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Final Report

Safety and Mobility Challenges of People with Disability in Mekelle City: Towards Inclusive Urban Transport

October 2024

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Abbreviations/Acronyms

ADA	The Americans with Disabilities Act
FCDO	Foreign, Commonwealth & Development Office
FDRE	Federal Democratic Republic Ethiopia
FGD	Focus Group Discussion
GDP	Gross Domestic Product
GTP	Growth and Transformation Plan
HVT	High Volume Transport
IDI	In-depth Interview
ILO	International Labour Organization
IT	Information Technology
KII	Key Informant Interview
LICs	Low Income Countries
ODK	Open Data Kit
PWDs	People with disabilities
RII	Relative Importance Index
SDGs	Sustainable Development Goals
SPSS	Statistical Package for Social Sciences
TDVA	Tigray Disabled Veteran Association
UKAID	United Kingdom Agency for International Development
UN CRPD	United Nations Rights of Persons with Disabilities
USD	United States Dollar
WHO	World Health Organization

Executive Summary

People with disabilities usually have to deal with various social, economic, and political challenges and inequalities. Stigma, discrimination, barriers to basic services, unequal opportunity to employment, and exclusion from decision-making are some of the most common problems people with disabilities face. When people with disabilities are excluded from accessing transport, it can lead to low self-esteem, limited access to education and work, poverty, health problems, and lower quality of life. These negative impacts affect not only people with disabilities, but also their families and communities, both nationally and globally.

Developed countries have been making encouraging efforts to address the challenges people with disabilities face with accessing transport, including establishing inclusive policies and strategies. However, these are still emerging in low income countries (LICs), but are encouraging. Awareness towards inclusive development is still low in LICs and infrastructures and services remain full of barriers for people with disabilities. In urban areas, planners, designers and administrators tend to prioritise vehicular traffic. This means the needs of people with disabilities remain neglected. Public transport systems and facilities do not accommodate the needs of people with disabilities, such as space for wheelchair users or adequate ramps.

This study assessed the safety and mobility challenges faced by people with disabilities in Mekelle city, northern Ethiopia. Based on the findings of this study and experiences from other countries, a disability-friendly design and infrastructure guide of urban transport was developed. A policy brief was also produced for Mekelle city to inform policy makers and provide recommendations based on the findings of the study. The study consists of a review of both scientific and grey literature, as well as primary data collection. Quantitative data was collected through digital questionnaires conducted through face-to-face interviews and on-site assessments of public roads, buildings, transport services and stops. Qualitative data was also collected by interviewing key informants and through focus group discussions (FGDs). The research findings were discussed among various stakeholders in consultative meetings.

This study found that while directives and guidelines exist for building infrastructure that meet the needs of people with disabilities, communication across the regulatory framework is inadequate and lacks clear mandatory enforcement for the effective implementation of rules and regulations. In Mekelle city, there are no inclusive directives or guidelines for road infrastructure and transport services that address the needs of people with disabilities. While people with disabilities should be involved in the planning, design and implementation of public infrastructures and services, this study found their participation in urban transport policy preparation remains limited.

The built urban environment in Mekelle city is not inclusive for people with disabilities. Building entrances and transport infrastructures are often unsuitable to these disadvantaged groups. Among the various urban transport infrastructures and facilities needed and provided in Mekelle city, a lack of or poor accessibility, and inadequate design and management of sidewalks were found to be major factors that negatively impact the safety and daily mobility of people with disabilities. Road sidewalks and entrance ramps to public buildings were identified as some of the least suitable facilities for people with disabilities in Mekelle city. Walkability index (WI) on a scale from 0 (least walkable) to 100 (most walkable) was used to evaluate the walkability of the main streets in the city.

This study revealed that the overall walkability of the main streets in the city was found below average, with WI of 46.5. The low WI of sidewalks confirms the findings of the questionnaire based surveys, key informant interview (KIIs) and FGDs surveys. Sidewalks in the main streets of the city are available, but they are narrow, full of roadside static obstacles and encroachments, and are poorly managed and unclean. According to the assessment result, the availability of infrastructure for people with disabilities is limited, unsafe and not in a usable condition. The availability of pedestrian crossings in the main streets is below average with a WI score of 41.2. Most of the streets assessed in the study had a width of below 3.5 metres.

The sidewalk space was poorly managed, with static obstructions located arbitrarily, creating a cluttered sidewalk environment. This results in obstructed paths for pedestrians and creates safety hazards for visually impaired people. According to the effective sidewalk assessment result, only 19.2% of the assessed sidewalks were found to fulfil the recommended width of 2.4 metres which is required to allow two wheelchair users to pass each other. Also, 46.2% of the assessed sidewalks were found to have a sidewalk width of less than 1.2 metres, which is below the bare minimum width required to allow two non-disabled people to pass each other. Cobblestone roads in the city serve as shared paths for pedestrians and car drivers with no defined standards. These are sometimes used as sidewalk paving in the main

streets, but cobblestones are unsafe, inconvenient, and uncomfortable for pedestrians and especially for people with disabilities.

Assessments made on public transport vehicles, stops and public buildings indicated that all of the public transport vehicles operating in the city were found to be inaccessible to wheelchair users and do not have facilities that aid visually impaired people. Some of the vehicles do not have space to carry wheelchairs. Public transport stops in the city are limited with no access ramps, tactile guidance, and other supporting facilities for people with disabilities. More than 75% of the available entrance and exit ramps for hotels and commercial centres were constructed in inappropriate locations, with inadequate slopes, landings, and widths.

An assessment was made to know how the urban transport infrastructure and services in Mekelle city are affecting the daily activities of people with disabilities. People with disabilities were made to rate the negative impact of the existing transport infrastructure and services on a scale from 1 (not sever) to 5 (extreme sever). These Likert scale results were used to estimate the severity index (SI) on a scale from 0 (low negative impact) to 100 (very high negative impact). The study revealed that people with disabilities in Mekelle have serious difficulties accessing work, education and healthcare, elaborated with high value (87.5%) of SI. The results from the workshops, key informant interviews and FGDs indicated that the major challenges that result in the exclusion of people with disabilities in the built environment and transport services in the city are due to poor law enforcement, a lack of directives and guidelines, poor awareness of the needs and rights of people with disabilities, and a lack of professional ethics.

People with disabilities in Mekelle city are facing serious safety and accessibility difficulties in the built environment and in accessing transport services. The challenges are mainly institutional, physical, and due to a lack of awareness. Therefore, to remove the safety and mobility barriers facing people with disabilities in the urban built environment, as part of the research objective, a policy brief and an infrastructure guide were prepared together with this report.

As Mekelle city is growing fast in terms of population and construction of civil infrastructures, the challenges people with disabilities and other pedestrians experience need urgent integrated policy interventions. The policy responses to remove the barriers need to be tailor-made or city-specific, but should incorporate lessons and best practices from other countries and cities around the globe. The policy interventions should be supported with results from this research work. The guide is prepared to support the development of disability-inclusive urban transport infrastructure in Mekelle city and other cities in LICs.

The guideline provides information about the recommended design approaches to include the needs of people with disabilities. While this document does not provide all design approaches and principles for the inclusion of people with disabilities in the transport sector or context, urban planners and designers in Mekelle city and in other cities of LICs can apply the design principles and recommendations enclosed in this guide to develop inclusive urban transport infrastructures. The aim of this guide is to show how the transport infrastructure barriers facing people with disabilities can be removed or at least be reduced. This will have a positive impact on improving the design of infrastructures that are suitable for all pedestrian groups, with minimal effect on the level of service to car drivers.

1. Introduction

1.1 Background

The term disability is often used interchangeably with impairment despite its different concept. The Americans with Disabilities Act [1] defined disability as “a physical or mental impairment that substantially limits one or more major life activities”. WHO [2] defined *impairment* as a problem in body structure and appearance or problem in organ function; and *disability* as an individual’s limitation in executing an activity due to impairment. In other words, disability is the result of negative interactions between a person with impairment and its environment [3]. It is the result of barriers in society that are imposed on people with impairments restricting their day-to-day activity [4]. The United Nations Relief and Works Agency [4] classify impairments into four: physical, sensory, intellectual, and mental. It also categorises barriers for people with disabilities into attitudinal, physical, and institutional barriers.

Global estimates indicate that people with disabilities comprise approximately 15% of the world’s population, with over 80% living in developing countries [5,6]. The Horn of Africa is globally known as a conflict and drought prone area. Frequent conflicts in Somalia, Ethiopia, Eritrea, and Sudan; famine of the 1980s in Ethiopia; political tensions in Sudan and South Sudan and drought and conflicts in Ethiopia and Somalia are examples. These natural and human-made adversities cause poverty and poor health conditions, increasing the number of people with disabilities. People experience physical disabilities from shortage of vitamins, various diseases, and war injuries. Together with disabilities as a result of other factors, it means there are a significant number of people with impairments in the region.

The World Report on Disability [7] revealed that people with disabilities in Ethiopia constitute 17.6% of the total population. According to the International Labour Organization (ILO) report [8], around 95% of these disadvantaged groups live in poverty, making their livelihood dependent on family support and begging. Even though clear data was not found, the number of people with disabilities in Tigray region is believed to be above the national average. Government reports from Tigray region showed that around 100,000 Tigray People’s Liberation Front (TPLF) militants were disabled during the fight against the Derg regime from 1975 to 1991. Recent reports also indicated that the war fought in the last couple of years in Tigray has left hundreds of thousands either death and or with injuries.

The serious impact of the war is visible, with people moving with mobility aids, wheelchairs and crutches are seen on the streets of Mekelle city. Including impairments as a result of other factors, a huge number of people with disabilities are believed to live in the region. People with disabilities usually deal with various social, economic, and political challenges and inequalities [3]. These challenges differ depending on the type and severity of the disability. Exclusion including stigma, discrimination, barriers to basic services such as healthcare, education, water and sanitation, unequal opportunity to employment, and exclusion from decision making are some of the most common problems people with disabilities face. Exclusion of people with disabilities result in low self-esteem, poverty, aggravated health problems, and lower quality of life [9]. The negative outcomes of these exclusions range from the vulnerable individuals and their families to the community at a national and global level. The World Bank [10] estimates that the exclusion of people with disabilities results in an annual global GDP loss between 1.71 to 2.23 trillion USD.

People with disabilities constitute the most disadvantaged groups in a society [11]. The Rehabilitation Act [11] described disability as a natural human experience and in no way diminishes the right of individuals to participate and benefit from full participation in economic, social, and political mainstreams. People with disabilities have the right to inclusive, integrated and accessible urban infrastructure and services that meet their needs. This requires that all barriers to people with disabilities get eliminated or reduced, and these vulnerable groups be afforded equal opportunities to education, work and employment, healthcare services, decision making, among many others.

Globally, the United Nations and its member states have been making encouraging efforts to address the challenges of people with disabilities and to realise the motto of “no one is left behind”. These efforts are well established in the policies and strategies of developed countries, but are still emerging, though encouraging, in low and middle income countries (LMICs) [12]. In 1969, the UN General Assembly adopted a declaration with a view to protect the rights and welfare of people with disabilities that gave international recognition that it is the society that creates barriers for the full participation of disadvantaged groups. Since then, the UN has been adopting declarations and establishing conventions. This includes the 2006 Convention on the Rights of Persons with Disabilities (CRPD), aimed and used as an instrument for protecting the rights, dignity and inclusive development of people with disabilities.

It also included 17 goals of the 2030 Agenda for Sustainable Development Goals (SDGs), calling the international community "*to seize every opportunity to include disability as a cross cutting issue*" and ensure "*no one is left behind"* to achieve disability inclusive development [13]. As a UN member state, Ethiopia has been adopting and implementing a number of conventions, policies, and laws pertaining to people with disabilities. This can be clearly seen in the nation's 1995 constitution Article 41(5) stating the government's responsibility for the *"provision of necessary rehabilitation and support services*" for people with disabilities. It also included it in the Proclamation No. 568/2008 that aimed to protect the rights of employment of disadvantaged groups and eliminate any discriminatory laws, practices, custom, and attitudes that limit equal opportunities for people with disabilities.

Among many others, the country also ratified the UN CRPD convention with Proclamation No. 676/2010 and included it as cross-cutting issue under social welfare in its first and second Growth and Transformation Plan (GTP) [14, 15]. Despite Ethiopia adopting many international treaties and conventions and ratifying them as part of its laws and policies, the issue of including people with disabilities is far from realisation. The attitude towards inclusive development is still low. Infrastructure and services still remain full of barriers for disadvantaged groups. The construction and transport sectors are clear indicators of the current challenges for people with disabilities in Ethiopia. Despite the ratification of Building Proclamation No. 624/2009 aiming to provide accessibility in the design and construction of any building to ensure suitability for physically impaired people, public buildings remain inaccessible for vulnerable groups.

On urban roads, planners, designers and administrators are giving higher priority to vehicular traffic. This means the needs of pedestrians and people with disabilities in particular remain neglected. Public transport and facilities do not have room for people with disabilities. Regional states and cities in the country are far from realising disability inclusive development. The existing policies, regulations, and enforcements are not adequate to avoid the problems faced by people with disabilities.

Similarly, transport infrastructure and services in Mekelle city did not consider the needs of people with disabilities resulting in aggravated socio-economic problems of the disadvantaged groups. This is manifested in terms of inaccessible buildings for people with disabilities; challenges for wheelchair users to get into bus stations and onto buses; non-existent, narrow or poorly designed and managed sidewalks; missing kerb ramps; lack of signage and information; no waiting areas for wheelchair users; lack of elevators and lifting platforms; and access difficulties to education, healthcare, and job opportunities.

To make the transport system sustainable in Mekelle city, the planning, design and operation of infrastructure and services need to be inclusive to people with disabilities. Therefore, to overcome the challenges and promote inclusive and sustainable urban transport, the existing situations in the city should be scientifically assessed, challenges should be identified, and best practices of other countries assessed and customised to suit local conditions, and create ground for idea sharing and bring common understanding among stakeholders. This research project aims to (1) assess the suitability of the existing transport system in Mekelle city for people with disabilities, (2) propose a disability friendly design and implementation guide of urban transport infrastructures, and (3) develop an urban transport infrastructure and service policy brief. The research work consisted of a review of both scientific and gray literatures, primary data collection, and detailed data analysis and reporting. Consultative meetings were also carried out to gather and share ideas on the research project.

1.2 Aims of the project

This study aims to explore the safety and mobility challenges of the existing transport system in Mekelle city, Ethiopia for people with disabilities and propose possible solutions. It also intends to develop inclusive transport policies and strategies for people with disabilities in cities of LICs.

Generally, this study has the following three objectives:

1. Assess the suitability of Mekelle city transport system for people with disabilities.
2. Propose a disability friendly design and implementation guide of urban transport infrastructures for Mekelle city.
3. Develop an urban transport infrastructure and service policy brief.

1.3 Project alignment with the HVT Programme

This research project is in line with the HVT programme themes of "*policy regulation*" and sub-themes "*inclusion, gender and road safety*" and Sustainable Development Goals (SDGs) of the transport sector. The research outputs are expected to contribute to bringing urban transport policy, planning, and design changes in Ethiopia and other LICs.

1.4 Expected project outcomes and impacts

- Developed/improved urban transport infrastructure and service inclusive urban transport infrastructure policy, strategies, and guidelines
- Improved transport infrastructure design recommendations
- Implemented inclusive urban transport infrastructure for people with disabilities
- Improved safety and mobility for people with disabilities
- Increased network and connectivity among stakeholders in the transport sector
- Improved awareness with stakeholders on planning, design, and implementation of inclusive urban transport systems
- Enhanced capacity of stakeholders on planning, design, and implementation of inclusive urban transport system
- Drive experiences for cities in LICs.
- Improved law enforcement for proper management of urban transport infrastructures
- Improved level of satisfaction of persons with disabilities and pedestrians as a result of improved transport infrastructure design and services

2. Research approach and methodology

2.1 Overview of the project

The research project was undertaken as applied research work in Mekelle city, northern Ethiopia. The general objective of the research was to explore the safety and mobility challenges of urban transport systems in Mekelle city with respect to people with disabilities. The duration of the research project was 6 months starting from 1st July, 2023 and ended on 20th December, 2023. The project was planned to be carried out mainly in three parts; (1) assessment of the safety and mobility challenges of people with disabilities, (2) proposing disability friendly design and implementation guide for urban transport infrastructure and (3) developing disability inclusive policy directions and strategies. The research work consists of a review of both scientific and grey literatures, primary data collection, and detail data analysis and reporting.

Project briefing and consultative meetings were also carried out with stakeholders and disability associations to gather and share ideas on the project objectives and activities. Discussions with Mekelle University School of Civil Engineering dean, department heads, and senior staffs were also conducted to create common understanding and for information sharing on inclusive urban transport infrastructure system.

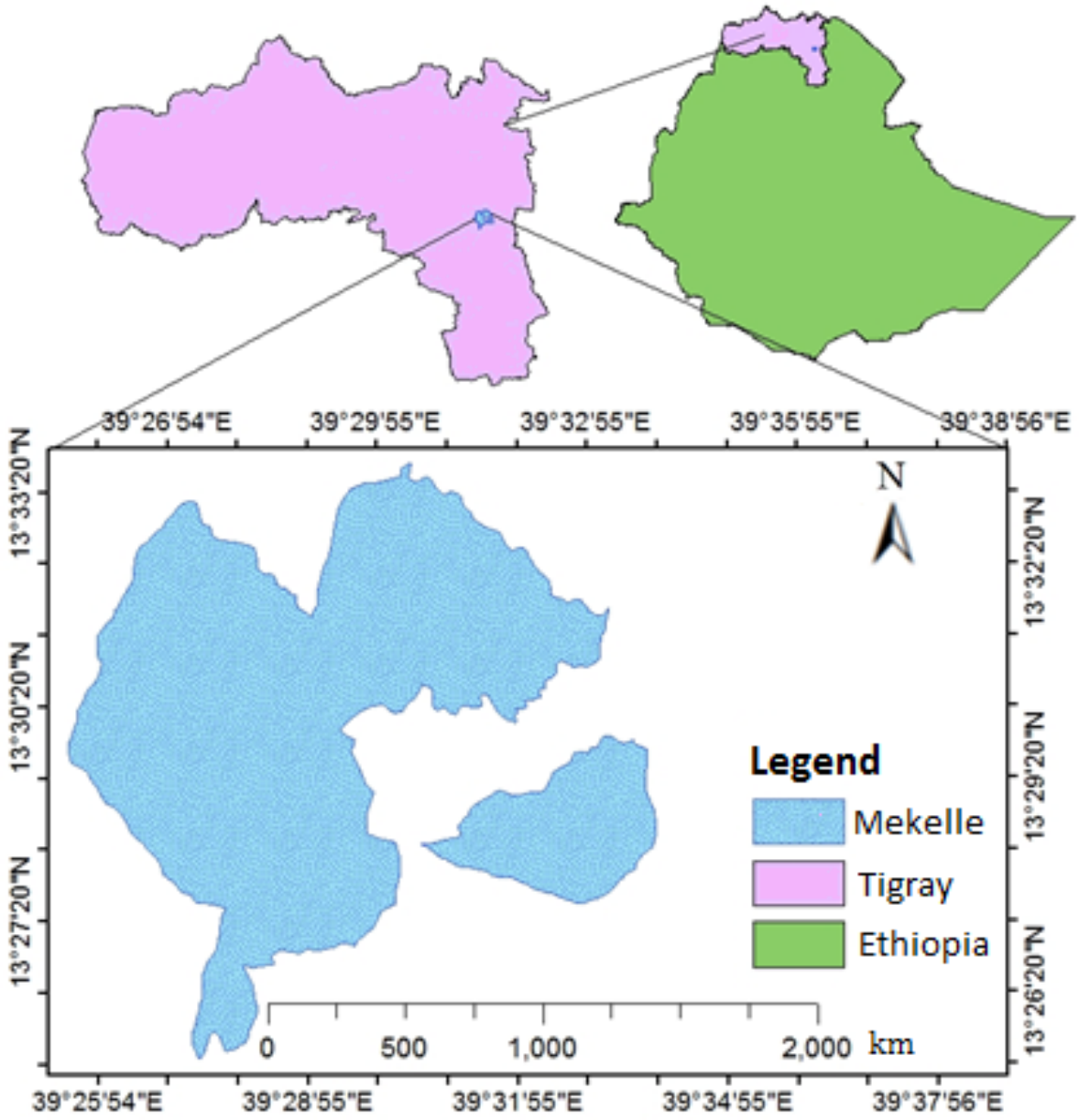
2.2 Study area description

Mekelle, which is the capital city of Tigray region, is the second largest and fast growing city in Ethiopia next to Addis Ababa. It is located in the northern part of Ethiopia with the geographical location of 13º 29'36.78'' N and 39º27'56.66'' E. The population projection of Ethiopia shows that Mekelle city had a total population of 358,528 in 2017 [16]. However, due to the current political, social and economic situation in the country, the population is expected to be more than half a million [17]. The mode shares of non-motorised and motorised means of transport in Mekelle city are 66.5% and 33.5% respectively [17]. A study by Developmental Partners [18] indicated that around 70% of trips are made to and from the city

centre. Walking is the dominant mode of transport with a 52.8% share of all trips. The majority of the existing roads and roads under construction are narrow with no or inconvenient walkways especially for people with disabilities.

Even though there is no quantitatively described evidence, Mekelle city is believed to be the home of many people with disabilities. It is also the home of the strongest disability association in the country, Tigray Disabled Veteran Association (TDVA). The association has more than 30,000 war veteran members in Tigray region, including its 3,000 members located in Mekelle city. A number of local NGOs and disability associations were also recently established in the city.

Figure 2-1: Location map of Mekelle city in Tigray and Ethiopia



2.3 Research methodology

2.3.1 General

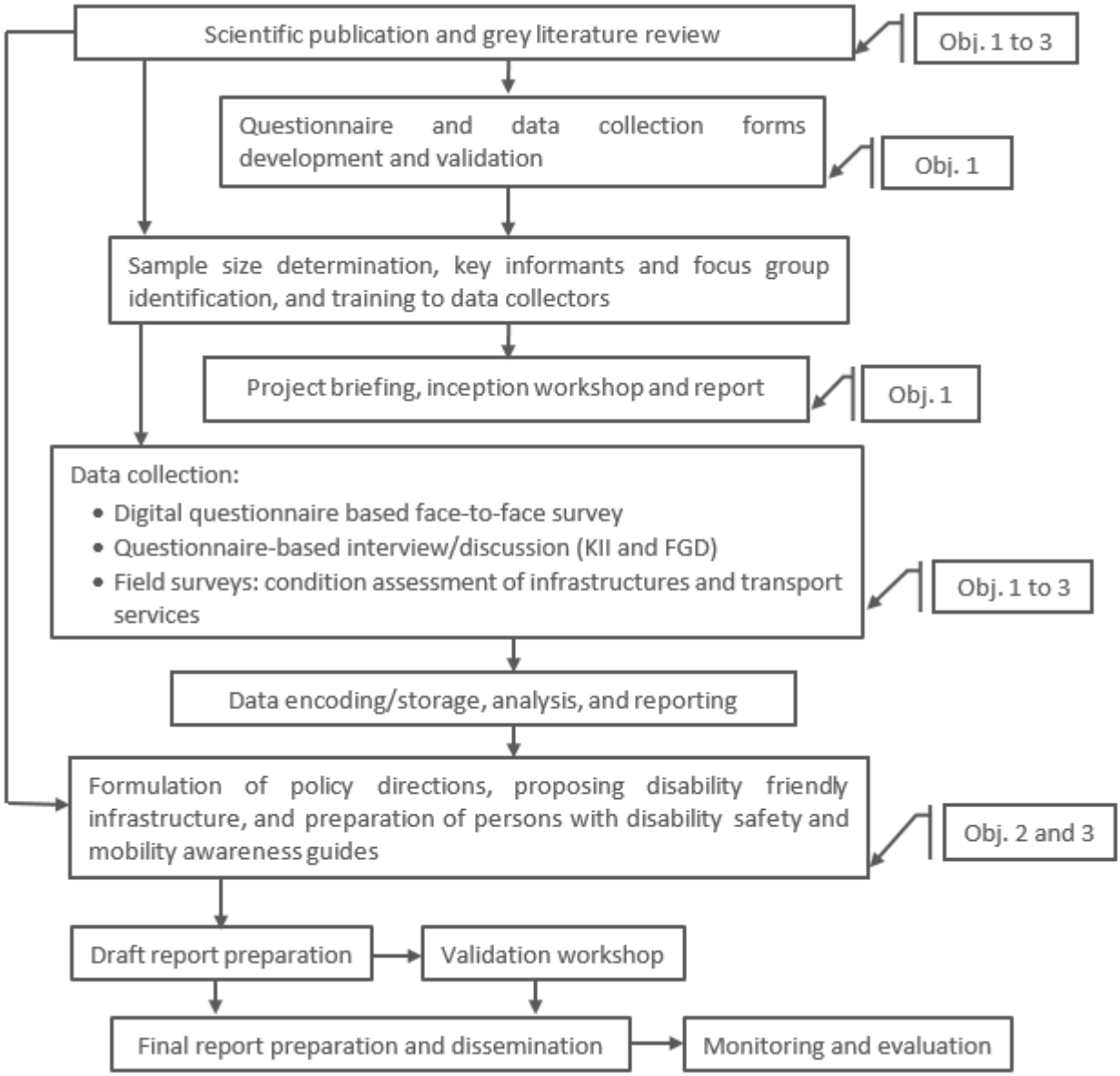
A comprehensive review of both scientific and grey literatures and detailed analysis of primary data were performed for this study. Primary data was collected using questionnaire-based face-to-face interviews, FGDs, and on-site assessments of the transport infrastructure and services in Mekelle city. A thematic analysis approach was employed to analyse the qualitative data obtained from in-depth interviews (IDI) and FGDs. The analysis began with identifying textual data and organise meanings to detect repeated

patterns from life experiences of people with disabilities and finally end with developing themes. The goal of the analysis was to illuminate unique information from the respondents and participants, keeping the study objectives in mind. Descriptive and inferential techniques were used to analyse the quantitative data. Discussions were made on the research findings and these discussions were used as benchmarks to propose disability friendly urban transport infrastructure design guidelines and to develop a policy brief that could promote the safety and mobility of people with disabilities in LICs. The methodological framework of our research project is as illustrated in Figure 2-2.

Consultative meetings and FGDs were also carried out to gather and share ideas on the research project objectivities and activities. In-depth discussions were made on the research findings where conclusions and recommendations were drawn on developing disability friendly urban transport infrastructure guidelines and policy directions.

Policy recommendations and proposed future required improvements were proposed and discussed with local government officials. The outcomes and impacts of this research work will be examined through continuous monitoring and evaluation (M&E) works during and after the project period.

Figure 2-2: Methodological framework of the research project



2.3.2 Review of literature

An overall review of scientific publications and other relevant documents were carried out in this research. A review of guidelines, policy and regulation documents, and other grey literatures related to people with

disabilities were also carried out. The search mainly included documents from Tigray region and Mekelle city. It also incorporated national documents relating to transport inclusion for people with disabilities. The search was also expanded to other cities and countries to obtain best experiences that fit the study objectives.

The literature review works and findings were used to compare the findings from the primary data analysis. They were also used to support the preparation of disability friendly urban transport infrastructure guidelines and to develop policy directions. Best practices from around the globe were identified and suggested for application in cities of LICs.

2.3.3 Sampling techniques

This research work consisted of both quantitative and qualitative data collections. The minimum sample size for the quantitative data collection using digital questionnaire based face-to-face interviews was estimated using the Cochran's formula (Equation 1).

$$n_o = \frac{Z^2 pq}{e^2} \quad (1)$$

Where, n_o is the minimum sample size; Z is the value corresponding to the selected alpha level, in this case is 1.96 considering a 95% confidence level; p is the estimated proportion which is 0.5; q is equal to 1-p; and e is the acceptable margin of error which in this case is 0.05. Generally, the sample size used for collecting the quantitative data from face-to-face interview of sample persons with disabilities was 423, which is relatively higher than the minimum required sample size of 384. Respondents with disabilities were selected using stratified and systematic techniques.

At first, communications with the disability associations and city administrators were carried out. Then, the location of persons with disabilities residences, working and training areas were identified. Furthermore, information on the list of persons for the questionnaire study was gathered. Institutions were stratified at first by their geographic location and type (union of war disabled persons, unions of vision impaired persons, care centres, etc.).

Since the number of institutions in the city were few, all of them were included for data collection. Classification of persons with disability with respect to geographic location, type of impairment (physical, vision, and hearing), sex, and age group was carried out. From each institution, representative samples from each of the physical and visually impaired groups aged 18 and above were taken randomly and interviewed at their residence or workplace. Some respondents with hearing impairments were also incorporated. Care was taken to avoid duplication of persons that are in two or more lists of institutions by checking their full names and replacing individuals with similar identities. On-street assessments were also carried out to get additional persons with disability to the survey.

Yamane's formula (Equation 2) was used to determine the sample size of main streets for the onsite assessment of the asphalt roads.

$$n = \frac{N}{(1 + N \times e^2)} \quad (2)$$

Where, n is the minimum sample size in kilometre; N is the population size in kilometre; and e is the acceptable margin of error, which in this case is 0.05. A total of 68 km asphalt roads were assessed.

A total of 10 km cobblestone roads were also purposefully selected and assessed. A total of 44 public buildings, including hotels, government offices, education centres, health centres, and commercial centres were purposefully selected and assessed.

2.3.4 Data collection

2.3.4.1 Interviews and discussions

A mixed research design approach was used to collect and analyse data in this study. Digital questionnaire based face-to-face surveys were carried out to collect quantitative data from people with disabilities. The digital questionnaire survey form was developed using an Open Data Kit (ODK) and loaded onto mobile phones and tablets to facilitate the data collection process and save the time needed for data encoding. An information technology expert was recruited to develop the digital form, train the

data collectors, and manage the collected data. The questionnaire was well structured with mainly closed-ended questions.

Some open-ended questions were also incorporated to enable respondents to deliver additional or new information when necessary. The questions included in the form were categorised into seven parts: respondents' general background information, (2) types and causes of impairments, routine transport mobility used, and persons with disabilities safety and mobility challenges in using the transport systems. Respondents were able to rate the suitability of existing transport infrastructures using the five point Likert scale from *1 (Very Poor)* to *5 (Very Good)* and the impact of these facilities on their livelihood from *1 (Very Low)* to *5 (Extremely High)*.

Quantitative Survey Respondents

A total of 423 physical (315) and sensory (108) impaired respondents were interviewed using the digital questionnaire based face-to-face interview. These sample participants were from all of the seven sub-cities of Mekelle: Adi-haki (45), Ayder (54), Hadnet (91), Hawelti (54), Kedamay Weyane (91), Quiha (40), and Semen sub-city (48). Female respondents were 28% of the study and the age distribution is illustrated in Figure 2-3.

Only six respondents were incorporated from hearing impaired individuals. This is due to the difficulty finding these respondents, challenges in finding good interpreters and the significance of the data from such respondents on the overall objective of the project. The scope of the project is mainly towards solving the problems of physical and visually impaired individuals. People with learning disabilities and mental health conditions were not incorporated in this research.

Figure 2-3: Age distribution of respondents

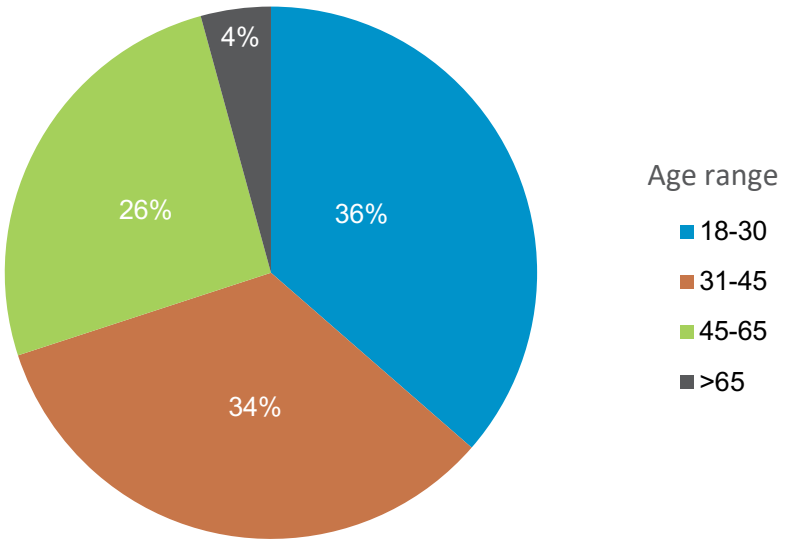


Figure 2-4: Number of respondents from each sub-city

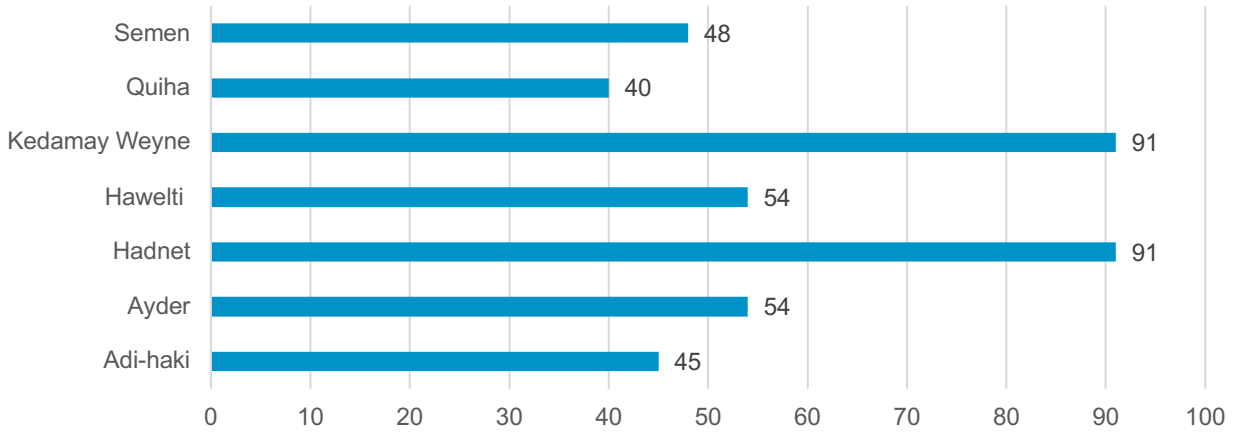


Table 2-1: Educational background of respondents

Educational Status	Frequency	Percentage
No formal education	64	15.1
Basic education	49	11.6
Primary school (1-8)	73	17.3
Secondary school (9-12)	93	22
Diploma	48	11.3
First degree	86	20.3
Second degree	10	2.4
Total	423	100

The persons with disability respondents were from various occupational backgrounds as illustrated in Table 2-1. The educational background ranged from no formal education (15.1%) to first degree (20.3%) and second degree (2.4%) educations.

Qualitative Survey

In this research, qualitative data was also collected using an in-depth interview of selected people with disabilities, interviews with key informants (KII) and FGDs. Based on the unique lived experiences of people with disabilities obtained during the quantitative survey, open-ended questions were prepared and five respondents were contacted and scheduled for in-depth interview task. The respondents were asked questions moving from more general into specific ones.

An in-depth semi-structured interview of 15 key informants from governmental institutions, public transport unions, disability associations, professional associations, practitioners, higher education, and hotel owners was carried out. Three FGDs, with 6-9 participants in each group, were carried out. Participants of the FGDs were selected from different age, sex, impairment, level of education, and employment groups.

The discussion focused on the participants understanding of the existing Mekelle city's transport infrastructure and services with respect to inclusion of people with disabilities, identifying the safety and mobility barriers, their experience in participating in planning, design and implementation of the urban transport infrastructures and services, coordination among stakeholders, availability and implementation of existing policies and regulations pertaining to the safety and mobility of people with disabilities, and measures to be taken to improve the inclusiveness of urban transport systems.

2.3.4.2 Transport infrastructure assessment

Transport system related primary data was also collected using on-site assessments of the transport infrastructure and services in Mekelle city. A total of 68 km asphalt roads and 10 km cobblestone roads were assessed. Most of these streets connect residential areas with nearby public transports that go direct to the city centre.

The main streets included in this study were also expected to serve relatively higher numbers of daily walking trips. Data collection checklists that incorporated points related to total width of street, total width of sidewalks, sidewalk space utilisation, street crossing condition, walkway surface condition, signage and information, taxi and bus station facility conditions, building entrance and vertical transport conditions were prepared.

A walkability assessment of the main streets was also carried out using 9 parameters (Table 2-2). Overhead obstructions below 2.3 m high were also recorded at sidewalks during the assessment work. To identify the proper utilisation of street sidewalks, type and placement of sidewalk obstructions were also recorded. These points helped to evaluate the safety and accessibility of the existing infrastructures in Mekelle city, whether the facilities are direct and/or easy to access, demand minimum effort to be used by all community groups, including people with disabilities, and allow sufficient space for users, especially wheelchair users.

2.3.5 Data analysis

The completeness and consistency of the collected data was checked at first to ensure its reliability. The collected data was stored in Microsoft Excel for storage and further analysis. Thematic analysis was employed to analyse the qualitative data obtained from IDI, KII, and FGD. This process included three steps: achieve familiarity with the data through repeated open minded reading, search for meanings and organising them into patterns, organising themes and writing them into meaningful text.

Statistical Package for Social Sciences (SPSS) version 16 software was used to organise data and make statistical analysis and research. Quantitative data obtained from the digital questionnaire based face-to-face survey was analysed using descriptive and inferential statistics. This data analysis involved simple descriptive statistics such as average, frequency counts and percentages. Relevant parametric and non-parametric statistical tests were also used to analyse the questionnaire based and field-based measured data. Relative importance index (RII) for importance and severity index (SI) for impacts were used to compare rank of various factors in relation to suitability of urban transport infrastructure on people with disabilities and the impacts of poor infrastructure on their livelihoods.

RII was calculated based on Equation 3, described below.

$$RII = \frac{\sum W}{(A \times N)} \tag{3}$$

Where *RII* is relative importance index (%), *W* is weight given to each mitigation measure by respondents (1 to 5), *A* is the highest weight (5), *N* is total number of respondents. Importance index was categorised as highly important (5), important (4), moderately important (3), less important (2) and not important (1).

An assessment was made to know how the urban transport infrastructure and services in Mekelle city are affecting the daily activities of people with disabilities. People with disabilities were made to rate the negative impact of the existing transport infrastructure and services on a scale from 1 (not severe) to 5 (extremely severe). These Likert scale results were used to estimate the severity index (SI) using Equation 4;

$$SI = \sum a\left(\frac{n}{N}\right) \times \frac{100}{4} \tag{4}$$

Where *SI* is severity index (%), *a* is a constant expressing weight given to each response (1 to 5), *n* is frequency of responses and *N* is the total number of responses. Degree of severity was categorised as extreme (5), high (4), moderate (3), low (2) and not sever (1).

The quantitative and qualitative data were integrated during the data collection and analyses. Mixed method research was used to compare results from the quantitative and qualitative data.

From the on-site infrastructure condition assessment, the effective sidewalk width (W_E) of the main streets in the city was determined using the following equation 5 [19]:

$$W_E = W_T - W_o \quad (5)$$

Where: W_E = effective sidewalk width (m),
W_T = total sidewalk width (m),
W_O = sum of effective width of fixed objects located on the sidewalk and shy distances from obstructions (m).

Effective sidewalk width determined using equation 5 was compared with the minimum sidewalk width required for wheelchair users. The accessibility of sidewalk surfaces, kerb ramps, and building entrances were also evaluated and results were compared with the standard requirements.

Table 2-2: Grouping of parameters to the aspects.

No	Aspect	Code	Parameter	Weight (%)
1	Accessibility aspect	P2	Availability of sidewalk	25
		P7	Infrastructure for disabilities	15
2	Supporting facilities aspect	P3	Availability of pedestrian crossings	10
		P6	Supporting facilities (amenities)	5
3	Safety aspect	P1	Pedestrian conflicts with other modes of transportation	5
		P4	Safety of pedestrian crossings	10
		P5	Motorist behaviour	5
		P9	Encroachment	10
4	Convenience aspect	P8	Sidewalk obstacle	15

Generally, results were presented in tables and charts. Primary data obtained from different sources were discussed in reference to secondary data outlined in the literature review as well as baseline information describing the situation of the urban public transport conditions in Mekelle city.

3. Results and discussion

The safety and mobility of people with disabilities in the built urban environment is affected by a number of factors. These include the suitability of building entrance/exit facilities, pedestrian facilities, modes of transport, the availability of people with disabilities inclusive policies and regulations and awareness of government bodies, practitioners, service providers and the vulnerable groups on the available policies and regulations.

The convenience of transport infrastructures and services may determine the choice of facility and frequency of trips made. Assessments were carried out using questionnaire based face-to-face interview, in-depth interviews, FGDs, and onsite surveys of building and transport infrastructures in Mekelle city to explore how the factors affect the safety and mobility of people with disabilities. The findings of the research work are described and discussed in the following sub-sections.

3.1 Disability and mobility in Mekelle city

Assessments on the causes of impairments, mobility aids used, frequency of travel and the mode of travel used were carried out using the questionnaire based survey of 423 people with disabilities. The study indicated that the major causes of impairments in Mekelle city were war related incidents (39.95%) and illness (28.13%) as shown in Figure 3-1. The higher number of people with disabilities in Mekelle city is most probably because of its location in the Horn of Africa, in which conflict, disease and famine frequently occur.

The study result indicated that 85.26% of people with disabilities in Mekelle city use mobility aids in their usual travels (Figure 3-2). This demonstrates that a significant proportion of individuals with physical and visual impairments rely on various forms of assistive devices to facilitate their mobility. Out of the mobility aid users, 44.48% of them use a walking stick and 36.26% of them use a wheelchair.

Figure 3-1: Causes of physical and vision impairments in Mekelle city

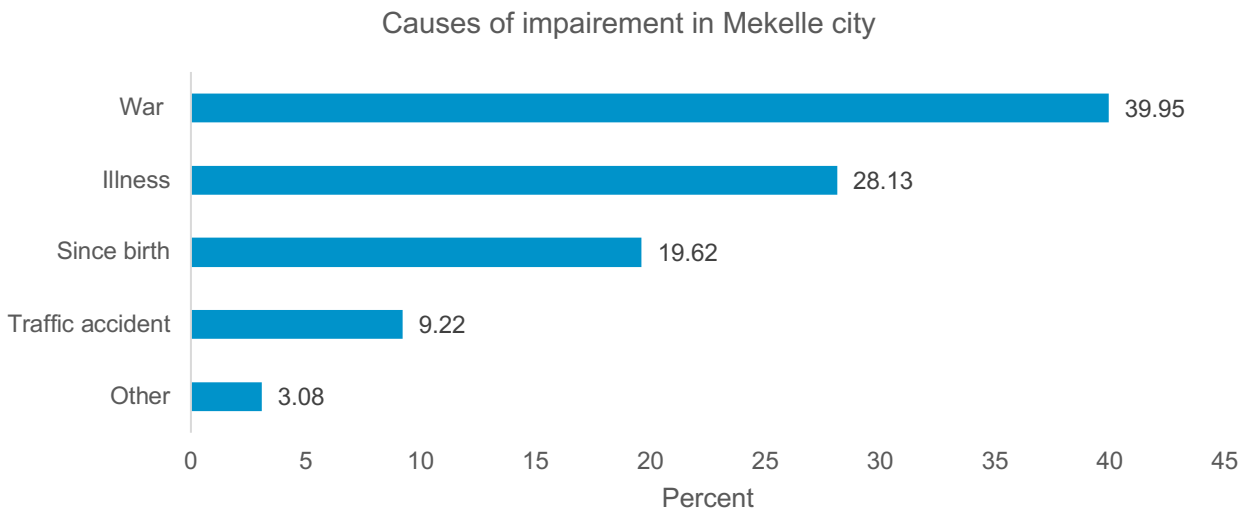
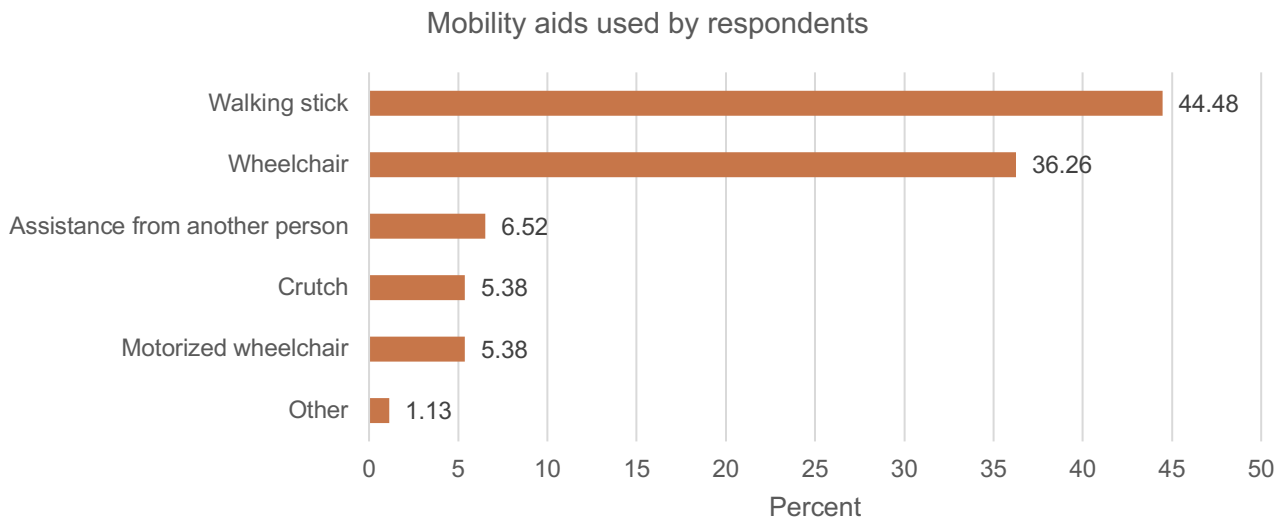
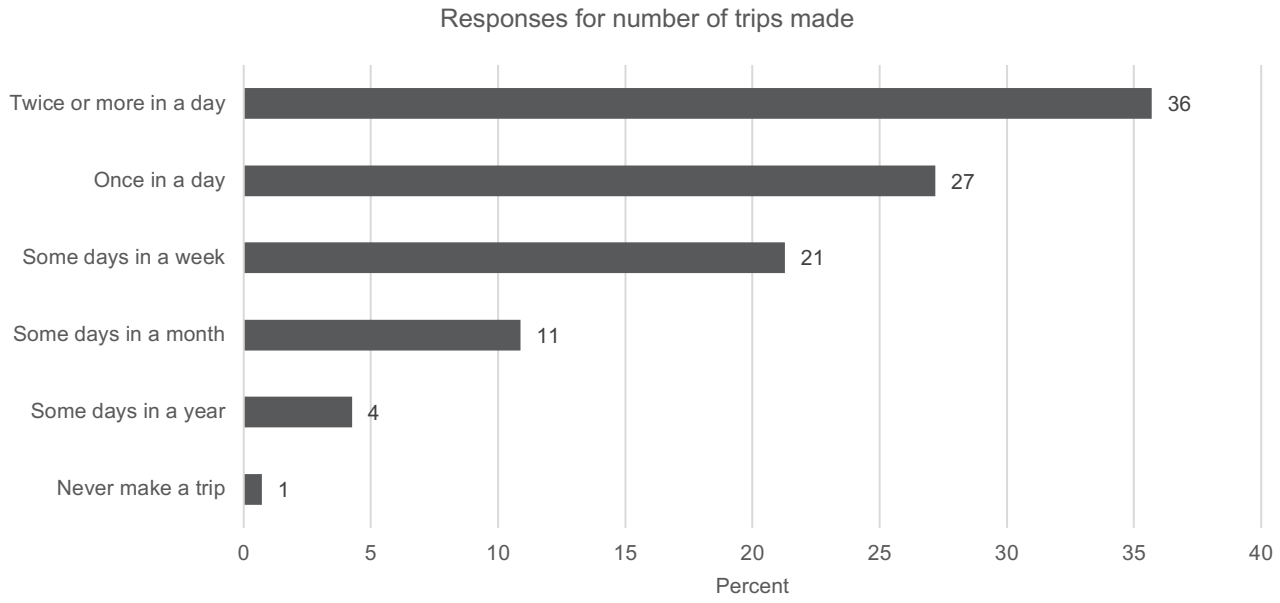


Figure 3-2: Mobility aids used by people with disabilities in Mekelle city



Regardless of the purpose of their trip and the suitability of the existing transport infrastructure and services for their mobility, 63% of the respondents indicated that they make a trip at least once in a day. About 21% of them make trips some days in a week. The remaining respondents indicated that they make trips some days in a month (11%) or a year (4%). Only 1% of people with disabilities in Mekelle city never make trips throughout the year.

Figure 3-3: People with disabilities respondents' frequency of making trips in Mekelle city



The study indicated that 40% of the respondents encountered additional accidents or injuries as a result of their impairments. More than 50% of these accidents or injuries happened on roadways (sidewalk, carriageway, and crossings) and 24.3% of them happened at home (Figure 3-4). The accidents were caused mainly (68%) by lack of inclusive building and transport infrastructure in Mekelle city. During the in-depth interview session with selected people with disability respondents, one interviewee shared an experience from his friends as summarised below.

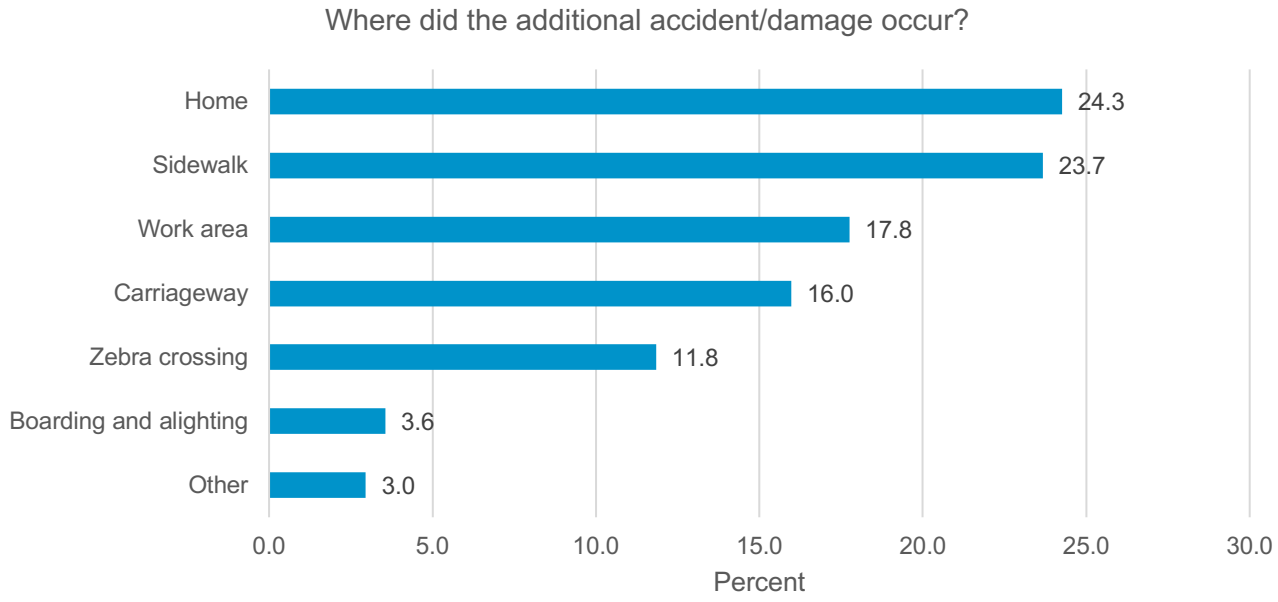
"I used to experience some injuries on sidewalks though they were not too bad. However, one time my friend, who is visually impaired, used to walk on a sidewalk and suddenly fell into a manhole and was forced to wait for hours until he got someone who took him out of the hole. Another friend of mine also lost his life after falling into a manhole".

Most of the respondents agreed that the sidewalks in Mekelle city are a challenge to people with disabilities. Sidewalks in the city are even inconvenient to non-disabled individuals too. Another participant of a group discussion also shared his experience regarding the problem of sidewalks as follows:

"I was standing along the sidewalk of a main street in my neighbourhood. I saw a woman with a child in her shoulder coming to my direction. Suddenly, I saw her falling downward on the sidewalk and people running toward that area. I was quite surprised! When I went there, I got to an open manhole with the woman and her small kid begging for help. We took them out of the manhole but the woman suffered from a broken arm."

Almost all of the participants in the interview and group discussions agreed that the streets in Mekelle city are not convenient for people with disabilities in particular and all pedestrian groups in general. During the questionnaire based interview, 81.6% of the respondents who use walking only or wheelchair only as their mode of transport often use the carriageway because sidewalk facilities are narrow, inaccessible, full of obstacles, and have poor surface forcing them to avoid it.

Figure 3-4: Respondents experience of accidents on the urban built environment of Mekelle city



As illustrated in Figure 3-5, 36.9% of the respondents use walking and public transport during their trip. About 17.1% use wheelchairs during their travels. Only 6.2% of the respondents use walking only as their mode of transport. Wheelchair users usually face challenges not only from the transport infrastructure and vehicle designs, but also from mini-bus drivers and their assistants. The bus transport in the city is usually limited and it was not functional during the survey time. The rickshaw or bajaj transport is common mode used in Mekelle. Mini-bus taxi, the main public transport in the city, however, was described negatively by wheelchair users. Taxi drivers and their assistants are reluctant to serve wheelchair users and usually ask fees for wheelchairs, resulting in double tariffs. One wheelchair user described this problem in a discussion as follows:

"I have been living in Mekelle city for the last 20 years, but I never used to take taxis for my daily trip. Do you know why? Because the taxi drivers and their assistants usually ignore to pick my wheelchair for free. My wheelchair is like my shoes, but they often ask me to pay double, and there is no law that enforces them. The awareness of the taxi drivers is low. Hence, I usually prefer rolling my wheelchair instead of taking taxi for my travels".

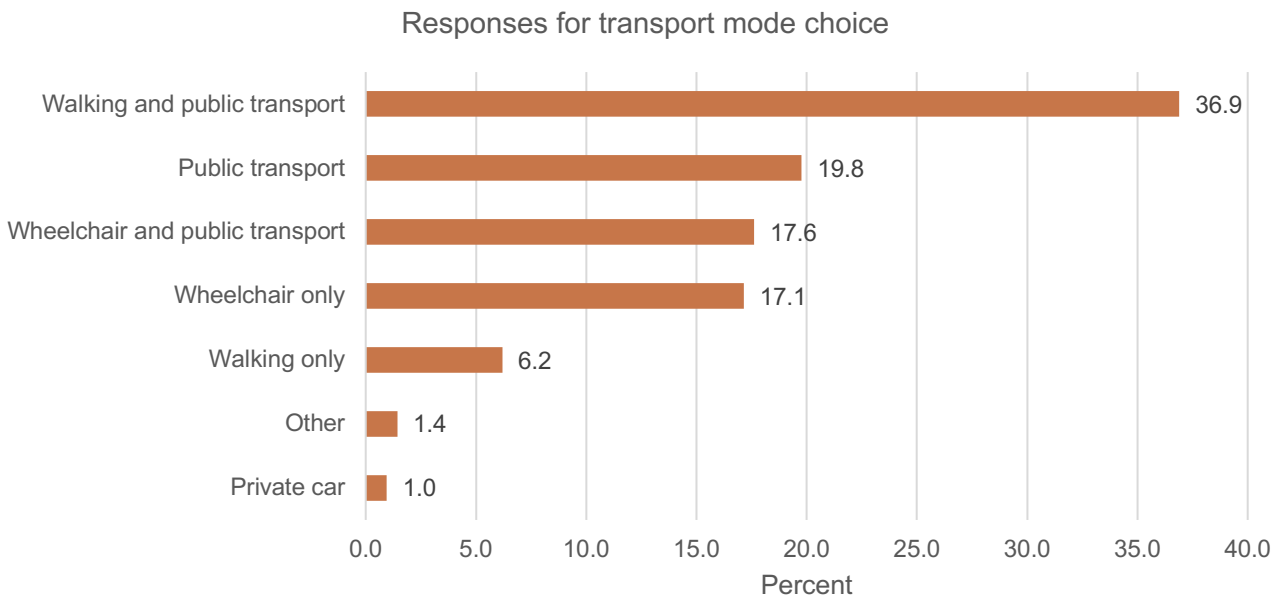
Similarly, another person with a disability also shared his challenges on the public transport as follows:

"So many times, because of my disability, the drivers and their assistants did not let me use the public transport. They usually respond to me as there exist no space or the space is not convenient for me, hence, they prefer to load one over the other to maximize their advantages."

Wheelchair users frequently claimed that when they try to take mini-bus taxis, the drivers pretend the taxi is full while they are calling for others to serve. During one of the FGDs, a participant from the Mekelle city Transport Administration confirmed the challenges wheelchair users face by iterating the problem arises

because of lack of awareness from the drivers and weaknesses in implementation of the available rules and regulations supporting people with disabilities.

Figure 3-5: Transport mode choice of people with disabilities in Mekelle city



Unlike wheelchair users, 79.6% of visually impaired people were found to take mini-bus taxis for their daily travels. The streets in Mekelle city were found to be unsuitable for visually impaired people and wheelchair users.

Similar to the challenges people with disabilities observed on streets and transport services, there are challenges on the public building entrances and exits too (Figure 3-6). During the questionnaire based survey, one respondent shared his daily experience on such problem as follows:

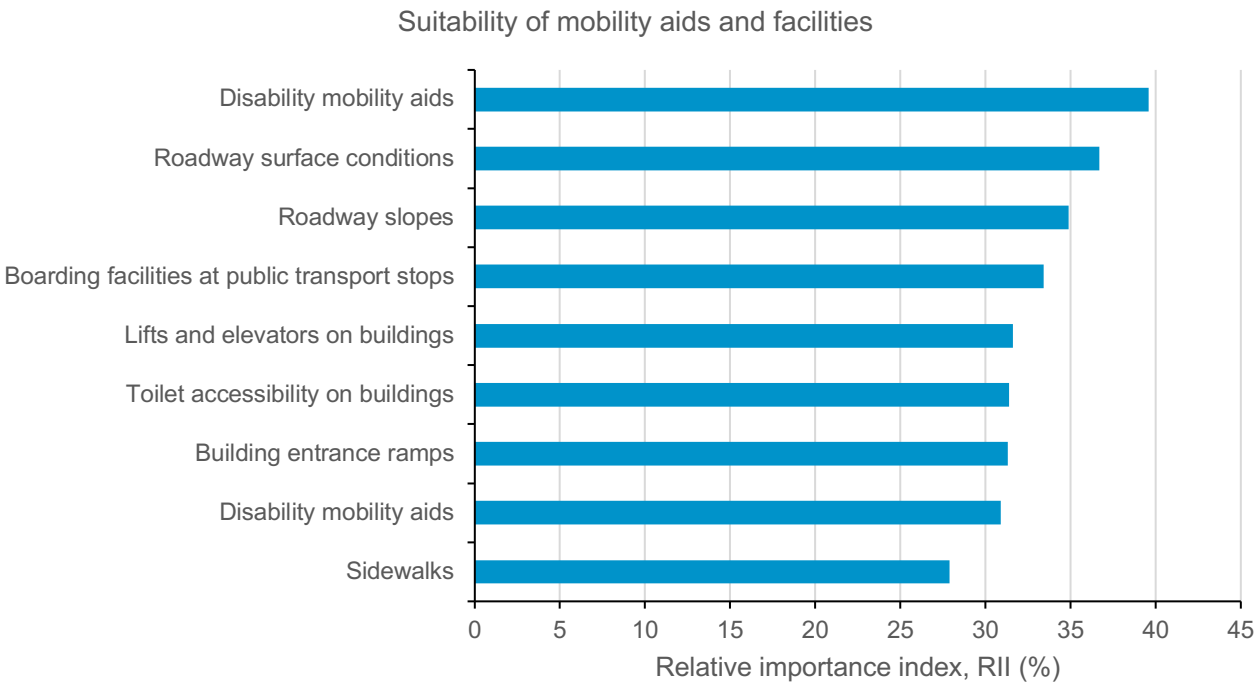
"I work in a bank. But at my work place, the existing entrance to the building has no ramp and it is not convenient for me. I usually ask the guards to carry me up to the entrance of the building."

Generally, the suitability of the existing public buildings and transport infrastructures and services are further illustrated and discussed in the next sub-sections.

3.2 Suitability of existing transport facility

The questionnaire based survey showed that the existing urban transport facility of Mekelle city is unsuitable for people with disabilities. This was revealed by below 50% RII values for suitability of the existing urban transport facilities (Figure 3-6). The first three most unsuitable facilities were road sidewalks (RII=27.9), disability mobility aids (RII=30.9%), and building entrance ramps (RII=31.3%) respectively. Other building facilities such as toilets and spaces (RII=31.4%), and lifts and elevators were found to be uncomfortable for people with disability's mobility.

Figure 3-6: Suitability of existing transport facility in Mekelle city

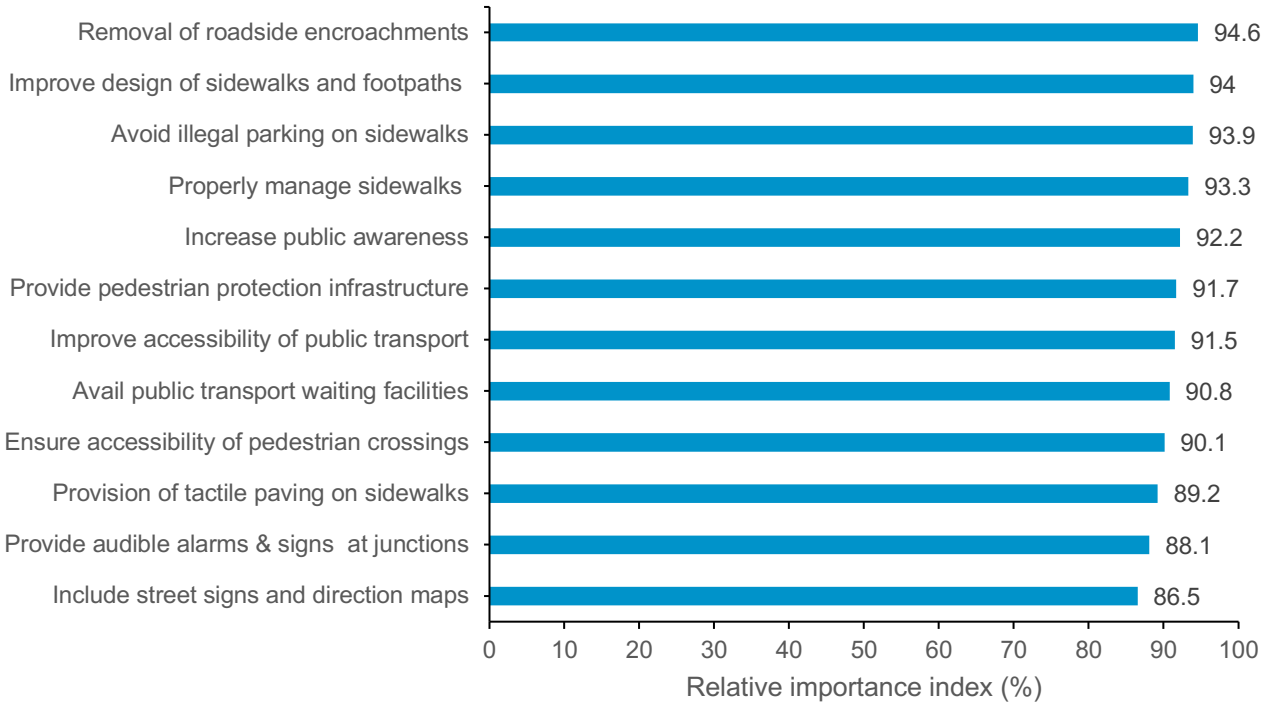


This study revealed that the existing transport facility is way below the standard considered to be an inclusive urban transport infrastructure for vulnerable groups. Therefore, the transport policy need to be revised so that an inclusive transport infrastructure can be put in place as soon as possible. This demands integrated action from governmental and non-governmental organisations to start implementing an inclusive infrastructure for future developments.

The measures that need to be implemented to improve the existing urban transport infrastructure in Mekelle city are detailed in Figure 3-7. Measures include on time removal of waste and avoiding roadside cafes and vendors (RII=94.6%), improving design of road sidewalks and footpaths (RII=94%) and avoiding illegal parking on road sidewalks. These were the top three priority measures that need to be implemented to improve the existing transport infrastructure in Mekelle city.

Furthermore, proper management of sidewalks, increasing public awareness on inclusive transport, improving public transport boarding facilities, providing public transport awaiting facilities, and ensuring smoothness and accessibility of public transport were still important measures with RII values greater than 90%. All other measures in Figure 3-2 have RII values of greater than 85%. This result indicates that there is a need for a paradigm shift in our current transport policy and strategy to bring about tangible results to improve the suitability of existing transport infrastructure in Mekelle city for people with disabilities.

Figure 3-7: Proposed measures to be implemented to improve suitability of existing transport facility in Mekelle city



3.2.1 Road infrastructure

Generally, the on ground assessment of the existing public transport infrastructures indicated that the main streets in Mekelle city were found to be poorly walkable. This was revealed by a result of 46.5 walkability index (WI) of the selected streets in Mekelle city which is below average walkable (Table 3-1).

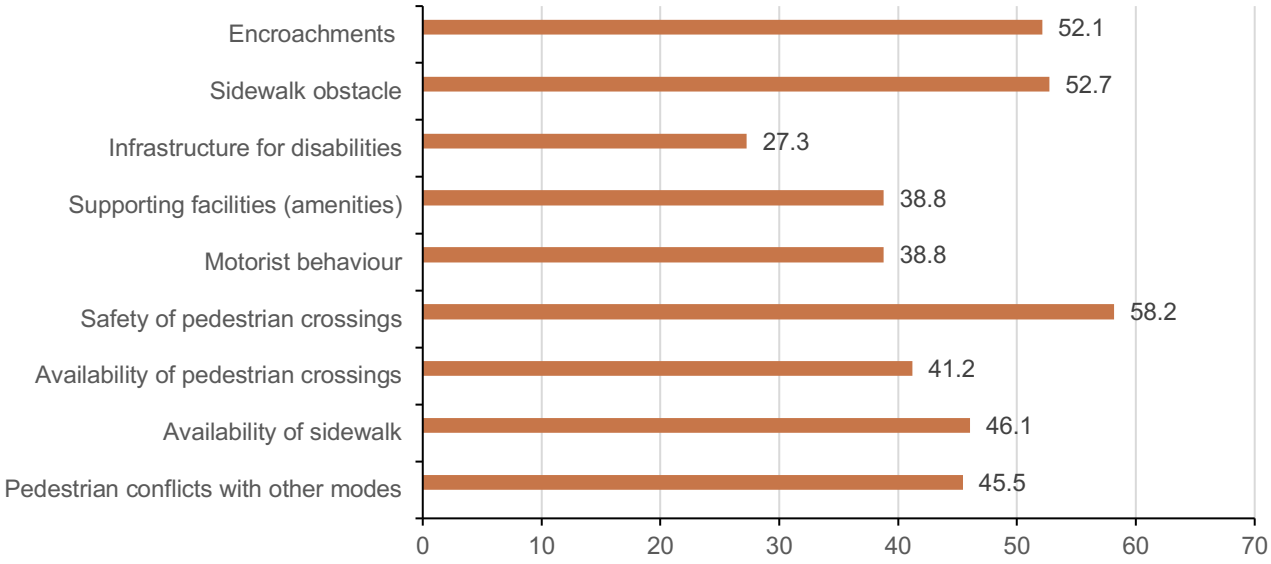
Table 3-1: Weighted average walkability index of Mekelle city streets

Parameter	Weight (W)	Walkability index (WI)
Pedestrian conflicts with other modes	5	2.3
Availability of sidewalk	25	12.0
Availability of pedestrian crossings	10	4.2
Safety of pedestrian crossings	10	6.0
Motorist behaviour	5	2.0
Supporting facilities (amenities)	5	2.0
Infrastructure for disabilities	15	4.3
Sidewalk obstacle	15	8.2
Encroachments	10	5.5
Total	100	46.5

Similarly, the assessment on the walkability of the main streets showed that the overall WI per parameter is below average (Figure 3-8). Sidewalks in the main streets of the city are available but they are full of roadside static obstacles and encroachments, are poorly managed and unclean as shown in Figure 3-11, Figure 3-12 and Figure 3-13. Trees, utility poles, and refuse bins were located arbitrarily on the sidewalk space, building access ramps, shops and cafes were seen encroached onto sidewalks, and open or broken manhole covers were seen in various areas.

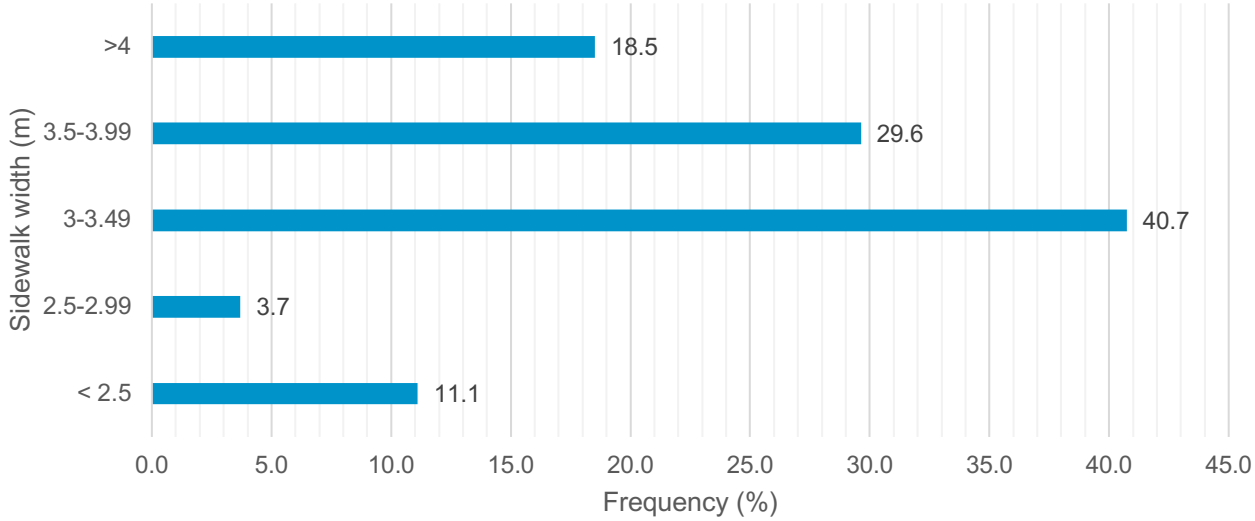
According to the assessment result (WI=27.3), the availability of infrastructures for people with disabilities are limited, unsafe and not in a usable condition. The availability of pedestrian crossings in the main streets is below average with a WI score of 41.2.

Figure 3-8: Average walkability index per parameter of Mekelle city streets



The study also incorporated sidewalk width assessment of the main streets. Most of the streets in the study had a width of below 3.5 metre (Figure 3-9).

Figure 3-9: Sidewalk widths of surveyed roads of Mekelle city streets



The sidewalk space was found to be poorly managed and static obstructions were located arbitrarily with no coordination. These obstruct paths for pedestrians and create safety hazards to visually impaired people. According to the effective sidewalk assessment result, only 19.2% of the assessed sidewalks were found to fulfil the recommended width of 2.4 metres which is required to allow two wheelchair users to pass each other. Of the sidewalks assessed in this study, 46.2% were found to have a sidewalk width usable to pedestrians of less than 1.2 metres, which is below the bare minimum required width to serve two pedestrians to pass each other (Figure 3-10).

Figure 3-10: Effective sidewalk widths of surveyed roads of Mekelle city streets

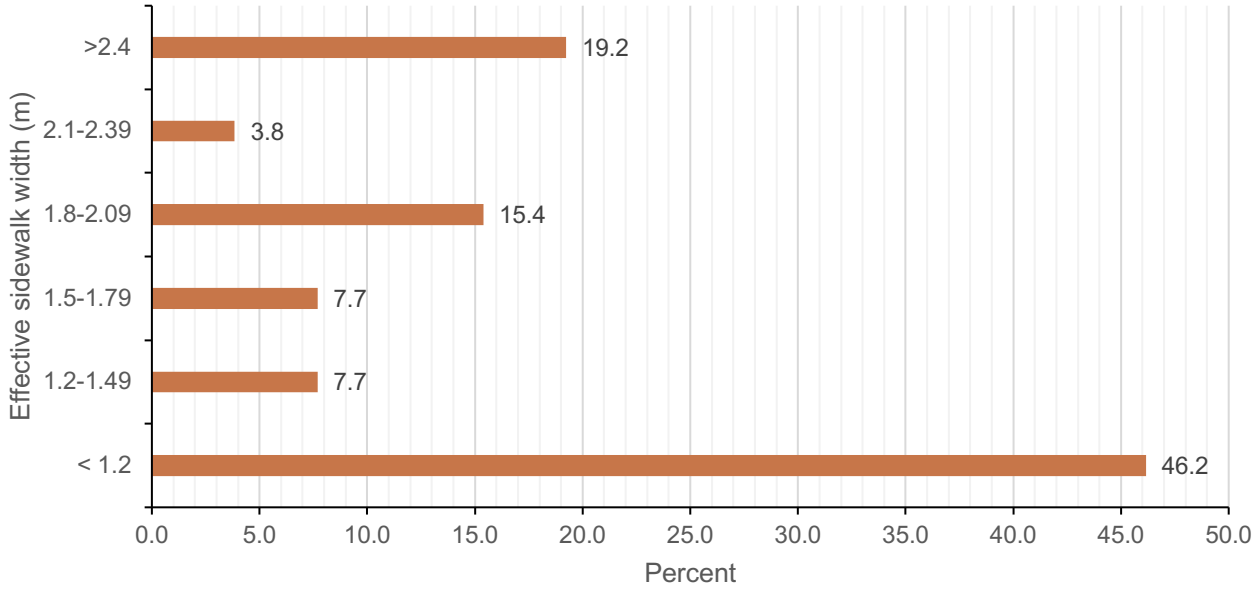


Figure 3-11: Sidewalk obstructions in Mekelle city main streets: Alula Street (a, b, c) and Adihawsi-Hawelti Dldi Street (d)

Figure 3-12: Obstacles and safety hazards on sidewalks of Mekelle city: extended ramp and tree with planter box (a); sidewalk café, planter container and street furniture (b); open manhole (c); and missed ramp, congested utility poles and perpendicular on street parking (d)

Figure 3-13: Poor sidewalk space management on the Agazi Street in Mekelle city

Assessments of cobblestone roads

Cobblestone roads in Mekelle city usually serve as shared paths for pedestrians and car drivers with no defined standards. They provide access to residential areas and sometimes connect the city neighbourhoods with the city centre. Cobblestone roads are unsafe, inconvenient, and uncomfortable to be used by pedestrians and especially by people with disabilities. They are rough, full of undulations, with no traffic regulations and a lack of tactile paving to help pedestrians with various impairments.

Cobblestone roads in Mekelle are often designed with a small ditch on either or both sides of the road and sidewalks are rarely available. On some roads, the construction of closed u-ditch drainage structure on either side of a road was observed.

These drainage structures are used to serve pedestrians even though they were full of level brakes or vertical cuts as they are primarily not constructed for pedestrians. Around a residential area used by war veteran disabled groups, known locally as “Sifra Jeganu” (Figure 3-14a and b), the disabled people were observed to walk around the area and access to the nearby asphalt roads using the u-ditch drainage covers serving as sidewalks.

Figure 3-14: Cobblestone roads in Mekelle city

3.2.2 Public transport and facilities

In Mekelle city, the two most popular modes of transport are the white and blue coloured mini-bus taxi and the auto rickshaw, locally known as “bajaj”. Company employee and student service buses are also available, but there is no bus transport that currently operates to serve the wider public. All of the public transport vehicles operating in the city were found to be inaccessible to wheelchair users and do not have any facilities to aid visually impaired people. Some vehicles do not even have space to carry wheelchairs. Public transport stops in the city are limited. No defined stops were observed in the streets of the city except shades with seating (Figure 3-15a), but with no access ramps, tactile guidance, and other supporting facilities for people with disabilities. The pavements and facilities around these shades are similar to the facilities throughout the streets.

Figure 3-15: Public transport stops and services in Mekelle city

3.2.3 Building facilities

Evaluation was carried out on a total of 44 public buildings in order to assess the physical environment (both the entrance and interior) of public buildings with regards to their accessibility for people with disabilities. This survey encompassed various types of institutions including hotels, commercial buildings, educational centres, health centres, and government offices. The findings of the survey revealed that, among the assessed hotels and educational centres, 80% and 90% respectively had access entrances and exits with ramps.

Only 14.3%, 40%, and 42.9% of the surveyed commercial buildings, health centres, and government offices respectively were found to be accessible. It was observed that more than 75% of the available entrance and exit ramps on hotels and commercial centres were constructed in inappropriate locations, with inadequate slopes, landing, and widths. Less than 50% of these ramps had supportive infrastructure, such as handrails and other facilities for people with disabilities. The results of the survey indicated that accessibility within the buildings themselves was limited, with more than 60% of all the surveyed institutions being inaccessible.

During the on-site assessment, in some buildings, the available ramps and stairs were seen to extend into the adjacent road sidewalks, becoming obstacles to pedestrians (Figure 3-16). During the workshops, FGDs, and key informant interviews this issue was raised repeatedly. One participant shared his experience as follows:

"There should be integration between the street design, city plan, and building regulations. The land directive contradicts the building regulation. For instance, the regulation demands basement parking in mixed-use and commercial buildings starting from a 200 square metre area. This is too difficult to implement, almost impractical. The question is that how far should a building be built if we are going to provide a ramp for people with disabilities.

This is the problem we have been facing as a building consultant. We want to provide basement for vehicle parking but at the same time we have to provide accessible ramps for people with disabilities. But, with limited building space, when we provide parking spaces, we have to make the ground floor of the building somewhat higher than the nearby street sidewalk making it difficult to provide accessible ramps for people with disabilities. The integration between the building and the street should be considered. As a result of the above problems, we are sometimes forced to design buildings with no or inaccessible ramps for people with mobility impairments."

Figure 3-16: Access ramps and stairs in some public/commercial buildings extended onto street sidewalks in Mekelle city

Through the on-site assessments made, public and commercial buildings built in wider plan areas were seen installing access ramps to the buildings poorly and significantly extended into the nearby sidewalks (Figure 3-16). The study did not consider this as a result of insufficient space but might be as a result of lack of awareness, poor design and regulation works. The limited space, together with the poor design works of buildings, are creating obstacles to pedestrians in general and in particular, for people with disabilities.

Figure 3-17: Access ramps, lifts and amenities in hotels in Mekelle city

3.3 Impact of poor urban transport infrastructure on the livelihoods of people with disabilities

The main causes and impacts of existing urban infrastructure on the livelihoods of people with disabilities were studied using a questionnaire with 423 respondents. The results of the questionnaire are summarised in Table 3-2 and Table 3-3. Table 3-2 shows that the problems that influenced people with disabilities' livelihood mainly arise from absence of disability friendly utilities on sidewalks, lack of or poor design of mobility aids, lack of resting spaces and the bad behaviour of drivers and their assistants.

The top three problems of urban transport infrastructure that negatively impact the livelihood of people with disabilities in Mekelle city are a lack of or poor accessibility features of public utilities, design and management problems of sidewalks with relative importance index (RII) values of 90.1%, 89.6% and 88.8%, respectively. Other factors such as lack of mobility aids (RII=86.9%), lack of resting spaces (RII=85.8%) and poor boarding facilities at public transport systems have also significantly affected the livelihoods of people with disabilities in Mekelle city.

The higher values of RII (>75%) in Table 3-2 indicate that existing infrastructure in Mekelle city is inconvenient for these people. This problem might have resulted from lack of attention to them in infrastructure planning, development and management from the infrastructure and transport sectors.

Table 3-2: Causes for poor urban transport infrastructure/facility for people with disabilities in Mekelle city

No	Infrastructure/facility condition	RII (%)	Rank
1	Lack of/poor accessibility features of public utilities	90.1	1
2	Sidewalk design problems	89.6	2
3	Poor management of sidewalks	88.8	3
4	Lack of wheelchair, walking stick, and other basic mobility aids	86.9	4
5	Absence of resting places for people with disabilities	85.8	5
6	Poor boarding facilities of public buses, taxes, rickshaws, etc.	85.4	6
7	Poor connectivity of road infrastructure to public spaces	84.2	7
8	Poor information and signage on road, and limited timing of traffic light	82.3	8
9	Poor design of mobility aids	82.2	9
10	Uncomfortable interior features of buses, taxes, rickshaws	80.6	10

Poorly developed and managed urban infrastructure in Mekelle city has negatively affected the livelihood of people with disabilities in the area. Based on the results summarised in Table 3-3, the primary impact of existing poor urban transport infrastructure in Mekelle city on people with disabilities were difficulties in accessing work, education and healthcare, elaborated with high value (87.5%) of SI.

The second ranked impact of poor urban transport infrastructure was limiting mobility and causing delays in personal and work related activities with SI values of 87.4% respectively. Some more significant impacts of poor urban transport infrastructure were physical barriers to access public services, safety and health problems, and discomfort during mobility, usage and rest for people with disabilities. In addition, the poor infrastructure has also limited the ability of people with disabilities to engage in social and political activities in the city (Table 3-2).

Table 3-3: Impacts of poor urban transport infrastructure on the livelihoods of people with disabilities' in Mekelle city. SI: severity index.

No	Types of impacts	SI (%)	Rank
1	Difficulties in accessing work, education and healthcare	87.5	1
2	Limit personal mobility	87.4	2
3	Delay in personal activities and work	87.4	2
4	Physical barriers to access public services and utilities	87.0	4
5	Safety and health problems	86.6	5
6	Discomfort during mobility, usage and rest	86.4	6
7	Lower daily/monthly incomes	83.8	7
8	Limit social interactions	82.3	8
9	Cause for unemployment	80.3	9
10	Quitting or resignation from work	74.6	10
11	Limit political and social engagements	72.8	11
12	Discriminations and/harassments	70.2	12

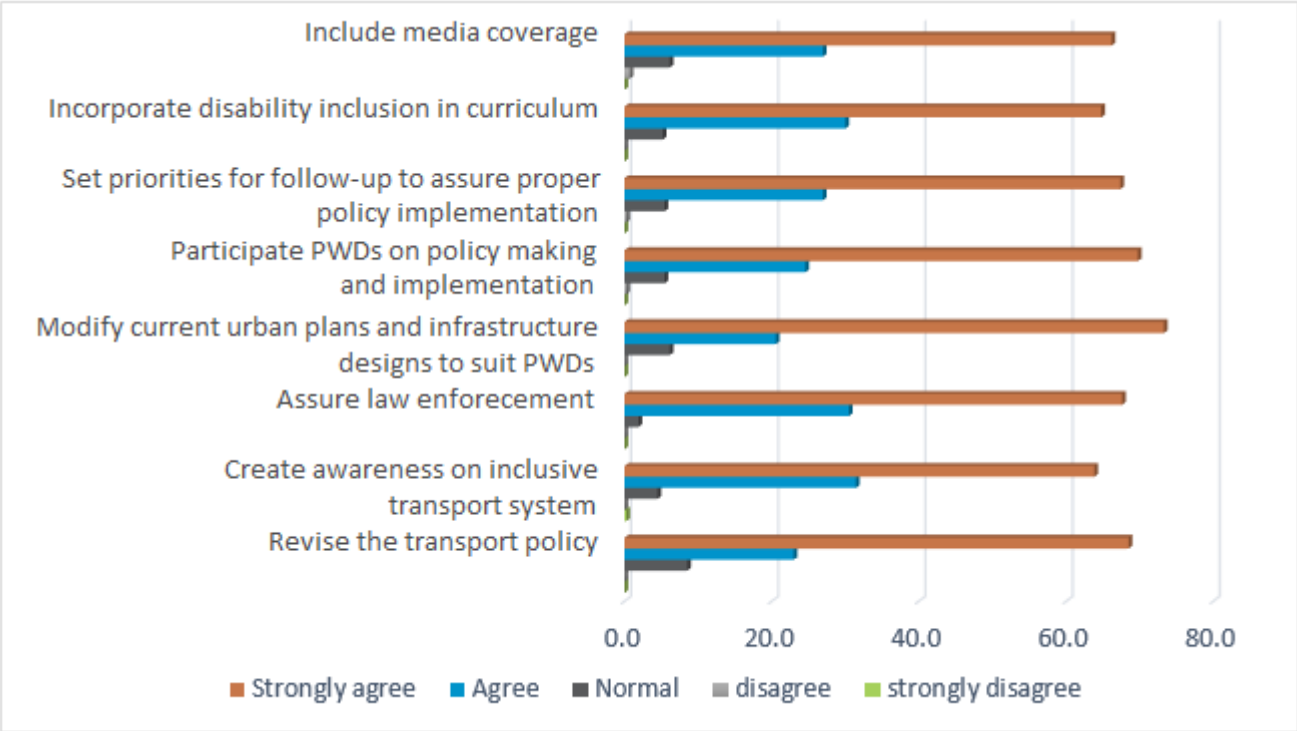
3.4 Assessment results on policy issues

Previous experiences of Ethiopia show that various offices have adopted international treaty and developed national policy, regulations and action plans to integrate people with disability needs and rights in different development and social affairs. This includes the Ministry of Labour and Social Affairs (MOLSA, 1999), Ministry of Education and Training Policy (1994), Building Proclamation No. 624/2009, National Plan of Action of Persons with Disabilities (2012-2021), National Transport Policy (2020), and Road Transport Proclamation No. 1274/2022.

This study found that the proclamation for building infrastructures is supported with directives and guidelines for people with disabilities. However, the understanding of the various stakeholders on these policies and proclamations is inadequate and the regulatory body lacks clear enforcement rules and regulations for effective implementation. Although policies and proclamations exist, no distinct inclusive directives and guidelines were found for the road infrastructure and transport services in Mekelle city or Tigray region.

The project investigated the need for revision and/or formulating new regulatory frameworks that enhance the mobility capability of people with disabilities in Mekelle city. More than 60% of the respondents strongly agree that the proposed measures in Figure 3-18 need to be implemented to minimise policy related problems.

Figure 3-18: Proposed measures of quantitative survey respondents



Involving people with disabilities in the preparation and implementation of policies at all levels plays a significant role in realising inclusive development. People with disabilities should participate during the planning, design and implementation of public infrastructures and services. Establishing strong disability unions and involving disability groups in the preparation of transport policy, strategies, plans and regulation at all levels helps to minimise various barriers that people with disabilities face. However, this study found that the participation of people with disabilities in policy preparation of the urban transport sector is limited.

During the questionnaire based survey, 36.4% of the respondents indicated people with disabilities do not participate in policy preparation. Furthermore, 49.7% of the respondents did not know if people with disabilities participated in policy formulation. These results show that the majority of people with disabilities do not believe they have an opportunity in the policy formulation process for the transport sector.

This was confirmed during the FGD sessions where representatives from the city administration confirmed that the participation of disadvantaged groups in policy formulation of the urban infrastructure and transport services was inadequate.

It is important to provide comprehensive training on these regulatory frameworks to the disabled society, the general public, as well as to the various staff members working in the city's road administration and other relevant institutions. This project result showed that the majority of disabled people (79%) did not ask other organisations beyond their union regarding the challenges of mobility due to their perception that they do not expect positive responses.

Table 3-4: Questionnaire-based survey results on policy issues in Mekelle city

S/N	Question	Response	Frequency	Percent
1	Do you think the disabled group of the society are involved in preparation of the urban transport policy?	Yes	59	13.9
		No	154	36.5
		I do not know	210	49.6
2	Are you a member of any disability association?	Yes	152	35.9
		No	271	64.1
2.1	If you are a member, do you know your association's activity?	Yes	72	47.4
		No	71	46.7
		I do not know	9	5.9
2.2	Do you think the efforts made to remove the existing PWDs barriers in the transport sector by your association so far is sufficient?	Yes	15	20.8
		No	57	79.2
3.3	Have you ever asked your association to act and minimize challenges on PWDs safety and mobility?	Repeatedly	14	19.7
		Sometimes	37	52.1
		Once	6	8.5
		Never	14	19.7
4	Have you ever asked to other organizations beyond your association regarding the challenges?	Yes	89	21
		No	334	79
4.1	Civic society representatives	yes	59	72.8
		No	22	27.2
4.1.1	Did you get adequate response from the civic society representatives?	Yes	1	1.7
		No	57	98.3
4.2	Wereda administration	Yes	73	88
		No	10	12
4.2.1	Did you get adequate response from the Wereda administration?	Yes	1	1.4
		No	72	98.6
4.3	Zone administration	Yes	44	57.1
		No	33	42.9
4.3.1	Did you get adequate response from zone administration?	Yes	0	0
		NO	44	100
4.4	Regional administration	Yes	43	56.6
		No	33	43.4
4.4.1	Did you get adequate response from the regional administration?	Yes	41	95.3
		No	2	4.7
4.5	Other disability associations	Yes	53	64.6
		No	29	65.4
4.5.1	Did you get adequate response from the disabilities associations?	Yes	3	5.7
		No	50	94.3
4.6	Federal representatives	Yes	22	30.6
		No	50	69.4
4.6.1	Did you get adequate response from the federal representatives?	Yes	0	0
		No	22	100
5	If your answer is 'No', what is the reason you don't asked to other organizations beyond your association regarding the challenges?	I do not know there exist a solution	51	15.3
		I do not believe I can get proper solution	110	32.9
		I do not get an opportunity to ask	99	29.6
		I do not know to whom I should ask	65	19.5
		Other	9	2.7

4. Conclusion and recommendations

4.1 Conclusion

This study investigated the safety and mobility challenges faced by people with disabilities in Mekelle city, northern Ethiopia. The main challenges and policy related issues with regards to urban transport infrastructure and services in Mekelle city are summarised below.

An overall assessment of the study indicated that the existing built urban environment in Mekelle city is not inclusive for people with disabilities. Building entrances and transport infrastructures are unsuitable. Among the various urban transport infrastructures and facilities needed and provided in Mekelle city, a lack of or poor accessibility, flawed design, and inadequate management of sidewalks were identified as major factors negatively affecting the safety and daily mobility of people with disabilities. Sidewalks and entrance ramps to public and commercial buildings were found to be particularly unsuitable for these people.

The main streets in Mekelle city were found to be poorly walkable, with narrow sidewalks cluttered with obstacles, encroachments and are poorly managed and unclean. Static obstructions are located on the sidewalk spaces arbitrarily, creating a cluttered sidewalk environment that obstructs the path for pedestrians, reducing effective widths, and creating safety hazards to visually impaired people. Paving surfaces are rough with no uniform paving material. The availability of infrastructures for people with disabilities in these facilities are limited, unsafe and not in a usable condition. The availability of pedestrian crossings in the main streets is below average.

All of the public transport vehicles operating in the city are inaccessible to wheelchair users and do not have any facilities to aid visually impaired people. Some of the vehicles do not even have space to carry wheelchairs. Public transport stops in the city are limited with no access ramps, tactile guidance, and other supporting facilities for people with disabilities. Entrance and exit ramps to hotels and commercial centres are often inappropriately located, with inadequate slopes, landings, and width.

The study also indicated that the widespread exclusion of people with disabilities in the built environment and transport services are not only the result of poor law enforcement or lack of directives and guidelines, but also due to a lack of awareness and professional ethics. People with disabilities in Mekelle city are facing serious safety and accessibility difficulties in the built environment and in getting transport services as a result of the existing institutional, physical, and attitudinal barriers.

An assessment of disability-related policies and regulations in Ethiopia indicated that, while there are disability-inclusive policies, proclamations, directives and guidelines for building infrastructures, the understanding of the various stakeholders on these policies and proclamations is inadequate and lacks clear enforcement rules and regulations for their effective implementation. Although policies and proclamations exist, inclusive directives and guidelines were not found for the road infrastructure and transport services in Mekelle city. The study also revealed that people with disabilities are often deprived of their rights to participate in policy preparation of the urban transport sector.

4.2 Recommendations

Based on the findings of the research work, the following recommendations are drawn:

- Public buildings and streets should be planned, designed, and implemented to ensure they are safe, accessible, and comfortable for people with disabilities, as well as for all pedestrians. Disability-inclusive public transport vehicles should be introduced to the city.
- The plan and design of public buildings, particularly in relation to basement parking spaces, must include disability-accessible ramps that do not extended into road sidewalks.
- Existing laws on buildings and public transport vehicles should be implemented and enforced properly to ensure safe accessibility and protect the rights of people with disabilities.
- Disability-inclusive directives and guidelines for the design, implementation and management of transport infrastructures should be formulated to realise the safe and easy mobility of the vulnerable groups.

- The formulation of policies and regulations in Mekelle city should include people with disabilities through their associations and advocacy groups. The proper implementation of the available rules and regulations in the city should be monitored and evaluated.
- Available policies, proclamations, directives, and guidelines should be easily available and well communicated among stakeholders and the wider community to reduce confusion.
- Enhance the integration of sectors in urban transport infrastructure planning, design, implementation and management stages.
- Awareness programmes targeting government personnel, architects and engineers, contractors, public transport providers and drivers, and the community should be arranged to highlight the importance of including people with disabilities in the urban built environment and transport services.
- Timely evaluation and revision of existing rules and regulations need to be realised to support the timely removal of barriers for people with disabilities. Rules and regulations should be binding and reflect responsibility and accountability of offices, organisations and individuals involved.
- Collaboration between government bodies, disability associations, architects and engineers, contractors, public transport providers, and other relevant stakeholders should be encouraged to foster inclusive urban built environment and transport services.
- The application of universal design principles for public spaces and transportation should be actively promoted.

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Appendix A: Design and Implementation Guide: Persons with Disability Inclusive Urban Transport Infrastructure

See separate attachment

Appendix B: Policy Brief

See separate attachment

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