

Declaration

I, Tigist Assefa, do here by declare that this research work entitled “**Evaluation of street vendor management at side walking in Addis Ababa**” is my original work, and it has not been submitted to any other university, organization or institutions for any degree, diploma and for other purposes. Material and information used in this study other than me owe appropriately acknowledged and cited.

Name: Tigist Assefa

Id No: GSE/7387/12

Signature -----

Date -----

Approval

As a member of the examiners board of the final Master's thesis open defense Tigist Assefa, we have read and evaluated the thesis prepared by Tigist Assefa entitled “**Evaluation of street vendor management at side walking in Addis Ababa**” and recommended to college of technology and built environment (CTBE), Addis Ababa University to accept the thesis for the fulfillment of requirements for the apart of degree of masters of science in urban planning.

Approved by Board of Examiners

_____ Advisor	_____ Signature	_____ Date
_____ External Examiner	_____ Signature	_____ Date
_____ Internal Examiner	_____ Signature	_____ Date
_____ Chair Person	_____ Signature	_____ Date
_____ Department of Urban & Regional Planning	_____ Signature	_____ Date

Acknowledgement

First of all, I would like to praise almighty GOD who gave endurance and strength in all my life. Then I would like to express my appreciation to my principal advisor Berhanu Woldetensae (PhD, Dipl-Ing) who gave me his critical, invaluable and constructive advices and suggestions while I was doing this thesis. I would also like to thank my families, my best friends and all individuals who participated in this paper work for their helps and encouragement. Finally, I would like to thank all of the people who have responded for questionnaire to give me vital information for my study.

Abstract

Urban centers like Addis Ababa witness substantial pedestrian traffic. However, due to inadequate sidewalks, pedestrian pathways often pose challenges. Given pedestrians' heightened vulnerability. This study was conducted with the main objective of evaluate sidewalk safety by focusing on the sidewalk environment as it relates to the comfort and convenience of pedestrian users Addis Ababa while utilizing sidewalks. In order to address the stated objective, the researcher applied mixed research approach. And also, the researcher used descriptive research design. The main data sources were both primary and secondary sources. In this researcher around 819 individuals across 21 selected sidewalks involved to discern user awareness. Based on the study findings, there were common challenges across sidewalks, including issues stemming from vendor activities, congested pedestrian traffic on most of Addis' sidewalks and interactions with vendors, alongside deficiencies in street network and sidewalk infrastructure, encompassing physical and user-related aspects. This causes high dissatisfaction among a majority of pedestrian road users leads to the conclusion that people are not attracted to sidewalks. This dissatisfaction may lead walking users to seek alternative forms of transportation in the future. To enhance sidewalks and foster a more walk able city, the study advocates leveraging the substantial demand for pedestrian infrastructure improvements, Insights gleaned from this research can inform city planners in devising strategies and foot traffic prioritizing pedestrian -friendly policy interventions with ensuring their effective implementation aimed to make Addis Ababa a bolstering sidewalk quality, thereby promoting pedestrian safety, comfort, and convenience urban environments for pedestrians ultimately enhancing the overall quality of life in the city.

Key Words: Safety, Comfort, Convenience, Sidewalk, Pedestrian Level of Service, Street Vending

Contents

Declaration	i
Approval	ii
Acknowledgement	iii
Abstract	iv
List of Figures	ix
List of Tables	x
List of Acronyms and Abbreviations	xi
CHAPTER ONE: INTRODUCTION	1
1. Background of the study	1
1.1. Statement of the problem	2
1.2. Objective of the Study	3
1.2.1. General objective	3
1.2.2. Specific objective	3
1.3. Research Questions	3
1.4. Significance of the study	4
1.5. Scope of the study	4
1.6. Organization of the study document	5
CHAPTER TWO: LITERATURE REVIEW	6
2. Introduction	6
2.1. Conceptual definition	6
2.2. Urbanization and transportation	7
2.3. History of sidewalk	8
2.4. Benefits of walking	10
2.4.1. Environmental benefit	10

2.4.2.	Health and social benefit.....	10
2.4.3.	Economic benefits.....	11
2.5.	Benefit of sidewalk in Addis Ababa.....	13
2.6.	Standards of sidewalks	14
2.6.1.	Zoning system.....	14
2.6.2.	Spacing of sidewalk	15
2.6.3.	Speed.....	15
2.7.	Dimensions of sidewalk management	18
2.8.	Sidewalk practice around the world	19
2.8.1.	Different research on evaluating and monitoring sidewalk	19
2.8.2.	Quality of sidewalk management.....	20
2.8.3.	Sidewalk in developed countries	21
2.8.4.	Organization in Addis Ababa that are involved sidewalk development.....	22
2.9.	Street vending	23
2.9.1.	Street vendors' profile.....	24
2.9.2.	Urban policies and street vending regulations	25
2.9.3.	Street vendors' strategies of resistance and negotiation	26
2.9.4.	Nature of sidewalk vending	27
2.10.	Best sidewalk vending in practice in Ethiopia.....	32
2.11.	Research gap	43
CHAPTER THREE: RESEARCH METHODOLOGY		44
3.	Introduction.....	44
3.1.	Description of the study area	44
3.2.	Research design	45
3.3.	Source of data	46

3.3.1.	Primary data sources	46
3.3.2.	Secondary data sources	46
3.4.	Sampling design	47
3.4.1.	Sampling population	47
3.4.2.	Sample size	47
3.4.3.	Sampling technique.....	47
3.5.	Method of data collection	48
3.6.	Data processing and analysis methods	48
3.6.1.	Data processing.....	48
3.6.2.	Data analysis	48
3.6.3.	Tools and software's	49
3.7.	Validity of the instruments	49
3.8.	Ethical considerations.....	49
CHAPTER FOUR: RESULT AND DISCUSSION		50
4.	Introduction.....	50
4.1.	Demographic characteristics and response rate of respondents	50
4.1.1.	Demographic characteristics of the respondents.....	50
4.1.1.1.	Sex ratio.....	50
4.1.1.2.	Age group.....	51
4.1.1.3.	Income level	52
4.1.1.4.	Health condition	52
4.1.1.5.	Pedestrian experience on the sidewalk.....	53
4.1.1.6.	Pedestrian road user trip purpose	54
4.1.1.7.	Respondents' car ownership.....	54
4.2.	Presentation and interpretation of the study findings	55

4.2.1.	Northern section (part) descriptive analysis	55
4.2.2.	Southern section (part) descriptive analysis	59
4.2.3.	Central section (part) descriptive analysis	61
4.2.4.	East section (part) descriptive analysis	64
4.2.5.	West section (part) descriptive analysis.....	67
CHAPTER FIVE: CONCLUSIONS AND RECOMMENDATIONS		70
5.	Introduction.....	70
5.1.	Conclusion and recommendations.....	70
5.1.1.	Conclusion	70
5.1.2.	Recommendations.....	71
5.1.2.1.	Recommendation for policy action and planners.....	71
5.1.2.2.	Suggestion for further studies	72
REFERENCES		73
Annex 1: Questionnaires.....		77
Annex 2: Sample Segment Maps of All Sections (Parts)		81
Annex 3: Sample Pictures Showing Side Walk Conditions of Addis Ababa.....		88
Annex 4: research Article		1

List of Figures

Figure 3.1: Map of the study area	45
Figure 4.1: Sex distribution of respondents	51
Figure 4.2: Age group of respondents.....	51
Figure 4.3: Income level	52
Figure 4.4: Health condition of the respondents	53
Figure 4.5: Condition of physical problems that disrupt walking of the respondents	53
Figure 4.6: pedestrian road user trip purpose.....	54
Figure 4.7: respondents car ownership	54
Figure 4.8: Northern section (part) sample yekatit 12 to US Embassy: N2	56
Figure 4.9: Relation of comfort with non-walking activities Lem hotel to Shola market N1	57
Figure 4.10: Southern section (part) i.e. Garment RA-Lebu Mebrat Haile	59
Figure 4. 11: Central section (part) i.e. St. George RA- Abuna Petros Sq – Yekatit 12	62
Figure 4.12: Eastern section (part) i.e. Hyatt Regency to Dembel city center	65
Figure 4.13: Western section (part) i.e. Benin Mosque To T/haimanot church: S1	67

List of Tables

Table 2.1: Standard for footpath and cycle	16
Table 3.1: Software's that the researcher used to process the collected data	49
Table 4.1: Northern section (part) segment samples	56
Table 4.2: Awareness of road users towards the walking environment	57
Table 4.3: Awareness of pedestrian road users towards the sidewalk environment.....	58
Table 4.4: Southern section (part) segment samples	60
Table 4.5: Awareness of pedestrian road users to directions the sidewalk environment	60
Table 4.6: Awareness of road users' comfort on sidewalk the walking environment activates...	61
Table 4.7: Central section (part) segment samples	62
Table 4.8: Awareness of pedestrian road users to direction the sidewalk environment	63
Table 4.9: Awareness of pedestrian road users' comfort on sidewalk environment	64
Table 4.10: Eastern section (part) segment samples	65
Table 4.11: Awareness of road users towards the sidewalk environment	66
Table 4.12: Awareness of pedestrian road users' comfort on sidewalk environment	66
Table 4.13: Western section (part) segment samples.....	68
Table 4.14: Awareness of road users towards the sidewalk environment	68
Table 4.15: Awareness of pedestrian road users' comfort on sidewalk environment	69

List of Acronyms and Abbreviations

AACRA:	Addis Ababa City Road Authority
AASHTO:	American Association of State Highway and Transportation
AARTB	Addis Ababa Road and Transport Bureau
AAC TPMO:	Addis Ababa City, Transportation Program Management Office
HCM:	Highway Capacity Manual
IRAP:	International Road Assessment Program
LRT:	Light Rail Train
RTA:	Road Transport Accident
TPMO	Transportation Program Management Office
TMA	Traffic Management agency
WHO	World Health Organization

CHAPTER ONE: INTRODUCTION

1. Background of the study

Rapid urban population growth is leading to massive unplanned spatial expansion on cities peripheries (Hiluf & Alemayehu, 2022). Ethiopia's rapid urbanization and the consequential economic, social, and spatial transformations, particularly in Addis Ababa, have marked significant progress in enhancing the city's economic and social landscape over the past decades. Despite these advancements, challenges persist in the quest for Addis Ababa to evolve into a more inclusive, safe, resilient, and sustainable city, aligning with the objectives outlined in the sustainable development goals (UN-Habitat, 2017).

Street vendors have an important role in the informal economy by making a significant contribution due to the initiation capacity of the modern organized sector to provide employment for the rapidly expanding labor force, a large number of persons try to create or find income opportunities (Amsale, 2017). Street vending in Ethiopia is a very important yet unbridled component of the informal sector. In the context of the current demographic dynamics & absence of sufficient job opportunities, street vending has become an important economic shelter to urban poor. The key reasons for joining street vending include the small capital requirement, lack of access to credit facilities and lack of suitable and commercially viable trading outlets (Elias, 2021).

According to Lawrence et al. (1995) cited in Nardos (2020), walking was the most common mode of travel due to the short distances required. Cities of long-ago were small, circular and compact providing a five kilometer or less distance to travel. The transportation infrastructure in Addis Ababa is notably deficient, resulting in a heavy reliance on non-motorized modes of transportation. Across the country, more than 60% of the population relies on walking as their primary means of transportation due to the inadequacy of other transportation options. Consequently, walking has become a fundamental aspect of daily life for many individuals, necessitated by the lack of viable alternatives. It is crucial to shift the focus of transportation planning away from prioritizing vehicle movement and towards prioritizing mobility for pedestrians. Urgent measures are necessary to ensure a more equitable allocation of road space, with an emphasis on facilitating walking and cycling as viable modes of transportation within

Addis Ababa and beyond. By redirecting attention towards pedestrian needs, urban planners can contribute to creating more accessible, sustainable, and inclusive urban environments.

This research endeavors to evaluate sidewalk and street vendor management within Addis Ababa, recognizing that the majority of residents rely on walking and public transportation, with personal motor vehicles being relatively scarce in the city. The scope of this research project encompasses an overview of walkway design and street vendor implementation in Addis Ababa, with a specific focus on the major thoroughfares such as PAS (Boulevard) street. It seeks to identify prevalent issues within this specific area, comparing the implementation against government standards and international benchmarks. However, the primary emphasis of this study lies in pinpointing the gaps within Addis Ababa's infrastructure through a case study approach. It aims not only to assess compliance with standards but also to scrutinize the various offices involved in the design, implementation, maintenance, and monitoring of sidewalks and street vendors in Addis Ababa. By doing so, it aims to uncover the underlying factors contributing to the subpar implementation of sidewalks throughout the city.

1.1. Statement of the problem

Despite the widespread use of walking as a primary mode of transportation in Addis Ababa, the city's sidewalks fail to provide a comfortable and encouraging environment for pedestrians. While some governmental efforts have been made to address this issue, the current state of sidewalks in Addis Ababa remains inadequate, disproportionately impacting the city's poorer populations (Nardos, 2020).

Several key problems contribute to the discomfort and lack of encouragement for walking in Addis Ababa. Firstly, the design, implementation, and maintenance of sidewalks are subpar, resulting in a lack of functionality and usability. Additionally, there is a notable absence of effective coordination between governmental offices responsible for sidewalk management and maintenance. Moreover, a general lack of awareness within society contributes to the improper disposal of waste on sidewalks, further diminishing their usability and appeal. Furthermore, the sidewalks in Addis Ababa are often occupied by informal commercial activities, primarily street vending, rather than serving their intended purpose for pedestrians (Ibid).

Issues such as inadequate shading, misplaced trees obstructing sidewalks, and substandard surfacing exacerbate the challenges faced by pedestrians in Addis Ababa. Collectively, these problems significantly detract from the functionality, safety, and appeal of sidewalks, hindering their effectiveness in promoting walking as a viable means of transportation within the city. In urbanized areas, costs are spiraling from the effects of traffic, particularly accidents, but also from congestion, consumption of public space, air pollution, noise and disruption of social and economic interaction. The lack of sidewalk space results in a high number of pedestrian fatalities. Therefore, the focus of the study was valuation of street vendor management at side walking in Addis Ababa to provide safe and comfortable travel for walkers.

1.2. Objective of the Study

1.2.1. General objective

The main objective of this study was to evaluate sidewalk safety by focusing on the sidewalk environment as it relates to the comfort and convenience of pedestrian users Addis Ababa while highlighting the importance of effective management in addressing these issues.

1.2.2. Specific objective

- i. To identify influence factors on sidewalk design in Addis Ababa.
- ii. To evaluate awareness of pedestrian road users' comfort while walking on sidewalk environment.
- iii. To analyze the management of street vendors in relation to sidewalk management.
- iv. To identify the roles of different offices and their contributions to creating a conducive pedestrian environment.

1.3. Research Questions

1. What factors influence sidewalk design in Addis Ababa?
2. What is the awareness of pedestrian road users comfort feeling while walking on the side environment?
3. What are the underlying gaps leading to the poor implementation of walkways in Addis Ababa?

4. What level of coordination is necessary among relevant stakeholders to improve sidewalk management?

1.4. Significance of the study

For the significance of this study extends beyond academic pursuits for the researcher, serving as a vital component for the partial fulfillment of the requirements for a master's degree in urban planning from the college of technology and built environment (CTBE).

Additionally, the study holds broader importance, to addressing the constraints observed in implementing walkway designs and highlight gaps in managerial procedures related to sidewalk and street vendor management in Addis Ababa. It has also a significance of pedestrian walkways in urban environments, particularly in mitigating transportation challenges within Addis Ababa. By elucidating the importance of walkways, the study underscores their pivotal role in enhancing the city's overall transportation infrastructure and pedestrian experience.

The result of this study can change practices in sidewalk planning and construction policies for formulation of appropriate policies for preventing, reducing and controlling the problem of street vendors. Overall, the study's insights have practical implications for urban planning and management strategies aimed at improving pedestrian infrastructure and addressing urban mobility challenges in Addis Ababa.

1.5. Scope of the study

The focal emphasis of this study is evaluation of street vendor management at side walking in Addis Ababa to make pedestrian safety and comfort on sidewalks situated. So, the study was delimited on assessment of the general implementation of sidewalks, evaluate the gap in implementation and design and identifying the different offices involved in implementing and maintaining walkways. For my study areas were chosen segments of pedestrian sidewalks between two crossings. The sidewalks to be studied have been selected throughout the different parts of Addis Ababa city in the north, south, center, east and west. All defined sidewalks are found along major roads traffic accidents involving pedestrians involve these sidewalks.

1.6. Organization of the study document

This study is organized in five main chapters with sections and sub sections as follows: chapter one, contains the introduction comprising of the background of the study, statement of the problem, objective of the study, research question, significance of the study as well as the organization of the study document. Chapter two, contains the literature review comprising the empirical, theoretical, conceptual framework of the study and a summary of the chapter. Chapter three, contains the research methodology, which has the introduction, study area, research design, source of data, sampling design, sampling design and procedures, methods of data collection, and method of data analysis techniques, ethical issues considerations and validations. Chapter four, comprises the data analysis, presentation and interpretation of the findings and includes the sub-sections: the introduction, questionnaire response rate, demographic characteristics, presentation and interpretation. Chapter five, covers the summary of the findings, discussion, conclusions and recommendation.

CHAPTER TWO: LITERATURE REVIEW

2. Introduction

The literature review presented in this chapter offers a comprehensive analysis of various scholarly works and research studies pertaining to walkway infrastructure, encompassing a holistic perspective. It delves into the standards required to establish high-quality walkways that effectively serve society's needs. Additionally, it explores the extent of demand for walkways within the city context, highlighting the gap between current provisions and societal requirements.

Furthermore, this section illuminates the societal and national benefits derived from well-implemented walkway infrastructure. By examining different case studies and successful implementations, valuable lessons and best practices are identified, offering insights that can be applied to the city of Addis Ababa.

The concept of good walkway implementation and its significance to urban environments are thoroughly elucidated, emphasizing the pivotal role that pedestrian infrastructure plays in enhancing the livability and functionality of a city. By synthesizing existing literature, this chapter aims to pinpoint key gaps in walkway provision and management while providing valuable insights into potential solutions to address the identified challenges.

2.1. Conceptual definition

Pedestrian: The term "pedestrian walkway" encompasses various expressions along roadways, including pedestrian walkway, sidewalk, footpath, and walkway, all used interchangeably within this paper. It is an individual walking or in a stroller or on a bicycle or using a wheelchair. It is well known that people have transported themselves by foot along designated or non-designated trails since the beginning of time. Walking is the most primitive form of transportation (Giraffine et al., 2008).

Street vending: is one of the most visible activities in the informal economy and it is found everywhere in the world, both in developed and developing countries. It has been defined in many different ways by various authors. However, a common theme among definitions is the location of trade. It may include trading without a permit, trading outside formally designated trading locations and non-payment of municipal/national taxes or self-allocation of shelter for

trading. Street vendors are known to play a very important role in the urban economy by providing employment, income and other items to the public. Street vendors are mainly those who are unsuccessful or unable to get standard jobs (Lyons and Snoxell, 2005 and Khadar, 2016). According to Berner et al, (2008), survival entrepreneurs do not start their business by choice but because they cannot find wage employment; they attempt to increase security and smoothen consumption rather than maximizing profits; for this purpose, they diversify their activities instead of specializing, they consider profits as part of their household income. Street vending provides essential goods and services to a wide range of population groups (UN-Habitat 2018).

Informal economy: activities and income that are partially or fully outside government regulation, taxation, and observation. This activity allows employers, paid employees, and the self-employed to increase their take-home earnings or reduce their costs by escaping taxation and social contributions (World Bank, 2016 cited in Amsale, 2017). According to Fluitman (1989), informal sector as a heterogeneous phenomenal which encompassed a wide variety of economic activities which tend to be overlooked in statistics including all sorts of manufacturing activities, construction, trade and commerce, repair and other services. For example, informal sector workers made beds, pots and pan, they repair watches, cars and radio, they write letters, lend money, run restaurant, and barber-shops in the side walk, they transport goods and people on their motorbikes, they sell fruits and cooking oil and cigarettes by the piece.

Sidewalks: space for pedestrian movement and access, with the objective of improving connectivity and promoting active mobility. It serves as a transition space between the city/public space and private establishments (World bank 2022).

2.2. Urbanization and transportation

Urbanization, driven by factors such as globalization and technological advancements, has undergone significant evolution over time. While its fundamental concept remains settlement and population concentration in urban areas, the definition and implications of urbanization have transformed with changing societal dynamics and rural advancements.

Historically, urbanization traces back to approximately 5000 years ago, with the emergence of settlements and villages in regions like Mediterranean Europe and China. Since then, the urban

population has steadily increased, drawn by the allure of job opportunities, healthcare services, and technological advancements unavailable in rural settings. Urbanization manifests various characteristics, including industrialization, technological advancement, globalization, and advanced mobility infrastructure. Industrialization is a defining feature, with urban areas often serving as hubs for manufacturing and production activities. Moreover, urban centers are characterized by technological sophistication and connectivity, facilitated by globalization and the availability of advanced mobility options.

Transportation infrastructure plays a pivotal role in shaping urbanization dynamics, encompassing roads, transit systems, and pedestrian walkways. Historically, movement within cities predominantly relied on walking, exemplified by ancient European and East Asian cities where a significant portion of urban travel occurred on foot, ranging from one-third to two-thirds of city traversals. However, this pedestrian-centric model differs from the transportation patterns observed in more recently developed Australian, Canadian, and American cities, which prioritize vehicular travel due to their modernized infrastructure and layout.

The interplay between urbanization and transportation underscores the intrinsic link between urban development and mobility infrastructure. As cities evolve and expand, the demand for efficient and sustainable transportation solutions becomes increasingly paramount, shaping the trajectory of urban growth and societal dynamics. Understanding these dynamics is critical for informing urban planning and transportation policies geared towards fostering inclusive, accessible, and sustainable urban environments.

2.3. History of sidewalk

The history of sidewalks dates back approximately 4000 years, with their implementation varies across different countries and regions over time. For instance, the city of Corinth in Greece initiated sidewalk construction as early as the 4th century BCE, while the Romans referred to sidewalks as "semitae" (Anastasia & Renia, 2009). However, during the Middle Ages, pedestrians and wagons shared narrower roads, suggesting a lack of separation between pedestrian and vehicular areas (Georgian, 2011).

In 1671, following the Great Fire of London, efforts to separate pedestrians from main roads gained traction, leading to the establishment of footways in London. These footways featured

distinct paving materials, notably cobblestones, and were implemented across the city (Linda Clarke, 2002).

In the United States, sidewalk construction was subject to individual property owner decisions until 1917, wherein property owners were responsible for the construction costs associated with sidewalks in front of their properties. The emergence of sidewalks in Addis Ababa lacks precise documentation; however, it is likely related to earlier master plans of the city.

The evolution of sidewalks reflects changing urban landscapes and transportation needs over centuries, with varying approaches to pedestrian infrastructure evident across different historical contexts. Understanding the historical development of sidewalks provides valuable insights into urban planning practices and infrastructure development, informing contemporary efforts to enhance pedestrian mobility and safety in urban environments.

Pedestrianism: The dynamics of space allocation between pedestrians and vehicles within urban environments have a rich historical backdrop. Between approximately 1880 and 1960, a period characterized by vehicular emerged. During this time, special spaces were designated for vehicles, leading to disconnected urban patterns with limited attention to pedestrian needs.

In contrast, the era spanning from 1960 to 1980 witnessed a paradigm shift prompted by the adverse effects vehicles brought to urban spaces. The rise of anti-car movements advocated for the elimination of vehicles from urban areas, emphasizing the allocation of separate spaces for pedestrians and the expansion of walkways.

Recognizing that urban development is intricately linked to transportation, the period from 1980 to 2000 prioritized equilibriumization. This approach aimed to adjust vehicle movements, enhance compatibility between vehicles and pedestrians, and achieve a balance in traffic dynamics.

In more recent years, spanning from 2000 to the present, efforts have intensified to mitigate conflicts between vehicles and pedestrians through controlled vehicle usage. Various measures are being implemented to promote safer and more harmonious interactions between vehicles and pedestrians within urban spaces.

The evolution of pedestrianism reflects changing societal attitudes, urban planning philosophies, and transportation priorities over time. By understanding historical trends and contemporary challenges, urban planners and policymakers can adopt informed strategies to create pedestrian-friendly environments that prioritize safety, accessibility, and sustainability for all road users.

2.4. Benefits of walking

2.4.1. Environmental benefit

In contemporary discourse, sidewalks, pedestrian-only roads, and other non-motorized transportation methods are gaining renewed attention due to their significant contributions to mitigating climate change. Well-designed sidewalks play a crucial role in encouraging individuals to opt for walking over motorized transportation, thereby reducing car usage and mitigating vehicle miles traveled, which in turn minimizes carbon emissions. Studies examining sidewalks and transit investments in Seattle neighborhoods have revealed substantial reductions in vehicle travel, ranging from 6 to 8%, and corresponding reductions in CO₂ emissions, ranging from 1.3 to 2.2% (Washington State, 2011). Additionally, sidewalks offer environmental benefits by promoting the integration of green infrastructure elements, such as trees and vegetation, along roadways. Contemporary urban design standards often mandate the inclusion of trees and vegetation for shading purposes, both enhancing the aesthetic appeal of sidewalks and contributing to environmental sustainability by mitigating heat island effects and promoting biodiversity.

2.4.2. Health and social benefit

Walking stands as the most fundamental form of transportation, yet its significance in daily life is often underestimated. It offers free, immediate, and healthful means of motion, contributing to overall well-being and energy efficiency. Evidence suggests that when neighborhoods and communities are designed to support walking trips, there is a notable increase in community interaction and involvement. Furthermore, the benefits extend to reduced transportation costs for vulnerable demographics such as the elderly, children, the economically disadvantaged, and the physically challenged. Additionally, fostering a walking-friendly environment enhances the success of transit systems.

Defined by Southworth (2005), walkability refers to the degree to which the built environment facilitates and promotes walking by prioritizing pedestrian comfort, safety, and visual interest throughout the network. By creating walk able communities, there is a notable reduction in roadway congestion, enhancing mobility for all individuals.

By promoting walking as a viable mode of transportation and designing urban environments that prioritize pedestrian infrastructure, cities can reap significant health and social benefits. These include improved physical and mental well-being, enhanced community cohesion, and reduced transportation inequities, contributing to the creation of healthier, more inclusive, and vibrant urban spaces for all residents.

2.4.2.1. Safety

Sidewalks play a crucial role in enhancing pedestrian safety within urban environments. Research conducted by the Florida Department of Transportation highlights the significant impact of sidewalks on accident reduction. According to findings published in 2005, walking alongside roadways poses an 88.2% higher risk compared to walking on separate sidewalks.

Moreover, the Crash Reduction Factor (CRF), utilized to estimate the anticipated reduction in crashes over a specific period, underscores the efficacy of sidewalks in mitigating pedestrian accidents. Research commissioned by the Florida Department of Transportation revealed that the installation of sidewalks resulted in an average CRF of 74% in Florida.

These findings underscore the critical importance of sidewalks in promoting pedestrian safety and reducing the incidence of accidents. By providing dedicated pedestrian pathways separated from vehicular traffic, sidewalks contribute significantly to creating safer and more pedestrian-friendly urban environments. As cities prioritize investments in pedestrian infrastructure, they can enhance safety for pedestrians of all ages and abilities, fostering healthier and more livable communities.

2.4.3. Economic benefits

Sidewalks offer significant economic advantages, particularly for disadvantaged populations, by serving as an accessible means of transportation. Additionally, the reduction in accidents associated with pedestrian infrastructure contributes to economic savings. In many cities, including Addis Ababa and numerous African urban centers, accidents impose a considerable

economic burden, impacting the city's GDP. By minimizing accidents through improved pedestrian infrastructure, cities can mitigate these costs and redirect resources towards economic development initiatives.

Furthermore, the economic benefits of sidewalks extend to reduced congestion and fuel consumption. As congestion decreases, the amount of fuel wasted due to traffic congestion also diminishes, resulting in substantial cost savings for individuals and businesses alike. Additionally, the enhancement of public health outcomes associated with increased walking can have ripple effects on economic productivity. A healthier population is more productive, contributing to overall economic growth and prosperity.

By investing in pedestrian infrastructure and promoting walking as a sustainable mode of transportation, cities stand to realize significant economic gains. From reducing accident-related expenses to curbing fuel wastage and enhancing productivity, sidewalks play a pivotal role in fostering economic resilience and prosperity within urban environments.

2.4.3.1. Time savings

Despite the perception that sidewalks may appear time-consuming compared to motorized transportation, they play a crucial role in saving time by mitigating congestion. In urban environments where sidewalks are absent, pedestrians are compelled to walk alongside roadways, impeding the smooth flow of vehicular traffic. This phenomenon exacerbates congestion, resulting in delays for motorists and pedestrians alike.

By providing dedicated pathways for pedestrians, sidewalks effectively separate pedestrian and vehicular traffic, facilitating smoother traffic flow and reducing congestion. As a result, sidewalks contribute to overall time savings for commuters by minimizing delays caused by traffic congestion.

Furthermore, sidewalks promote efficient and predictable movement for pedestrians, enabling them to navigate urban environments safely and expeditiously. By allocating space specifically for pedestrian travel, sidewalks enhance overall transportation efficiency and contribute to a more seamless urban mobility experience for all road users.

In essence, while sidewalks may appear to add time to pedestrian journeys, their role in reducing congestion ultimately results in significant time savings for both pedestrians and motorists, enhancing the overall efficiency of urban transportation systems.

2.5. Benefit of sidewalk in Addis Ababa

Addis Ababa's road safety history is very peculiar and differs significantly from global trends, the African context, and even from Ethiopian reality. In the last ten years, the yearly death toll related to traffic accidents has risen by almost 50%, going from 395 in 2009 to 585 in 2019: an increase of almost 200 fatalities in 10 years. The problems in pedestrian mobility in Addis Ababa span across design, construction, maintenance, and risky behaviors from road users especially drivers and pedestrians (World Bank 2022). Research conducted by UN-Habitat (2014) as part of a sustainable transport project projected the population of Addis Ababa to reach 5.5 million by 2022. Despite the high volume of pedestrian traffic, a report by the Transport Research Laboratory in 2012 revealed that 60% of Addis Ababa's Road networks lack footpaths, indicating poor provision for non-motorized transportation. This deficiency, coupled with related issues, has led to a significant increase in the annual accident rate, growing at 12% per annum. According to statistics from the Ethiopian Road Authority (ERA), 1,700 lives are lost and 7,000 individuals are injured annually due to road accidents in Ethiopia. These figures likely underrepresent the true extent of accidents, as many incidents go unreported.

A study on urban transport in 2005 further highlighted that 90% of all accidents in Addis Ababa involve pedestrians, impacting their ability to be productive. Males are particularly affected, both directly and indirectly, due to moral and economic factors. Road accidents in Ethiopia result in a loss of 0.8% of the Gross National Product (GNP), according to the Ethiopian Road Authority.

In response to these challenges, the Ethiopian government has prioritized non-motorized transportation systems, as evidenced by the 2017/18 structural map of Addis Ababa. This strategic plan includes the integration of pedestrian and cycling lanes across the city, particularly in key commercial and market areas. Moreover, designated non-motorized roads and overpass pedestrian walkways are being implemented, alongside the study of 19 pedestrian crossings along the east-west and north-south Light Rail Transit (LRT) route.

While these initiatives hold promise for addressing some of the challenges, the focus of this thesis is on the gaps in implementation and maintenance of sidewalks. By identifying these gaps and proposing potential solutions, this research aims to contribute to the improvement of pedestrian infrastructure in Addis Ababa, ultimately enhancing road safety, promoting economic productivity, and fostering a more sustainable urban environment.

2.6. Standards of sidewalks

2.6.1. Zoning system

According to UN-Habitat (2018) standardized sidewalks adhere to a zoning system comprising three distinct zones: the frontage zone, the pedestrian zone, and the furniture zone. Each zone serves a specific function aimed at ensuring the effective operation of the footpath and enhancing the overall pedestrian experience.

The frontage zone: situated closest to buildings or properties, serves as a buffer between pedestrian traffic and private spaces. It may include features such as building entrances, outdoor seating areas, or display racks for merchandise.

The pedestrian zone: constitutes the central area of the sidewalk designated for pedestrian movement. It should be wide enough to accommodate the anticipated volume of foot traffic comfortably and safely. Clear signage, pavement markings, and tactile indicators may be utilized to delineate pedestrian pathways and ensure smooth navigation.

The furniture zone: positioned adjacent to the curb or roadway, accommodates street furniture, utilities, and landscaping elements. This zone may feature benches, trash receptacles, bicycle racks, trees, and other amenities aimed at enhancing the aesthetic appeal and functionality of the sidewalk environment.

By delineating these zones and adhering to standardized guidelines, sidewalks can be designed and implemented in a well-mannered and area-specific manner, thereby promoting comfort, continuity, and safety for pedestrians. The adoption of such standards contributes to the creation of pedestrian-friendly urban environments conducive to active mobility and community engagement (UN-Habitat 2017/18).

2.6.2. Spacing of sidewalk

According to UN-Habitat (2017), spacing of sidewalks varies based on the specific characteristics of the area. Different areas, such as residential, commercial, and high-density commercial zones, require varying widths to accommodate pedestrian flow and urban activities effectively. In residential areas, the total width of the sidewalk is typically 3 meters. This allocation comprises a 0.5-meter frontage zone, a 2.0-meter pedestrian zone, and a 0.5-meter furniture zone. This configuration ensures sufficient space for pedestrian movement while providing room for street furniture and landscaping elements.

In commercial areas, the sidewalk width increases to 4 meters. This wider allocation includes a 1-meter frontage zone, a 2.5-meter pedestrian zone, and a 0.5-meter furniture zone. The additional space accommodates higher pedestrian volumes and supports commercial activities such as outdoor seating or merchandise displays. For high-intensity commercial zones, the sidewalk width expands to at least 7 meters. This broader allocation comprises a 1.5-meter frontage zone, a 4-meter pedestrian zone, and a 1.5-meter furniture zone. The increased width facilitates the movement of large crowds and supports bustling commercial activities characteristic of high-density urban centers (Ibid).

2.6.3. Speed

The emphasis on maximizing the utilization of non-motorized transportation stems largely from the imperative to reduce the alarming rise in transportation-related accidents. Regulating vehicle speeds is paramount in fostering the viability and convenience of non-motorized modes of transport. Achieving this entails a fundamental reevaluation of street space allocation to accommodate all modes of transportation effectively. Two primary approaches can facilitate this reevaluation. Firstly, systematically reducing traffic on smaller streets is essential. This necessitates the creation of safe environments that facilitate the harmonious coexistence of pedestrians and other modes of transportation. Implementing traffic calming measures, such as speed humps or chicanes, can help regulate vehicle speeds and prioritize pedestrian safety in residential and urban settings (UN-Habitat 2017/18).

Secondly, providing segregated infrastructure for pedestrians on larger streets is imperative. By creating dedicated pedestrian pathways separated from vehicular traffic, cities can enhance pedestrian safety and promote active mobility. Pedestrian-friendly enhancements may include

widened sidewalks, pedestrian islands, and designated crosswalks equipped with traffic signals (Ibid). By rebalancing street space to accommodate the diverse needs of pedestrians and other road users, cities can foster safer, more accessible, and sustainable urban environments. Through strategic speed regulation and the provision of segregated pedestrian infrastructure, non-motorized transportation modes can be integrated seamlessly into the urban fabric, promoting pedestrian safety and enhancing overall mobility (UN-Habitat, 2017).

Table 2.1: Standard for footpath and cycle

Category	Standard for footpath	Standard for cycle
Height	Footpath should be elevated above the carriageway. With a curb height of no more than 150mm	Cycle tracks should be constructed above the carriageway (at least 100mm) to allow for storm water run off.at property access point, the cycle track remains at the same level and vehicle access is provided by a ramp in the buffer.
Surface	Footpath should have flat walking surface allowing for proper drainage and preventing puddles from forming.	For a comfortable riding surface, cycle tracks require a smooth material-asphalt or concrete, but not paver blocks.
Property entrances	Footpath must be continued at property entrances for uninterrupted pedestrian movement. The height of the footpath should remain the same with ramps for vehicles. Bollards should be installed to prevent vehicles from parking on footpath with spacing of 1.2m between at least one set of bollards to allow	Footpaths that maintain a constant level through property entrance are convenient pedestrians to use. Vehicles use ramp

	wheelchairs to pass. And for car entrance spacing 4m Since cars are heavier than people the pavement at property entrances should be more robust than other sections of the footpath.	helping to reduce speed
Shade	Continuous shades from street trees are very important they help by reducing the street temperature, making it comfortable for people to walk, cycle or gather for social activities. Even during summer afternoon.	Shade enhances the walking environment. Street designs should take into account the position of existing trees so that they can be retained during construction.
Lighting	Adequate that is specifically designed for the specific walkway helps to reduce the perceived and actual threat of harassment and criminal activity thereby encouraging walking activity.	Continuous lighting improves safety and personal security.
Vending	Street vending activity involves the selling of articles either directly or from a stall or standing vehicle or at a footpath restaurant or take– away service facility on public roads and public places... The furniture zone of the footpath or a bulb out in the parking lane are ideal locations for vending	Footpaths should be designed such that there is sufficient space for vending outside of the pedestrian zone.
Bus stops	Well-designed bus stops offer a comfortable, weather protected waiting area for public transport passengers while leaving clear space for pedestrians’ movement behind the shelter. The bus stop should be placed in the furniture zone, leaving at least 2.0m of clear width on the footpath. Bus stops should be placed adjacent to the bus’s linear line of travel so that the bus does not need to pull over to the left. Bus bays should be avoided because they increase travel time for bus users. The	They should be located on a bollard in parking lane. passengers can board directly from the curb rather than stepping into the street

	position of the bus stop should always leave clear space for walking behind the shelter.	
Parking pays	On street parking may be allowed on streets where all the other requirements for public transport and non-motorized travel have been met. The material for parking areas should be different and parking bays should be avoided at intersections. Where there is insufficient space, the footpath should be extended through a bulb out in the parking lane. The standard width for a parallel parking is 2m and this type of parking preferred in order to save space.	

Source: UN-Habitat 2018

2.7. Dimensions of sidewalk management

The term "dimensions" in the context of sidewalk management encompasses various aspects or characteristics that significantly contribute to the creation of high-quality pedestrian walkways. Each dimension plays a crucial role in ensuring accessibility, safety, comfort, and functionality for pedestrians. Below are some key dimensions outlined.

Accessibility and mobility: Priority should be given to providing accessible sidewalks and facilities for users of all ages and physical abilities. Sidewalks should offer clear, unobstructed paths of suitable width to accommodate pedestrian flows and minimize clutter.

Network of continuous sidewalks: Establishing a network of continuous sidewalks with dedicated space for pedestrians, separate from cyclists and motorized vehicles, fosters healthier, more vibrant, and resilient communities.

Design for safe crossings: Pedestrian-friendly design considers factors such as crossing opportunities, street width, intersection geometry, visibility, and signal timing to ensure safe crossings, especially for vulnerable pedestrians.

Place making: Sidewalks serve as public spaces for social interaction. Designing sidewalks to be inviting with amenities like seating, trees, cafes, public art, and lighting enhances community engagement and accommodates diverse needs.

Design for comfort: Sidewalks should be adequately wide and designed for year-round use, considering factors like shade, protection from the elements, and buffer zones between pedestrians and traffic to ensure comfort and safety.

Greening infrastructure and storm water management: Incorporating passive storm water measures, such as rain gardens and permeable paving, into sidewalk design helps manage storm water runoff and enhances the street environment's quality and sustainability.

Design for efficient maintenance: Utilize durable materials and designs that are easy to maintain, while ensuring adequate access to utilities for maintenance purposes. Coordination of repairs and upgrades minimizes disruptions to pedestrian activities.

Coordination with different bodies: assigning responsibility for sidewalk management to a single body facilitates accountability and coordination among stakeholders involved in designing, implementing, monitoring, regulating, and enforcing sidewalk activities.

2.8. Sidewalk practice around the world

2.8.1. Different research on evaluating and monitoring sidewalk

Professionals and various governmental and non-governmental organizations worldwide are dedicated to enhancing urban environments, particularly focusing on pedestrian level of service concerning safety, comfort, accessibility, and visual integration with surrounding functions, especially streets.

Several practices and research efforts have been undertaken globally to evaluate and monitor existing sidewalks to ensure they effectively serve society beyond meeting basic standards. The following examples highlight the extent to which pedestrian walkability can be improved and emphasize the diverse approaches taken in different contexts:

Development of pedestrian level of service in Greek urban areas: This research aims to enhance the quality of mobility for pedestrians in Greek urban settings. It involves the application of various models specifically formulated for assessing pedestrian level of service.

The research evaluates and selects an appropriate model for evaluating pedestrian level of service along streets in Thessaloniki.

Walkability and pedestrians in Malang city's Emerging Business Corridor: This study focuses on improving existing sidewalks along Sukarno-Hatta Street in Malang, Indonesia, which faces challenges due to rapid economic growth and population increase. The research aims to assess the walkability of Sukarno-Hatta Street based on criteria outlined by the U.S. Department of Health and Human Services. These criteria include pedestrian facilities, conflicts, crosswalks, maintenance, lane width, accessibility, aesthetics, and shading. The research seeks to identify pedestrian walkway improvements based on pedestrian perceptions and international standards for walkability.

These examples underscore the global effort to enhance pedestrian infrastructure and walkability in urban areas. By adopting diverse methodologies and considering local contexts, cities worldwide strive to create safer, more accessible, and aesthetically pleasing pedestrian environments that promote health, well-being, and community connectivity.

2.8.2. Quality of sidewalk management

Implementing policies and laws related to sidewalk management and complete streets can be challenging, often requiring significant effort to move from formulation to practical implementation. Examples from various cities in the United States illustrate the complexities involved in managing transportation policies effectively:

1. **Enforcement through Lawsuits:** In some cases, lawsuits have been instrumental in ensuring the implementation of transportation laws and policies. For instance, in Oregon, the Bike Bill, which was largely ignored by local governments from 1971 to 1992, gained traction through legal action, leading to its eventual implementation.
2. **Detailed Implementation Plans:** detailed implementation plans can help translate policies into action. Massachusetts struggled to implement its complete streets law until 2006 when a comprehensive implementation process was established. This involved creating a detailed plan and forming committees tasked with specific responsibilities.
3. **Development of Design Standards and Procedures:** Moving beyond policy creation involves developing detailed transportation plans, design manuals, and standards, often

informed by pilot projects. By learning from these experiences, cities can codify new standards and procedures, facilitating effective sidewalk management.

Flexible transportation planning processes: Some cities, like Charlotte, North Carolina, have revamped traditional transportation planning processes to accommodate non-motorized transportation needs. The introduction of new urban street design guidelines shifted the focus from solely meeting automobile standards to inclusive planning that considers various transportation modes. This approach ensures that planners understand project requirements and their impact on existing infrastructure, applying to all relevant plans and projects.

2.8.3. Sidewalk in developed countries

In the present era, many countries are placing a greater emphasis on prioritizing pedestrians and their requirements. The United States, for instance, witnesses various governmental and organizational efforts aimed at crafting pedestrian-friendly spaces. These initiatives encompass actions undertaken by municipal authorities, academic researchers, and theorists.

Current endeavors include the development of master plans specifically tailored to enhance walkability, the creation of street design manuals, revisions to zoning regulations, and the utilization of digital media platforms. Cities and their inhabitants are increasingly acknowledging the importance of walkability, leading some communities to invest substantial efforts into policy and design modifications towards this goal.

For example, the Seattle Pedestrian Master Plan advocates for healthier lifestyles by fostering walkable neighborhoods and encouraging walking as a preferred mode of transportation. Additionally, numerous cities, such as Boston and Nashville, are actively working towards designing streets that are safer, more livable, and inclusive for everyone, focusing on enhancing street connectivity and expanding sidewalk networks.

The recognition of walking's significance to children's health is further reinforced by national programs like Safe Routes to School and advocacy organizations like America Walks, which actively promote walkable communities by engaging, educating, and connecting walking advocates in specific regions. By employing data collection techniques and performance metrics, cities can monitor the progress of improvements in various communities over time.

Moreover, groups dedicated to promoting active design, such as the Active Living Resource Center, offer technical assistance, programs, and strategies to local organizations aiming to create more active spaces within their communities.

Pedestrian master plans for urban areas play a crucial role in encouraging the gradual development of a comprehensive, safe, and comfortable sidewalk network. Several cities, including Seattle, Portland, and Denver, have conducted comprehensive analyses to prioritize funding for sidewalk enhancements. Louisville, for instance, has embraced a Community Walkability Plan focused on enhancing its pedestrian infrastructure. Through extensive public engagement, specific locations have been identified and prioritized, with an accompanying action plan for implementation.

2.8.4. Organization in Addis Ababa that are involved sidewalk development

Numerous organizations play pivotal roles in the design, implementation, maintenance, and monitoring of sidewalks in Addis Ababa. The Addis Ababa city administration, recognizing the significance of non-motorized transportation modes, formulated a strategy spanning from 2019 to 2029, outlining the involvement of key government entities in sidewalk implementation:

1. **Addis Ababa City Road Authority (AACRA):** Responsible for designing and implementing pedestrian and cycling facilities within the city.
2. **Addis Ababa Traffic Management Agency (TMA):** Tasked with regulating traffic operations, overseeing on-street parking management, and implementing traffic calming measures, including safe intersections, speed bumps, and pedestrian crossings.
3. **Transport Programs Management Office (TPMO):** Engaged in preparing and reviewing transport project plans and designs, developing transport policies and standards, and monitoring progress while updating the NMT strategy.
4. **Addis Ababa Road and Transport Bureau (AARTB):** Provides political leadership and general oversight in implementing the NMT strategy.
5. **Rivers and Riversides Development Project Office:** Responsible for developing greenway corridors with continuous walking and cycling facilities.

6. **Plan Commission:** Develops pedestrian-friendly planning regulations to ensure urban development aligns with pedestrian needs.
7. **Code Enforcement Office:** Manages street vending and prevents encroachments on NMT facilities to maintain pedestrian access.
8. **Construction Bureau:** Develops pedestrian-friendly building control rules to ensure new constructions support pedestrian infrastructure.
9. **Traffic Police:** Tasked with controlling and managing traffic operations to ensure pedestrian safety.
10. **Construction and Housing Development Bureau:** Develops pedestrian-friendly layouts for social housing projects, integrating walkability into urban planning.
11. **Road Safety Council:** Coordinates stakeholders on road safety initiatives related to walking and cycling environments, promoting safer pedestrian experiences.
12. **Addis Ababa Trade and Social Affairs Bureau:** Plays a role in social aspects related to sidewalk management and pedestrian rights.

2.9. Street vending

Street vending stands as one of the most prominent activities within the informal economy, prevalent across the globe in both developed and developing nations. Various authors have offered definitions for street vending, with a common thread revolving around the nature of trade and its location. Lyons and Snoxell (2005) cited in Kalikuwa (2011), define street vending as encompassing activities conducted without permits, outside formally designated trading areas, and often without payment of municipal or national taxes, with vendors often resorting to self-allocation of shelter for trading purposes.

Bhowmik (2005) characterizes street vendors as self-employed individuals operating within the informal economy, with their trade being either stationary or mobile. Crucially, street vendors offer goods for sale to the public without the presence of a permanent built-up structure from which to conduct business.

Street vendors fulfill a significant role in the urban economy, providing employment opportunities, generating income, and supplying various goods to the public. Their merchandise spans a wide array, including second-hand clothing, fresh produce, prepared food items, plastic goods, and other household necessities typically sourced from small-scale or home-based industries. Notably, many urban residents from low-income backgrounds prefer purchasing clothing and accessories from street vendors due to the affordability and competitive pricing compared to formal retail outlets (Saha, 2009).

Bromley (2000) identifies streets and other public thoroughfares such as alleys, avenues, and boulevards as the primary locations for street vending activities. Similarly, Mitullah (2004), cited in Kalikuwa (2011), characterizes street trade as occurring outdoors, encompassing street pavements, sidewalks, bus stops, and other public spaces devoid of enclosed premises or covered workspaces.

2.9.1. Street vendors' profile

In many developing countries, street vending represents an important source of income mainly for marginalized and poor people, especially for internal rural migrants (Roever, 2014, Onodugo et al., 2016, Turner & Schoen 2012 and Swider 2015). Moreover, in many developing countries, petty trade is performed mainly by less educated people (Steel et al., 2014, Turner and Schoen 2012). Street vending require slow professional skills and human capital resources, is chosen especially by those who have fewer resources to invest (Roever, 2014). Developing countries like Asia and Africa, gender also influences street selling practices. In fact, in many southern countries, women represent a majority of street vendors (Bhowmik 2001, Milgram 2011, Williams and Gurtoo, 2012). Finally, as some studies emphasize, the sector is also comprised by workers who were previously employed in the formal sector and who, in the absence of alternatives, were forced to enter the informal economic circuit (Milgram, 2011 and Schindler 2014). In developed countries, instead of internal rural migrants, informal street vending activities are carried out by immigrants. In some North American cities, Latin Americans represent the main categories of migrants who carry out informal street vending activities (Bhimji 2010, Martin 2014 and Munoz 2016). Moving the analysis to the European context, the majority of informal street vendors are from North-African and South-East Asian countries (L'Hote and Gasta, 2007, Blanchard 2011, Harvey 2004 and DeLuca, 2012). The close

relationship between informal street vending and immigrant status highlights how in many developed countries, migrants, mostly irregular, suffer from socio-economic discrimination, which drives them to find work in unskilled segments of the labor market, often in the informal economy (Raijman 2001, Boels 2014 and DeLuca 2012).

2.9.2. Urban policies and street vending regulations

An examination of the literature sheds light on public opinion and local authorities' perceptions of street vending activities. While street vending is acknowledged as a vital economic lifeline for marginalized populations in both developing and developed nations, prevalent discourse often portrays street vendors as problematic figures.

In developing countries, street vendors are frequently accused of encroaching on public spaces and tarnishing the city's image, particularly in the context of modernization initiatives aimed at enhancing competitiveness with Northern global cities (Donovan 2008, Rogerson 2016, Anjaria 2006). Moreover, informal street vending is associated with perceptions of degradation and social disorder, often competing with formal trade markets (Saha 2009, Boonjubun 2017, Turner & Schoenberg 2012 and Devlin 2019).

Efforts to regulate street vending activities vary, with some initiatives aimed at decentralizing vending areas within the city to provide regular working spaces (Reyes 2013, Swanson 2007, Donovan 2008 and Weng & Kim, 2016). However, relocation projects sometimes aim to make street vendors less visible, aligning with gentrification plans prevalent in many developing nations, particularly in Latin American cities (Hunt 2009, Bromley & Mackie 2009 and Crossa 2009).

Law enforcement and local authorities often resort to harassment tactics and arbitrary confiscation of merchandise, contributing to a hostile environment for street vendors (Schindler 2014, Rogerson 2016, Lyons & Snoxell 2005, Etzold 2015, Milgram 2011 and Brown et al., 2010). Despite this, some authorities oscillate between exclusionary policies and more tolerant regulations, recognizing the importance of street vending as a source of income for marginalized groups (Rogerson 2016, Bell & Loukaitou-Sideris 2014 and Huang et al. 2014).

In contrast, urban policies in the global North exhibit varying degrees of tolerance and repression. European cities generally adopt more heterogeneous and tolerant approaches,

whereas the US tends to favor repressive and no-tolerance regulations (Devlin 2019 and Bhimji 2010). Ambiguous laws in North American cities grant authorities discretionary power, leading to intimidation tactics and physical expulsion measures against street vendors (Martin 2014 and Devlin 2019).

In European contexts, the control of street vending activities is sometimes linked to regulating irregular immigration, resulting in repression of street vending in certain cities (Moffette 2018, L'hote and Gasta 2007). However, many local authorities prioritize informal vending activities lowly (Nelken 2006 and Boels 2014).

2.9.3. Street vendors' strategies of resistance and negotiation

Traditionally perceived as marginal individuals passively conducting their activities, street vendors have recently been recognized for their agency, particularly in the global South. Studies underscore their strategies of resistance and negotiation to confront exclusionary policies and assert their right to work in public spaces (Crossa 2016, Schindler 2014, Hunt 2009 and Boonjubun 2017).

Across developing and developed nations, street vendors demonstrate resilience and adaptability, modifying their daily strategies to overcome political limitations.

a. Individual Strategies: Street vendors adopt various individual strategies to navigate the challenges they face. These include:

- **Itinerant Vending:** Vendors carry fewer goods and constantly move around streets to evade scrutiny and minimize attention (Milgram 2011, Crossa 2009, Boels 2014 and DeLuca 2012).
- **Relocation:** Some vendors relocate their businesses to less monitored areas to mitigate harassment and confiscation risks.

b. Collective Strategies: In addition to individual efforts, street vendors engage in collective strategies to advocate for their rights and interests:

- **Leadership Influence:** Leaders of local associations wield political influence, leveraging electoral and political support for favorable treatment from local authorities (Crossa 2009 and Eltozon 2015).

- **NGO Advocacy:** Non-governmental organizations such as Street Net International and WIEGO play a crucial role in advocating for informal workers' rights and seeking to regularize their working conditions through negotiations with governments and local authorities (Roever 2014, Bhowmik 2001 and Cui 2016).

2.9.4. Nature of sidewalk vending

Sidewalk vending, as defined by Republic Act 9485 (1988), falls within the purview of the informal sector, encompassing individuals operating small-scale businesses that are unregistered with national government agencies and workers earning subsistence wages or alternative forms of compensation. According to Bhowmik (2009) characterizes sidewalk vendors as individuals who sell goods to the public without a permanent built-up structure.

Furthermore, Agnello (2003) and Pizali (2010) elaborate on the nature of sidewalk vending, noting that vendors may either be stationary, occupying space on pavements or other public and private areas, or mobile, transporting their merchandise via push carts or baskets. Pizali (2010) further categorizes informal sector activities into two groups: the self-employed and casual laborers.

Sidewalk vending thus represents a dynamic and varied aspect of informal economic activity, providing livelihood opportunities for individuals across a spectrum of circumstances and locations.

A significant portion of the self-employed population engages in street vending, reflecting the broader expansion of the informal sector, particularly in Asian countries (Vanzi, 2001). Street and sidewalk vendors constitute a substantial segment of the informal economy, earning their livelihood through vending activities, as highlighted by Sekar (2010). Their flexible vending hours contribute to the economic dynamism of urban areas and provide employment opportunities, mitigating the challenges of formal employment (Alabanza, 2004).

The proliferation of sidewalk vending is a global urban phenomenon driven by the lack of gainful employment in the formal economy, prompting individuals to explore alternative livelihoods (Roever, 2012). Sidewalk vendors encompass various selling modalities, including fixed stalls, semi-fixed stalls such as folding tables or wheeled pushcarts, and mobile vending methods (Bromley, 2000).

The locations where sidewalk vendors operate vary, encompassing regulated street markets, natural market areas, transportation hubs, major establishments, churches, schools, and university vicinities (Bromley 2000). Sidewalk vending is characterized by its accessibility, low resource requirements, often family-based ownership structures, and labor-intensive and informal skill acquisition processes (Garcia-Bolivar 2006).

2.9.4.1. Sidewalk vending in Philippines

In the Philippines, sidewalks serve as spaces occupied by vendors and are even utilized as illegal transport terminals, as noted by Santiago (2009). Illegal structures such as basketball courts and extensions of business establishments, including barangay halls, further obstruct sidewalks, forcing pedestrians onto the roads and leading to traffic congestions and accidents.

Silverio (2009) metaphorically describes sidewalk vendors as persistent pests akin to flies that cannot be eradicated. Legitimate stores may have reluctantly accepted the presence of vendors in their vicinity, resigned to the situation. Additionally, Malazarte (1999) suggests that certain government officials, complicit in the bribes received by the police, have opted to forego corrupt practices and instead collect legal rent fees from sidewalk vendors.

Roever's study (2012) highlights the prevalence of over 50,000 sidewalk vendors across urban areas in the Philippines. Alonzo (2000) and Mangahas (1991) further delineate the nature of informal sector activities in the Philippines, with 70% engaged in sidewalk vending, 50% operating variety stores, and 25% involved in selling raw and cooked food.

Golosino's study (2012) underscores how street vending becomes a livelihood option for individuals with limited economic alternatives. Politicians intermittently address the challenges associated with sidewalk vending, demonstrating an inconsistent approach to problem-solving.

Economy and aims to provide them with opportunities for livelihood. Similarly, in Quezon City, Ordinance No. SP-2336, S-2014, or the QC Sidewalk Vending Ordinance of 2014 was enacted to regulate sidewalk vending activities in the city. The ordinance seeks to ensure the orderly and systematic management of sidewalk vending, balancing the interests of sidewalk vendors with the needs of the community.

Furthermore, the Local Government Code of the Philippines (Republic Act No. 7160) provides the legal framework for local government units to regulate and manage sidewalk vending

activities within their jurisdiction. This law empowers local government units to enact ordinances and implement policies related to sidewalk vending, taking into account the welfare of both vendors and the general public.

Despite the existence of legal provisions and policies, the implementation and enforcement of regulations related to sidewalk vending remain challenging in the Philippines. Enforcement efforts often face resistance from vendors and encounter difficulties due to the complex socio-economic dynamics underlying sidewalk vending activities.

In conclusion, sidewalk vending in the Philippines reflects broader social and economic issues, including poverty, informal employment, and urban space management. Effective interventions require a comprehensive understanding of these issues and the development of policies that balance the interests of sidewalk vendors with broader urban development goals.

Sidewalk vending, despite its challenges and regulatory issues, serves as a critical source of livelihood for many individuals and families in the Philippines. It addresses the pressing need for income generation, self-dependence, and assistance in managing household expenditures for vendors facing limited employment opportunities. The motivations for engaging in sidewalk vending are diverse, ranging from economic necessity to aspirations for socio-economic advancement.

However, the precarious nature of sidewalk vending, exacerbated by threats from municipal and national government authorities, contributes to the instability of vendors' jobs and businesses. Despite these challenges, sidewalk vending remains an integral part of the socio-economic landscape of cities like Cebu City, providing tangible benefits such as supporting children's education, covering rental and household expenses, and supplementing family incomes.

The presence of sidewalk vending reflects broader socio-economic realities in the country, including unemployment and poverty. Efforts by the government to eradicate sidewalk vending without addressing the underlying issues may perpetuate poverty and exacerbate the unemployment situation, highlighting the need for comprehensive approaches that balance regulatory concerns with socio-economic considerations.

In conclusion, the impact of sidewalk vending on the lives of vendors underscores the complex interplay between economic necessity, regulatory frameworks, and socio-economic development

in the Philippines. Addressing the challenges faced by sidewalk vendors requires a nuanced understanding of their livelihood strategies and the development of policies that support their socio-economic well-being while ensuring the orderly management of urban spaces

2.9.4.2. Sidewalk vending in India

In India, the Ministry of Housing and Urban Poverty Alleviation's report highlights the prevalence of street vendors, estimating their number at 10 million nationwide. Major cities like Mumbai, Delhi, Kolkata, and Ahmedabad host significant concentrations, with Mumbai alone accounting for 250,000 vendors. Many of these individuals are migrants or unemployed workers, often toiling for 10-12 hours daily while still struggling to escape poverty. Unfortunately, strict licensing quotas in cities like Mumbai, which issues only 14,000 licenses, force many vendors to operate illegally, exposing them to bribery, extortion, and harassment by local authorities and police.

Over time, street vendors have organized into trade unions and associations, bolstered by the support of numerous NGOs advocating for their rights. The National Association of Street Vendors of India (NASVI), headquartered in Delhi, serves as a federation of 715 street vendor organizations, trade unions, and NGOs. The Street Vendors (Protection of Livelihood and Regulation of Street Vending) Bill, 2012, proposed by the Indian government, aims to regulate street vendors in public spaces and safeguard their livelihoods. Introduced in the Lok Sabha, India's lower house of parliament, on September 6, 2012, by the Union Minister of Housing and Urban Poverty Alleviation, this bill seeks to address the challenges faced by street vendors across the country.

Street vending constitutes a crucial component of the urban informal economy in developing nations. It generates employment, income, and affordable services for many low-income urban residents. In India, for example, street vendors make up 2.5% of the urban population, contributing significantly to the economic landscape. Similarly, in countries like Kenya and Nigeria, where small-scale enterprises, including street vendors, dominate urban employment, these individuals play a vital role in sustaining social resilience. Consequently, street vending activities in developing countries represent an integral part of the informal economy and serve as a driver of social resilience.

The continuous rise of sidewalk vendors, particularly in the context of rapid urbanization and socioeconomic challenges in the global south, is a significant phenomenon. Many vendors turn to sidewalk vending due to unemployment or the inability to meet formal sector requirements. While street vending may provide a viable long-term career for some, it poses challenges for urban management and traffic flow.

The placement of vendors in public spaces often disrupts pedestrian flow and exacerbates traffic congestion, leading authorities and planners to view street vending as a misuse of public space. However, addressing this issue requires initiatives and inclusion programs from local governments to reduce informality and improve the negative perception of street vending.

Enforcement measures are often employed to restrict illegal vending, but they can be costly and ineffective, leading vendors to devise avoidance strategies or resist enforcement efforts. Relocation to designated marketplaces is one alternative proposed by authorities, but vendors may resist such plans due to the benefits and social networks established at their current locations.

Some municipalities consider accommodating street vendors within road infrastructure itself through street management as an alternative solution. Despite facing various social threats such as evictions, adverse weather conditions, and abuse of authority, vendors exhibit resilient behavior by adapting to their circumstances and taking necessary steps to prevent adverse situations. Their ability to respond creatively, flexibly, and resourcefully reflects essential elements of social resilience.

The integration of sidewalk vendors into urban streetscapes requires careful consideration of various factors, including pedestrian safety, mobility, and the efficient use of public space. Street management strategies aim to accommodate the social and economic needs of the community while ensuring sustainable development and road user safety.

Design principles for streetscapes should balance the diverse needs of users, including pedestrians, vendors, and other road users, to ensure accessibility, safety, convenience, sustainability, and urban quality of life. Recent reports suggest that proper streetscape design can integrate sidewalk vending without significantly affecting other road users. Suggestions include allocating space within the furniture zone of pedestrian walkways and the curbed extension of

parking lanes for sidewalk vendors. However, quantitative data on how these proposed alternatives impact pedestrian safety and mobility are often lacking.

To address this gap, calibration exercises using social-force-based pedestrian models such as PTV Viswalk can help evaluate the effects of different scenarios on average pedestrian density. By simulating alternative scenarios and analyzing their impact on pedestrian flow, researchers and urban planners can assess the feasibility and effectiveness of integrating sidewalk vending into urban environments.

During the calibration exercise, a macroscopic model describing bi-directional pedestrian flow was developed based on field observations. The calibration process aimed to reduce errors associated with estimating pedestrian capacity in local contexts, ultimately making the simulation tool more relevant and accurate for evaluating street management strategies.

Overall, the use of simulation models and calibration exercises provides valuable insights into the potential effects of integrating sidewalk vendors into urban streetscapes. By considering pedestrian behavior, mobility patterns, and safety concerns, urban planners can develop more effective strategies for accommodating sidewalk vending while ensuring the overall functionality and safety of urban environments.

2.10. Best sidewalk vending in practice in Ethiopia

a. Street Vendors

Several roadside frictions which pose traffic malfunctioning prevail at Bahir Dar city Arterials. Amongst them, street vending activity is the most visible one. The general definition of the street vendor was given by different organizations, scholars, and researchers. They all argue that street vendors were those who offer goods and services for sale from public places, primarily streets and pavements, sidewalks, etc. (ILO 2013 and Karda, 2017). As per Ray (2000) Street vending varies in terms of scale, timing, location, remuneration, workforce, and types of goods sold and services provided. It can be a full-time occupation, a part-time occupation, seasonal, or occasional. It can be a survival strategy or part of big business (Bromley 2000).

b. Road verses street

According to Street Design Standards for Urban Ethiopia (2017) devised by FDRE Ministry of Urban Development and Housing (MoUDH), roads are defined as movement networks that connect urban centers or their peri-urban or rural hinterlands and give service more to vehicles while streets are urban spaces with urban design elements and aspects and sense of

Side Friction is an interaction b/n traffic flow and roadside activities causing a reduction of saturation flow. Informal economy (sector or activity) refers to activities and income that are partially or fully outside government regulation, taxation, and observation.

Place; movement networks serving pedestrians, cyclists, mass transport, and other vehicles and as conduits for utilities (MoUDH 2017).

The UK's department for transport (DfT) manual for streets also puts a clear distinction between the two: Roads are essentially highways whose main function is accommodating the movement of motor traffic while for Streets movement is still a key function; there are several others, of which the place function is the most important. The street functioned as space, movement, access, parking, and drainage, utilities, and street lighting. So, the street accommodates road furniture that considers pedestrians, cyclists, and street vendors. Thus, streets have to fulfill a complex variety of functions to meet people's needs as places for living, working, and moving around in. (UK's DfT 2007).

In the past, road design hierarchies have been based almost exclusively on the importance attributed to vehicular movement. This has led to the marginalization of pedestrians, street vendors, and cyclists in the upper tiers where vehicular (traffic) capacity requirements predominate. But the emerging modern thinking as those manuals depicts both kinds of infrastructures i.e., Roads and Streets have to be designed in the heart of the cities.

c. Urban street segment verses link

US-HCM defined a link as a length of roadway between two boundary points. These points can be an intersection or ramp terminal. A link and its boundary points are referred to as a segment. The I-HCM justifies the road segment as a length of a road between and unaffected by signalized or major unsignalized intersections, and having similar characteristics along its length. For the

sake of an accurate indication of overall segment performance, the link and its boundary points were evaluated together by both manuals. Thus, an arterial segment is a one-way segment of arterial that begins just downstream of a signalized intersection and extends through the next downstream signal.

This particular study assesses the link of the urban road segment at which street vendors manifestation is high and then segment performance analysis was done by the US and Indonesian capacity manual. O'Flaherty (2006) defined road capacity to fulfill all capacity definitions of “Economic Capacity”, “Environmental Capacity” and “Traffic Capacity”.

d. Impact of Roadside Frictions for Traffic Characteristics

Rapid urbanization has increased the rate of motorization and influences rural exodus to cities. Thus, an increase in the number of vehicles besides unemployment within the cities in developing countries makes a mess to traffic. The pace of development of the cities and the managerial skills of local authorities were not compatible. So, informal activities like Street vendors are prominent which in turn impedes traffic characteristics like travel speed, speed-flow characteristics, the capacity of roads, and safety of commuters and other road users. Currently, the condition of life-making through informal sector activities in Ethiopian cities and towns is a common phenomenon.

Though it is widely appreciated that activities at the roadside affect the operation of the traffic stream and may cause delays, few references try to quantify their effects directly especially for developing countries where their effects are likely to be high. The most usual way in which such effects are incorporated into traffic calculations and procedures is by some kind of proxy classification. Perhaps the most well-known set of procedures for capacity and level of service (LOS) calculations are applied in the US-HCM. This manual considers the roadside environment as one of the three major factors besides “interaction among vehicles”, and “traffic controls” that affect the speed of the vehicles on the urban streets. It also tells us the existence of parking and the level of pedestrian

Activity that affects capacity. But the manual doesn't consider these road frictions to calculate the FFS and space mean speed (travel speed) of the urban street rather takes only the other two factors.

HCM (2000) follows an explicit empirical procedure to get the mean travel speed of the urban street. It classifies the urban roads into four classes and incorporates parking and some pedestrian interference to class IV arterial roads. This classification indirectly incorporates the effects of friction through the degree of access control and level of frontage development (HCM, 2000). The recent version of the Highway Capacity Manual (HCM, 2010) of the USA provides a methodology for urban street analysis, which may be used to evaluate mobility in terms of travel speed for through traffic stream. The methodology, however, does not directly account for capacity constraints such as street vendors as the previous version of TRB (HCM, 2010).

A particular study performed on the mere impact of street vendors on traffic characteristics is hard to find. Rather various researchers tried to characterize different combinations of roadside frictions. Salini S. et.al (2016) assessed the combined and individual impact of three side friction types, i.e. Pedestrian, Parking, and Bus stops on three major metro roads in India. Their impact on travel speed was found to be statistically significant. The model they devised for the combined sections indicates the speed was reduced by an amount of 50% in case of traffic volume higher than 3000 PCU/hr. (Salini S, 2016).

Chiguma (2007) assesses the effects of factors like Flow, side friction, and geometric characteristics on speed and capacity. The results indicated that all these factors had an effect on speed-flow curves and hence speed and capacity. It was shown that in the presence of friction, capacity was approximately reduced by 4.3% on two-lane two-way roads. At the same time, the effect of friction on performance was measured in terms of speed reduction, which was shown to be approximately 8% on two-lane two-way roads and 2% on four-lane two-way roads. The study considers the combined effect of all frictions as a single variable 'FRIC', which was identified to affect speed-flow relationships, and hence affected speed and capacity (Chiguma 2007).

A summary of the latest findings by Sprinkle consulting for lane width shows that the capacity of a lane at a signalized intersection is reduced by 3.33% for each foot of lane width less than 12 feet. Consequently, according to the HCM, the capacity of a 10-foot lane is only 93% of the capacity of a 12-foot lane. However, in 2007 a literature search performed as part of the Florida Department of Transportation says "The measured Capacity is similar for lane widths between 10 feet and 12 feet. For lane widths below 10 feet, there is a measurable decrease in Capacity". Thus, so long as all other geometric and traffic signalization conditions remain constant, there is

no measurable decrease in urban street capacity when lane widths are narrowed from 12 feet to 10 feet (Theodore Petritsch 2007). However, Islam et al. (2018) found that an average of 12 to 29 percent of effective roadway width is reduced due to different side friction. We know with the reduction of roadway width roadway capacity is reduced. Qualitatively roadway capacity is reduced enormously as well as the level of service which leads to traffic congestion (Mofizul 2018).

Though Bajaj vehicles were prohibited to and out of the road from a few arterials, the roads of Bahir Dar operate under highly mixed traffic conditions. The traffic conditions become more chaotic when street vendors play on these roads. By considering the pedestrian movements, stopped vehicles, entry and exit movements, and the wrong movement of vehicles due to road friction, Pallavi Gulivindala, and Arpan Mehar devised a model to predict travel speed on four 4-lane-2-way roads of Warangal city in India. By applying multiple linear regression analysis, they formulated a model for prediction speed at various friction intensity levels. The speed reduction has been observed significantly at a higher level of side friction which is about 51% (Gulivindala, 2018).

Arterial roads in metropolitan cities are designed to provide mobility to a high volume of traffic between major traffic generators and attractors. Observations on such roads in Bahir Dar show a lack of control of roadside activities like street vending etc. and traffic operation in mixed mode with slow-moving non-motorized vehicles. The effect of these two phenomena should be analyzed to refurbish the functional performance requirement of an arterial road in terms of speed. The study carried out by Chetan R. et.al (2014) on a midblock section of a divided urban multilane arterial road in Pune and Patna cities of India shows the capacity of the urban arterial road is greatly affected by the effect of lane width, the presence of NMV and effect of side friction. Patna has a carriageway width of 10.5m but due to side parking, the effective utilization of the lane is only 7.0m which results in a 57% reduction in the capacity. Also, due to the side friction and presence of the NMV, a 14% reduction in speed is observed in Patna city compared to Pune city (Chetan 2014).

Before even thinking of providing additional infrastructure, like the widening of the road, pedestrian bridge, etc., it is a must to give special attention to effective road asset management to properly utilize the road facility at its maximum intended capacity. For this particular study

effect of street vendors and other informal activities or actors that were attracted by them to the urban roads of Bahir Dar were assessed for road performance in terms of travel speed.

e. Street Vendors

Street Vendors choose a place where easily visible to pedestrians and motorists which is most profoundly highways. Since it is an informal activity, Bahir Dar city authorities were tried to control them not to use the roads. Rather than producing a convincing environment for traffic, this action even makes the situation worse by making street vendors more mobile on the carriageway. Thus, an option that ponders street vendors on access roads for economic vibrancy has to be considered. Scholars recommend a traffic impact analysis (TIA)⁷. Bastian (2016) says that TIAs can be applied for development that fits within the current zoning, as well as for development that will require a change in the zoning (Bastian 2016). In conformity with the current zoning, it is possible to undergo TIA planning of roadside furniture for street vendors on access roads rather than arterials. Thus, it is still possible to work on TIAs for the city's access roads to decide the road furniture relevant for street vendors by managing their numbers without compromising mobility. Therefore, it is possible to balance the needs of street vendors and the level of traffic congestion. However, the authorities intuitively evict street vendors and provide them with a vending zone by blocking the street from mobility.

TIA is a method to measure the traffic generated due to the construction of new roads or access existing ones and suggested mitigation measures.

Karda et. al (2017) conducted a trip generation for street vendors. They use a separate regression analysis of variables of floor area and number of employees as independent variables and street vendors as dependent variables. They took random samples of the plant area and several employees of different shopping centers, banks, offices, hospitals and schools from Bandung, Indonesia.

The most powerful relationship between the generating activities with street vendors is found in the allotment of shopping centers, hospitals and schools (Karda 2017). Thus, it implied that the hawker trip is a thing that must be considered in the analysis of the impact of traffic in general. They finally issued a mitigation by providing roadside furniture for street vendors based on the outcome.

Bahiru Mekuria (2019) researched the impact of street vendors at three potential sites of street vendors in Addis Ababa. He measured pedestrian level of service, the relationship between delay and vendors; and queue development in connection with vending activity. He follows a procedure of the HCM (2010) for his performance evaluation. The performance indicators of his interest show the negative impact of street vendors. The relationship between vendors and pedestrian space has resulted in a negative slope ($-0.003\text{m}^2/\text{vendor}$). Therefore, the impact of street vendors on pedestrian space significantly increases as their number increases. Adwa roundabout was assessed for control delay. He found that the impact of street vendors on delay per vendor is computed as $4.2\text{ sec/vehicle/vendor}$. This relationship increases exponentially with a further increase in vendor numbers. Finally, he showed up, and the queue length linearly increased with an increasing number of vendors. However, the work undermines the dynamic nature of street vendors rather than focusing on the area they can hold. (Bahru 2019).

According to Jibat et.al (2015), urban informal sectors are a SafetyNet8 for more than half of the total labor force and many poor urban dwellers in many developing countries. This situation is also true in Ethiopia as per Tamrat (2012) cited by Jibat et.al (2015) that 65 % of employment in Addis Ababa is informal (Jibat 2015). Thus, evicting these activities may aggravate the problem of traffic mobility since they don't have any choice but to do a better job. Rather they prefer to pursue the job in a volatile mode. Thus, some street vendors would be unemployed, many street vendors and their dependents would be destitute, and some might turn to crime, rioting, or revolution. So, designing infrastructures for street vendors along the side of access roads may serve as a social safety net which is much cheaper for the government than establishing a comprehensive welfare system or substantially expanding the police, courts, and prison system (Ray Bromley, 2000).

f. Debate for Space

Public spaces are spaces that are theoretically open for all to use and enjoy indiscriminately. The street is a public place that has to be sustainable. By definition for a street to be sustainable, it has to be approached from a familiar perspective, that of the triad – economic, social, and environmental sustainability. Thus, responsible government entities seek the simultaneous achievement of three fundamental goals: economic profitability, social responsibility, and environmental conservation (Gleeson 2003). Aside from the transportation economic benefits,

the streets have to adapt to the miscellaneous desires of the community. Streets especially urban streets have to be integrating diverse groups and cultural practices in a just and equitable fashion. Among the societal needs on the street facilities were vending activities. Since integrity among scholars was not persistent, there was a debate about whether street vendors have the right to vend on roads or not. Thus, a very difficult balance must, therefore, be found between the right of access to public spaces Safety Net is a safeguard strategy against adversity that may be devised by the government. and the need to move about in the city, on the one hand, and the right of street vendors to work and earn a living, on the other.

Scholars from the mere transport engineering argue urban roads were built under the motto of “time is money”, reducing the time spent to cover a given distance has been the main aim though the accessibility of roads was undeniable. But scholars like Jain et.al (2014) argue, streets were also designed for activities that go beyond transport purposes, other activities represent a significant part of urban life, transforming the streets into a stage for the Sunday promenade, a playground for children, activities correlated to street cafés, (illegal) shelters for the homeless, commercial places for street vendors, etc. (Jain 2014).

Jain et.al. (2014) points out that street in European cities experienced a transformation from mixed to specialized uses, or, better, a trend from mixed to particular use. They also tell us, that activists’ movements like Reclaim the Street or Critical Mass are developing, claiming a different use of public spaces not only linked to movement or to transport. Here, informal groups of cyclists or pedestrians worldwide gather together in an open space or even at crossroads until a critical mass is reached which can occupy whole streets. In this way, they demonstrate more respect among different street users and more livable open spaces. Once accused of stopping the traffic, they replied with the motto “We don’t stop the traffic, we are the traffic”. Thus, public space needs to be re-negotiated by the inhabitants of the city to develop a common set of values and rules according to society’s understanding of the common use of space.

Ray (2011) defends street vendors’ right to work by comparing them with those using the road by law. Highway design manuals recommend the frequency and design of service areas for motorized vehicles. Street vendors and hawkers serve the same function as pedestrians, bicyclists, and bus users. Pedestrians need cobblers on the road to have their footwear fixed, just as much as car owners need tire repair shops. Bicyclists need repair shops to have their tires,

chains, and pedals fixed. All commuters need cold drinks, snacks, and other services on the roadside. These services have to exist at frequent intervals, otherwise walking or bicycling would become impossible, especially in summer. As long as our urban roads are used by these various sections, street vendors will remain inevitable (Ray 2011). While current planning trends promote banning vendors from transport and public spaces in the name of creating more welcoming public spaces, these exclusionary policies have far-reaching consequences for the livelihoods of the vendors and the economic vibrancy of the city. The officials' position regarding vendors is that even if a few of them are allowed on our roads, then their numbers will proliferate. As part of the public, street vendors have to come into the minds of planners, designers, and policymakers before the establishment of the road infrastructure.

g. Re-Building the City?

Bouillard et.al (2017) performs a case study by assessing practices of the refurbishment of city centers by removing motorways. By completely evicting the car from the riverfront (case study road in Paris), the street has become a lively public space. The urban motorways were transformed into a pedestrian and soft mobility⁹ promenade in the heart of the French capital. Containers, moveable chair tables, and wooden boards are found all over the promenade. Freight containers are used as flexible shelters for coffee houses and other small catering. The containers are also used for auxiliary functions such as trade, services, or artistic facilities like mini-ateliers (Bouillard 2017).

Refurbishment of the street may be uneconomical for us but modal segregation is still perceptible. The asphalted section was designed to be used by cars but nowadays Bahir Dar roads are also utilized by Street vendors, bikes, and skateboards. Thus, segregation of city arterial roads in purposes of the execution of certain activity types is permissible or not since allowing all activities on a single street makes a mess.

Some city's urban street design guidelines demand a new and highly appreciated concept of Multi Utility Zone (MUZ). The concept is very simple and workable. All the stationary elements on the street are organized in a dedicated space which results in obstruction-free streets. Stationary elements like Street vendors, trees, bus stops, underground and overhead utilities like electric supply, light poles, etc, parking, and such other elements are organized mobility

alternatives such as bikes, roller-skates, steps, skateboards etc. in a space on the shoulders between a footpath/cycle track and a motor vehicle lane (Pune Municipal Corporation 2016).

To offer a higher degree of mobility, the current situation of the study sites has to be renovated to perform their intended purposes. Bahir Dar city officials would rather prefer to expel street vendors and provide a free vending zone intuitively on one road link, Papyrus Road segment, once a week locally a.k.a. Sunday market. Jain et.al. (2014) says “regulated spaces were rather dangerous, also because some users were stronger (and protected by an “armor”), while others were weaker, socially “marginal” and easily assaulted.” Rather, Jain et.al. Recommends for the common use of street space was the segregation of streets into “fast spaces” and “slow spaces”. The planning implies the city should create a few traffic corridors, with high speed devoted to automobiles; but this was balanced with more pedestrian rights in the inner streets, including fully pedestrianized areas, strict speed limits, and well-designed intersections. Thus, the space available was cut into different slices: one for cars (the biggest one), one for cyclists, one for pedestrians, and another one for shops for street vendors or street cafés here and there.

A website created by a cross-disciplinary team called Project for Public Spaces (PPS) pointed out that after decades of prioritizing for vehicle movements on streets in Europe, governments have started to rediscover the broad role that streets can and should play in public arenas such as commerce, socialization, community celebration, and recreation (PPS, 2016).

One of the innovative modern government guides in this area is the UK's Department for Transport (DfT) manual for Streets published in 2007, which states: ‘For the last fifty years, urban street planning and design in the UK and several other European countries have been led by traffic engineers who have given priority to the needs of motor vehicles. This has resulted in street environments that are unattractive for people on foot, whether traveling along the street or using the street as a destination for economic or social activities.’ Thus, the manual recommends the categorization of streets as Links and Places. Streets in which movement is the priority are called Links, while Place is the category for a street that is a destination in its own right: a location where activities occur on or adjacent to the street. The guide suggests while transport planners and engineers should take the lead in planning and managing Link streets, urban planners and urban designers should take the lead on Place streets (UK's DfT, 2007).

Similarly, in the US, New York City's Department of Transportation (NYC's DOT) broke ground with its Sustainable Streets strategic plan, released in 2008, which includes a focus on recognizing "streets as vital public places that foster social and economic activity, in addition to their more traditional roles as corridors for travel." This document outlined a series of policy and programmatic priorities to "make our streets great destinations," including the launch of the Public Plaza initiative, raising the agency's streetscape standards, expanding public art on the streets program, and fostering temporary and permanent pedestrian streets (NYC's DOT, 2008).

Ethiopian Ministry of Urban Development and Housing (MoUDH) also tried to standardize the design of streets in urban centers uniformly by employing a newly developed manual called Street Design Standards for Urban Ethiopia. This document incorporates design standards for which street vendors are to be available along the road. The manual identifies roads appropriate for vending. Arterial roads can be an option for vending based on demand and study.

The document clarifies a criterion for street vending furniture. Street vending furniture shall be movable on wheels and size shall be 0.6 meters by 1.2 meters including moving place for the operator height of 2.2 meters, and 2-4 stools/vender. It pointed out that "Street vending shall be located only in the street furniture section of the pedestrian walkways, at 0.4-0.8m from the curb at corners of pedestrian crossings, street intersections/junctions, and with a spacing of 50-100m at mid-blocks and in selected locations along streets." (MoUDH,2017).

2.11. Research gap

Contemporary transportation issues such as traffic accidents, congestion, pollution, and societal health concerns stemming from motorized transportation systems have spurred government officials and professionals to prioritize non-motorized transportation modes, including pedestrian walkways. While numerous studies concentrate on assessing the standards of sidewalks and methods for evaluating existing infrastructure, the literature underscores a critical gap in understanding the management aspects of sidewalk development. This research delves into the pivotal role of sidewalk management in creating safe, comfortable, inclusive, and site-specific walkable environments. By exploring various topics comprehensively, the study underscores the significance of evaluating sidewalk management practices.

The researcher asserts that understanding current stakeholders involved in sidewalk development, identifying existing shortcomings, and proposing solutions to the myriad issues plaguing sidewalks in Addis Ababa and beyond are paramount. By elucidating these aspects, the study aims to shed light on the key considerations essential for establishing high-quality pedestrian walkways in urban settings.

CHAPTER THREE: RESEARCH METHODOLOGY

3. Introduction

This chapter discusses about the description of the study area and methodology of this research mainly related with the studies research design, source of data, sampling design, method of data collection, method of data analysis, software's used to process the research and ethical considerations. Validity was discussed in line with the quality standard of the research.

3.1. Description of the study area

Addis Ababa, the capital of Ethiopia, serves as the focal point of this research. It houses significant institutions such as the African Union and the United Nations Economic Commission for Africa within a sprawling area of 203.5 square kilometers. As per the 2008 population census, Addis Ababa boasts a populace of 3.385 million, exhibiting a notable annual growth rate of 3.8 percent. According to a survey on urban employment and unemployment, approximately 37.4% of the city's population, which was estimated at 3,048,631, relies on economic support. For administrative convenience, Addis Ababa is divided into 11 sub cities, namely Arada, Bole, Lideta, Addis Ketema, Kirkos, Gulela, Yeka, Nifas Silke/Lafto, Akaki Kaliti, and Kolfe Keranyo. Lem ikura. The city also accommodates a significant number of automobiles, with a registered count of 715,562. Despite a notable 32% annual growth in automobile registration, walking remains the predominant mode of non-motorized transportation in Addis Ababa.

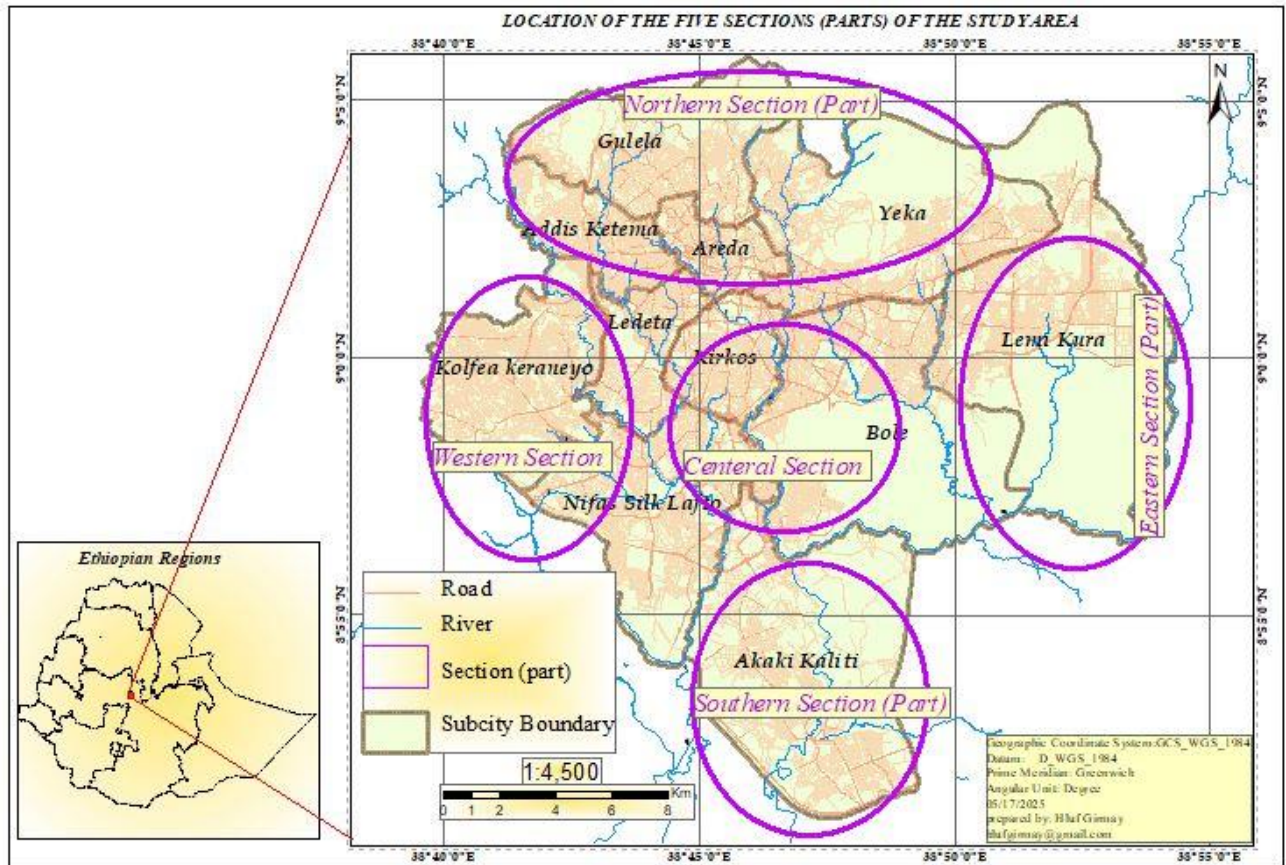


Figure 3.1: Map of the study area

Source: Prepared by the researcher, 2024

3.2. Research design

For this study, the researcher was used descriptive survey research design. It is because of it enabled to describe the intended study for the evaluation street vendor management at side walking in Addis Ababa. The researcher adopted a descriptive approach, aiming to offer a precise depiction of activities along the selected study corridor. Non-probability sampling techniques were employed to select units of analysis, including roads, road infrastructure, street furniture, landscaping, available space, and their respective qualities. Randomly chosen individuals utilizing the specified strip was invited to participate in a brief, structured questionnaire, eliciting insights into their experiences while traversing the route.

Furthermore, the research methodology utilizes case studies to illustrate typical practices in Addis Ababa, the focal point of this study. Survey questions serve as the primary data collection method, while secondary data obtained from sidewalks and street vendors across five sections and 21 segments of parts supplement the survey findings.

Given that specific offices were targeted for inquiries, the sampling method utilized in this research is exclusively non-probabilistic. In order to address the stated objectives, the researcher used both qualitative and quantitative types. This is because of the proposed study needs the collection of statistical (numerical) data for the quantitative approach. qualitative method applied to evaluation street vendor at side walking in Addis Ababa.

3.3. Source of data

For this study the necessary data for this investigation were both primary and secondary sources.

3.3.1. Primary data sources

Primary sources are original information and not ready-made sources of data and can provide current and factual information about the study and they are fresh and collect for the first time and also these sources are original both in time and in their space. The primary sources of the study gathered through structured questionnaires (objective perspective questionnaires that the researcher responding to pre-established questions designed to evaluate the quality levels of the surveyed segments in an unbiased manner and subjective perspective questionnaires that involve questioning pedestrians about their opinions regarding various pavement segments, allowing for a qualitative assessment of their experiences), observations and interview from randomly chosen individuals utilizing the specified strip was invited to participate in a brief, structured questionnaire, eliciting insights into their experiences while traversing the route.

3.3.2. Secondary data sources

For this study, the secondary sources of data were collected from statistical report related to street vendor management at side walking, reviews of relevant books, journals, articles, official reports, websites, legal documents, proceeding reports, published and un-published documents and previous studied researches documents were used.

3.4. Sampling design

A research design serves as the roadmap that directs researchers through the processes of data collection, analysis, and interpretation. In this study, both descriptive and explanatory research designs are utilized to address the research problems effectively. Descriptive research involves the collection of data that characterizes events, followed by the organization, tabulation, depiction, and description of the collected data. This design is chosen because it frequently employs visual aids such as graphs and charts, facilitating the reader's comprehension of data distribution patterns. Given that the human mind may struggle to extract the full significance of a large volume of raw data, descriptive statistics play a crucial role in condensing the data into a more manageable form.

3.4.1. Sampling population

In this study, the researcher used a combination of purposive and systematic sampling techniques to gather necessary data from the study areas mainly focused on sidewalks along the Primary Arterial Streets (and Secondary Arterial Streets within five distinct sections of the city).

3.4.2. Sample size

For the study, a total of 819 sidewalks from the selected five sections and 21 segments of the city were chosen. The pedestrian count was done manually not only to create a sample size, but also to identify the traffic flow and to differentiate which sections of the study area are high, medium and low volume. Based on pedestrian counts, an average of 488 individuals were observed on the sidewalks, leading to a sample size of 39 pedestrians per single segment.

3.4.3. Sampling technique

In the process of realization this study, the researcher employed a non-probability sampling technique by focusing on five sections of the city selected based on direction. In order to adequately cover all areas of Addis Ababa, the city map has been divided into five main parts (sections): North, South, Central, East and West section with a purposive sampling in an attempt to assess the different characteristics of the city. From all the divided parts the arterial roads have been selected and then observed by identifying various sidewalk segments. From each direction, the most utilized sidewalk segments were identified for inclusion in the study. Questionnaires were distributed to pedestrians along these specific selected directions and segments. The aim

was to assess and identify gaps in sidewalk implementation, design, and maintenance within each segment.

3.5. Method of data collection

In this study both primary and secondary data were used as methods of data collection. The main data gathering instruments for this study were both primary sources includes (questionnaires, field observation and face to face interviews) and secondary sources.

For this study, the researcher used both open ended (subjective survey questions) and close ended (objective survey questions) questions were used in helping the researcher to get answers and relevant information from pedestrians along these specific selected directions and segments. The researcher also employed field observation in order to evaluation street vendor management at side walking in Addis Ababa. The observation helped to collect nonverbal responses from the pedestrians and interview was used to collect depth information from selected pedestrians and officials from the five main parts.

For this research, the essential secondary data were collected from statistical report of street vendor management at side walking, reviews of relevant books, journals, articles, official reports, websites, legal documents, proceeding reports, published and un-published documents that the research carefully reviewed and analyzed.

3.6. Data processing and analysis methods

3.6.1. Data processing

The study area was selected from Ethio- GIS using arc map and export as a shape file.

3.6.2. Data analysis

The primary data obtained from interview of the customers street vendor management at side walking pedestrian interview and field observations were analyzed qualitatively. With regard to the data gathered from questionnaires, field supervisor (researcher) checks every completed questionnaire, the pre-coded questionnaires were processed, managed and analyzed quantitatively using the Statistical Package for Social Sciences (SPSS) software and Micro-soft excel program. The analyzed output was displayed using frequencies & percentage tables, figures, charts and reports.

3.6.3. Tools and software's

Table 3.1: Software's that the researcher used to process the collected data

Software	Function
ArcGIS 10.5	To prepare map of the study area.
Google Earth Pro	To navigate and view the five section (parts) the study area
Micro-soft word	To write the research paper.
Micro-soft excel	To perform different statistical calculations
SPSS 23	To process, manage and analyze the pedestrian's socioeconomic data collected

3.7. Validity of the instruments

To the validity of this research the researcher conducted an extensive search of the literature on the concept street vendor management at side walking. It was attained by thoroughly covering all the target information area by ensuring data is collect within three weeks to minimize major event that would change content in relation to the study topic. Data was collected from the credible sources, for instance experience commuters particularly on street vendors and pedestrians.

3.8. Ethical considerations

Before administering the questionnaire on the potential respondents, prior arrangement was made. The purpose of the study was explained to the respondents and they were not forced to give their responses but were allowed to participate voluntarily in the study. An explanation of the objectives of the research was done before and after undertaking the research for clarity purposes on the direction of the study. Utmost confidentiality about the respondent's responses was assured by way of keeping all responses secure and using them only for academic purposes.

CHAPTER FOUR: RESULT AND DISCUSSION

4. Introduction

This chapter presents the data analysis, presentation and interpretation of the main findings of the study concerning street vendor management at side walking in Addis Ababa. The results presented in this chapter seek to achieve the main objective of the study, which is to evaluate sidewalk safety by focusing on the sidewalk environment as it relates to the comfort and convenience of pedestrian users Addis Ababa while highlighting the importance of effective management in addressing these issues. This part of the research deals with the description of demographic characteristics including sex ratio, age group, income level, health condition, physical problem, trip purpose and car ownership of respondents and the descriptive analysis presentation and interpretation of the study findings of the study areas dividing five geographical location which were the street vendors practiced side walking in Addis Ababa.

4.1. Demographic characteristics and response rate of respondents

4.1.1. Demographic characteristics of the respondents

This section presents sex ratio, age, income, health condition, physical problem, trip purpose and car ownership of the respondents. This information is important for the study as it helped to evaluate the credibility of the respondents in answering the questionnaires posed to them regarding the street vendor management at side walking in Addis Ababa Ethiopia. For this study, subjective data from 819 individual pedestrian road users were collected. The researcher took 819 pedestrians were interviewed across various sidewalk segments, responding to twenty-three questions that encapsulated both dependent and independent variables.

4.1.1.1. Sex ratio

The result of my study implies that both sexes were significantly represented in the study and the data were collected from both sexes to make the data from the perspectives of male and female respondents. Based on figure 4.1 below the out of 819 respondent's majority (55.9%) of the respondents were female and 44.1% male.

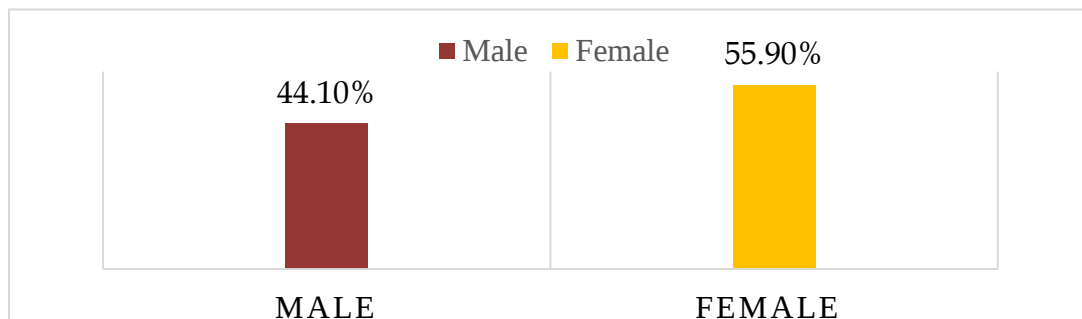


Figure 4.1: Sex distribution of respondents

Source: Own survey data, 2025

4.1.1.2. Age group

In the study area different age groups who involved in street vending at sidewalks. As we can see from the (figure 4.2) below indicates that majority (37.72%) of the respondents were aged between 30-39 years old, 22.46% between 19-29 years old, 18.9% aged below 18 years and remaining see figure below. 3.3% were aged over 45 years. The age of the respondents was presumed as the ideal in terms of capacity, purpose and ability to walk.

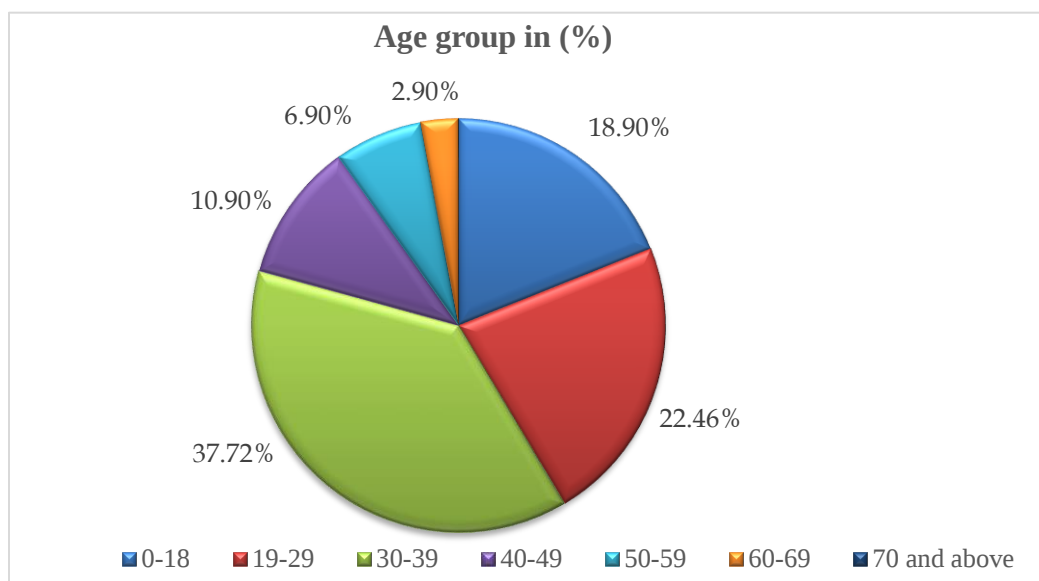


Figure 4.2: Age group of respondents

Source: Own survey data, 2025

4.1.1.3. Income level

The interview results from all five sections regarding income levels of pedestrian's figure 4.3 shows monthly income distribution in birr, that majority 49.69% of the walkers earn below 500 birr a month, followed by 22.45%, 11.6%, 8.9% and 6.9% respondents representing the income 501 to 2000, 2001 to 5000, above 5001 to 1999 birr and above 10,000birr respectively.

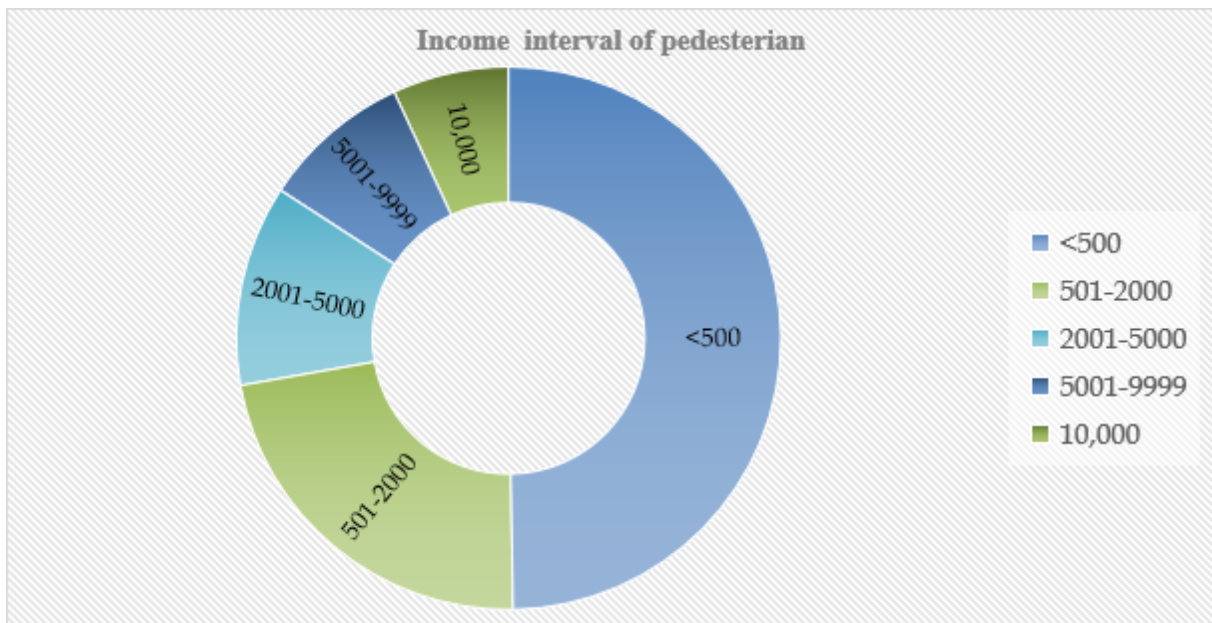


Figure 4.3: Income level

Source: Own survey data, 2025

4.1.1.4. Health condition

Meanwhile health conditions can affect a person's opinion about walking and its walking behavior, the researcher collects information pedestrian respondents' health condition. A person's perception of walking and even their walking behavior can be impacted by their health. In order to determine whether health has anything to do with the responsiveness of pedestrians, health related question was asked during the interview to see if there was any relationship between pedestrian responsiveness and health. As figure 4.4 below depicted, utmost of the respondents responded their health was very good (78.2%) and good (15.9%) condition.

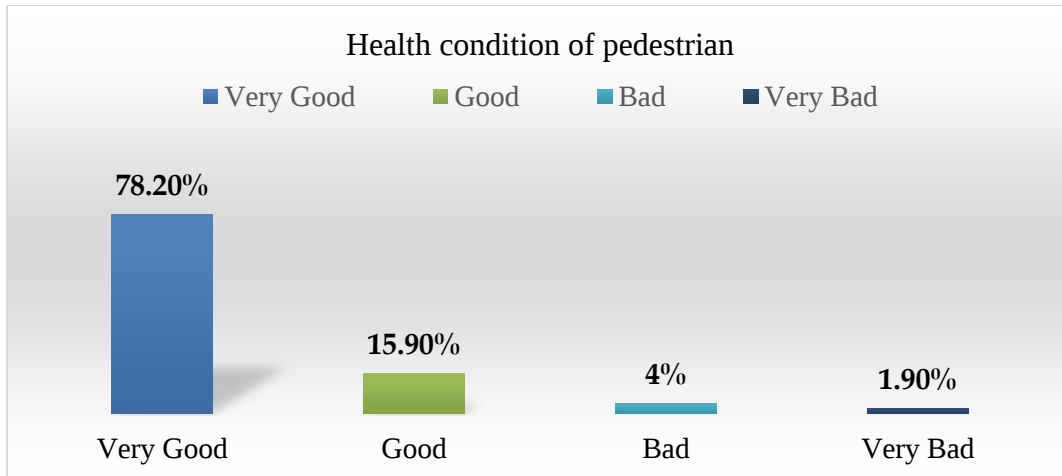


Figure 4.4: Health condition of the respondents

Source: Own survey data, 2025

4.1.1.5. Pedestrian experience on the sidewalk

The study aimed to ascertain whether any pavement users experienced physical impairments. The figure 4.5 below shows the pedestrian respondents surveyed i.e. 88.80% claimed to be physically healthy and the remaining 11.2% was physically disabled individuals with reported encountering difficulties while using the pavement, underscoring the need for accommodating measures to address their hindrance.

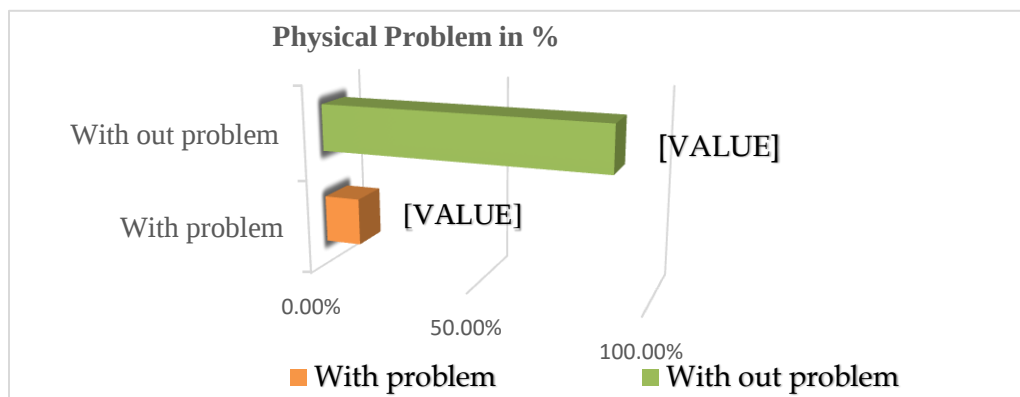


Figure 4.5: Condition of physical problems that disrupt walking of the respondents

Source: Own survey data, 2025

4.1.1.6. Pedestrian road user trip purpose

In this research the researcher asked respondents to indicate their opinion on the statement that says “for what purpose do you use the sidewalk”? Accordingly, out of 819 respondents (46%) utilizing sidewalk for work-related purposes and (31.9%) used as transition to a transport station. This highlights that the sampled pavements or paths serve a crucial function, and users cannot always be categorized based on their choice to use the sidewalk.

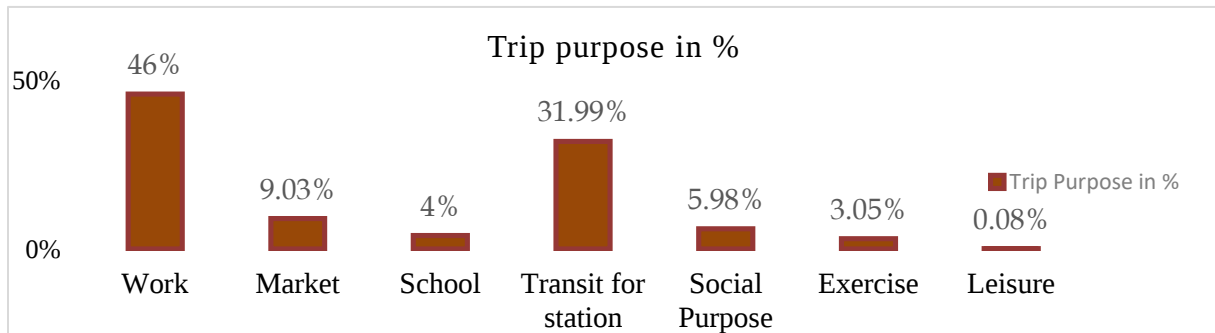


Figure 4.6: pedestrian road user trip purpose

Source: Own survey data, 2025

4.1.1.7. Respondents' car ownership

Issues such as inadequate shading, misplaced trees obstructing sidewalks, and substandard surfacing exacerbate the challenges faced by pedestrians in the study area. These problems significantly detract from the functionality, safety, and appeal of sidewalks. Those types of problems were very affected to foot walkers than people who travel using car. Thus, figure 4.7 illustrates out of 819 respondents, all most all (99.1%) do not own car.

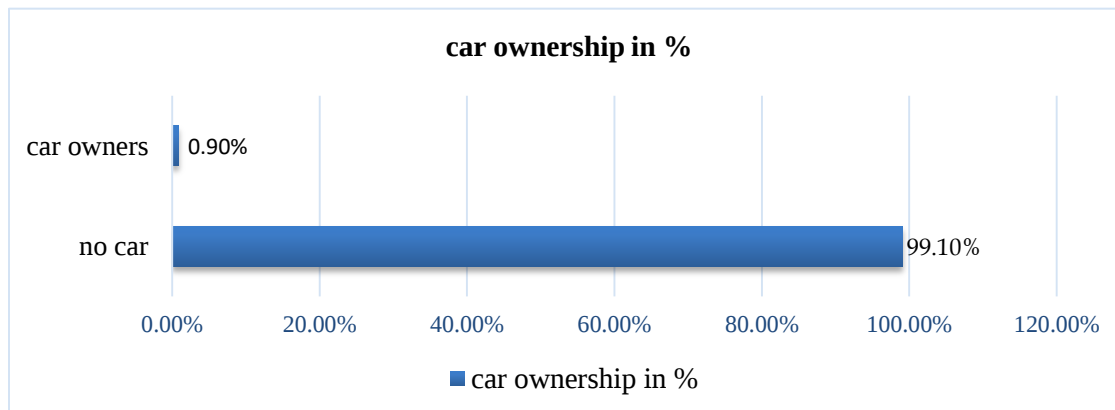


Figure 4.7: respondents car ownership

Source: Own survey data, 2025

4.2. Presentation and interpretation of the study findings

This sub part of the unit encompasses the comparison and discussion of various associated variables for each section. Analyzing the data for each section was essential to understand how the results varied with changes in each location's characteristics. Given Addis Ababa's reputation for diversity and the unique qualities of each neighborhood, analyzing the city inherently highlights the distinctions between them.

In order to adequately cover all areas of Addis Ababa, the city map has been divided into five main parts (sections): North, South, Central, East and West section (part) with a distinct number of segments, each distinguished by its geographical position. The East section comprises six segments; the West has five, while the South and Central each have four. The North section comprises two segments. So, for each section or part analysis of the study area were presented below. Analyzing the data for individual section (parts) helped understand the difference of the results as the character of each locational change.

4.2.1. Northern section (part) descriptive analysis

From the northern arterial road sidewalk portions, two samples were selected based on the percentage of the sidewalk road's length. This area exhibits the smallest segment sample, indicating that the pavement is relatively small compared to other directions and is intersected by arterial streets. The site may offer opportunities for revitalization or adaptive reuse, transforming underutilized or blighted areas into vibrant and economically viable spaces. The below figure 4.8 and table 4.1 shows the northern arterial road sidewalk segments information. A total of 78 pedestrians were observed using the road in this section. Additional information sees annex two part 1.

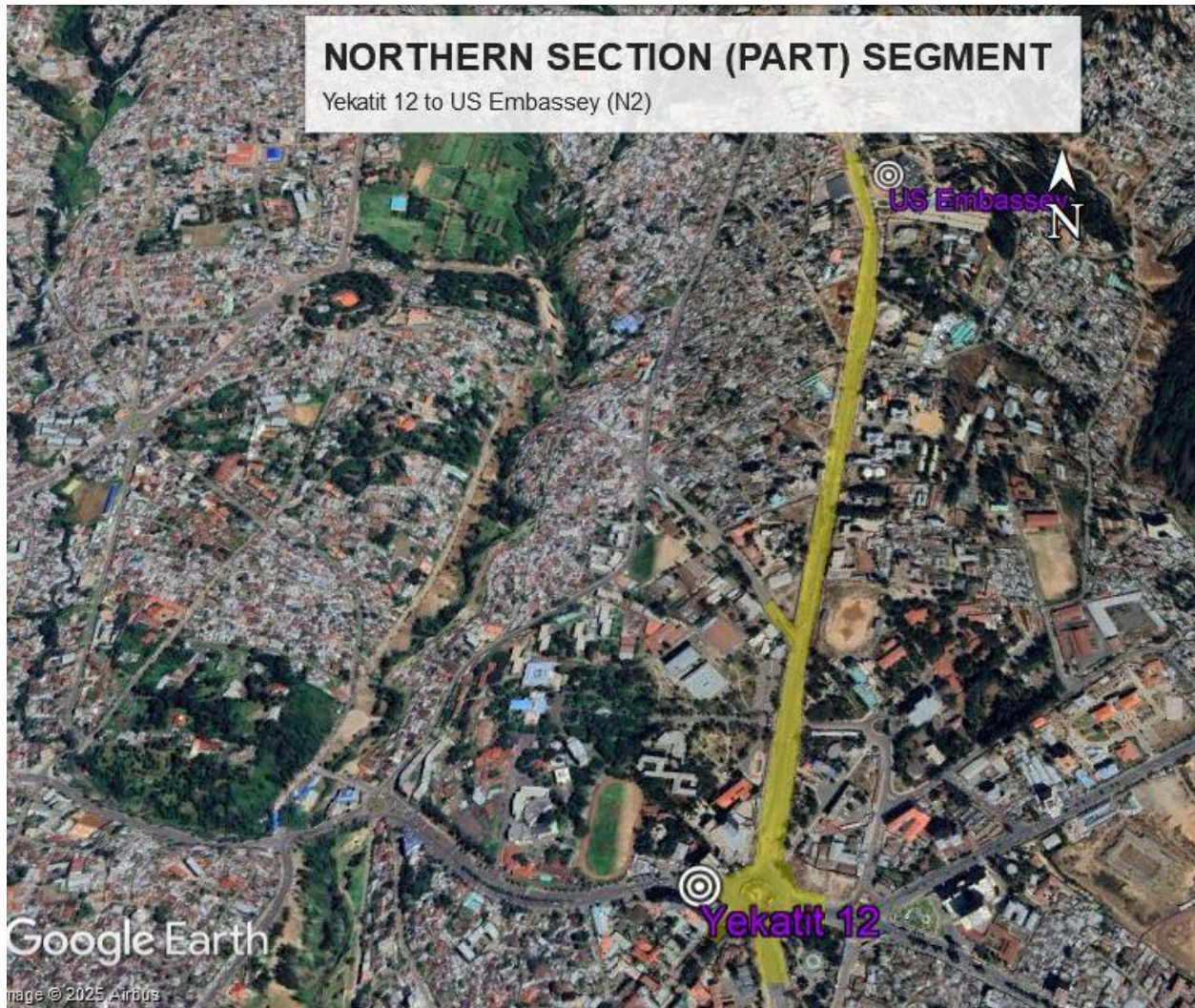


Figure 4.8: Northern section (part) sample yekatit 12 to US Embassy: N2

Source: Source: Source: Prepared by the researcher, 2025

Table 4.1: Northern section (part) segment samples

	Name of Segment	Distance by m	Total =N
North Section	Lem hotel to shola market: N1	1300	39
	Yekatit 12 Sq to US embassy: N2	1300	39

Source: Own survey data, 2025

The activities taking place on or within the sidewalk concurrently with people actively walking, which is the intended use of the path, are considered a characteristic feature of Addis Ababa's

sidewalks. Therefore, understanding perceptions towards these various activities is essential to comprehend the impact that non-walking activities are having.

		Segment	very bad	bad
sidewalk Disconcerting Activities and vending	Food Vending	Yekatit 12 Sq to US Embassy	2%	5%
		Lem hotel to Shola Market	7%	0%
	Mobile Street Vending	Yekatit 12 Sq to US Embassy	23%	52%
		Lem hotel to Shola Market	46%	1%
	Shoeshines	Yekatit 12 Sq to US Embassy	7%	7%
		Lem hotel to Shola Market	5%	7%
	On street bicycle/ motorcycle Parking	Yekatit 12 Sq to US Embassy	1%	14%
		Lem hotel to Shola Market	9%	0%

Table 4.2: Awareness of road users towards the walking environment

Source: Own survey data, 2025

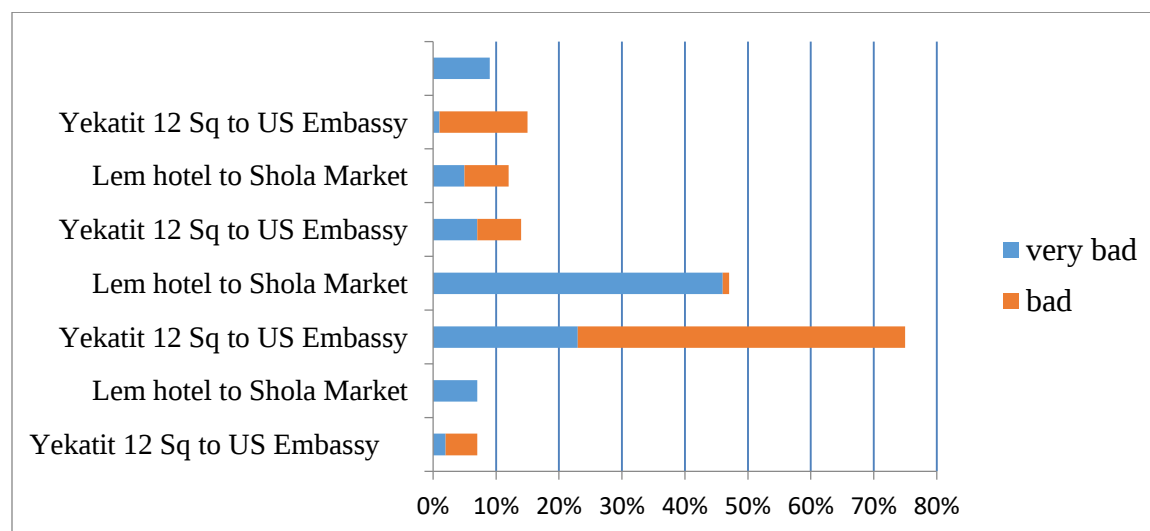


Figure 4.9: Relation of comfort with non-walking activities Lem hotel to Shola market N1

According to table 4.2 mobile street vending emerges as the activity that most bothers pedestrians when traveling north. This finding aligns with the broader analysis presented in the preceding section. both N1 and N2 pedestrian road users rated mobile street vending higher on

the "very bad" and "bad" scales. Perception is considered a tool to understand users, and in this study, users' perceptions can inform improvements in pavement travel, thereby enhancing the appeal of walking.

Table 4.3: Awareness of pedestrian road users towards the sidewalk environment

	Yes	No
Violence	35.4%	64.6%
Slipping and falling cause	61.4%	38.6%
Safety during night	22.8%	77.2%
Safety during day	41.3%	58.7%
Benches existence	47.6%	52.4%
Comfortable/convenient or not	28.6%	71.4%
Physical problem disrupts walking	11.1%	88.9%

Source: Own survey data, 2025

Table 4.3 indicates that 88.9% of pedestrian road users have no physical restrictions, and over 50% of those surveyed are satisfied with the current benches. However, 71.4% of them express that walking on this north section is neither comfortable nor convenient, suggesting potential pavement environment issues hindering their activity. While violence is less common than other concerns, slipping and falling cause 61.4% of people to feel unsafe. Although safety concerns might be expected to be higher at night, 41.3% of people report feeling unsafe during the day. The overwhelmingly negative responses to the research questions suggest deterrents to walking overtime.

4.2.2. Southern section (part) descriptive analysis

For this study from the southern section of the study area, the researcher took four sidewalk segment samples were selected from the Southern arterial route based on the percentage of sidewalk road length in the city. The segments in this direction represent typical sample segments. Table 4 provides details regarding the directions and other pertinent information for all four segments. In total, there are 156 pedestrian responder road users within the part. Additional information sees annex two part 2.



Figure 4.10: Southern section (part) i.e. Garment RA-Lebu Mebrat Haile

Source: Prepared by the researcher, 2025

Table 4.4: Southern section (part) segment samples

	Name of Segment	Distance by m	Total =N
South Directions	Adey Abeba- Abo: S1	1000	39
	Hamsa Simint- Hana Mariam: S2	1000	39
	Karl RA- Puskind RA: S3	1000	39
	Garment RA- Lebu Mabrat Haile Sq: S4	1000	39

Source: Own survey data, 2025

In this section the user's perception of pavement safety has been assessed using various criteria, as previously outlined. In the south section, 156 individuals were interviewed, and the findings are presented in table 4.5. Similar to the statistics from the south direction, physical issues are not a major concern, and 75% of individuals express satisfaction with the benches. However, the most problematic factors appear to be comfort and convenience, with 82.05% of respondents providing unfavorable responses. It is evident that elements other than physical disability or bench quality may have impacted their sidewalk experience.

Table 4.5: Awareness of pedestrian road users to directions the sidewalk environment

	Yes	No
Violence	62.2%	37.8%
Slipping and falling cause	68%	32%
Safety during night	44%	56%
Safety during day	69.2%	30.8%
Benches existence	75%	25%
Comfortable/convenient or Not	17.9%	82.05%
Physical problem disrupts walking	14%	86%

Source: Own survey data, 2025

Table 4.5 above illustrates that 30.8% of respondents feel unsafe during the day, and 56.8% do not feel comfortable at night. feelings of safety are undoubtedly influenced by concerns about violence, as indicated by 62.2% of the 156 respondents reporting fear of violence. Similarly, concerns about falling and slipping are significant (68%). These two indicators contribute to the lack of safety perceived by pedestrian road users.

Table 4.6: Awareness of road users' comfort on sidewalk the walking environment activates

	Very bad	bad	Fair	Good	Very good
Sidewalk Width Perspective	3	14	52	28	3
Pedestrian Traffic Perspective	9	88	3	0	0
Street Venders Existence	67	22	5	4	2
Comfort Vs. Street Venders Existence	33	33	29	5	0
Vending vs. Walking Space	22	29	21	18	10
Quality of sidewalk		17	55	20	8

Source: Own survey data, 2025

According to above table 4.6, pedestrian perceptions regarding comfort and convenience are unfavorable. The presence of street sellers is overwhelmingly regarded as extremely poor (67%) and bad (22%). Moreover, 88% of respondents identified heavy pedestrian traffic as the most common obstruction on pavements. Despite the sidewalks' quality being rated as fair or good by a total of 55% and 20% of respondents, respectively, the presence of street sellers occupying pedestrian space is consistently viewed as terrible and extremely bad.

4.2.3. Central section (part) descriptive analysis

The researcher took four arterial sample portions of road are present in the central section; pavement segments were selected based on the fraction of the city's pavement road length. The table below provides information about the map and the three section sites. Within the part, there are 156 pedestrian road users in total. Additional information sees annex two part 3.

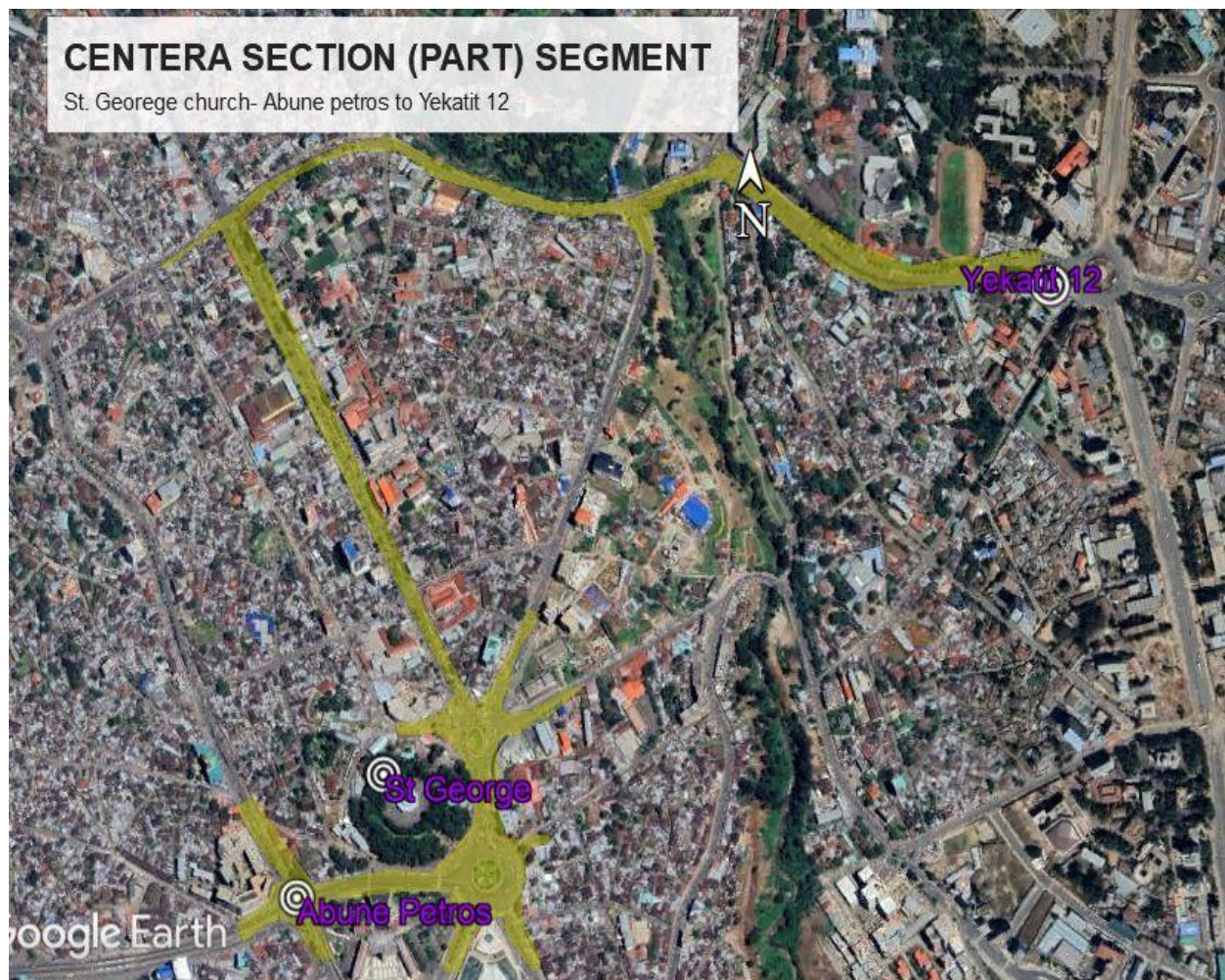


Figure 4. 11: Central section (part) i.e. St. George RA- Abuna Petros Sq – Yekatit 12

Source: Prepared by the researcher, 2025

Table 4.7: Central section (part) segment samples

	Name of Segment	Distance by m	Total =N
Central section	St. George RA- Abuna Petros Sq:C1	1150	39
	Yekatit 12 RA to Minilik II hospital:C2	1150	39
	Mexico Sq- Stadium:C3	1150	39
	Lycée Guebre- Mariam- Legehar Station:C4	1150	39

Source: Own survey data, 2025

In consciousness, the measurements in table 4.8 below demonstrates that physical issues that could impede walking are not a concern; 94% of the respondents do not have such issues. However, only 12% of people found the pavement to be convenient and comfortable, while 72% appreciated the seating provided on the walkways. Only 44% of those surveyed felt comfortable at night, compared to 77% who felt safe during the day. Sixty-one percent of the 156 respondents classified violence as posing a high danger.

Table 4.8: Awareness of pedestrian road users to direction the sidewalk environment

	Yes	No
Violence	61.0%	39.0%
Slipping and falling cause	42.0%	58.0%
Safety during night	44%	56%
Safety during day	77.0%	23.0%
Benches existence	72.0%	28.0%
Comfortable/convenient or Not	12.0%	88.0%
Physical problem disrupts walking	6.0%	94.0%

Source: Own survey data, 2025

Overall awareness of the pedestrian's road users shows in table 4.9 below were more favorable, with fair and good evaluations accounting for 56% of the totals. 90% of respondents said that pedestrian traffic congestion was awful, however 30% said that pavement quality was fair and 27% said it was poor. The three linked categories of results are those that garner the most attention Vendor existence, comfort versus vending, and walking space against vending are all issues with sidewalk sellers. The majority of the reviews for each were unfavorable, with 56%, 90%, and 48%, respectively. This demonstrates how vending annoys pedestrians. Vendors and backed-up traffic are the two main problems that make strolling less enjoyable.

Table 4.9: Awareness of pedestrian road users' comfort on sidewalk environment

	Very bad	Bad	Fair	Good	Very good
Sidewalk width perspective	7%	26%	48%	19%	0%
Pedestrian traffic perspective	8%	90%	2%	0%	0%
Street vendors Existence	25%	37%	32%	5%	1%
Comfort Vs Street vendors' existence	56%	20%	17%	7%	
Vending vs walking space	40%	27%	30%	3%	
Quality of sidewalk	2%	33%	40%	21%	4%

Source: Own survey data, 2025

4.2.4. East section (part) descriptive analysis

The East section part of the study area includes six examples of pavement segments along the arterial route. The selection of samples is based on the percentage of pavement and road length relative to Addis Ababa as a whole. This section boasts the highest number of sample segments, indicating a greater prevalence of arterial roadways and pavements compared to other sections. The map and additional details of the six segments are provided in the table below. In total, the section has 234 pedestrians who use the roads as pedestrians, making it the section with the highest number of pedestrian responders. Additional information sees annex two part 4.



Figure 4.12: Eastern section (part) i.e. Hyatt Regency to Dembel city center

Source: Prepared by the researcher, 2025

Table 4.10: Eastern section (part) segment samples

	Name of Segment	Distance by m	Total =N
Eastern Section	Megenagna Intersection to Lim Hotel Intersection: E1	1500	39
	Mebrat hail to Yarer Goro: E2	1500	39
	Hyatt Regency to Dembel City center: E3	1500	39
	Bole Mikael Sq to Bole Airport Sq: E4	1500	39
	Bole Mikael Sq to Rwanda Sq: E5	1500	39
	Bole Braas Sq to Edna Mall Sq: E6	1500	39

Source: Own survey data, 2025

Based on the table 10.11 below, the significant portion, 88%, expressed dissatisfaction with comfort and convenience, while the lack of benches along the sidewalk was noted by the same

percentage. This suggests that a low comfort rating correlates with a lower bench count. Only 32% of pedestrians feel safe walking at night, compared to 56% feeling safe during daylight. However, fear of violence and slipping and falling are relatively lower in the North, Central, and Southern Sections.

Table 4.11: Awareness of road users towards the sidewalk environment

	Yes	No
Violence	46.0%	54.0%
Slipping and falling cause	40.0%	60.0%
Safety during night	32.0%	68.0%
Safety during day	56.0%	44.0%
Benches existence	12.0%	88.0%
Comfortable/convenient or Not	13.0%	87.0%
Physical problem disrupts walking	9.0%	91.0%

Source: Own survey data, 2025

Table 4.12: Awareness of pedestrian road users' comfort on sidewalk environment

	Very bad	Bad	Fair	Good	Very good
Sidewalk width perspective	2.99%	8.9%	52.9%	34.6%	0.6%
Pedestrian traffic perspective	0.03%	99.9%			
Street vendors' existence	62.8%	22.6%	14.9%		
Comfort Vs. street vendors' existence	37.1%	28.2%	33%	2%	
Vending vs. walking space	37.17%	12.8%	18.8%	23.08%	8%
Quality of sidewalk	38.88%	47.86%	13.24%		

Source: Own survey data, 2025

According to the above table 10.12, the pavement width received satisfactory ratings, with 34.6% rated as good and 52.9% as fair. However, all respondents rated pedestrian traffic congestion poorly. When asked about the effect of vendors on their comfort while walking, respondents gave a very low rating to the presence of sellers (37.1%) and a terrible rating to

vendors (28.2%). A very poor rating of 37.17% was assigned to the influence of street vendors on the walking area. This study highlights that the standards and amenities of pavements themselves are not the primary cause of issues arising from activity congestion.

4.2.5. West section (part) descriptive analysis

The West arterial road utilizes the second-highest number of segment samples, with five segments, following the East section. The table below offers descriptions of the part and other site content. In total, there are 195 respondents who are pedestrian road users. Additional information sees annex two part 5.

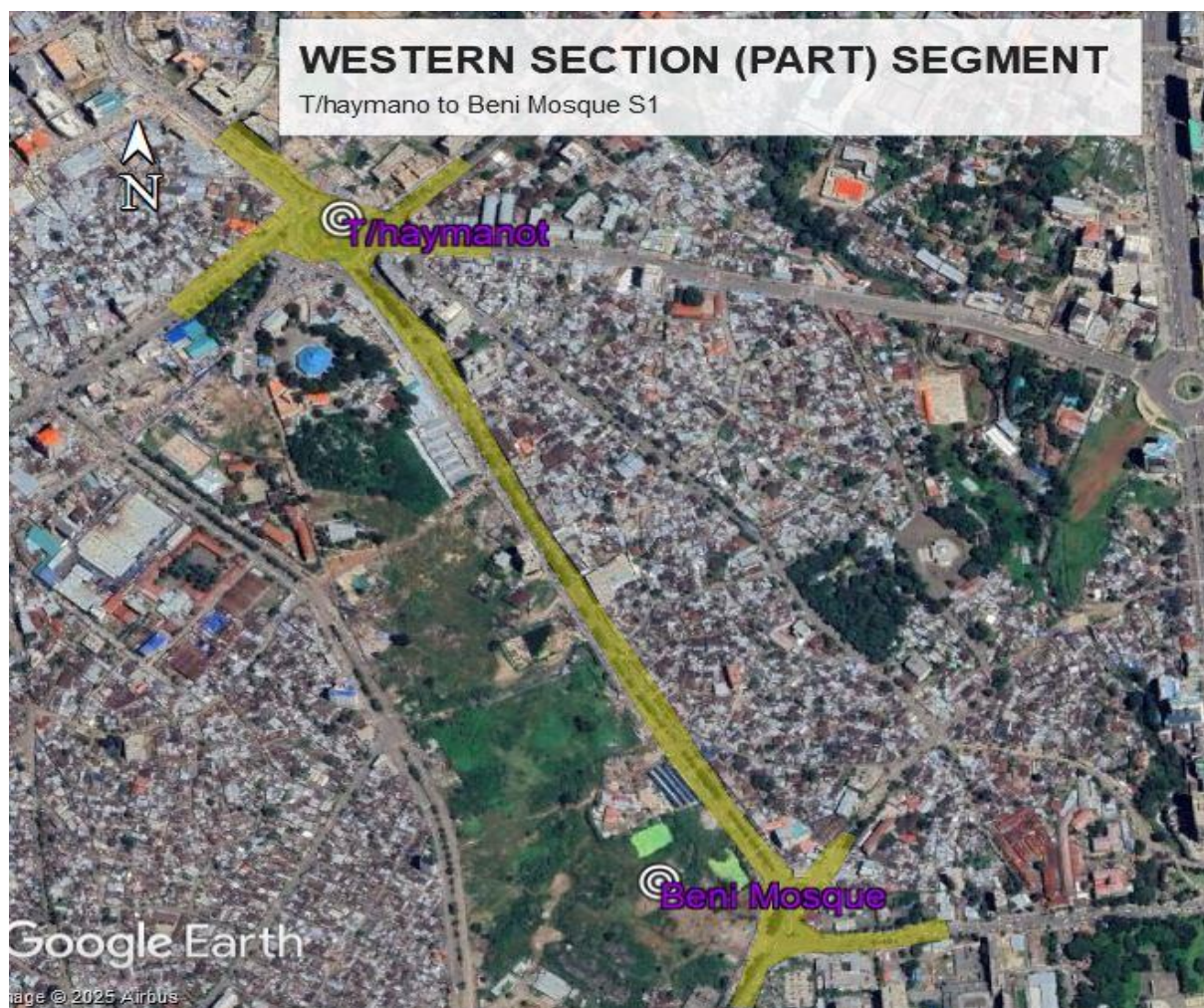


Figure 4.13: Western section (part) i.e. Benin Mosque To T/haimanot church: S1

Source: Source: Prepared by the researcher, 2025

Table 4.13: Western section (part) segment samples

	Name of Segment	Distance by m	Total =N
West Section	Benin mosque to T/haimanot Church: S1	1,500	39
	Winget Sq to Ras Hailu Park: S2	1,500	39
	Autobus Tera Sq-Abnet hotel: S3	1,500	39
	Ayertena Sq - Zenebework Sq: S4	1,500	39
	Torhayloch Sq- Sost kutr mazoria: S5	1,500	39

Source: Own survey data, 2025

Below table 4.14 shows violence is present, 45 percent of the respondents, but compared to the other Direction the percentage is lower. Likewise, the results of this study show there are other factors other than physical problems or Sidewalk amenities that cause pedestrian discomfort. Pedestrian perception of safety during the day is high (69%feelsafe), but only 18% feel safe at night which is low compared to other Direction.

Table 4.14: Awareness of road users towards the sidewalk environment

	Yes	No
Violence	45.0%	55.0%
Slipping and falling cause	38.0%	62.0%
Safety during night	18.0%	82.0%
Safety during day	69.0%	31.0%
Benches existence	95.0%	5.0%
Comfortable/ convenient or Not	12.0%	88.0%
Physical problem disrupts walking	26.0%	74.0%

Source: Own survey data, 2025

Table 4.15: Awareness of pedestrian road users' comfort on sidewalk environment

	Very Bad	Bad	Fair	Good	Very Good
Sidewalk width perspective	1%	3%	45%	49%	2%
Pedestrian traffic perspective	2%	92%	6%	-	-
Street vendors' existence	66%	14%	16%	4%	-
Comfort vs. street vendors' existence	48%	28%	20%	4%	-
Vending vs. walking space	26%	26%	25%	20%	3%
Quality of sidewalk	6%	46%	44%	4%	

Source: Own survey data, 2025

The above table 4.15 shows the respondents' perceptions of the sidewalk environment reveal that the majority, 49%, perceive the sidewalk width perspective as good. However, the pedestrian traffic perspective is rated as bad by 92% of respondents, while 66% deem the street vendors' existence as very bad. Additionally, 48% perceive comfort vs. street vendors' existence as very bad, and 46% rate the quality of the sidewalk as bad. These findings suggest that in the sidewalk environment, pedestrian traffic and quality of the sidewalk are perceived negatively, along with the existence of street vendors and the comfort vs. their presence.

CHAPTER FIVE: CONCLUSIONS AND RECOMMENDATIONS

5. Introduction

The chapter provides the conclusions and recommendations of the study based on the objectives of the study. Descriptive quantitative analysis was used to discuss the findings of the study.

5.1. Conclusion and recommendations

5.1.1. Conclusion

The general objective of this study was to evaluate sidewalk safety by focusing on the sidewalk environment as it relates to the comfort and convenience of pedestrian users Addis Ababa. As noted by Loukaitou (2001), factors such as darkness, lack of windows opening to the sidewalk, among others, may render individuals more susceptible to crimes in a sidewalk setting. He also mentions environmental elements perceived as "cues to danger," including unfamiliarity and the presence of other people. Inadequate illumination in public spaces, overgrown bushes, darkness, and desolate environments all contribute to safety concerns, as outlined in the literature.

While this study has addressed these factors, additional pavement safety concerns persist in Addis Ababa. Jacobs (1961) advocated for mixed-use development, emphasizing the importance of street vendors in mitigating safety issues. Street vendors are prevalent on nearly all sidewalks in Addis Ababa, and their activity contributes to avoiding safety issues.

The condition of the sidewalk itself serves as a significant indicator of safety, comfort, and convenience. The presence of street vendors, along with other obstructions and the state of the sidewalks, contributes to an unsafe environment for walking. In essence, despite heavy foot traffic, pavements face challenges such as inadequate lighting, leading users to attribute their discomfort and inconvenience to the poor quality of the sidewalks and the presence of street businesses.

The study recognizes that, due to a congested pedestrian traffic on most of Addis' sidewalks, there is not a clear understanding of whether walkers are using the sidewalk by choice or not. And also, street vendors identify the locations where they vend on their own without any guideline. This causes high dissatisfaction among a majority of pedestrian road users leads to the

conclusion that people are not attracted to sidewalks. This dissatisfaction may lead walking users to seek alternative forms of transportation in the future.

5.1.2. Recommendations

5.1.2.1. Recommendation for policy action and planners

Based on the designed objectives, the light discussions and findings of the study, the following recommendations have been suggested for the policy action and planners to address sidewalk comfort, convenience & environment quality with special attention given to street vending:

- To control side vendors designed line or fence could be established for vendor spaces, with compliance enforced by law. Establishing comprehensive standards and enforcing compliance to ensure that pedestrian facilities meet the necessary safety and quality throughout the city.
- Establish a code for the city to prescribe contextual guidelines ensuring compliance with national policies and guidelines. Regular sidewalk maintenance, including upkeep of drainage infrastructure, should be systematically conducted and strictly enforced.
- Reinforce walkability, bike ability + wellbeing walkability require a range of strategies that consider human scale, pedestrian comfort, safety, and land use, as well's respond to the specific physical and cultural characteristics of each neighborhood
- Planning bodies must prioritize the needs of pedestrians, who constitute the majority of travelers. This includes ensuring appropriate sidewalk width, safe surface conditions, fewer obstructions, designated pedestrian crossings, buffer zones between sidewalks and traffic lanes, proper lighting, and the planting of shade trees.
- Enabling street design should focus on the functional integration of multifunctional streets with engaging streetscapes and foot traffic. Planning should consider non-walking sidewalk activities to enhance the overall pedestrian experience.
- Prioritizing pedestrian-friendly policies and ensuring their effective implementation, Addis Ababa can create safer and more accessible urban environments for pedestrians, ultimately enhancing the overall quality of life in the city.

5.1.2.2. Suggestion for further studies

The researcher suggests that further studies shall be conduct on the sidewalk safety, comfort, convenance and on street vendors in detail by including variables that were not surveyed in this research in order to improve the prediction of future outcomes.

REFERENCES

- Amsale Alebachew (2017). street vending and Local Authorities in Addis Ababa city: Challenges and the way forwards. Master's research on public administration and development management, Addis Ababa university, Ethiopia.
- Anastasia Loukaitou Sideris and Renia Ehrenfeucht (2009). Sidewalks: Conflict and Negotiation Over Public Space. MIT Press.
- Athanasios Galanis and Nikolaous Eliou (2012). Department of civil Engineering, social and behavioral Sciences, Transport Research Arena.
- Bell, J.S. and Loukaitou Sideris (2014). Sidewalk informality: an examination of street
- Berner, E., G. Gomez and P. Knoringa (2008). The Logic of Survival Entrepreneurs and the Moral Economy of the Slum, Paper Presented at the UNU – WIDER Workshop Entrepreneurship and Economic Development, Helenski.
- Bhimji, F. (2010). Struggles, urban citizenship, and belonging: the experience of undocumented Street vendors and food truck owners in Los Angeles, Urban Anthropology and Studies of Cultural.
- Bhowmik, S.K. (2001). Hawkers and the Urban Informal Sector: A Study of Street Vending in Sever Cities, Unpublished report prepared for National Association of Street Vendors in India.
- Bhowmik, S.K. (2012). Street Vendors in the Global Urban Economy, Taylor & Francis, London.
- Blanchard, M. (2011). Fare Mercato a Torino: carriere professionali e pratiche quotidiane degli Ambulanti stranieri nei mercati rionali”, Mondì Migranti, Vol. 2, pp. 75-99.
- Boels, D. (2014). It's better than stealing: informal street selling in Brussels”, International.
- Boonjubun, C. (2017). Conflicts over streets: the eviction of Bangkok Street vendors, Cities, Vol. 70, pp. 22-31.

- Bromley, R. and Mackie, P. (2009), “Displacement and the new spaces for informal trade in La and public.
- Bromley, R. (2000). Street vending Policies: a global review”, *International Journal of Sociology and Social Policy*, Vol. 20 Nos 1- 2, pp. 1-28 *Systems and World Economic Development*, Vol. 39 No. 4, pp. 455-492.
- Buchanan C, 1963 “Traffic in Towns”, the Specially Shortened Edition of the Buchanan Report,
- Central Intelligence Agency (2011). *The World Factbook* [Online]. Washington: Central Damsere Intelligence Agency. Available: <https://www.cia.gov/library/publications/the-world-factbook/geos/et>.
- Derry, J., Ebel, B. E., Mock, C. N., Afukaar, F. & Donkor, P. (2010). Pedestrians’ Injury Patterns in Ghana. *Accident Analysis & Prevention*, 42, 1080-1088.
- Elias Berhanu (2021). Street Vending: Means of livelihood for the urban poor and challenge for the city administration in Ethiopia. *Journal of Public Administration, Finance and Law*, Department of Public Administration and Development Management Addis Ababa University, Ethiopia. [pdf] Retrieved from, <https://doi.org/10.47743/jopafl-2021-19-09>.
- Ethiopian Roads Authority (2005). *How Safe Are Ethiopian Roads*, Ministry of Infrastructure, FDR of Ethiopia, Paper Prepared for Mid-Term Review of Road Sector Development Programmed II in Ethiopia, April, 2005.
- Fluitman, F (ed.) (1989) *Training for Work in the Informal Sector*. Geneva: ILO
- Golosino, E.O. (2012). The unheard stories of the sidewalk vendors of Tagbilaran City, Bohol, Philippines. *International Journal of Social Sciences*, 2, 56-60
- Grignaffini, S., Cappellanti, S. & Cefalo, A. (2008). Visualizing sustainability in urban conditions. *WIT Transactions on Ecology and the Environment*
- Hiluf Girmay & Woldeamanuel, A. A. (2022). The Urban Built-Up Area Expansion and Its Impacts on the Livelihoods of Farm House Holds in Peri-Urban Areas of Atsbi

- Town, Tigray Region, Ethiopia. *Journal of Urban Development Studies*, 2(1). [pdf]
Retrieved from, <http://jms.dlcecsu.org/index.php/juds/article/view/39>
- Gwilliam, K. (2003) urban transport in developing countries. *Transport Reviews*, 23, 197- 216
<https://en.wiktionary.org/wiki/semita#Latinsemita>
- Ipingbemi, O. and Aiworo, A. (2013). Journey to School, Safety and Security of School Children in Benin City, Nigeria. *Transportation Research Part F: Traffic Psychology and Behavior*, 19, 77-84.
- Khadar Mohamed Abdi (2016). Challenges Faced by Women Street Vendors in Business Development, Hargeisa – Somaliland, A Research Paper submitted in Partial Fulfillment for the Apart of Masters in Business Administration (MBA) at Abaarso-Tech University.
- Lyons, M. and S. Snoxell (2005). Sustainable Urban Livelihoods and Marketplace Social Capital: Crisis and Strategy in Petty Trade, *Urban Studies*.
- Nantulya, V. M. & Reich, M. R. (2003). Equity dimensions of road traffic injuries in low- and Middle-income countries. *Injury Control and Safety Promotion*, 10, 13-20
- Nardos Abebe, (2020). An investigating on safety, comfort, and convenience of pedestrian street sidewalks. Master's research on urban planning, Addis Ababa university, Ethiopia.
- Roever (2012). Anthropological perspective on the concepts of dualism, the informal sector, and Marginality in developing urban economics. *International Regional Science Review*.
- Saha, D. (2009), 'Decent Work for the Street Vendors in Mumbai, India—A Distant Vision' *Journal of Workplace Rights*
- UN-Habitat, (2017). The state of Addis Ababa: the Addis Ababa We meant. pdf] Retrieved from, https://www.researchgate.net/publication/348151661_The_State_of_Addis_Abeba_2017_The_Addis_Abeba_we_want_UN-HABITAT

UN-Habitat, (2018). Streets for Walking and cycling: Designing for safety, accessibility, and comfort in African cities. [pdf] Retrieved from, <https://unhabitat.org/sites/default/files/2020/06/streets-for-walking-and-cycling.pdf>

World bank (2022). Addis Ababa Sidewalk Design and Maintenance Guidelines. Washington DC. [pdf] Retrieved from, <https://documents1.worldbank.org/curated/en/099427403282212415/pdf/IDU016981078031bd04bce0b83202391d87a8a9a.pdf>

Annex 1: Questionnaires

Part One: Introduction Letter

Tigist Assefa

Cell phone: +251913081054

April/2025

Dear respondent,

Data collection for academic research

I am conducting academic research on the topic evaluation of street vendor management at side walking in Addis Ababa. A series of questions have been prepared to be answered by you. The questionnaire is aimed collect information on the profile of the sidewalk and vendors, working conditions, challenges of the pedestrian, I would like to promise you that the whole information given by the respondent is used for academic purpose only for fulfillment of the requirements for the apart of the degree of master in college of technology and built environment (CTBE). I assure you that whatever information is obtained, will be used for academic purposes only and will be treated as confidential information. I will be extremely grateful for your kind cooperation.

Yours Sincerely,

Tigist Assefa

Cell phone: +251911675070

Part two: survey questionnaires (subjective)

Name_____Date_____Time_____

Subjective assessment of pedestrian safety

1. What is your Gender? ☐ Male ☐ Female
2. What age group best describes you? ☐ 0 -18 ☐ 19-29 ☐ 30-39 ☐ 40-49 ☐ 50-59 ☐
60-69 ☐ > 70
3. Health condition ☐ Very Good ☐ Good ☐ Fair ☐ Poor
4. How frequently do you use this sidewalk? ☐ Frequently ☐ Occasionally ☐ Very Rarely ☐
Never
5. Income level ☐ < 500 ☐ 500 – 2,000 ☐ 2,000 – 5,000 ☐ 5,000 – 10,000 ☐ > 10,000
6. Car ownership ☐ Yes ☐ No
7. What are the activities on the sidewalk you find discomforting? ☐ Street foods vending
☐ Bicycling on the sidewalk ☐ Street retailing ☐ Motor vehicles parking on the sidewalk
☐ Street shoe shiner ☐ wood and metalworks on the sidewalk
8. Trip purpose ☐ going to work ☐ Going to Market ☐ Going to School ☐ for transitions
station ☐ Visit ☐ Exercise ☐ Enjoy the outdoors
9. Do you have a physical condition that affects your ability to walk? ☐ Yes ☐ No
10. Are you interested in goods sold by vendors along this sidewalk? ☐ Very uninterested
☐ Uninterested ☐ Neutral ☐ Interested ☐ Very interested

11. Do you agree the number of pedestrians in this sidewalk is too large, causing this sidewalk to be crowded? ☐ Agree Slightly ☐ Disagree Strongly ☐ Disagree Moderately ☐ Disagree Slightly ☐ Neutral

12. Do you think the total width of the sidewalk is satisfying? ☐ very dissatisfied ☐ dissatisfied ☐ satisfied ☐ very satisfied ☐ Neutral

13. Are there any benches or other places to rest along the sidewalk? ☐ Yes ☐ No

14. Do you feel safe walking on this street during the day? ☐ Yes ☐ No

15. Do you feel safe from trips, slips and falls? ☐ Yes ☐ No

16. If, Yes or No, why_____

17. Do you feel safe walking on this street at night? ☐ Yes ☐ No

18. If, Yes or No, why_____

19. Do you agree the number of pedestrians in this sidewalk is too large, causing this sidewalk to be crowded? ☐ Agree Slightly ☐ Disagree Strongly ☐ Disagree Moderately ☐ Disagree Slightly ☐ Neutral

20. Sidewalk standard perception ☐ Yes ☐ No ☐ Neutral

21. What is your suggestion on how to improvement the sidewalk quality?

Part three: survey questionnaires (objective)

This questionnaire is for objective assessment of the sidewalk pedestrian environment

1. How is the intensity of activities on/by the sidewalk?
 - a. Very high activity b. High Activity c. Low activity d. Very low activity e. No activity
2. Is the sidewalk/path clear of brush, broken glass, debris and unsightly garbage?
 - a. Very clear b. Clear c. fairly clear d. Not clear
3. Are the sidewalks/paths wide enough for adults walking side by side?
 - a. Yes b. No
4. How is the condition of the pavement on the sidewalk?
 - a. Excellent b. Very Good c. Good d. Fair e. Poor f. No Pavement
5. Is the sidewalk/path clear of brush, broken glass, debris and unsightly garbage?
 - a. Very clear b. Clear c. fairly clear d. Not clear
6. How good is the sidewalk for users with mobility aide?
 - a. Excellent b. Very Good c. Good d. Fair e. Poor f. No Pavement
7. Are there curbs to separate the sidewalk/paths from the street?
 - a. Yes b. No

Annex 2: Sample Segment Maps of All Sections (Parts)

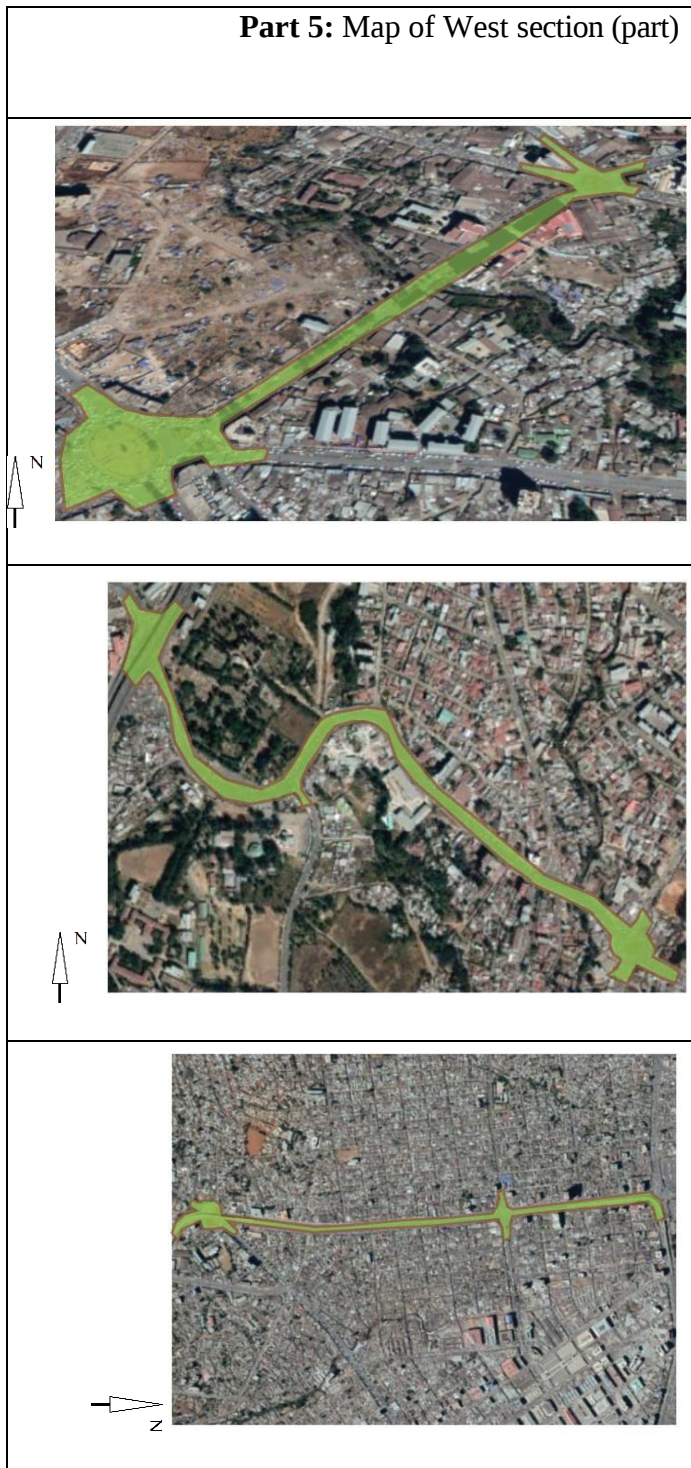
Part 1: Map of northern section (part)	Name of segment	Distance by m	Total = N
	Lem hotel to Shola Market: N1	1,300	39
	Yekatit 12 Sq to US Embassy: N2	1,300	39

Part 2: Map of south section (part)		Name of segment	Distance by m	Total=N
		Adey Abeba- Abo: S1	1,000	39
		Hamsa Simint- Hana Mariam: S2	1,000	39
		Karl RA- Puskine RA S3	100	39
		Garment RA- Lebu Mabrat Haile Sq S4	1,000	39

Part 3: Map of central section (part)	Name of segment	Distance by m	Total = N
	St. George RA- Abuna Petros Sq: C1	1,150	39
	Yekatit 12 RA to Minilik II hospital: C2	1,150	39
	Mexico Sq- Stadium: C3	1,150	39
	Lycée Guebre- Mariam- Legehar Station: C4	1,150	39

Part 4: Map of east section (part)	Name of segment	Distance by m	Total=N
	Megenagna Intersection to Lim Hotel Intersection E1	1,500	39
	Mebrat hail to Yerer Goro E2	1,500	39
	Hyatt Regency to Dembel City center E3	1,500	39

	Bole Mikael Sq to Bole Airport Sq E4	1,500	39
	Bole Mikael Sq to Rwanda Sq E5	1,500	39
	Bole Braas Sq to Edna Mall Sq E6	1,500	39

Part 5: Map of West section (part)		Name of segment	Distance by m	Total=N
		Benin Mosque To T/haimanot Church W1	1,500	39
		Winget Sq to Ras Hailu Park W2	1,500	39
		Autobus Tera Sq- Abnet Hotel W3	1,500	39

	Ayertena Sq - Zenebework Sq: W4	1,500	39
	Torhayloch Sq- Sost kutr mazorla: W5	1,500	39

Annex 3: Sample Pictures Showing Side Walk Conditions of Addis Ababa





Annex 4: Research Article

EVALUATION OF STREET VENDOR MANAGEMENT AT SIDE WALKING IN ADDIS ABABA

Tigist Assefa^a Berhanu Woldetensae (PhD, Dipl-Ing, Associate Professor)^b

^a CTBE Campus, Urban Planning, Addis Ababa University, Email: tigistasefa@gmail.com, P. O. Box 518, Addis Ababa, Ethiopia

^b CTBE Campus Chair of Urban Planning, Addis Ababa University,
Email: berhanu.woldetensae@eiabc.edu.et, P. O. Box 518, Addis Ababa, Ethiopia

Abstract

Urban centers like Addis Ababa witness substantial pedestrian traffic. However, due to inadequate sidewalks, pedestrian pathways often pose challenges. Given pedestrians' heightened vulnerability. This study was conducted with the main objective of evaluate sidewalk safety by focusing on the sidewalk environment as it relates to the comfort and convenience of pedestrian users Addis Ababa while utilizing sidewalks. In order to address the stated objective, the researcher applied mixed research approach. And also, the researcher used descriptive research design. The main data sources were both primary and secondary sources. In this researcher around 819 individuals across 21 selected sidewalks involved to discern user awareness. Based on the study findings, there were common challenges across sidewalks, including issues stemming from vendor activities, congested pedestrian traffic on most of Addis' sidewalks and interactions with vendors, alongside deficiencies in street network and sidewalk infrastructure, encompassing physical and user-related aspects. This causes high dissatisfaction among a majority of pedestrian road users leads to the conclusion that people are not attracted to sidewalks. This dissatisfaction may lead walking users to seek alternative forms of transportation in the future. To enhance sidewalks and foster a more walk able city, the study advocates leveraging the substantial demand for pedestrian infrastructure improvements, Insights gleaned from this research can inform city planners in devising strategies and foot traffic prioritizing pedestrian -friendly policy interventions with ensuring their effective implementation aimed to make Addis Ababa a bolstering sidewalk quality, thereby promoting pedestrian safety, comfort, and convenience urban environments for pedestrians ultimately enhancing the overall quality of life in the city.

Keywords: Safety, Comfort, Convenience, Sidewalk, Pedestrian Level of Service, Street Vending

1. Introduction

Rapid urban population growth is leading to massive unplanned spatial expansion on cities peripheries (Hiluf & Alemayehu, 2022). Ethiopia's rapid urbanization and the consequential economic, social, and spatial transformations, particularly in Addis Ababa, have marked significant progress in enhancing the city's economic and social landscape over the past decades. Despite these advancements, challenges persist in the quest for Addis Ababa to evolve into a more inclusive, safe, resilient, and sustainable city, aligning with the objectives outlined in the sustainable development goals (UN-Habitat, 2017).

Street vendors have an important role in the informal economy by making a significant contribution due to the initiation capacity of the modern organized sector to provide employment for the rapidly expanding labor force, a large number of persons try to create or find income opportunities (Amsale, 2017). Street vending in Ethiopia is a very important yet unbridled component of the informal sector. In the context of the current demographic dynamics & absence of sufficient job opportunities, street vending has become an important economic shelter to urban poor. The key reasons for joining street vending include the small capital requirement, lack of access to credit facilities and lack of suitable and commercially viable trading outlets (Elias, 2021).

According to Lawrence et al. (1995) cited in Nardos (2020), walking was the most common mode of travel due to the short distances required. Cities of long-ago were small, circular and compact providing a five kilometer or less distance to travel. The transportation infrastructure in Addis Ababa is notably deficient, resulting in a heavy reliance on non-motorized modes of transportation. Across the country, more than 60% of the population relies on walking as their primary means of transportation due to the inadequacy of other transportation options. Consequently, walking has become a fundamental aspect of daily life for many individuals, necessitated by the lack of viable alternatives. It is crucial to shift the focus of transportation planning away from prioritizing vehicle movement and towards prioritizing mobility for pedestrians. This research endeavors to evaluate sidewalk and street vendor management within Addis Ababa, recognizing that the majority of residents rely on walking and public transportation, with personal motor vehicles being relatively scarce in the city. The scope of this research project encompasses an overview of walkway design and street vendor implementation

in Addis Ababa, with a specific focus on the major thoroughfares such as PAS (Boulevard) street. It seeks to identify prevalent issues within this specific area, comparing the implementation against government standards and international benchmarks. However, the primary emphasis of this study lies in pinpointing the gaps within Addis Ababa's infrastructure through a case study approach. It aims not only to assess compliance with standards but also to scrutinize the various offices involved in the design, implementation, maintenance, and monitoring of sidewalks and street vendors in Addis Ababa. By doing so, it aims to uncover the underlying factors contributing to the subpar implementation of sidewalks throughout the city.

Despite the widespread use of walking as a primary mode of transportation in Addis Ababa, the city's sidewalks fail to provide a comfortable and encouraging environment for pedestrians. While some governmental efforts have been made to address this issue, the current state of sidewalks in Addis Ababa remains inadequate, disproportionately impacting the city's poorer populations (Nardos, 2020).

Issues such as inadequate shading, misplaced trees obstructing sidewalks, and substandard surfacing exacerbate the challenges faced by pedestrians in Addis Ababa. Collectively, these problems significantly detract from the functionality, safety, and appeal of sidewalks, hindering their effectiveness in promoting walking as a viable means of transportation within the city. In urbanized areas, costs are spiraling from the effects of traffic, particularly accidents, but also from congestion, consumption of public space, air pollution, noise and disruption of social and economic interaction. The lack of sidewalk space results in a high number of pedestrian fatalities. Therefore, the focus of the study was valuation of street vendor management at side walking in Addis Ababa to provide safe and comfortable travel for walkers.

2. Method of data collection and analysis

2.1. Study Area

Addis Ababa, the capital of Ethiopia, serves as the focal point of this research. For administrative convenience, Addis Ababa is divided into 11 sub cities, namely Arada, Bole, Lideta, Addis Ketema, Kirkos, Gulela, Yeka, Nifas Silke/Lafto, Akaki Kaliti, and Kolfe Keranyo. Lem ikura. The city also accommodates a significant number of automobiles, with a registered count of 715,562. Despite a notable 32% annual growth in automobile registration, walking remains the predominant mode of non-motorized transportation in Addis Ababa.

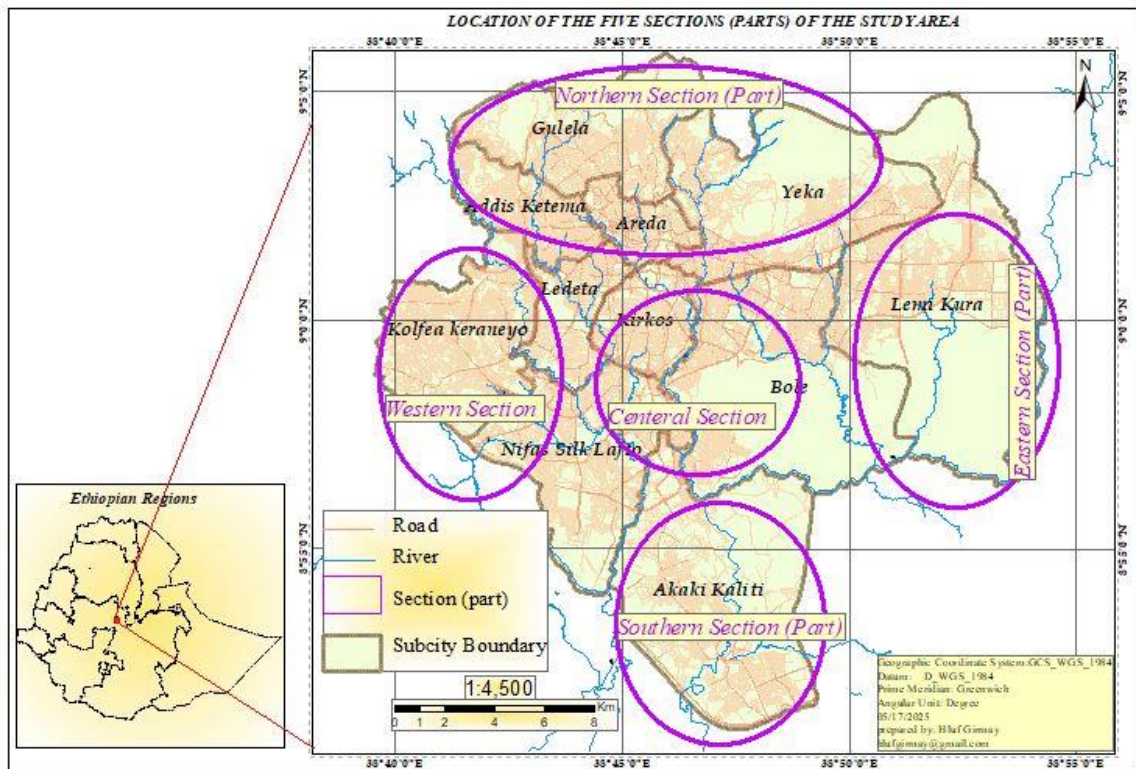


Figure 2: Map of the study area

1.1. Method of data collection and Analysis

In order to address the stated objective, the researcher applied mixed research approach. And also, the researcher used descriptive research design. The main data sources were both primary and secondary sources. In this researcher around 819 individuals across 21 selected sidewalks involved to discern user awareness

2. Result and Discussion

The study was conducted on evaluate sidewalk safety by focusing on the sidewalk environment as it relates to the comfort and convenience of pedestrian users Addis Ababa while highlighting the importance of effective management in addressing these issues. In order to adequately cover all areas of Addis Ababa, the city map has been divided into five main parts (sections): North, South, Central, East and West section (part) with a distinct number of segments, each distinguished by its geographical position. The East section comprises six segments; the West has five, while the South and Central each have four. The North section comprises two segments. So, for each section or part analysis of the study area were presented below. Analyzing the data for individual section (parts) helped understand the difference of the results as the character of each locational change.

2.1. Northern section (part) descriptive analysis

From the northern arterial road sidewalk portions, two samples were selected based on the percentage of the sidewalk road's length. This area exhibits the smallest segment sample, indicating that the pavement is relatively small compared to other directions and is intersected by arterial streets. The site may offer opportunities for revitalization or adaptive reuse, transforming underutilized or blighted areas into vibrant and economically viable spaces. The below figure 2 and table 2 shows the northern arterial road sidewalk segments information. A total of 78 pedestrians were observed using the road in this section.

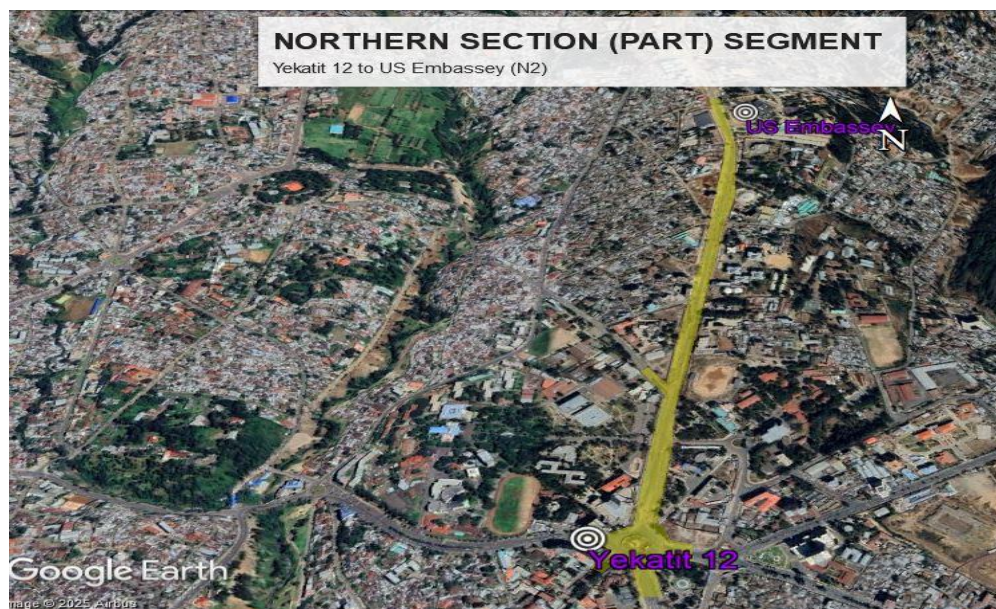


Figure 2: Northern section (part) sample yekatit 12 to US Embassy: N2

Source: Source: Source: Prepared by the researcher, 2025

Table 2: Northern section (part) segment samples

	Name of Segment	Distance by m	Total =N
North Section	Lem hotel to shola market: N1	1300	39
	Yekatit 12 Sq to US embassy: N2	1300	39

Source: Own survey data, 2025

The activities taking place on or within the sidewalk concurrently with people actively walking, which is the intended use of the path, are considered a characteristic feature of Addis Ababa's sidewalks. Therefore, understanding perceptions towards these various activities is essential to comprehend the impact that non-walking activities are having.

		Segment	very bad	bad
sidewalk Disconcerting Activities and vending	Food Vending	Yekatit 12 Sq to US Embassy	2%	5%
		Lem hotel to Shola Market	7%	0%
	Mobile Street Vending	Yekatit 12 Sq to US Embassy	23%	52%
		Lem hotel to Shola Market	46%	1%
	Shoeshines	Yekatit 12 Sq to US Embassy	7%	7%
		Lem hotel to Shola Market	5%	7%
	On street bicycle/ motorcycle Parking	Yekatit 12 Sq to US Embassy	1%	14%
		Lem hotel to Shola Market	9%	0%

According to table 4 mobile street vending emerges as the activity that most bothers pedestrians when traveling north. This finding aligns with the broader analysis presented in the preceding section. both N1 and N2 pedestrian road users rated mobile street vending higher on the "very bad" and "bad" scales. Perception is considered a tool to understand users, and in this study, users' perceptions can inform improvements in pavement travel, thereby enhancing the appeal of walking.

Table 5: Awareness of pedestrian road users towards the sidewalk environment

	Yes	No
--	-----	----

Violence	35.4%	64.6%
Slipping and falling cause	61.4%	38.6%
Safety during night	22.8%	77.2%
Safety during day	41.3%	58.7%
Benches existence	47.6%	52.4%
Comfortable/convenient or not	28.6%	71.4%
Physical problem disrupts walking	11.1%	88.9%

Source: Own survey data, 2025

Table 5. indicates that 88.9% of pedestrian road users have no physical restrictions, and over 50% of those surveyed are satisfied with the current benches. However, 71.4% of them express that walking on this north section is neither comfortable nor convenient, suggesting potential pavement environment issues hindering their activity. While violence is less common than other concerns, slipping and falling cause 61.4% of people to feel unsafe. Although safety concerns might be expected to be higher at night, 41.3% of people report feeling unsafe during the day. The overwhelmingly negative responses to the research questions suggest deterrents to walking overtime.

2.2. Southern section (part) descriptive analysis

For this study from the southern section of the study area, the researcher took four sidewalk segment samples were selected from the Southern arterial route based on the percentage of sidewalk road length in the city. The segments in this direction represent typical sample segments. Table 4 provides details regarding the directions and other pertinent information for all four segments. In total, there are 156 pedestrian responder road users within the part.



Figure 3: Southern section (part) i.e. Garment RA-Lebu Mebrat Haile

Source: Prepared by the researcher, 2025

Table 6: Southern section (part) segment samples

	Name of Segment	Distance by m	Total =N
South Directions	Adey Abeba- Abo: S1	1000	39
	Hamsa Simint- Hana Mariam: S2	1000	39
	Karl RA- Puskin RA: S3	1000	39
	Garment RA- Lebu Mabrat Haile Sq: S4	1000	39

Source: Own survey data, 2025

In this section the user's perception of pavement safety has been assessed using various criteria, as previously outlined. In the south section, 156 individuals were interviewed, and the findings are presented in table 6. Similar to the statistics from the south direction, physical issues are not a major concern, and 75% of individuals express satisfaction with the benches. However, the most problematic factors appear to be comfort and convenience, with 82.05% of respondents providing unfavorable responses. It is evident that elements other than physical disability or bench quality may have impacted their sidewalk experience.

Table 7: Awareness of pedestrian road users to directions the sidewalk environment

	Yes	No
Violence	62.2%	37.8%
Slipping and falling cause	68%	32%
Safety during night	44%	56%
Safety during day	69.2%	30.8%
Benches existence	75%	25%
Comfortable/convenient or Not	17.9%	82.05%
Physical problem disrupts walking	14%	86%

Source: Own survey data, 2025

Table 7 above illustrates that 30.8% of respondents feel unsafe during the day, and 56.8% do not feel comfortable at night. feelings of safety are undoubtedly influenced by concerns about violence, as indicated by 62.2% of the 156 respondents reporting fear of violence. Similarly, concerns about falling and slipping are significant (68%). These two indicators contribute to the lack of safety perceived by pedestrian road users.

Table 8: Awareness of road users' comfort on sidewalk the walking environment activates

	Very bad	bad	Fair	Good	Very good
Sidewalk Width Perspective	3	14	52	28	3
Pedestrian Traffic Perspective	9	88	3	0	0
Street Venders Existence	67	22	5	4	2
Comfort Vs. Street Venders Existence	33	33	29	5	0
Vending vs. Walking Space	22	29	21	18	10
Quality of sidewalk		17	55	20	8

Source: Own survey data, 2025

According to above table 8, pedestrian perceptions regarding comfort and convenience are unfavorable. The presence of street sellers is overwhelmingly regarded as extremely poor (67%) and bad (22%). Moreover, 88% of respondents identified heavy pedestrian traffic as the most common obstruction on pavements. Despite the sidewalks' quality being rated as fair or

good by a total of 55% and 20% of respondents, respectively, the presence of street sellers

	Name of Segment	Distance by m	Total =N
Central section	St. George RA- Abuna Petros Sq:C1	1150	39
	Yekatit 12 RA to Minilik II hospital:C2	1150	39

occupying pedestrian space is consistently viewed as terrible and extremely bad.

2.3. Central section (part) descriptive analysis

The researcher took four arterial sample portions of road are present in the central section; pavement segments were selected based on the fraction of the city's pavement road length. The table below provides information about the map and the three section sites. Within the part, there are 156 pedestrian road users in total.

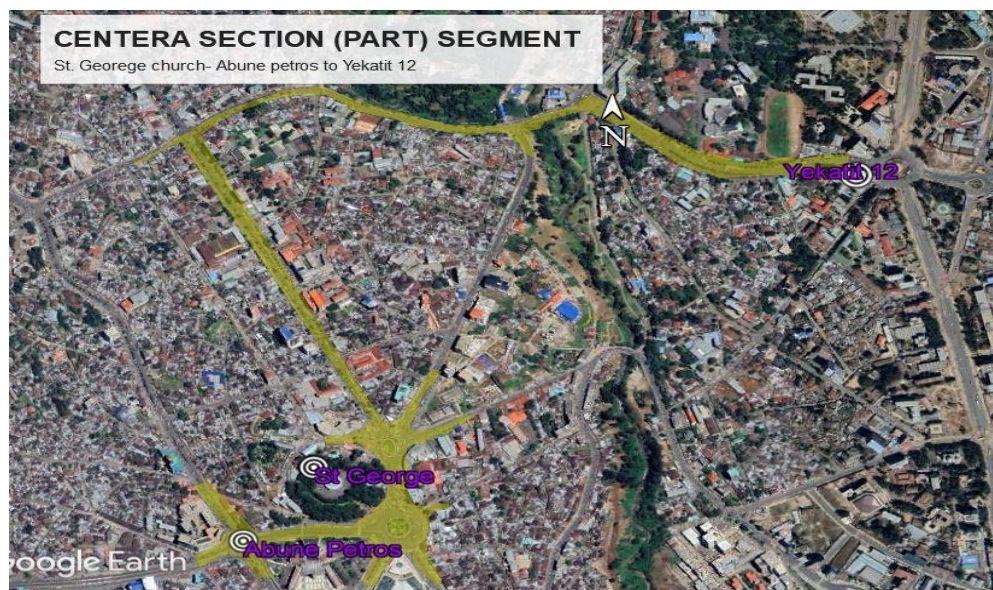


Figure 4: Central section (part) i.e. St. George RA- Abuna Petros Sq – Yekatit 12

Source: Prepared by the researcher, 2025

Table 9: Central section (part) segment samples

	Mexico Sq- Stadium:C3	1150	39
	Lycée Guebre- Mariam- Legehar Station:C4	1150	39

Source: Own survey data, 2025

In consciousness, the measurements in table 10. below demonstrates that physical issues that could impede walking are not a concern; 94% of the respondents do not have such issues. However, only 12% of people found the pavement to be convenient and comfortable, while 72% appreciated the seating provided on the walkways. Only 44% of those surveyed felt comfortable at night, compared to 77% who felt safe during the day. Sixty-one percent of the 156 respondents classified violence as posing a high danger.

Table 10: Awareness of pedestrian road users to direction the sidewalk environment

	Yes	No
Violence	61.0%	39.0%
Slipping and falling cause	42.0%	58.0%
Safety during night	44%	56%
Safety during day	77.0%	23.0%
Benches existence	72.0%	28.0%
Comfortable/convenient or Not	12.0%	88.0%
Physical problem disrupts walking	6.0%	94.0%

Source: Own survey data, 2025

Overall awareness of the pedestrian's road users shows in table 11. below were more favorable, with fair and good evaluations accounting for 56% of the totals. 90% of respondents said that pedestrian traffic congestion was awful, however 30% said that pavement quality was fair and 27% said it was poor. The three linked categories of results are those that garner the most attention Vendor existence, comfort versus vending, and walking space against vending are all issues with sidewalk sellers. The majority of the reviews for each were unfavorable, with 56%, 90%, and 48%, respectively. This demonstrates how vending annoys pedestrians. Vendors and backed-up traffic are the two main problems that make strolling less enjoyable.

Table 11: Awareness of pedestrian road users' comfort on sidewalk environment

	Very bad	Bad	Fair	Good	Very good
Sidewalk width perspective	7%	26%	48%	19%	0%
Pedestrian traffic perspective	8%	90%	2%	0%	0%
Street vendors Existence	25%	37%	32%	5%	1%
Comfort Vs Street vendors' existence	56%	20%	17%	7%	
Vending vs walking space	40%	27%	30%	3%	
Quality of sidewalk	2%	33%	40%	21%	4%

Source: Own survey data, 2025

2.4. East section (part) descriptive analysis

The East section part of the study area includes six examples of pavement segments along the arterial route. The selection of samples is based on the percentage of pavement and road length relative to Addis Ababa as a whole. This section boasts the highest number of sample segments, indicating a greater prevalence of arterial roadways and pavements compared to other sections. The map and additional details of the six segments are provided in the table below. In total, the section has 234 pedestrians who use the roads as pedestrians, making it the section with the highest number of pedestrian responders.



Figure 5: Eastern section (part) i.e. Hyatt Regency to Dembel city center

Source: Prepared by the researcher, 2025

Table 12: Eastern section (part) segment samples

	Name of Segment	Distance by m	Total =N
Eastern Section	Megenagna Intersection to Lim Hotel Intersection: E1	1500	39
	Mebrat hail to Yarer Goro: E2	1500	39
	Hyatt Regency to Dembel City center: E3	1500	39
	Bole Mikael Sq to Bole Airport Sq: E4	1500	39
	Bole Mikael Sq to Rwanda Sq: E5	1500	39
	Bole Braas Sq to Edna Mall Sq: E6	1500	39

Source: Own survey data, 2025

Based on the table 13 below, the significant portion, 88%, expressed dissatisfaction with comfort and convenience, while the lack of benches along the sidewalk was noted by the same percentage. This suggests that a low comfort rating correlates with a lower bench count. Only 32% of pedestrians feel safe walking at night, compared to 56% feeling safe during daylight. However, fear of violence and slipping and falling are relatively lower in the North, Central, and Southern Sections.

Table 13: Awareness of road users towards the sidewalk environment

	Yes	No
Violence	46.0%	54.0%
Slipping and falling cause	40.0%	60.0%
Safety during night	32.0%	68.0%
Safety during day	56.0%	44.0%
Benches existence	12.0%	88.0%
Comfortable/convenient or Not	13.0%	87.0%
Physical problem disrupts walking	9.0%	91.0%

Source: Own survey data, 2025

Table 14: Awareness of pedestrian road users' comfort on sidewalk environment

	Very bad	Bad	Fair	Good	Very good
Sidewalk width perspective	2.99%	8.9%	52.9%	34.6%	0.6%
Pedestrian traffic perspective	0.03%	99.9%			
Street vendors' existence	62.8%	22.6%	14.9%		
Comfort Vs. street vendors' existence	37.1%	28.2%	33%	2%	
Vending vs. walking space	37.17%	12.8%	18.8%	23.08%	8%
Quality of sidewalk	38.88%	47.86%	13.24%		

Source: Own survey data, 2025

According to the above table 14, the pavement width received satisfactory ratings, with 34.6% rated as good and 52.9% as fair. However, all respondents rated pedestrian traffic congestion poorly. When asked about the effect of vendors on their comfort while walking, respondents gave a very low rating to the presence of sellers (37.1%) and a terrible rating to vendors (28.2%). A very poor rating of 37.17% was assigned to the influence of street vendors on the

walking area. This study highlights that the standards and amenities of pavements themselves are not the primary cause of issues arising from activity congestion.

2.5. West section (part) descriptive analysis

The West arterial road utilizes the second-highest number of segment samples, with five segments, following the East section. The table below offers descriptions of the part and other site content. In total, there are 195 respondents who are pedestrian road users.

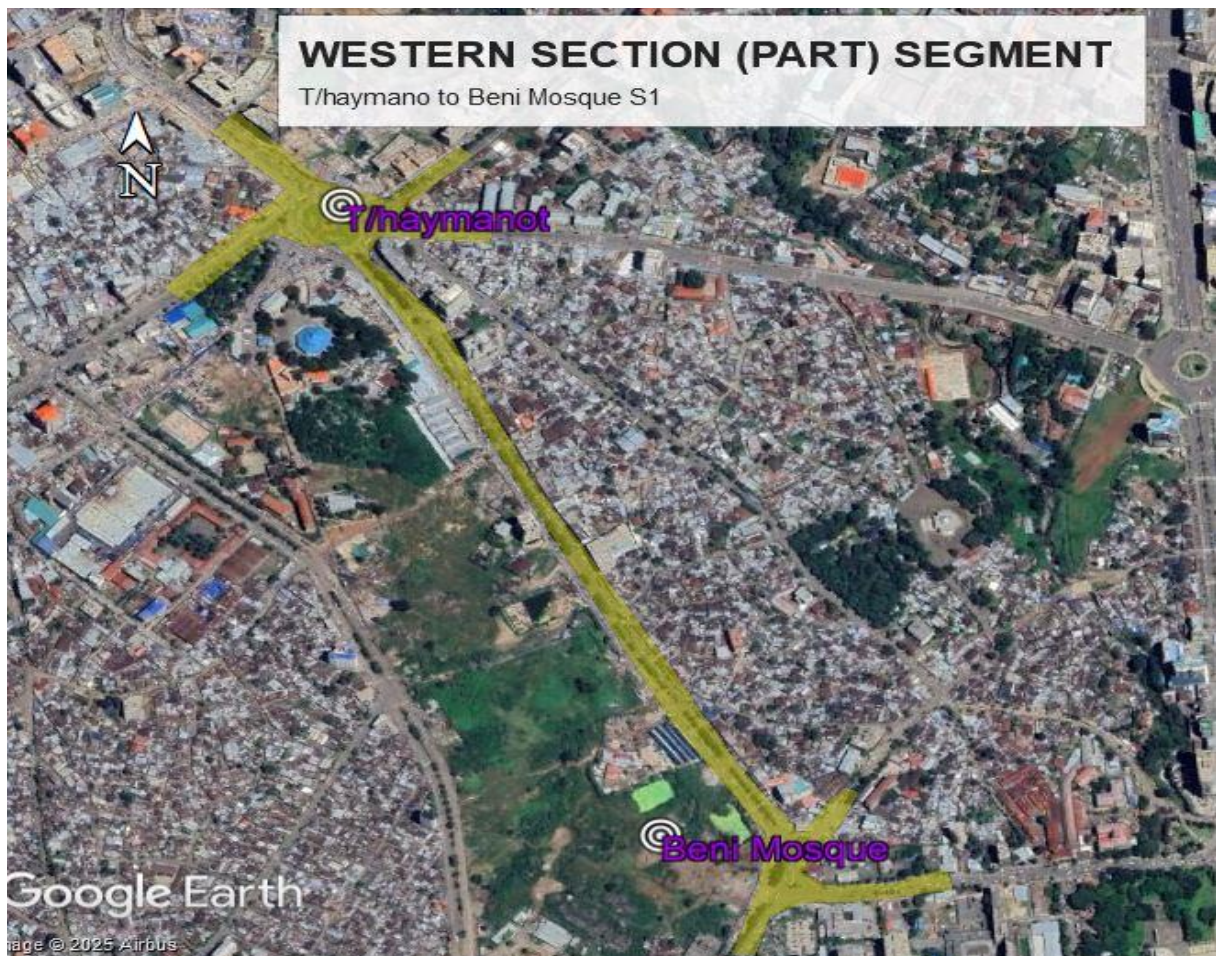


Figure 6: Western section (part) i.e. Benin Mosque To T/haimanot church: S1

Source: Source: Prepared by the researcher, 2025

Table 15: Western section (part) segment samples

	Name of Segment	Distance by m	Total =N
West Section	Benin mosque to T/haimanot Church: S1	1,500	39
	Winget Sq to Ras Hailu Park: S2	1,500	39
	Autobus Tera Sq-Abnet hotel: S3	1,500	39
	Ayertena Sq - Zenebework Sq: S4	1,500	39
	Torhayloch Sq- Sost kutr mazoria: S5	1,500	39

Source: Own survey data, 2025

Below table 16, shows violence is present, 45 percent of the respondents, but compared to the other Direction the percentage is lower. Likewise, the results of this study show there are other factors other than physical problems or Sidewalk amenities that cause pedestrian discomfort. Pedestrian perception of safety during the day is high (69%feelsafe), but only 18% feel safe at night which is low compared to other Direction.

Table 16: Awareness of road users towards the sidewalk environment

	Yes	No
Violence	45.0%	55.0%
Slipping and falling cause	38.0%	62.0%
Safety during night	18.0%	82.0%
Safety during day	69.0%	31.0%
Benches existence	95.0%	5.0%
Comfortable/ convenient or Not	12.0%	88.0%
Physical problem disrupts walking	26.0%	74.0%

Table 17: Awareness of pedestrian road users' comfort on sidewalk environment

	Very Bad	Bad	Fair	Good	Very Good
Sidewalk width perspective	1%	3%	45%	49%	2%
Pedestrian traffic perspective	2%	92%	6%	-	-
Street vendors' existence	66%	14%	16%	4%	-
Comfort vs. street vendors' existence	48%	28%	20%	4%	-
Vending vs. walking space	26%	26%	25%	20%	3%

Quality of sidewalk	6%	46%	44%	4%	
---------------------	----	-----	-----	----	--

Source: Own survey data, 2025

The above table 17, shows the respondents' perceptions of the sidewalk environment reveal that the majority, 49%, perceive the sidewalk width perspective as good. However, the pedestrian traffic perspective is rated as bad by 92% of respondents, while 66% deem the street vendors' existence as very bad. Additionally, 48% perceive comfort vs. street vendors' existence as very bad, and 46% rate the quality of the sidewalk as bad. These findings suggest that in the sidewalk environment, pedestrian traffic and quality of the sidewalk are perceived negatively, along with the existence of street vendors and the comfort vs. their presence.

3. Conclusion and Recommendations

3.1. Conclusion

The general objective of this study was to evaluate sidewalk safety by focusing on the sidewalk environment as it relates to the comfort and convenience of pedestrian users Addis Ababa. As noted by Loukaitou (2001), factors such as darkness, lack of windows opening to the sidewalk, among others, may render individuals more susceptible to crimes in a sidewalk setting. He also mentions environmental elements perceived as "cues to danger," including unfamiliarity and the presence of other people. Inadequate illumination in public spaces, overgrown bushes, darkness, and desolate environments all contribute to safety concerns, as outlined in the literature.

The study recognizes that, due to a congested pedestrian traffic on most of Addis' sidewalks, there is not a clear understanding of whether walkers are using the sidewalk by choice or not. And also, street vendors identify the locations where they vend on their own without any guideline. This causes high dissatisfaction among a majority of pedestrian road users leads to the conclusion that people are not attracted to sidewalks. This dissatisfaction may lead walking users to seek alternative forms of transportation in the future.

3.2. Recommendations

- ✚ Based on the study's findings, the researcher made the following recommendations;
- ✚ To control side vendors designed line or fence could be established for vendor spaces, with compliance enforced by law. Establishing comprehensive standards and enforcing compliance to ensure that pedestrian facilities meet the necessary safety and quality throughout the city.

- ✦ Establish a code for the city to prescribe contextual guidelines ensuring compliance with national policies and guidelines. Regular sidewalk maintenance, including upkeep of drainage infrastructure, should be systematically conducted and strictly enforced.
- ✦ Reinforce walkability, bike ability + wellbeing walkability require a range of strategies that consider human scale, pedestrian comfort, safety, and land use, as well's respond to the specific physical and cultural characteristics of each neighborhood
- ✦ Planning bodies must prioritize the needs of pedestrians, who constitute the majority of travelers. This includes ensuring appropriate sidewalk width, safe surface conditions, fewer obstructions, designated pedestrian crossings, buffer zones between sidewalks and traffic lanes, proper lighting, and the planting of shade trees.
- ✦ Enabling street design should focus on the functional integration of multifunctional streets with engaging streetscapes and foot traffic. Planning should consider non-walking sidewalk activities to enhance the overall pedestrian experience.
- ✦ Prioritizing pedestrian-friendly policies and ensuring their effective implementation, Addis Ababa can create safer and more accessible urban environments for pedestrians, ultimately enhancing the overall quality of life in the city.
- ✦ The researcher suggests that further studies shall be conduct on the sidewalk safety, comfort, convenance and on street vendors in detail by including variables that were not surveyed in this research in order to improve the prediction of future outcomes.

References

- Amsale Alebachew (2017). street vending and Local Authorities in Addis Ababa city: Challenges and the way forwards. Master's research on public administration and development management, Addis Ababa university, Ethiopia.
- Anastasia Loukaitou Sideris and Renia Ehrenfeucht (2009). Sidewalks: Conflict and Negotiation Over Public Space. MIT Press.
- Athanasios Galanis and Nikolaous Eliou (2012). Department of civil Engineering, social and behavioral Sciences, Transport Research Arena.
- Bell, J.S. and Loukaitou Sideris (2014). Sidewalk informality: an examination of street
- Berner, E., G. Gomez and P. Knoringa (2008). The Logic of Survival Entrepreneurs and the Moral Economy of the Slum, Paper Presented at the UNU – WIDER Workshop Entrepreneurship and Economic Development, Helsinki.
- Bhimji, F. (2010). Struggles, urban citizenship, and belonging: the experience of undocumented Street vendors and food truck owners in Los Angeles, Urban Anthropology and Studies of Cultural.
- Bhowmik, S.K. (2001). Hawkers and the Urban Informal Sector: A Study of Street Vending in Sever Cities, Unpublished report prepared for National Association of Street Vendors in India.
- Bhowmik, S.K. (2012). Street Vendors in the Global Urban Economy, Taylor & Francis, London.
- Blanchard, M. (2011). Fare Mercato a Torino: carriere professionali e pratiche quotidiane degli Ambulanti stranieri nei mercati rionali”, Mondi Migranti, Vol. 2, pp. 75-99.
- Boels, D. (2014). It's better than stealing: informal street selling in Brussels”, International.
- Boonjubun, C. (2017). Conflicts over streets: the eviction of Bangkok Street vendors, Cities, Vol. 70, pp. 22-31.
- Bromley, R. and Mackie, P. (2009), “Displacement and the new spaces for informal trade in La and public.
- Bromley, R. (2000). Street vending Policies: a global review”, International Journal of Sociology and Social Policy, Vol. 20 Nos 1- 2, pp. 1-28 Systems and World Economic Development, Vol. 39 No. 4, pp. 455-492.
- Buchanan C, 1963 “Traffic in Towns”, the Specially Shortened Edition of the Buchanan Report,

- Central Intelligence Agency (2011). The World Factbook [Online]. Washington: Central Intelligence Agency. Available: <https://www.cia.gov/library/publications/the-world-factbook/geos/et>.
- Derry, J., Ebel, B. E., Mock, C. N., Afukaar, F. & Donkor, P. (2010). Pedestrians' Injury Patterns in Ghana. *Accident Analysis & Prevention*, 42, 1080-1088.
- Elias Berhanu (2021). Street Vending: Means of livelihood for the urban poor and challenge for the city administration in Ethiopia. *Journal of Public Administration, Finance and Law*, Department of Public Administration and Development Management Addis Ababa University, Ethiopia. [pdf] Retrieved from, <https://doi.org/10.47743/jopafl-2021-19-09>.
- Ethiopian Roads Authority (2005). How Safe Are Ethiopian Roads, Ministry of Infrastructure, FDR of Ethiopia, Paper Prepared for Mid-Term Review of Road Sector Development Programmed II in Ethiopia, April, 2005.
- Fluitman, F (ed.) (1989) Training for Work in the Informal Sector. Geneva: ILO
- Golosino, E.O. (2012). The unheard stories of the sidewalk vendors of Tagbilaran City, Bohol, Philippines. *International Journal of Social Sciences*, 2, 56-60
- Grignaffini, S., Cappellanti, S. & Cefalo, A. (2008). Visualizing sustainability in urban conditions. *WIT Transactions on Ecology and the Environment*
- Hiluf Girmay & Woldeamanuel, A. A. (2022). The Urban Built-Up Area Expansion and Its Impacts on the Livelihoods of Farm House Holds in Peri-Urban Areas of Atsbi Town, Tigray Region, Ethiopia. *Journal of Urban Development Studies*, 2(1). [pdf] Retrieved from, <http://jms.dlcecsu.org/index.php/juds/article/view/39>
- Gwilliam, K. (2003) urban transport in developing countries. *Transport Reviews*, 23, 197- 216 <https://en.wiktionary.org/wiki/semita#Latinsemita>
- Ipingbemi, O. and Aiworo, A. (2013). Journey to School, Safety and Security of School Children in Benin City, Nigeria. *Transportation Research Part F: Traffic Psychology and Behavior*, 19, 77-84.
- Khadar Mohamed Abdi (2016). Challenges Faced by Women Street Vendors in Business Development, Hargeisa – Somaliland, A Research Paper submitted in Partial Fulfillment for the Apart of Masters in Business Administration (MBA) at Abaarso-Tech University.
- Lyons, M. and S. Snoxell (2005). Sustainable Urban Livelihoods and Marketplace Social Capital: Crisis and Strategy in Petty Trade, *Urban Studies*.
- Nantulya, V. M. & Reich, M. R. (2003). Equity dimensions of road traffic injuries in low- and Middle-income countries. *Injury Control and Safety Promotion*, 10, 13-20

- Nardos Abebe, (2020). An investigating on safety, comfort, and convenience of pedestrian street sidewalks. Master's research on urban planning, Addis Ababa university, Ethiopia.
- Roever (2012). Anthropological perspective on the concepts of dualism, the informal sector, and Marginality in developing urban economics. International Regional Science Review.
- Saha, D. (2009), 'Decent Work for the Street Vendors in Mumbai, India—A Distant Vision' Journal of Workplace Rights
- UN-Habitat, (2017). The state of Addis Ababa: the Addis Ababa We meant. pdf] Retrieved from, https://www.researchgate.net/publication/348151661_The_State_of_Addis_Abeba_2017_The_Addis_Abeba_we_want_UN-HABITAT
- UN-Habitat, (2018). Streets for Walking and cycling: Designing for safety, accessibility, and comfort in African cities. [pdf] Retrieved from, <https://unhabitat.org/sites/default/files/2020/06/streets-for-walking-and-cycling.pdf>
- World bank (2022). Addis Ababa Sidewalk Design and Maintenance Guidelines. Washington DC. [pdf] Retrieved from, <https://documents1.worldbank.org/curated/en/099427403282212415/pdf/IDU016981078031bd04bce0b83202391d87a8a9a.pdf>