.6 Coping with Urban Access Challenges

Cities in Africa are embracing new mobility patterns and models to deal with mobility challenges with a focus on rapid mass transit, improving inter-modality, digitalization, and improved planning (Colombo et al., 2017). For marginalized persons and vulnerable groups, new urban plans should consider their unique and dynamic needs (UN HABITAT, 2016). PWDs find difficulties navigating the public system and accessing the city due to multiple barriers, with limitations varying depending on the disability (Bezyak, Sabella, &

Gattis, 2017). They come up with different ways of improving their experiences while accessing cities and participating in socio-economic activities. The different ways may include hiring a guardian or using assistive devices that consequently increase costs and make accessibility unaffordable.

Small-scale traders are increasingly using technology to respond to environmental and work-related challenges (Chen, 2016). The technologies they employ include using the internet platforms, electrical equipment, and manual devices to overcome the constraints they face in their day to day work. The use of technology can reduce the need for physical access to worksites. Traders with special needs however have to access their worksites physically due to the nature of the goods and services they sell. The 2019 World Development Report shows that technology has contributed to the changing nature of work and the workplace (Stromquist, 2019). Mobile workers experience challenges as they move to access their workspaces that can be reduced with the use of technology. Workers with special needs physically access worksites and come up with innovative strategies that are not sufficiently documented in the world development reports and journals.

Travelling helps workers to access different places, people, goods, and services (Gichuna & Kinyanjui, 2013). Persons with disabilities have to move to access opportunities and markets for their products (UNDP, 2012). They have access needs that go beyond physical access of worksites to include the organization of spaces, the availability of transport services, and the availability of financial resources to overcome limitations. Accessing the workplace is an essential aspect of social inclusion (Cass, Shove, & Urry, 2005). Physical access is characterized by environmental aspects; the design of the environment and tools that enhance physical mobility. The organization of the environment may either inhibit or

enhance physical mobility and access for some groups within a population depending on the available facilities and services. The accessibility and nature of transport services will determine the extent to which individuals will access different parts of a city. In some areas, transport services are only available during specific hours of the day and so they limit accessibility. This study explores the different ways PWDs respond to their worksite access day-to-day needs.

2.1.7 Disability Policy in Kenya

Kenya has a disability act of the year 2003 and 2015 policy that focuses on improving physical access and employment for persons with disabilities. The Disability Act No. 14 of 2003 was reviewed and improved under article 54 of the 2010 constitution which entitles persons with disabilities to have reasonable access to public transport facilities and places. Kenya first developed a disability policy in the year 2006 that sought to enhance inclusivity through accessibility to all services by persons with disability.

The 2015 National Policy on Disability is informed by the Convention on the Rights of Persons with Disabilities and the 2010 Kenyan constitution. The policy aims at enhancing the inclusion of Persons with Disabilities in all spheres of life. Planning of urban areas in Kenya is informed by the Urban Areas and Cities Act (2011). The act recommends planning that takes into consideration the diversity of marginalized groups, including taking the needs of persons with disabilities into consideration. It is however not detailed on how planners can ensure an inclusive city that takes the access needs of the persons with disability into consideration.

2.2 Theoretical Framework

This study employs the universal design theory to explore the relationship between physical mobility experiences and access to worksites in Nairobi city. The term “universal design” was coined by Ronald Mace (1985) to mean “design of products and environments to be used by all people, to the greatest extent possible, without the need for adaptation or specialized design” (Steinfeld, & Maisel, 2012). It has its origins in anti-discriminatory movements advocating for disability rights between the 1970s and 1990s (Erkılıç, 2011). Universal design is also referred to as “design for all” and incorporates seven principles that can help planners design the physical mobility and work environment to make it safe, affordable and convenient for everyone irrespective of their gender, age, and capability. The universal design’s seven principles include; perceptible information, equitable use, flexibility in use, low physical effort, simple and intuitive use, size and space for approach and use, and tolerance for error (Preiser, 2008)⁷.

Imrie and Luck (2014) argued that the extent of diversity that universal design responds to was unrealistic. However, Rao (2021) observes that it is a proactive approach that improves physical access for diverse groups. Although universal design as a strategy for design and planning does not focus on a particular group, planning that is informed by the needs of people with disabilities helps to achieve its objectives. It acknowledges the diversity of users and when applied in the context of accessing worksites, can reduce their commuting inconveniences, reduce travel time and cut costs of physical mobility. Besides, use of the

⁷Perceptible information means necessary information is communicated to the user. More information on the Universal Design framework can be accessed at <https://www.washington.edu/doit/universal-design-process-principles-and-applications>

framework helps to eliminate the need for traders to adopt new strategies aimed at improving the worksite access experience. Ultimately, traders with special needs desire to have a positive physical mobility experience of safety, convenience, and affordability as they access worksites.

The universal design principle on space and approach is applicable when planning the urban environment to take the needs of traders with special needs into consideration. It envisages having physical mobility options, travel routes and paths that the traders can conveniently utilize to improve access. As a result of convenient access, the traders with special needs can access their worksites more frequently besides taking less time during their physical mobility. Traders' convenient access to worksites in Nairobi CBD should save more time that would be used to trade or productive activities.

Universal design aims at achieving equitable, safe access for all users at low physical efforts and postulates that some users should not feel stigmatized and excluded during physical mobility. The available physical mobility options should have designs that meet these objectives to improve physical mobility experiences and make access to worksites affordable to all. Traders with special needs in Nairobi should not be exposed to limited physical mobility options that often do not meet the users' needs. The motor-cycles, *matatus*, and environments within which persons with disability access worksites should not inconvenience traders with special needs. Traders with special needs should not use high physical effort or adapt by working fewer days and hours as this would create inequalities. Also, safety concerns should not arise from the traders with special needs who may worry about crime or accidents as they use motorized and non-motorized modes in accessing their worksites.

Plos et al. (2012) recommended the use of a universalistic design as an ergonomic intervention by considering the functional needs, social acceptability, accessibility, market concerns, and costs when coming up with interventions targeting persons with special needs⁸. The theory of universal design forms a lens for assessing the nature of access, describing their physical mobility experiences, and understanding the traders' response to different mobility experiences while accessing worksites.

2.3 Conceptual Framework

This study explored the effect of physical mobility options and experiences on access to worksites for small-scale traders. PWDs with special needs experienced safety, convenience and cost issues during physical mobility that affected the time they choose to travel, duration taken and physical efforts when accessing worksites. The conceptualization and analysis was informed by the universal design theoretical framework that ascribes to convenient, and environments that do not require costly coping mechanisms.

Figure 1 is an illustration of the relationship between different variables. Access to worksites' characteristics forms the dependent variable. Access to worksites' aspects in the study include; working time, commuting time, and frequency of accessing worksites. Physical mobility options and resulting experiences form the independent variable.

Physical mobility options and physical mobility experiences affect access to worksites, as illustrated in the diagram. Physical mobility options being explored are; use of motorized transport, use of mixed mode and use of non-motorized modes. Physical mobility is used

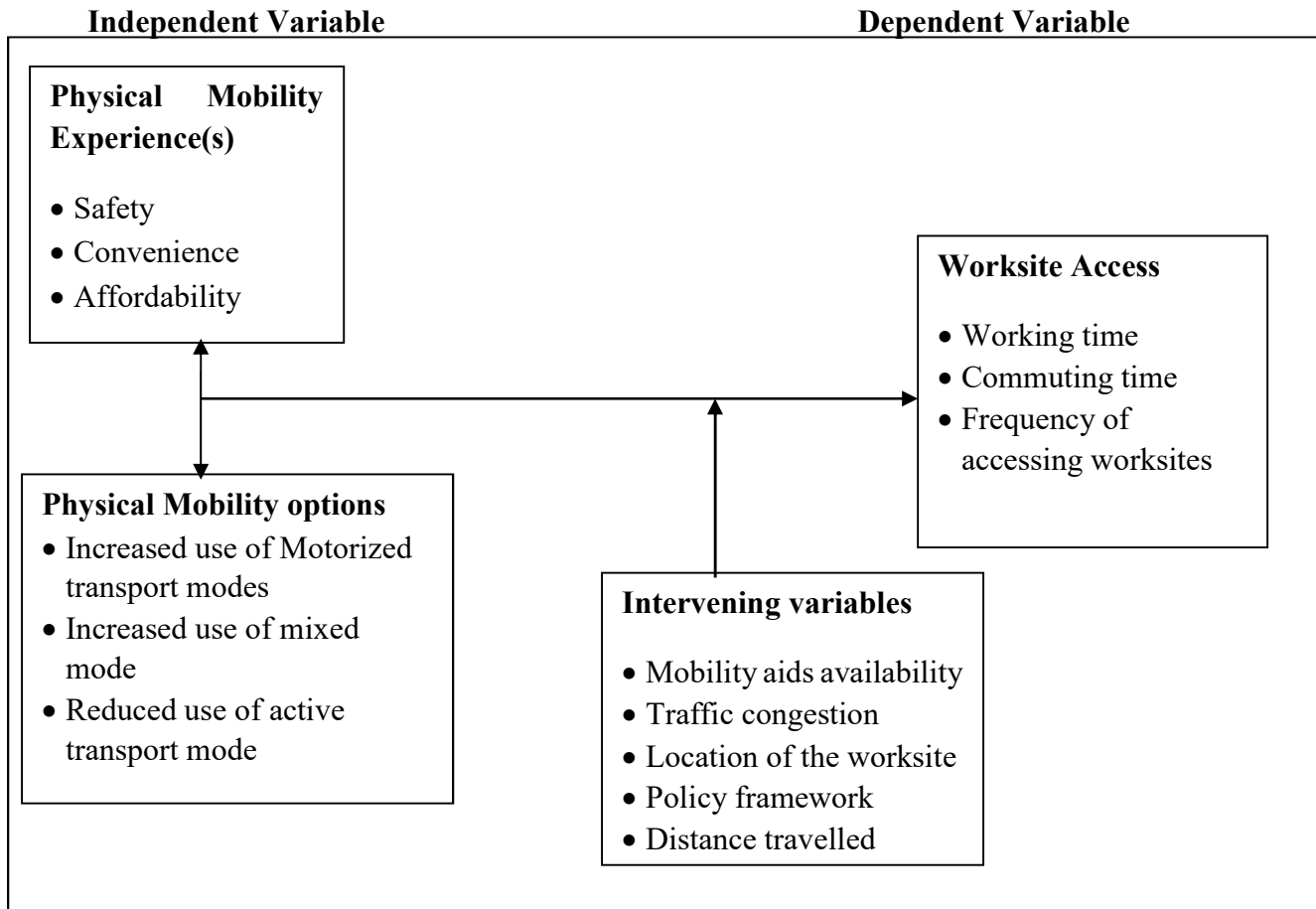
⁸Ergonomic means designed to ensure efficiency in a working environment

to refer to an individual's movement within an environment. Physical mobility option refers to availability and use of the existing transport modes.

'Access to worksites' for the PWDs is the independent variable. It is the ability and capacity to overcome physical mobility barriers within the environment to utilize worksites. Different attributes of the variable explored are frequency of accessing worksites, commuting time, and working time that are informed and affected by physical mobility experiences identified. The frequency was measured by the number of days in a week that the traders accessed worksites. Commuting time was measured as the time taken from different parts of Nairobi County to their worksite. Working time was measured by the difference between the time PWDs get to their workplace, and the time they leave.

In this case, traffic congestion, worksite location and availability of mobility aids are the mediating variables. The mediating variables affected the relationship between the dependent and independent variables. For instance, traders without mobility aids, experienced more safety, convenience and transport cost challenges.

Figure 1 Conceptual Framework



Source: Researcher's Conceptualization

CHAPTER THREE: RESEARCH METHODOLOGY

This section includes the research design, study area, study population, sampling procedure, the sources of data and data analysis that will help meet the objectives of the study.

3.1 Research Design

A research design provides a framework for planning and implementing social science research (Bryman, 2012). This study used a descriptive research design in the collection and analysis of data. Descriptive research design systematically and accurately describes a population and phenomenon at a particular point in time. It is used in the exploration of a phenomenon that little is known about and shows how things relate to one another (Sousa, Driessnack, & Mendes, 2007). A descriptive research design enhanced understanding on the effect of physical mobility experience on accessing worksites. Little was known on the outcomes of physical mobility experiences among traders with special needs on access to worksites. The study employed a qualitative approach.

3.2 Study Site

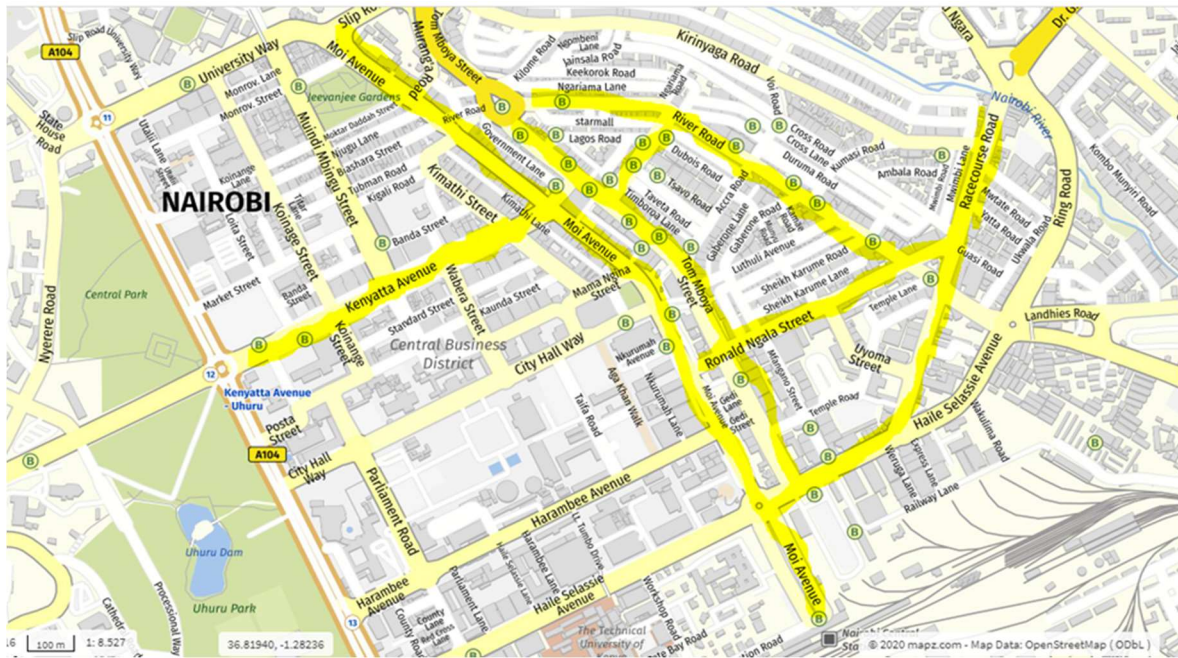
Nairobi's Central Business District (CBD) was the study site for this project. The CBD forms the nucleus of Nairobi City and covers an estimated area of 11 square kilometres (Kamunyori, 2007). Nairobi City County covers 684 square kilometres and has a population of 4.3 million people (KNBS, 2019).

Many government offices including parliament, ministries of education, and foreign affairs are located within the CBD. The research focused on worksites along Moi Avenue, Tom

Mboya Street, River Road, and Mfangano Street. The different streets have an observable varying population at different times of the day with the number of people highest in the evenings and low during the day. These are the streets and roads where most business activity takes place and therefore PWDs find it easy to conduct their businesses along the streets with a constant flow of people.

The study site was selected purposively due the presence of vibrant trading activities and as a central location that potentially attracted traders with special needs from different regions in Nairobi City. The centrality of Nairobi CBD to the City County provided an appropriate study area to explore physical mobility and access experiences for traders with special needs from different regions. The selected roads in the CBD had different accessibility levels that may have affected the distribution of traders with special needs. Most of the streets and roads covered in the study are located on the Eastern side of town. Many people and vehicles are present along the identified streets during peak hours (morning and evening hours). Traders in the study site sold various goods and services along the streets; weight measurement, sweets and biscuits, padlocks, bags, clothes, pesticides, pens, toys, masks, and carrier bags. They traded outside other shops and buildings along the streets. The traders competed with other road side vendors that invade the streets during peak hours.

Figure 2 Map showing the study area



Source <https://www.mapz.com/>

3.3 Study Population and Target population

The study population comprises traders with special needs owning small businesses in Nairobi County. The Kenya National Survey for Persons with Disabilities found that 13.9% of PWDs in Nairobi worked on family businesses. This research targeted small scale traders with special needs with worksites in the CBD. The City Directorate of Trade Licensing lacked updated records and estimated on the number of traders with special needs with worksites within the CBD to be 150. The low number of traders with special needs during the study may have been a result of the Covid -19 pandemic. This is because traders with special needs needed to stay home to reduce the risk of contracting the virus. On normal days, the number of traders with special needs would exceed 200. The study was limited to traders with physical disabilities who also formed the unit of analysis for this study. Some of the traders were often seated beside or on their physical mobility aids

while trading along the streets. Others had their small businesses attached to their mobility aids along the streets of the CBD. Traders with special needs meeting the inclusion criteria were those with physical disabilities and aged above 18 years.

3.4 Sample Size and Sampling Procedure

The study made use of non-probability sampling to identify the study participants while taking the gender of respondents and location of their worksites within the CBD into consideration. Observation was used to identify respondents trading along the streets in the CBD meeting the inclusion criteria. Snowballing was used to identify the key informants that participated in the study.

The key informants included guardians to traders with special needs, drivers and *matatu* conductors that had previously helped some traders as they board and alight when using public transport. Non probability sampling was necessary considering the availability of few traders accessing worksites during the Covid-19 pandemic. Use of convenience sampling to identify the traders was also necessary considering the unpredictable movements of traders in the city as they accessed worksites.

The study population of 150 traders with special needs, as provided by the Directorate of Trade Licensing, was used in calculating the sample size of this study. A sample size of 44 was drawn from the study population of 150 traders with special needs. A sample size of between 20 and 30 is appropriate in qualitative research (Rothman et al., 2009). The respondents for this study were selected while taking the variations of interest in consideration. Five key informants were also identified to participate in the study and helped to increase the information pool.

3.5 Data Sources and Collection Methods

This study made use of both primary and secondary sources of data. Primary data was collected with the use of semi-structured questionnaires targeting small scale traders with special needs and interviews held with key informants. The questionnaires targeting traders with special needs and Key informants' guide are found in appendix 1 and appendix 2 respectively. Secondary sources of data included journals, reports and books.

The data needs table breaks down the overall research question to specific research questions, as shown in table 1. It also shows the data collection instruments that were used to collect specific data to help meet the research objectives.

Table 1: Data Needs Table

Research question	Data needed	Source of data	Collection instrument
a) What are the characteristics of Small Scale traders with special needs who work in the CBD?	Age	Trader with special needs	Questionnaire
	Education	Trader with special needs	Questionnaire
	Years working in the CBD	Trader with special needs	Questionnaire
	Type of goods sold	Trader with special needs	Questionnaire
b) How do these traders access their CBD worksites and what are their physical mobility experiences?	Motorized modes	Trader with special needs Key informants	Questionnaire
	Non-motorized modes	Trader with special needs Key informants	Questionnaire
	Safety issues	Trader with special needs Key informants	Questionnaire
	Convenience issues	Trader with special needs Key informants	Questionnaire
	Cost issues	Trader with special needs Key informant	Questionnaire
c) What are the key barriers in accessing worksites and how do they adjust to these challenges?	Mobility barriers	Trader with special needs	Questionnaire
	Adapt to safety issues	Trader with special needs	Questionnaire
	Adapt to convenience issues	Trader with special needs	Questionnaire
	Adapt to cost issues	Trader with special needs	Questionnaire
d) How do physical mobility experiences affect traders with special needs in accessing worksites in Nairobi CBD?	Time taken to access worksites	Trader with special needs	Questionnaire
	Number of days worked	Trader with special needs	Questionnaire
	Working time	Traders with special needs	Questionnaire

Source: Researcher's Conceptualization

3.6 Data Collection Methods

The study made use of multiple approaches to ensure triangulation in the data collection process. Individual face-to-face interviews and key informant interviews enhanced the data collection process. Key informants ensured collection of data from individuals having first-hand information on physical mobility experiences and options for traders with special needs. The WHO guidelines were followed by the researcher strictly in the process of data collection. They included keeping a one-meter social distance, wearing a face mask properly, and ensuring frequent hand sanitization in the process of data collection. These measures were necessary for face-to-face interviews to minimize the risk of spreading/contracting the coronavirus. They were also necessary when dealing with PWDs, who are classified as a vulnerable population. Fieldwork was conducted in August 2020.

A) Individual face-to-face interviews

44 face-to-face interviews were conducted while following the ministry of health guidelines relating to Covid-19. Responses were then recorded into the questionnaires.

B) Telephone interviews

Some Key informant interviews were done remotely using telephone. The key informants included guardians for traders with special needs, and individuals facilitating their physical mobility in the city. Telephone interviews were appropriate at this time since they reduced physical interactions with the respondents. Three of the five key informants were also interviewed using face-to-face interviews.

C) Key informants

Key informant interviews were identified and selected using snowballing. This study's key informants either worked in the transport sector or were guardians of the small scale traders with special needs. A total of 5 key informants were interviewed. The key informants included one bus driver, a taxi driver, and three guardians that frequently helped, lived with or facilitated the physical mobility of traders with special needs. They provided information on the existing environmental attributes that limited physical mobility options for traders with special needs working in Nairobi.

3.7 Data analysis

Collected data was first cleaned by going through the completed questionnaires and entries to ensure accuracy, completeness, and consistency. Cleaning helped to get rid of the errors during the recording of the responses. The collected data was keyed into SPSS 22.0 to allow for ease of analysis. The findings were presented in the form of charts, graphs, figures, and tables. Data was analyzed by creating codes, reviewing the data, and presenting the findings cohesively.

3.8 Ethical Consideration

The research protocol was followed to ensure data is protected and utilized for academic purposes. It entailed getting approval from NACOSTI and the University of Nairobi. Before conducting interviews, the study participants were informed of their rights to participate in the study. A research permit was acquired to prove the university's and NACOSTI's authorization to conduct the study. The NACOSTI permit (License No: NACOSTI/P/20/5912) is attached to this project as appendix 3.

CHAPTER FOUR: FINDINGS AND DISCUSSIONS

This chapter presents the findings and discussion of the study. It is organized around the objectives of the study. It begins by illustrating the characteristics of the respondents and nature of the respondents. This is then followed by showing the physical mobility experiences while accessing worksites and how they respond to various experiences. The findings are drawn from semi structured interviews and key informant interviews.

4.1.1 Respondent Characteristics

The study involved 44 traders with special needs, 26 of whom were male while 18 were female. All the traders with special needs interviewed were self-employed and the majority were aged between 36 to 50 years as shown in the table below. A small number of the traders with special needs (5) were youths while 1 trader was aged above 66 years.

The traders with special needs had different levels of education with a majority having completed primary education. A small number of the 44 traders interviewed (7) were diploma holders. A majority of the traders (14) with special needs had worked within the CBD for between 6 and 9 years. There were four traders that had worked in the CBD worksites for less than a year. Other traders had worked for more than 10 years. Two traders had accessed worksites in the CBD for more than 30 years. The traders interviewed sold a wide range of goods and provided different services. Goods sold included jewelry, sweets, biscuits, padlocks, clothes, wallets, masks, bags and belts, newspapers, nail cutters, electrical appliances and insecticides. A majority of the traders sold sweets and biscuits. The services they offered included weight measurement, shoe shining and repair.

Table 2: Respondent Characteristics

Characteristic	Category	Frequency (n=44)
Gender	Male	26
	Female	18
Age	18-35	5
	36-50	33
	51-65	5
	66-80	1
Years working at the site	Less than 1	4
	1-5	5
	6-9	14
	10-14	4
	15-19	5
	20-24	6
	25-29	4
	30-34	2
Characteristic	Category	Frequency (n=44)
Education	Some primary	8
	Primary completed	12
	Some secondary	4
	Secondary completed	12
	College	7
	Opted not to answer	1
Type of goods/services sold	Sweets and Biscuits	16
	Shoe shining	2
	Jewelry	3
	Padlocks	2
	Weight measurement	3
	Clothes	3
	Wallets and masks	2
	Phone casings	1
	Bags and belts	3

	Toys	2
	Newspapers	1
	Shoe repair	1
	Watches	1
	Nail cutters	2
	Electric appliances and assorted goods	1
	Bags and insecticides	1

Source: Field data, 2020

4.1.2 Trading Sites

The small scale traders with special needs had makeshift worksites located along the street in the city. They had no permanent structures where they could store their goods or tools and were forced to travel long distances and overcome physical mobility challenges for a better market in the city. While in the city, the traders opted for streets and avenues that were highly populated on the Eastern side of the city (Divided by Moi Avenue). They perceived such areas and streets to have a viable market for the goods or services they sold. Considering that hawkers with no special needs were prohibited from trading in the CBD, the city provided a favorable market for traders to sell their goods and services.

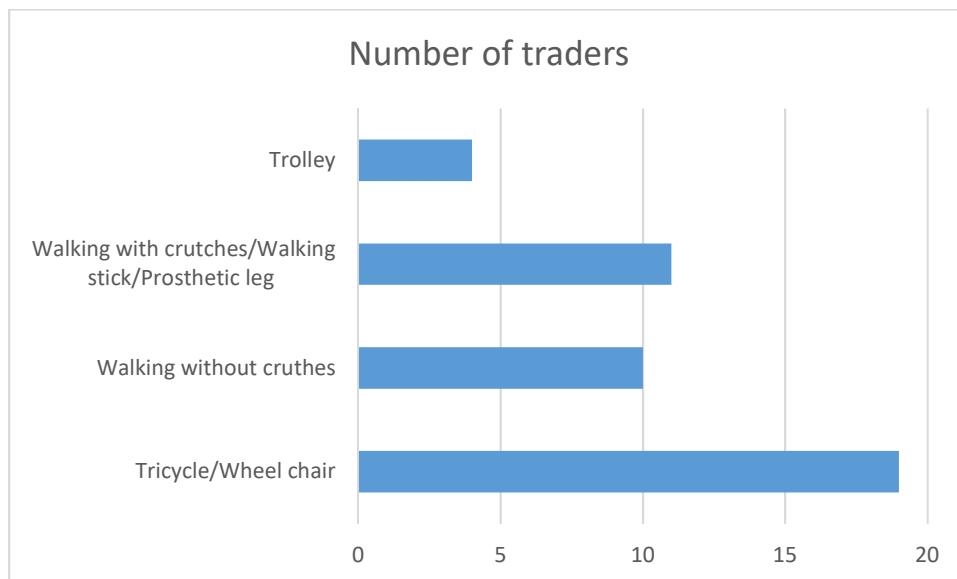
4.2 Physical Mobility Options

The respondents used mixed-modes; both motorized and non-motorized transport to access their worksites. Respondents showed diversity in their physical mobility options; walking, using a wheelchair or *matatu* depending on the location of worksites, distance they travelled and time of the day. The traders often stuck to their mobility routines and modes while accessing worksites which showed low levels of flexibility. To reach the bus stop from their homes, majority (32) of the traders made use of personal mobility aids while

nine traders frequently made use of the motorcycle. Three traders interviewed could not walk and had to be carried to board a *matatu*; they would then be pushed on a trolley to their worksites once they arrived in town.

The use of wheelchairs or tricycles was prevalent among 19 respondents, 10 respondents walked without crutches, 11 respondents made use of a walking stick, crutches, or a prosthetic leg, and four were pushed on trolleys (trolleys are usually used to carry goods in town) as they accessed their worksites within the CBD. The findings showed very high levels of wheelchairs or tricycles as the main non-motorized mode of transport that respondents used to access worksites. By using trolleys to access worksites, the four respondents showed great determination to overcome physical access barriers.

Figure 3 NMT forms used to Access Worksites within the CBD

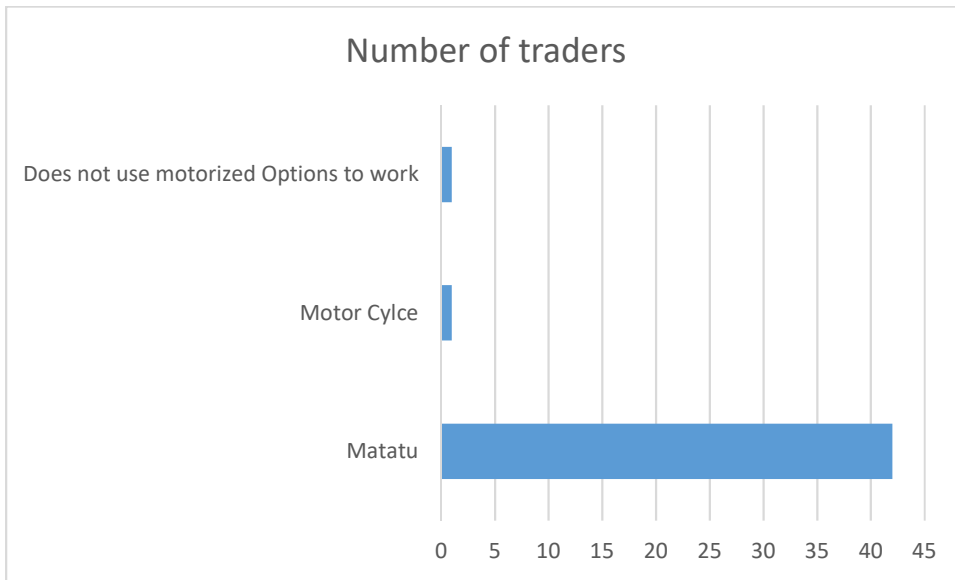


Source (Field data, 2020)

Matatus were available and used by 42 traders as the main mode of motorized transport for accessing worksites. The high reliance on *matatus* over long distances signifies their importance in enhancing the physical mobility of traders with special needs. One trader

reported using non-motorized transport daily when accessing worksites. No trader reported using the train or taxi to access worksites during their daily worksite access routine despite the proximity of the study area to a railway station located in the CBD.

Figure 4 MT forms used during Access of CBD Worksites



Source (Field data, 2020)

4.3 Factors that influence Physical Mobility Choices

The traders with special needs preferred using various mobility modes due to different reasons. A majority (14) had no better alternatives to the existing forms and modes for mobility. While 13 traders were influenced by the convenience of the modes, 10 traders reported using what was available, 4 traders prioritized safety and 3 traders were influenced by affordability. The different priorities of mobility choices also depended on the location of the worksites and distance to be travelled.

Table 3: Factors that influence Physical Mobility Choices

Main factor influencing physical mobility choice	N=44
Safety	4
Affordability	3
Convenience	13
No alternative	14
Availability	10
Total	44

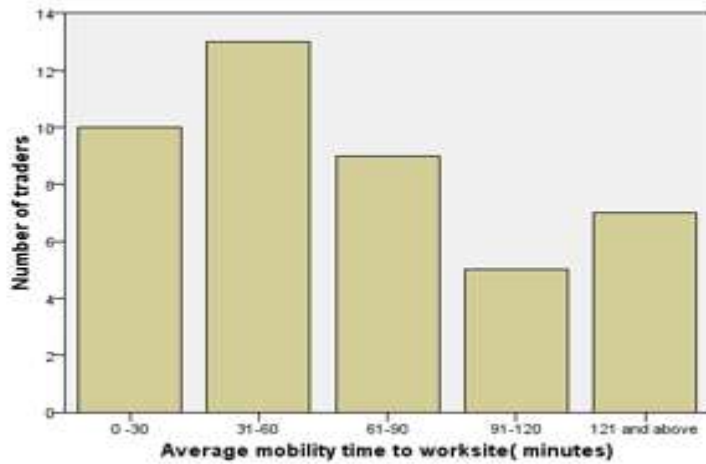
Source (Field data, 2020)

4.3.1 Time Taken to Access the Worksites

The study established that 13 respondents took between 30 minutes to 60 minutes to access their worksites from home, 10 used less than 30 minutes to access the worksites as illustrated in figure 5. Analysis of the data showed 9 respondents used between 60 and 90 minutes, 7 respondents used more than two hours accessing their worksites, while 5 respondents used between 90 to 120 minutes. As such, there were disparities in the time taken by traders with special needs to access worksites. This showed that the worksite access duration depended on the time of travel, the obstacles along the way and ways of responding to improve the worksite access experience.

“I have to wait for a vehicle that will accommodate me to book an extra seat for enough space. As a result, I take a lot of time on the way. I also have to go home late to reduce challenges” (Trader, 4).

Figure 5: Time Traders take to Access Worksites



Source (Survey data, 2020)

Out of the 44 traders with special needs, 15 respondents travelled less than 10 km to access their worksites located in the CBD. One respondent moved less than 4 km to access his worksite located in the CBD. A majority of the traders (26 respondents) travelled between 10 km to 20 km to access worksites in the city while 2 respondents travelled between 20 km to 30 km while accessing worksites. One respondent travelled over 40 km to access his worksite in the city as shown in table 4. This respondent travelled from Kiambu County to access the Nairobi CBD worksite. Respondents that lived further away from the CBD experienced more challenges to access their worksites when compared to those living closer to Nairobi CBD.

Table 4: Estimated Distance Travelled to Access Worksites

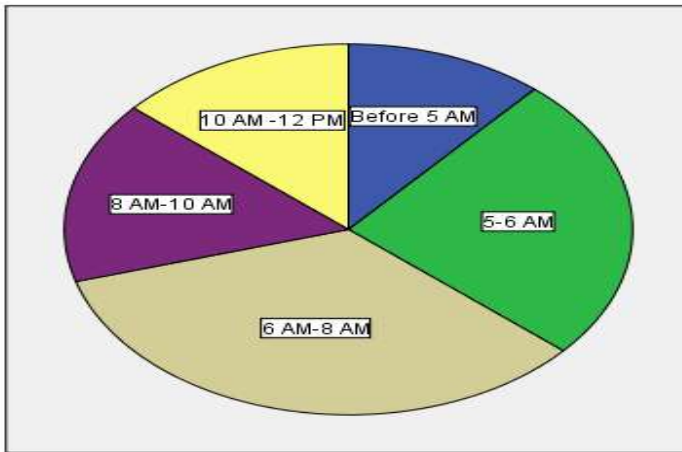
Distance Travelled(KM)	Number of traders with special needs (n=44)
0-2	0
2-4	1
4-6	9
6-8	3
8-10	2
10-12	3
12-14	5
14-16	14
16-18	2
18-20	2
20-22	1
22-44	0
24-26	0
26-28	1
28-30	0
30-40	0
40-50	1

Source (Field data, 2020)

4.3.2 Worksite Access Time

The study established that 15 traders started their journey to access the worksite between 6:00 am to 8:00 am. A small number of respondents (11) started between 5:00 am to 6:00 am, 7 respondents started between 8:00 am to 10:00 am, 6 respondents started between 10:00 am to 12:00 pm and 5 started before 5:00 am as shown in the chart below. Averagely the 44 respondents used one hour and six minutes to access their worksites.

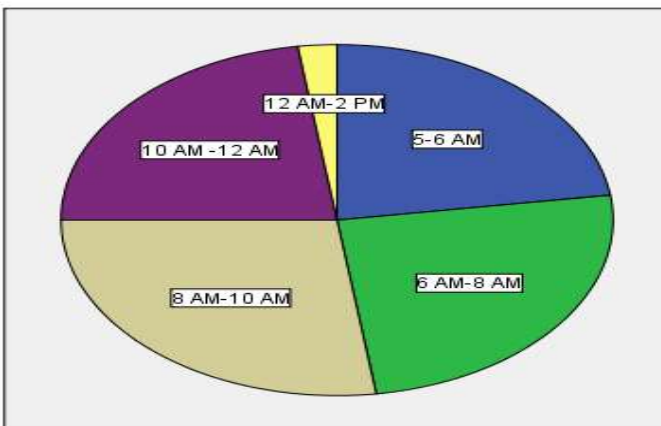
Figure 6: Start Time from different Locations



Source (Field data, 2020)

Out of the 44 traders with special needs interviewed, 12 arrived at their worksites between 6:00 am to 12 am. One respondent arrived after mid-day. All the other respondents arrived at their worksites before mid-day as summarized in the chart below. The arrival time to the worksites also determined the challenges that respondents experienced as they accessed worksites. For traders with special needs starting their journeys very early or arriving at their worksites during off-peak hours was a way of adapting to issues of convenience, cost of mobility, or safety.

Figure 7: Worksite Arrival Time



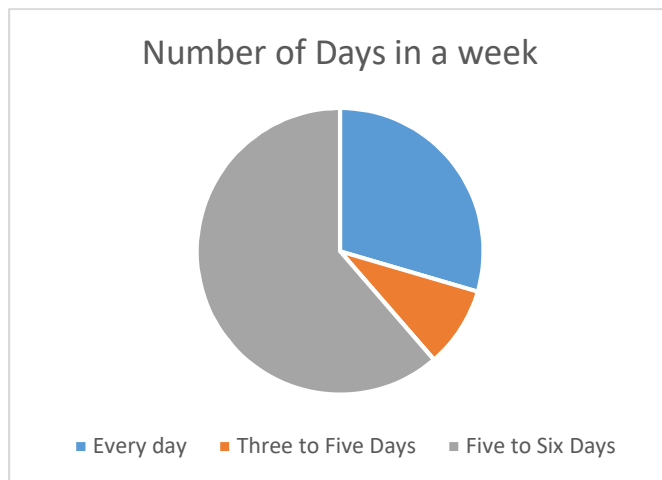
Source (Field data, 2020)

Over 75% of the respondents arrived at their worksites before 8.00 am. The traders worked for varied durations at their worksites. The curfew time set at 9.00 am due to the COVID-19 pandemic forced the traders to close their worksites between 5:00 pm and 7:00 pm. While the curfew time was set at 9.00 am, they closed earlier than the general public.

4.4 Number of Days Traders Access Worksites

The findings indicate that 13 traders accessed their worksites every day of the week and 27 traders accessed their worksites between five to six days. The other 4 traders accessed their worksites for three to five days as shown in the chart below.

Figure 8: Number of Days in a Week Traders Access Worksites



Source (Field data, 2020)

4.5 Obstacles during Worksite Access

The respondents identified various obstacles that affected access to worksites. Respondents identified the high cost of mobility (13), transport shocks (5) and unfavorable designs (18) as the main obstacles while accessing worksites. High cost of mobility meant that the

traders found it unaffordable to access worksites while transport shocks were in reference to the changing weather pattern and the Corona pandemic. Unfavorable designs were attributed to the poor design of spaces in the urban environment and the physical mobility modes. Negative driver, passenger and conductor attitudes, and distances travelled during physical mobility also emerged as accessibility barriers that affected small scale traders' access to worksites. The obstacles during worksite access are summarized in table 5.

Traders expressed their fears and worries in different ways;

“You alight from a matatu on a rainy day when going to work and it becomes difficult to find an appropriate mode. There are many uncertainties while accessing my worksite during rainy days” (Trader 38).

“You get drivers and conductors who are worried of wasting time during boarding. Others think fare will not be paid” (Trader, 15).

“The destination of the Kayole matatus I use is far from town. I therefore have to find other ways of accessing the CBD and town. Many times they are not available” (Trader, 21).

A key informant also noted the obstacles present as they used *matatus* to town:

“Some drivers do not easily welcome individuals with disabilities to their vehicles. At times, they are not able to board. When they are walking, they in most cases need help while crossing the road” (Respondent 1, KII)

Table 5: Access Obstacles Present

Access obstacles		N=44
	High cost for physical mobility	13
	Unfavorable designs of pathways and vehicles spaces	18
	Negative attitudes towards traders with special needs(By conductors, drivers and passengers)	4
	Distance travelled to access worksites and dropping points	4
	Transport shocks (unfavourable weather conditions like rain, Corona pandemic, traffic congestion)	5
	Total	44

Source (Field data, 2020)

4.6 Physical Mobility Experience

4.6.1 Safety

Most of the traders (17 respondents) expressed fears of crime as they accessed their worksites using motorized forms. While accessing worksites, 11 and 6 respondents feared for their health, and accidents respectively. One trader was worried about harassment by conductors while 8 traders expressed no safety issues when using motorized forms to access their worksites. The traders experienced safety risks when using both Motorized and Non-Motorized modes as observed by the respondents below;

“Moving around the city with a tricycle is very risky since you can easily get knocked over by moving vehicles” (Trader, 8).

“Matatu operators at times handle me carelessly, which endangers me” (Trader, 14).

“The disabled run the risk of being accident victims as they move around as they can be knocked down by vehicles, motor-cycles and other moving objects due to their hearing and visual impairment” (Respondent 2, KII).

Table 6: Safety issues that Affect Access (Motorized Transport Modes)

Safety experience when using Motorized Transport	N=44
Fear of crime	17
Negative impact on health	11
Accidents	6
Harassment by conductors	1
None	9
Total	44

Source (Field data, 2020).

The traders expressed a diverse range of safety issues when making use of non-motorized transport. Some had been victims of crime or had injuries during access to their worksites. Table 7 gives a summary on the effect safety issues had on traders during access. It shows that most respondents (17) worried about accidents as they physically accessed worksites located in the CBD

“A motor-cycle once hit me from behind at my worksite. It then disappeared before I could stand and shout” (Trader, 42).

Table 7: Safety issues that Affect Access (Non-Motorized Transport Modes)

Safety challenge experienced when using NMT	N=44
Fear of crime	10
Negative effect on health	6
Accidents	17
None	10
Rough terrain	1
Total	44

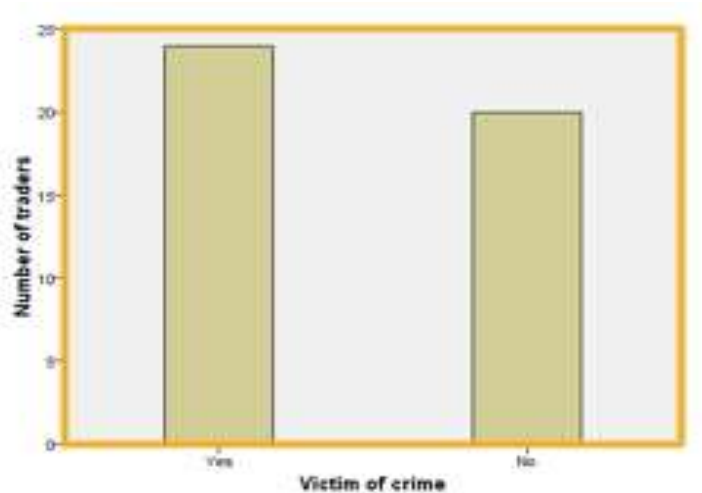
Source (Field data, 2020)

More than half of the respondents (Twenty four traders) had been victims of a crime as they accessed their worksites. During such incidents, they lost money and at times, got harmed.

“I was once attacked by thieves while coming to work very early in the morning. Since then, I stopped walking to the bus stop. I now use a motorbike to access the bus stop from home. Street boys almost stole from me just the other day after opening my worksite” (Respondent, 19).

The findings showed 20 of the 44 traders had never been victims of crime as they moved to access worksites in the city.

Figure 9: Traders that had been Victims of Crime



Source (Field data, 2020)

Out of the 44 traders with special needs, 34 were worried of the possibility of getting an accident. Those that worried about accidents noted;

“Passers-by easily knock you over without their knowledge” (Trader, 12).

“I am always worried. I have to stop vehicles completely before I can cross the road” (Trader, 29).

The traders considered safety issues to worksite access in different ways and remarked that worksite access time was negatively affected by safety issues. Besides the built environment, they reported other transport shocks like rain that created an unfavorable physical mobility environment.

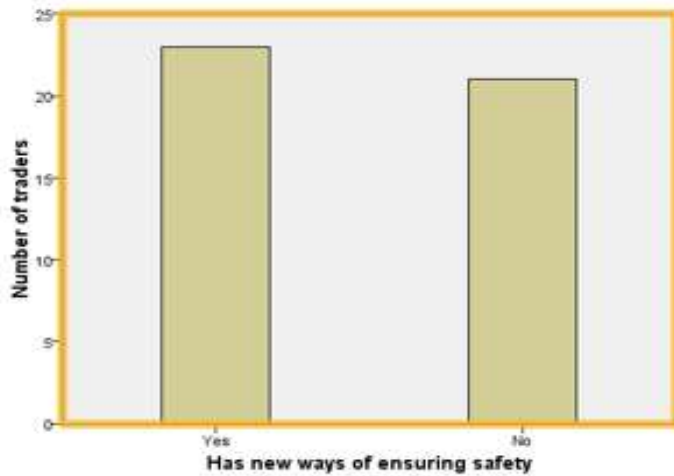
“Safety issues affect my working time. Although I would like to work past 9.00 pm on normal days, I close at the time to go home” (Trader, 33).

“I can easily slide and fall while working when it rains. I then waste the whole day seeking medication after the accident. It is also difficult for me to work when it is raining” (Trader, 43).

The study found traders with special needs adapted differently to the safety issues they experienced during access. A large number of the traders (24) changed their way of travelling to their worksites as a result of safety challenges they had encountered. Most of traders had changed the time of accessing their worksites. For instance, 14 traders interviewed felt safer to access their worksites late and closed their worksites earlier. Some traders (6) made use of a capable guardian to help them access their worksites to enhance their safety. Other ways they used to adapt to safety challenges included limiting the number of days worked, changing routes and means depending with the time of the day.

“Persons with disability have to choose their ways deliberately to reduce the challenges they experience. They very much want to come to town,” (Respondent 4, KII).

Figure 10: Number of Traders Adapting to Safety Issues



Source (Field data, 2020)

While 10 traders thought their response reduced the likelihood to experience the safety challenges, 14 traders thought they were still likely to experience them as they accessed worksites.

“Most of my safety challenges have reduced by avoiding accessing my worksite during peak hours” (Trader, 41).

The respondents managed to reduce safety risks by responding in different ways. However, they remained worried about safety issues despite taking measures to respond to the mobility experiences that made them feel unsafe while accessing their worksites.

Table 8: Ways of Responding to Safety Issues

Ways of responding to safety issues	Number of traders with special needs (n=24)
Time restriction or Working for fewer days	15
Route choice or mode choice	2
Capable guardian or friend	7

Source (Field data, 2020)

4.6.2 Convenience

Some of the respondents (17) considered the use of NMT to require a lot of physical effort. Other 9 respondents found the access process to be stressful and strenuous, while 6 associated the use of NMT with high levels of uncertainty of reaching the worksite. Unpleasant weather conditions were identified by 4 traders. Some traders (6) did not find or note inconveniences as they moved to access their worksites. One trader described the trolleys used to enhance their physical mobility as being too old for comfort. Similarly, the traders had varying experiences when using motorized forms. Many respondents (15) found it stressful and strenuous to get to their worksites on motorized forms. Another 13 traders considered uncertainty due to unpredictable stopping points by *matatus*. Poor designs of spaces and boarding levels were a challenge (for 7 traders) when using the *matatus*. Unfavorable weather conditions were an issue of concern for 3 respondents. The

use of high levels of physical effort while accessing worksites was reported by two traders with special needs.

The findings showed the majority (31 traders) responded to inconveniences during access by changing the time, routes, and ways they used to access their worksites. Some (8 traders) responded by changing the time they travel and (7 traders) accessed their worksites with the help of a capable guardian. Other traders (10) reduced or changed the number of days worked.

A few respondents avoided using some routes, and purchased drinks to rehydrate their bodies or walked slowly (3 traders). Two traders chose a particular driver and vehicle to enhance convenience while accessing worksites. They also had designated places that the vehicles picked them, were allocated particular seats and experienced better treatment on the vehicles. The choice of particular routes and drivers enhanced certainty as they accessed worksites.

“Inconveniences slow down my movement. In most cases, I arrive at my worksite late when there are fewer customers” (Trader, 18).

“Choosing an appropriate mode is very important. I get to choose a transport mode that meets most of my needs when going to work” (Trader, 28).

“I have deliberated on using a designated driver who understands and accommodates my needs” (Trader, 30).

Table 9: Ways of Coping with Inconveniences During Access

Ways of improving convenience	Number of traders with special needs (n=31)
Limited the number of days worked	10
Time restriction and route choice	9
Capable guardian	7
Purchase food and water to keep me hydrated	1
Choice of a particular vehicle and driver	2
Use of low speeds when accessing worksites	1
Staying near worksites/ Not going home everyday	1

Source (Field data, 2020)

Traders remained worried about transport shocks as they accessed worksites despite coming up with coping strategies. One trader noted;

“Shocks that affect mobility like the corona pandemic and weather changes are always common. They are always an inconvenience during worksite access”

(Trader, 5).

4.6.3 Cost

A majority of the traders (38 of the 44 traders) considered costs incurred while accessing worksites to be always high. One respondent considered the access costs to be high or low depending on the time. A small number of traders (5) did not consider the costs of mobility to their worksites to be high. The reasons for the high cost of mobility differed across the respondents; (5 traders) considered the costs of mobility to be high due to the distance they

travelled while (2 traders) considered access to be costly due to the long time they took to access their worksites. Other explanations for the high costs of mobility included; the presence of obstacles during mobility for (5 traders), usage of multiple modes (5 traders), accessing the worksites during peak hours (9) and unfavourable weather conditions during mobility (13 respondents). Shocks like the coronavirus and weather changes increased access costs as the traders reported. One of the 44 traders considered low incomes from the business despite the high living standards to be the reason for high mobility costs. Most of the traders (30) were always worried about the costs of mobility every day as they accessed the worksites.

“The transport costs are high due to the corona pandemic and high demand during peak hours and late hours” (Trader, 7).

“Costs of accessing my worksite increases due to indirect costs associated with where I store my wheelchair or has to pay for it on a vehicle” (Trader, 8).

“Disability many times will force you to use more modes when compared to other passengers which translates to higher mobility costs” (Trader, 14).

“Having to pay for a wheelchair and assistant increases my costs. When I luckily don't pay for it on a motor vehicle, I have to pay for its storage within the city” (Trader, 24).

A small number of traders with special needs (10) said they paid more compared to other individuals as they travelled to access their worksites. However, most of them (31 traders) did not think they paid more when compared to other traders without special needs accessing worksites or spaces in the CBD. The reasons why the 10 traders thought they paid more also varied; paying for an extra sit to get comfort or place their wheelchairs(2

traders)and paying for extra help (3 traders). Some traders (5) used more means to access their worksites which increased cost.

Many traders interviewed (27) changed the time, place and ways of accessing the worksite as a result of high costs of mobility.

“The number of days worked depend on the affordability of transport modes. At times, I don’t have fare” (Trader, 10).

Out of 27 respondents 18 changed the time they accessed their worksites. In this case, they opted to wake up very early or go to work after peak hours while other 6 traders reduced the number of days worked. Two changed routes while one considered begging or borrowing friends to overcome cost challenges while accessing the worksite.

Table 10: Different ways of Adapting to Cost Issues during Mobility

		Number of traders with special needs (n=27)
Changed daily mobility and access routine	Reduced number of days worked	6
	Time restriction (for instance, do not go out before 5:00 AM)	18
	Place restriction (do not use some routes and places during physical mobility to work)	2
	Beg	1

Source (Field data, 2020)

A small number of traders with special needs (8) reported their response to cost issues to be effective. Respondents however remained worried about physical mobility costs despite responding differently to minimize and eliminate the resulting negative effects during worksite access.

4.7 Discussion on Findings of the Study

Many traders with special needs used a lot of physical effort, found it costly, and worried about safety issues while accessing their worksites. They, therefore, had to adapt in different ways to the challenges. The theory of universal design envisions for a convenient, safe and cost effective environment that improves physical mobility. Taking more time, use of high physical effort and incurring more costs among traders with special needs during worksite access exacerbated inequalities and went against the universal design principles.

4.7.1 Traders Characteristics

The first research objective was to explore the characteristics of small scale traders with special needs that work in the CBD. The study found that most of the traders were aged between 30 and 50 years. Most of the traders had worked in the CBD for between 6 to 9 years. The traders sold and provided services along a wide range of assorted goods and services. Most of the small scale traders with special needs sold sweets, biscuits, jewellery and bags. Others were cobblers while others earned an income by measuring people's weight. These traders accessed worksites through mixed transportation modes. Consequently, they had to overcome barriers that included unfavorable designs and long distances to access worksites in Nairobi. The long duration in the number of years that traders with special needs had accessed the Nairobi CBD were an indication of the worksites importance in sustaining livelihoods.

4.7.2 Physical Mobility Options and Experiences

The second objective sought to find out how these traders accessed their CBD worksites and their physical mobility experiences. The study found that the traders used both motorized and non-motorized modes to access their worksites with high levels of reliance on *matatus* over long distances. Available physical mobility options presented safety, convenience, and cost issues as they accessed their worksites that should be taken into consideration in transport planning. Wheelchairs needed appropriate infrastructure for efficient locomotion that was scantily present in Nairobi city. Some traders opted to leave them at home since they required a lot of physical effort to navigate and would, at times, not fit in the *matatus* they preferred over longer distances. This showed that transport and

infrastructural development agencies in Nairobi took little consideration of the plight of marginalized groups.

Fatigue was also prevalent as they accessed their worksites daily due to the nature of mobility infrastructure. The physical mobility options and experiences increased the duration for the small scale traders striving to access their worksites and showed that traders with special needs were disproportionately affected by the existing transport and infrastructural barrier as they participated in economic activities. Social and physical barriers that contributed to worksite access barriers include high mobility cost, poorly designed vehicles, and driver attitudes towards the traders with special needs. The traders waited for longer hours to find vehicles that can better accommodate their needs. They considered the physical mobility costs high and worried about their safety in the process of accessing their worksites since they had limited physical mobility options that were also not designed to meet their daily worksite access needs.

Findings showed Nairobi did not provide a safe working environment for traders with physical disabilities. Safety challenges and uncertainty during physical mobility were present for traders with special needs using non-motorized modes to access worksites. Traders that used wheelchairs or tricycles feared getting knocked over by vehicles and human traffic. Also, the designs were largely not favourable for walking, and some traders could easily slide over or fall while accessing their worksites and presented an increased risk of accidents. While using NMT, traders were at times exposed to harsh and changing weather conditions. A majority of the traders worked on their wheelchairs, which were not designed to protect them from changing weather patterns. These experiences raised safety concerns relating to health and personal security.

Traders with special needs were unlikely to make use of Taxis to access their worksites. This was due to the high costs that come with using Taxis in Nairobi making them unaffordable to most traders with special needs. Firstly, they are not readily available in the informal settlements or the city spaces where most traders with special needs start their journeys. Also, they did not have disability friendly designs to attract persons with special needs. The high use of *matatus* that were not well adapted to meet the traders' needs was due to a lack of better affordable alternatives by the traders with special needs. For instance there was no affordable public transport system that met the physical mobility needs of the traders with special needs. The high use of *matatus* shows the important role of the para-transit system in urban areas that lack government public transport.

A big number of the respondents (21) spent more than an hour to access their worksites. Previous studies had shown the median commuting time in Nairobi to be 30 minutes (Salon & Gulyani, 2019). Some traders spent less than 30 minutes to access their worksites. The less time could be attributed to the time of the day they chose to access their worksites. These traders may have opted to access their worksites outside the rush hours which were more convenient and less costly. Also, some traders lived in informal settlements that are close to the CBD and this would make access to worksites take a relatively small time. By taking more time to access worksites, less time would be spent engaging in trading activities.

4.7.3 Key Barriers and Coping during Worksite Access

The third research objective sought to explore key barriers in accessing worksites and how traders adjusted to these challenges. Findings showed that traffic congestion, uncertainty

associated with alighting points, unavailability of better alternatives, and unfavourable weather conditions inconvenienced and endangered traders during access. The identified key barriers were poor design of pathways, vehicles and long distances travelled by the traders with special needs. Unfavourable weather conditions affected worksites access for traders with special needs who had to spend more time waiting for better means of transport and take more time when boarding and alighting.

In other instances, they were not allowed by some drivers or conductors to board for fears of inconveniencing them. The drivers and conductors are often motivated by profit and are unlikely to wait for commuters that will make them spend a lot of time at a particular picking point. This is in line with Kaye, Jans, and Jones (2011) that showed societal attitudes contributed to marginalization of PWDs.

A few traders moved by trolleys to worksites as they tried to overcome the existing physical mobility challenges. The dignity of these traders with special needs was negatively affected as they accessed their worksites. Others were forced to sleep in town to overcome the mobility costs. This showed remarkable resilience and determination which is a characteristic of informal sector workers (Kinyanjui, 2014). Some had no permanent worksites and had to endure a rough terrain and mobility infrastructure that was not well designed to meet their needs.

A small number of traders with special needs were oblivious of the physical mobility issues presented as they accessed their worksites. Despite the prevalent negative experiences during mobility, some traders were not limited and found existing modes for mobility convenient while accessing their worksites. To them, the perceived mobility issues affected

everyone irrespective of their abilities. Some of the traders had worked and accessed the worksites for very long (over two decades) and the mobility issues had become part of their daily routine. Other traders considered the use of non-motorized forms beneficial as they (NMTs) provided an opportunity to exercise frequently. A small number of traders found some physical mobility experiences positive for their physical health which indicated that the traders with special needs had different perspectives on their experiences.

4.7.4 The Effect of Physical Mobility Experience

The fourth research objective sought to find out the effect of physical mobility experiences on access to worksites among traders with special needs in Nairobi CBD. There were mobility limitations resulting from safety, cost, and convenience issues that affected the traders accessing their worksites. Safety issues made traders consider accessing their worksites late, work for fewer hours, close early, or work for fewer days. This led to missed trading opportunities and lower incomes, which further contributed to income inequalities within the community. The challenges of accessing their worksites in the city made it difficult to grow their business ventures.

Safety issues informed the time some traders choose to access and leave the worksites. The safety concerns were on accidents, the health and the security of the traders with special needs. It made them to access their worksites for fewer hours which also translated to fewer trading opportunities and low income levels. They mainly felt threatened by a harsh social and physical environment while accessing their worksites. As such, they chose modes that created a better safety experience while accessing worksites.

High costs of physical mobility often exacerbated by unfavourable weather conditions created a burden for traders with special needs. Some traders would end up working for fewer days in a week for not affording transport to access their worksites. As such, higher transport costs from transport shocks was likely to deter most traders from realizing optimum benefits by working on daily basis.

The use of mixed modes was high among the small scale traders with special needs. Traders with special needs were likely to take more time than the general population to transition from one mode to another due to inconveniences associated with physical mobility. The obstacles increased their waiting time included driver attitudes and their discrimination. Traders with special needs at times received support from the public or employed a guardian. The guardians and supportive public members not only helped to ensure that the traders were able to transition from one stage to another but were also helpful in opening and closing worksites.

CHAPTER FIVE: SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

This study explored the physical mobility options and experience of traders with special needs in accessing worksites. It also assessed the relationship between mobility experience and the access to worksites among small scale traders with special needs. The special needs taken into consideration in this study were physical disabilities. The summary and conclusions of the study are made in this chapter. Also, the recommendations and areas that need further research are provided.

5.1 Summary

The main objective for this study was to examine the effect of physical mobility options and mobility experiences on access to worksites among small scale traders with special needs in Nairobi. It was inspired by the invisibility of traders with special needs to planners and the need to have a safe, resilient, and inclusive Nairobi City. Cities should take into consideration the mobility needs of vulnerable groups (UN-Habitat, 2019). Safety, convenience and costs are physical mobility needs affecting how traders with special needs access their worksites which are central to creating inclusive cities.

The research applied the theory of universal design to evaluate the safety, convenience, and cost experience for traders with special needs accessing worksites in Nairobi CBD. Based on the theory, it was expected that the city was designed to meet the physical access needs for all. Key principles of universal design under consideration were use of low physical effort, appropriate design of spaces, equitable use, and flexibility in use of the available mobility options.

The principles inform the assessment of safety, convenience and affordability in accessing the worksites in the CBD, Safe physical mobility options for traders would ensure reliable access of their worksites as they navigated in an urban environment. The accessibility of Nairobi City worksites becomes limited when safety issues are not taken into consideration. Since 24 of the 44 traders had been victims of crime and others had accidents and injuries, there was a need to take safety issues into consideration. Traders with special needs also require a convenient environment to move as they access their worksites. In a conveniently accessible environment, individuals will take less time to travel to their worksites and feel comfortable as they access their worksites (Litman, 2008). This was not the case for traders with special needs in Nairobi, where more than half of the traders with special needs interviewed took more than an hour to access their worksites according to the study findings.

The higher costs of mobility created inequitable access to the city for small scale traders with special needs. They paid for the mobility costs from the low incomes they realized as small scale traders in the CBD. The traders adapted in multiple ways to reduce their mobility costs that included commuting during off peak hours and working for fewer days. Planners should always integrate models that reduce access costs (Litman, 2017) while taking the needs of PWDs into consideration (Pineda, & Corburn, 2020).

Traders with special needs faced obstacles as they moved to access worksites in the city. The obstacles included having negative passenger, conductor, and driver attitudes towards them as they accessed worksites. Persons with special needs took a longer duration to board and alight from vehicles they described as “disability unfriendly.” There was also a long

waiting time as they transitioned from one mode to another which indicated an inflexible transport system.

Obstacles during access created safety, cost and convenience issues to a majority of the traders. Traffic congestion and heavy human traffic in town created worries for accidents among traders with special needs. They had to be extra cautious as they moved to and within their worksites. City planners should consider integrating universal designs that eliminate the safety worries associated with accessibility. Traders with special needs do not have to worry about safety issues as they access their worksites. Reducing worries during access requires increasing certainty by providing convenient and reliable services during mobility (Kanda, 2019).

Traders with special needs have varied sensory challenges and abilities that should not be viewed as a limitation to accessing worksites and working effectively. Conversely, the design of pathways and mobility options either enhances or inhibits worksite access. While Nairobi CBD is expanding its available non-motorized spaces, the physical mobility spaces should accommodate the diverse needs of the traders with special needs since they showed diversity in the use of non-motorized forms.

The findings showed an existing relationship between physical mobility experiences and access to worksites for traders with special needs and the need for safe, convenient, and affordable mobility options to ensure inclusivity. However, the findings cannot be generalized to the whole country since the sample population comprised of small scale traders mainly working and living in Nairobi County.

5.2 Conclusions

The study reinforces the argument for using universal design to make physical accessibility for everyone possible. With the use of the universal design in planning, everyone's access needs are taken into consideration which then ensure that "no one is left behind," as outlined in SDG 11, that aims at building resilient and inclusive cities. Embracing universal design in planning means that the challenges of the most vulnerable in the community are well studied and taken into consideration. Safety, convenience, and cost issues during physical mobility should be examined when planning for small-scale traders with special needs who make little income from their sales and, to a great extent, find the cost of mobility high. The costs of mobility are also high due to transport shocks, the distance that traders travel, the time they choose to access their worksites, and extra support needed for the traders with special needs. Traders with special needs find themselves in contexts where they have to hire additional means and are more likely than other passengers to use more modes of transport as they navigate to access their workspaces. Transport shocks affect the affordability of mobility costs and productivity (Karayalcin & Pintea, 2015). The transport shocks like unfavourable weather conditions affected the traders with special needs more than the general public. With the same incomes and high fares during transport shocks, the traders found it challenging to meet the mobility costs as they move to work.

Physical mobility experiences, as informed by physical mobility options, affected worksites access of traders with special needs in Nairobi city. The findings showed remarkable resilience from small scale traders with special needs. Most of them accessed the city daily. Some found alternative places in the city where they can sleep to avoid worksite access limitations. Physical mobility obstacles increased vulnerability as PWDs accessed their worksites. The findings bring out inequalities prevalent during worksite

access in Nairobi manifested in form of longer commuting time, higher mobility costs, and lower comfort levels for the traders with special needs accessing worksites in the CBD.

Accessing worksites was necessary for the traders' livelihoods who adapted by changing the time they accessed their worksites, reducing the number of days worked, and getting assistance from capable guardians. However, some traders with special needs did not adjust to worksite access challenges. Many traders with special needs are not able to access their worksites with ease, do not maximize their potential and have to adapt to overcome physical mobility issues. As such, the use of universal design has not been fully utilized by city planners in Nairobi. The worksites access issues for traders with special needs are a result of poorly designed spaces.

There is very limited use of the universal design framework to improve the worksite access experience of traders with special needs in Nairobi. As such, persons with disabilities were forced to adapt to negative mobility experiences when accessing worksites in the city. These mobility experiences led to more time spent while accessing their worksites, fewer work hours and fewer days worked. Future development programs on access should embrace the theory of universal design to make the city safer, less costly and more convenient for traders with special needs.

5.3 Recommendations

The study findings have implications on the improvement of worksite access by traders with special needs in Nairobi city. As such;

- I. The government of Kenya through the Ministry of Transport, Infrastructure, and Housing, and Nairobi Metropolitan Services should consider introducing public

- transport means that consider all persons' needs, including those of persons with special needs.
- II. Drivers and conductors should be trained through Savings and Credit Co-operatives (SACCOs) and the National Transport and Safety Authority (NTSA) on ways to facilitate mobility for persons with special needs to enhance the flexible use of the available modes.
 - III. The government of Kenya, through the ministry of transport and the private sector should implement provisions of the disability act of the year 2003. The mobility patterns of traders with special needs should also be noted to guide future designs, to improve accessibility to worksites.
 - IV. The urban planning and lands department should design safe markets within the communities to reduce costs and the need for travel to the CBD among traders with special needs.
 - V. Trade policies should consider the plight of traders with special needs to make them have equitable access to market opportunities. The 2019 Nairobi county trade policy and the 2016 national trade policies fail to consider the plight of the traders with special needs. Access to daily activities should be identified as a challenge among small scale traders with special needs in the policy documents.
 - VI. There is a need for the ministries of labour and that of transport to develop access programs to help integrate persons with special needs into the labour markets. The Ministry of labour should work together with organizations at the community level and traders with special needs to ensure they can access worksites safely and work in dignity.

- VII. Transport and city planners should ensure enhance inclusion in planning by using the universal design and including traders with special needs to inform plans and programs. Also. They should develop a monitoring and evaluation framework for continuously improving worksite accessibility in urban areas.
- VIII. PWDs need safe, convenient, and affordable spaces and modes as they access their worksites. They should access worksites in environment designed to ensure universal access without adapting in ways that impact on their socio-economic well-being. There is a need for a monitoring and evaluation framework by the county government to ensure progress in the implementation of laid down policies.
- IX. More information should be provided to the traders with special needs on the available non-motorized resources in the city and how they can enhance their worksites' accessibility. Such information can help shape their mobility patterns. Warnings should also be well-positioned, and the routes followed by the traders noted. Consequently, the city department of planning should make use of universal design to monitor progress being made to make the city accessible to all.

5.4 Suggested Further Research

This study focused on small scale traders accessing working sites in the CBD. There is thus a need for studies focusing on access to worksites located in the informal sector and out of the CBD. Research should also be done on ways motor-cycles and Taxis can be adapted to meet the physical mobility needs of traders with special needs. This is because motor-cycles are increasingly being used by the majority to link transport modes in cities while taxi services were rarely used by traders to access worksites located in the CBD.

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APPENDICES

Appendix 1: Questionnaire

This study is being conducted by Cleusius Maranga – a student at the Institute for development studies-UoN as part of his Master of development studies research project. The questionnaire study topic is “**Physical mobility experience and access to worksites among small scale traders with special needs in Nairobi County**”. This study is done to investigate the effect of physical mobility on access to worksites. Please respond to each question.

Privacy Statement: This is a study done and intended only for education. Information collected will be kept confidential. Thank you for your cooperation and time.

A. DEMOGRAPHIC INFORMATION

1. Name (optional)..... Contact
2. Gender 1) Male 2) Female
- 3 Age
 - 1)18-35 years
 - 2)36-50 years
 - 3)51-65 years
 - 4) 66-80 years
4. Area of residence
5. Employment status
 - 1) Self-employed
 - 2) Employee
6. Highest level of education
 - 1) None
 - 2) Some primary
 - 3) Primary completed
 - 4) Some secondary
 - 5) Secondary completed
 - 6) College
 - 7) Graduate
 - 8) Post graduate

B. WORKSITE INFORMATION

7. Business location
 - 1) Luthuli Avenue
 - 2) Moi Avenue
 - 3) Gikomba Market
 - 4) Tom Mboya Street
 - 5) Mfangano Street
 - 6) River road
 - 7) Any other
8. Number of employees in the business
 - 1) No other employee
 - 2) Two to five
 - 3) Five to ten
 - 4) More than ten

9. Number of years working in the worksite

- 1) Less than one year
- 2) 1-5
- 3) 6-10
- 4) 11-15
- 5) 16-20
- 6) 21-25
- 7) 26-30
- 8) 31-35

10. Type of goods /services sold

- 1) Vegetables
- 2) Shoes
- 3) Sweets and biscuits
- 4) Shoe shining
- 5) Jewelry
- 6) Padlocks
- 7) Weight measurement
- 8) Clothes
- 9) Others

C. NATURE OF MOBILITY/ACCESS

11. What amount of time do you take to travel to your worksite?

- 1) 0 to 30 minutes
- 2) 30 minutes to 1 hour
- 3) 1 hour- 1 hr 30 minutes
- 4) 1 hr 30 minutes- 2 hours
- 5) More than 2 hrs

12. At what time do you begin your journey to your worksite?

- 1) Before 6 AM
- 2) 6 AM-8 AM
- 3) 8 AM-10 AM
- 4) 10 AM -12 AM
- 5) 12 AM-2 PM
- 6) 2 PM-4 PM
- 7) 4 PM-6 PM
- 8) 6 PM-8 PM

13. At what time do you arrive at your worksite?

- 1) Before 6 AM
- 2) 6 AM-8 AM
- 3) 8 AM-10 AM
- 4) 10 AM -12 AM
- 5) 12 AM-2 PM
- 6) 2 PM-4 PM
- 7) 4 PM-6 PM
- 8) 6 PM-8 PM
- 9) After 8 PM

- 14a. which form of transport do you use often for mobility to your worksite?
- 1) Motorized
 - 2) Non – motorized
 - 3) Both
- b) Explain how you move from your house to your worksite
- 1) Wheel chair from home and motor-cycle to town then motor-cycle
 - 2) Walking from home to stage, *matatu* to town, then walking (with crutches)
 - 3) Walking only (either with crutches or walking stick)
 - 4) *Matatu* only
 - 5) Wheel chair (Tricycle) or walking to the bus stop then *matatu* to and from the CBD
 - 6) I can walk, use a motor-cycle, *matatu* and use wheel chair in town
 - 7) Motor-cycle- *Matatu* then walk to my worksite
 - 8) Motor-cycle or walking to stage the *matatu*
15. Why do you mainly prefer this form for mobility?
- 1) Safety
 - 2) Affordability
 - 3) Convenience
 - 4) No alternative
 - 5) Availability
16. What distance do you travel to access your worksite?
- 1)0-2 KM
 - 2)2-4 KM
 - 3)4-6KM
 - 4)6-8 KM
 - 5)8-10 KM
 - 6)10-12 KM
 - 7) 12-14KM
 - 8)14-16 KM
 - 9) Others
17. How many days in a week do you travel to your worksite?
- 1) Everyday
 - 2)5 -6
 - 3)3-5
 - 4) Less than 3
18. In the past month, which of the following modes of transport have you used to access your worksite?
- 1) Wheelchair
 - 2) Bicycle
 - 3) Minibus
 - 4) Motor-cycle
 - 5) Walking
 - 6) Any other
19. a)Which one do you use most frequently when accessing your worksites?
- 1) Wheelchair
 - 2) Bicycle

- 3) Minibus
 - 4) Motor-cycle
 - 5) Walking
 - 6) Any other
 - b) How do you start and end your journey using the modes above?
20. What are the worksite access obstacles that are present during mobility?
- 1) High cost for mobility
 - 2) Distance travelled
 - 3) Unfavorable designs
 - 4) Any other

D. CHALLENGES/ISSUES

Safety

21. What is the main safety challenge experienced while using motorized transport?
- 1) Fear of crime
 - 2) Negative impact on health
 - 3) Accidents
 - 4) Others
22. What is the main safety challenge experienced while using non- motorized transport?
- 1) Fear of crime
 - 2) Negative impact on health
 - 3) Accidents
 - 4) Others
23. Are you about being a victim of crime during the time you start your journey or arrive at your worksite?
- 1) Yes
 - 2) No
- If yes, please explain.....
24. During your mobility to worksites, are you likely did/do you think you are to be a victim of crime?
- 1) Yes
 - 2) No
- Please explain
25. Have you ever been a victim of a crime while travelling to access your worksite?
- 1) Yes
 - 2) No
 - 3) Refused
 - 4) Do not know
- If yes, please explain
26. During your time opening and closing your work, are you likely do you think you can be a victim of crimes?
- 1) Yes
 - 2) No
- If yes, please explain.....
27. Whilst mobility to worksites, are you worried about getting an accident?
- 1) Yes

2) No

If yes, please explain.....

28. How are activities in your business affected by the safety issues? (For example, working time, number of days worked, number of opportunities missed)

Please explain.....

Convenience

29. What types of NMT are available for your mobility to worksites?

- 1) Wheelchairs
- 2) Walking
- 3) Any other

30. What is the main challenge that inconveniences you while using NMT?

- 1) I use a lot of personal effort
- 2) It is stressful and strenuous to get to the worksite
- 3) There are high levels of uncertainty
- 4) Weather conditions like rains often make it difficult to access my worksite
- 5) Any other

31. What types of MT are available for your mobility to worksites?

- 1) Taxi
- 2) Minibus
- 3) Motor-cycle
- 4) Any other

32. What are the main challenges that inconvenience you while using motorized transport?

- 1) I use a lot of personal effort
- 2) It is stressful and strenuous to get to the worksite
- 3) There are high levels of uncertainty
- 4) Weather conditions like rains often make it difficult to access my worksite
- 5) Any other

33. How are work activities in your business affected by the convenience issues? (For example, working time, number of days worked, number of opportunities missed)

Please explain.....

Cost

34 (a). Do you find it costly or relatively more expensive to access the worksite?

- 1) Yes 2) No

(b) If yes, what makes it costly?

- 1) The distance traveled to access the worksite
- 2) The time is taken
- 3) The obstacles on the way since I have to find alternatives
- 4) Using multiple modes for transport
- 5) Any other

35 Before starting your trip to your worksites, are you worried about the cost of mobility?

- 1) Yes
- 2) No

If yes, please explain.....

36. Do you pay more when compared to other passengers to travel to your worksite?

- 1) Yes 2) No

If yes, why

- 1) The public transport is not well designed to meet my needs
- 2) I have to pay more to get acceptance
- 3) I have to use expensive alternatives during mobility to meet my needs
- 4) Any other

37. How are work activities in your business effected by the cost issues on a scale (For example, working time, number of days worked, number of opportunities missed)

Please explain.....

D. ADAPTATION

38. Have you changed where, when and how you travel to your worksite because of your safety issues like crime, accidents and health hazards during mobility? (Give responses to choose from)

- 1) Yes 2) No

If yes, please continue

If no, move to question 42

39. If so, how have you changed your daily mobility and access routine? Please choose one or more.

- 1) Limited the number of days worked
- 2) Time restriction (for instance, do not go out before 5:00 AM)
- 3) Frequency restriction (do not go to work every day)
- 4) Place restriction (do not use some routes and places during mobility to work)
- 5) Capable guardian (friend's companion when going to work)
- 6) Any other

40. If so, do you think you are now less likely to experience issues relating to safety?

- 1) Yes
- 2) No

If yes, please explain.....

41. If so, since changing your daily routine, do you worry about safety issues (insecurity, health hazards, and accidents?)

- 1) Yes
- 2) No

If yes, please explain.....

42. Have you changed where, when and how you travel to your worksite because of convenience issues like the uncertainty of transport modes, use of a lot of physical effort during transport, and health hazards like rain?(And give some responses to choose from)

- 1) Yes 2) No

If yes, please continue

If no, move to question 46

43. If so, how have you changed your daily mobility and access routine? Please choose one or more.

- 1) Limited the number of days worked
- 2) Time restriction (for instance, do not go out before 5:00 AM)
- 3) Frequency restriction (do not go to work every day)
- 4) Place restriction (do not use some routes and places during mobility to work)

- 5) Capable guardian (friend's companion when going to work)
 - 6) Any other
44. If so, do you think you are now less likely to experience issues relating to inconvenience during mobility?
- 1) Yes
 - 2) No
- If yes, please explain.....
45. If so, since changing your daily routine, do you worry about inconvenience issues (transport shocks like unfavourable weather conditions, use of physical effort, and uncertainties during travel)?
- 1) Yes
 - 2) No
- If yes, please explain.....
46. Have you changed where, when and how you travel to your worksite because of cost issues like the uncertainty of higher fares, and high cost of fuel? 1) Yes 2) No
- If yes, please continue
- If no, end here
47. If so, how have you changed your daily mobility and access routine? Please choose one or more.
- 1) Limited the number of days worked
 - 2) Time restriction (for instance, do not go out before 5:00 am)
 - 3) Frequency restriction (do not go to work every day)
 - 4) Place restriction (do not use some routes and places during mobility to work)
 - 5) Capable guardian (friend's companion when going to work)
 - 6) Any other
48. If so, do you think you are now likely to experience issues relating to the cost of mobility?
- 1) Yes
 - 2) No
- Please explain.....
- 49 If so, since changing your daily physical mobility and access routine, do you worry about cost issues?
- 1) Yes
 - 2) No
 - 3) Please explain.....

Thank you for your time

Appendix 2: Key Informant Interview Guide

This study is being conducted by Cleusius Maranga – a student at the Institute for development studies-UoN as part of his Master of development studies research project. The study topic is “**Physical mobility experience and access to worksites among small scale traders with special needs in Nairobi County**”. This study is done to investigate the effect of physical mobility on access to worksites. Please respond to each question.

Privacy Statement: This is a study done and intended only for education purposes. It will take about 20 minutes. Information collected will be kept confidential. Thank you for your cooperation and time.

General information of the key informant

Details of key informant

Designation (“job description)

Contact (optional)

B Interview schedule

Are you aware of mobility issues affecting small scale traders with special needs? Yes, no

Which form of transport do small scale traders with special needs use often to access worksites?

Why do they prefer these forms for mobility?

What are the worksite access obstacles that are present during mobility?

What safety challenges do they experience while using NMT?

What safety challenges do they experience while using motorized transport?

How are they inconvenienced while using NMT?






How are they inconvenienced while using motorized transport?

What is the effect of the mobility challenge(s) you have highlighted on worksite access

How do you they respond to mobility challenges that affect worksite access?

Thank you for your time

Appendix 3: NACOSTI Authorization

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<p>This is to Certify that Mr., Cleonius Maranga Ondicki of University of Nairobi, has been licensed to conduct research in Nairobi on the topic: Mobility and Access to Workspaces among Small Scale Traders with Special Needs in Nairobi for the period ending : 31 July 2021.</p>	
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