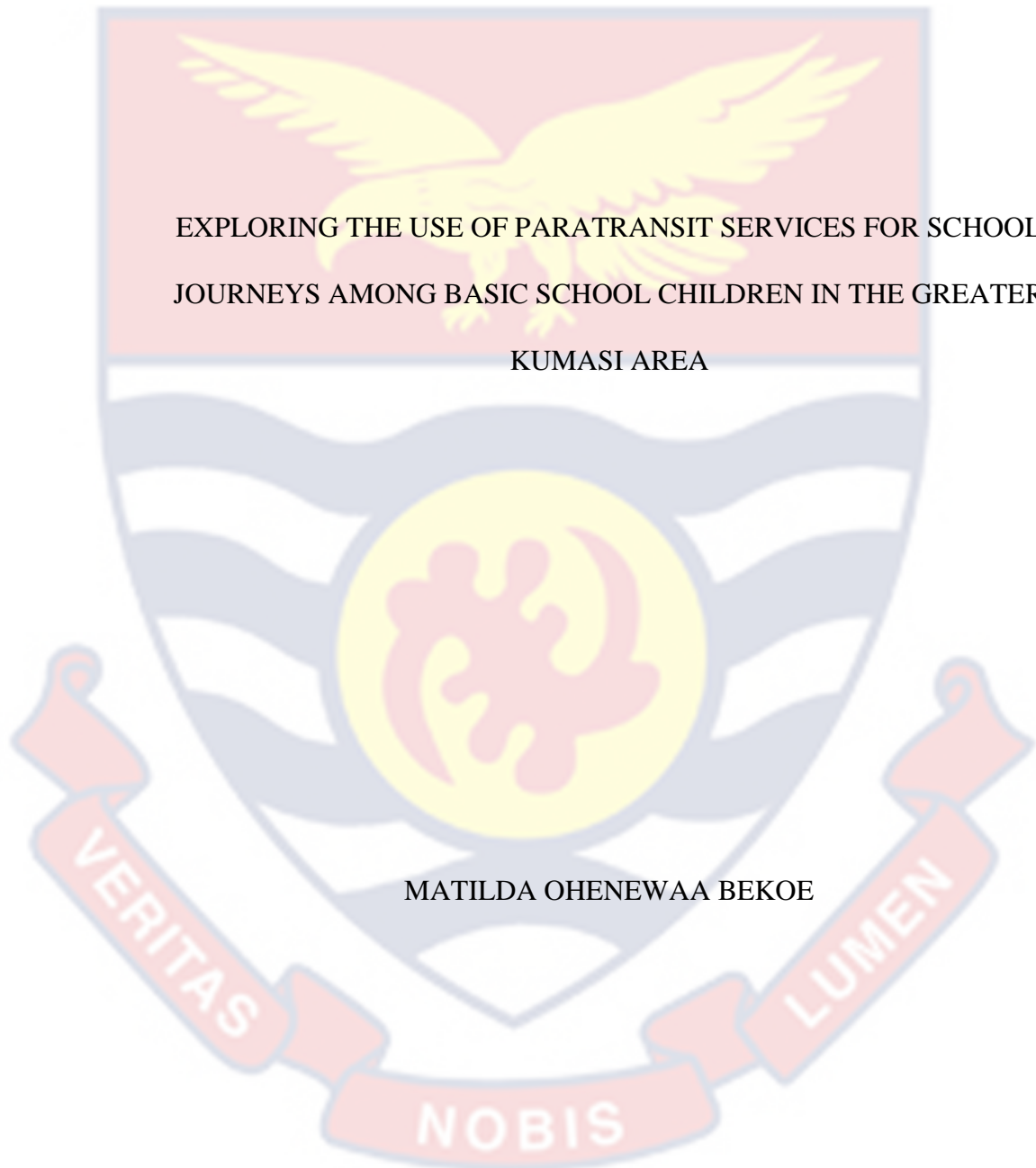


UNIVERSITY OF CAPE COAST



EXPLORING THE USE OF PARATRANSIT SERVICES FOR SCHOOL
JOURNEYS AMONG BASIC SCHOOL CHILDREN IN THE GREATER
KUMASI AREA

MATILDA OHENEWAA BEKOE

2023

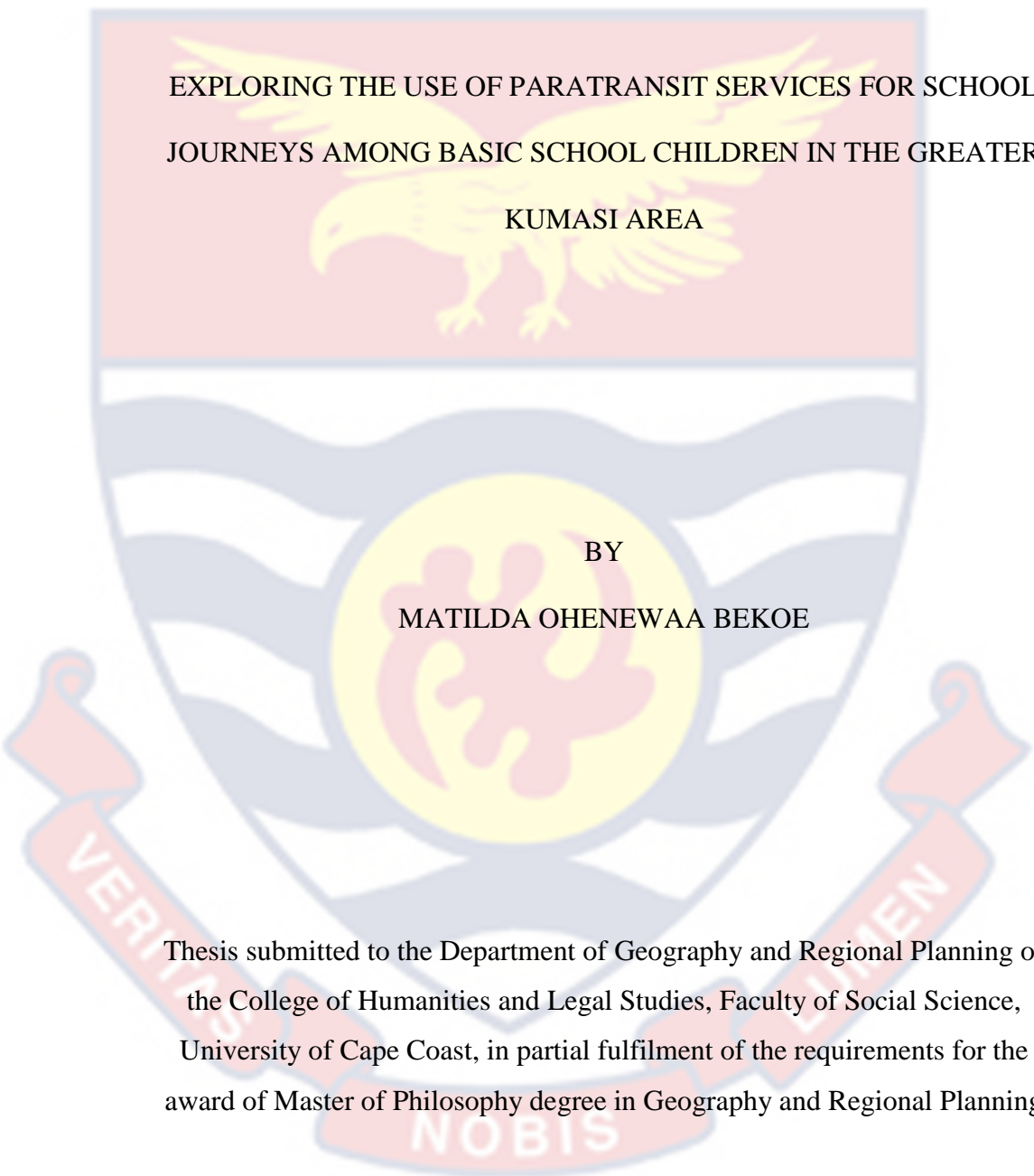


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KUMASI AREA

BY
MATILDA OHENEWAA BEKOE

Thesis submitted to the Department of Geography and Regional Planning of
the College of Humanities and Legal Studies, Faculty of Social Science,
University of Cape Coast, in partial fulfilment of the requirements for the
award of Master of Philosophy degree in Geography and Regional Planning

AUGUST, 2023

DECLARATION

Candidate's Declaration

I hereby declare that this thesis is the result of my original research and that no part of it has been presented for another degree in this university or elsewhere.

Candidate's Signature: Date:

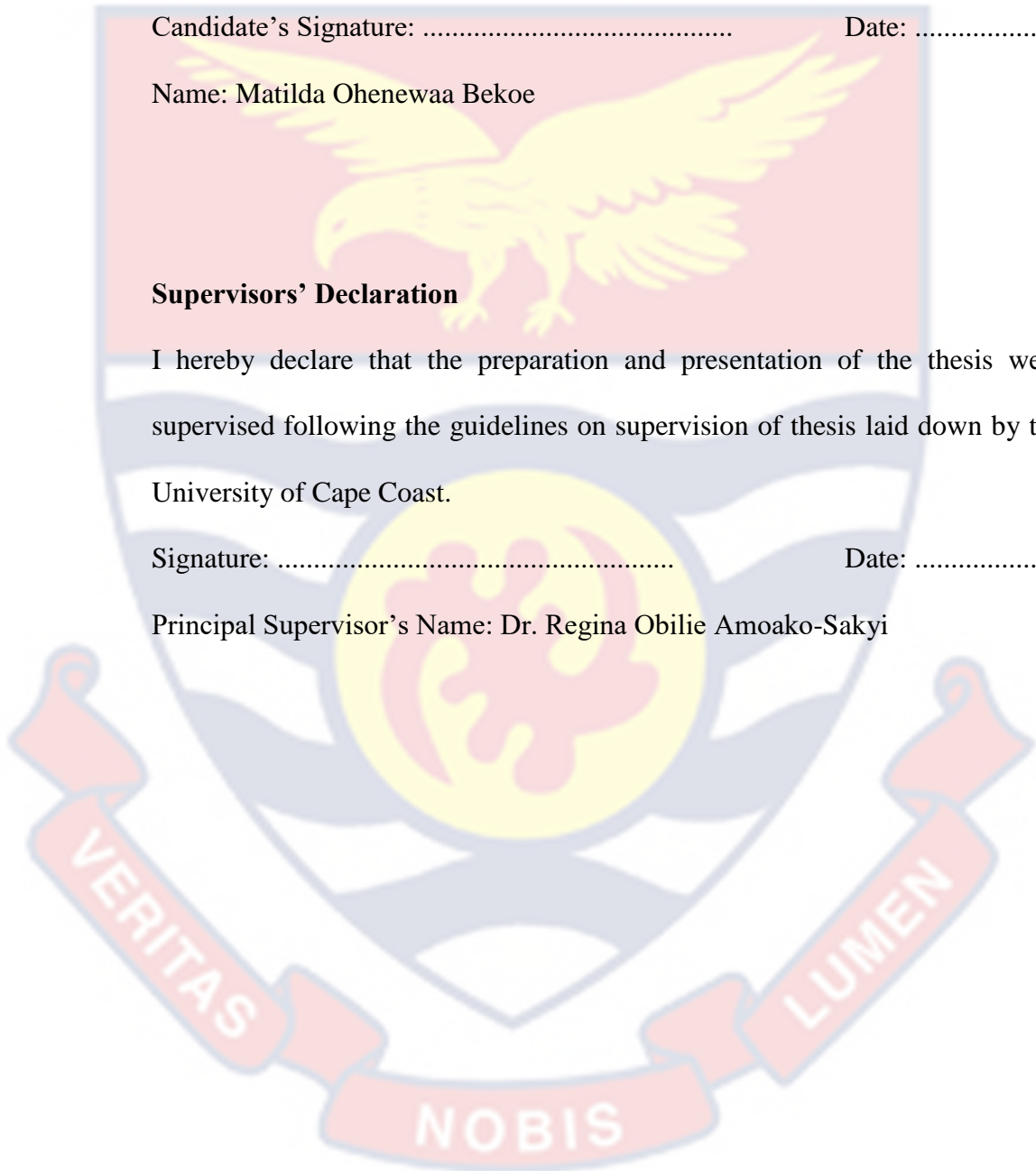
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Supervisors' Declaration

I hereby declare that the preparation and presentation of the thesis were supervised following the guidelines on supervision of thesis laid down by the University of Cape Coast.

Signature: Date:

Principal Supervisor's Name: Dr. Regina Obilie Amoako-Sakyi



ABSTRACT

How children perceive safety, convenience and other factors that influence the choice of mode for journey to school may be significantly different from an adult perspective. Understanding how children with different life experiences come to terms with day-to-day context and constraints in the journey to school has become an important topic that deserve critical attention. Using a pragmatic paradigm mainly through survey, focus group discussion (FGD), and observation, this study sought out to explore the use of paratransit services for school journeys among Basic School Children in Greater Kumasi Area. The study employed the simple random technique and sampled 123 pupil and as well used convenience sampling to sample an average of 12 pupil for three FGD's. The study revealed that parents are key players in the choice of paratransit modes for school journeys which may be influenced by their socio-economic factors and the perception about these modes. The study also identified condition of mode, infrastructure, and driver behaviour as the major challenges faced in using paratransit modes for school journeys. Though road safety education is seen as a global tool for reducing road traffic crashes, findings from this study further revealed that only two subjects (Citizenship Education and Our World Our People) taught in basic school had content on road safety. In view of this, it is recommended that policymakers including Land Use and Spatial Planning Authority (LUSPA), and National Road Safety Authority (NRSA) should include children in planning their activities to better understand their travel needs. The study further recommends that Ghana Education Service (GES) should include road safety education at all levels in basic schools to reduce the number of road crashes.

KEYWORDS

Basic school

Journey to school

Paratransit

Parent

Pupil

Road safety

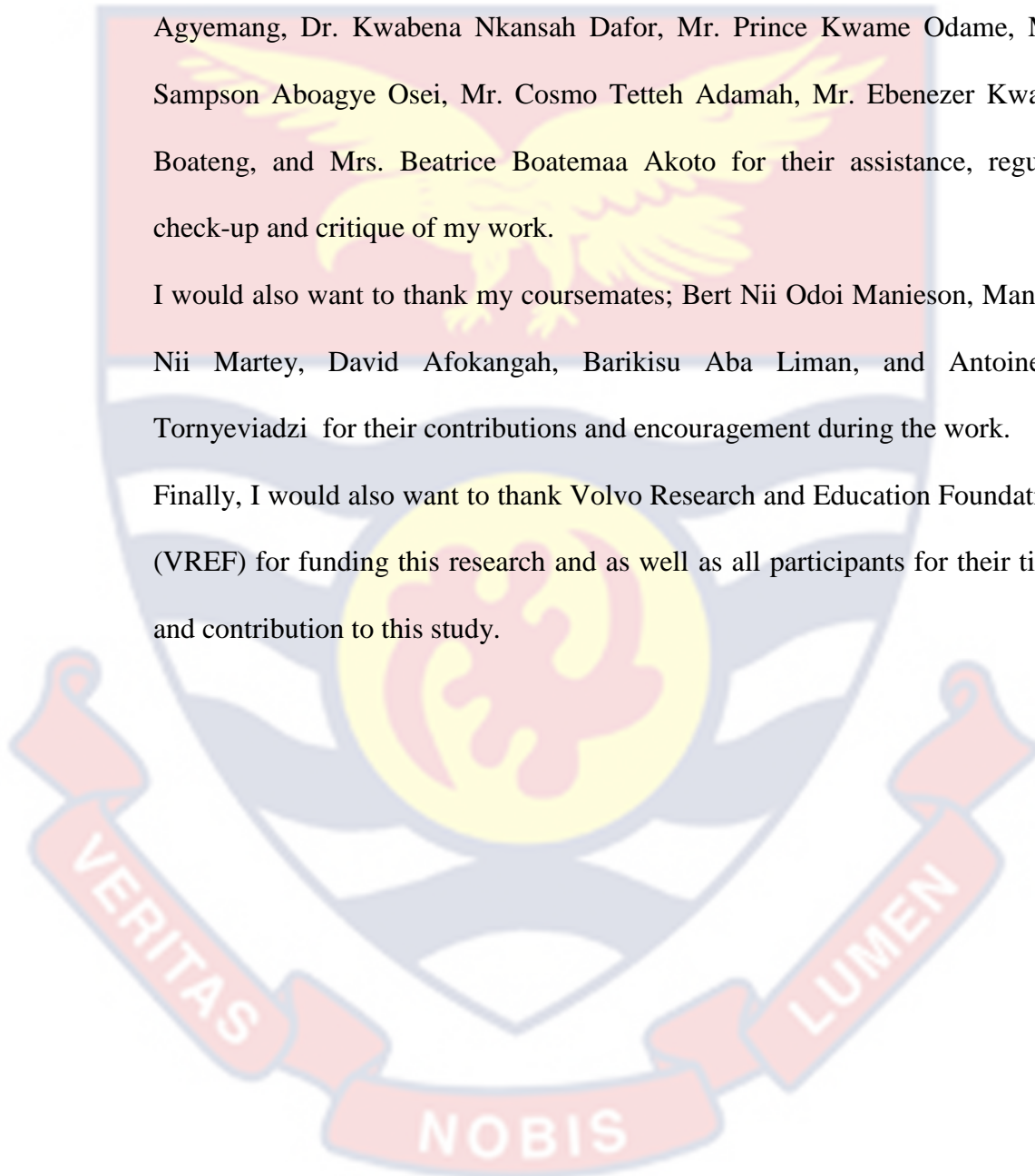


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DEDICATION

To my family



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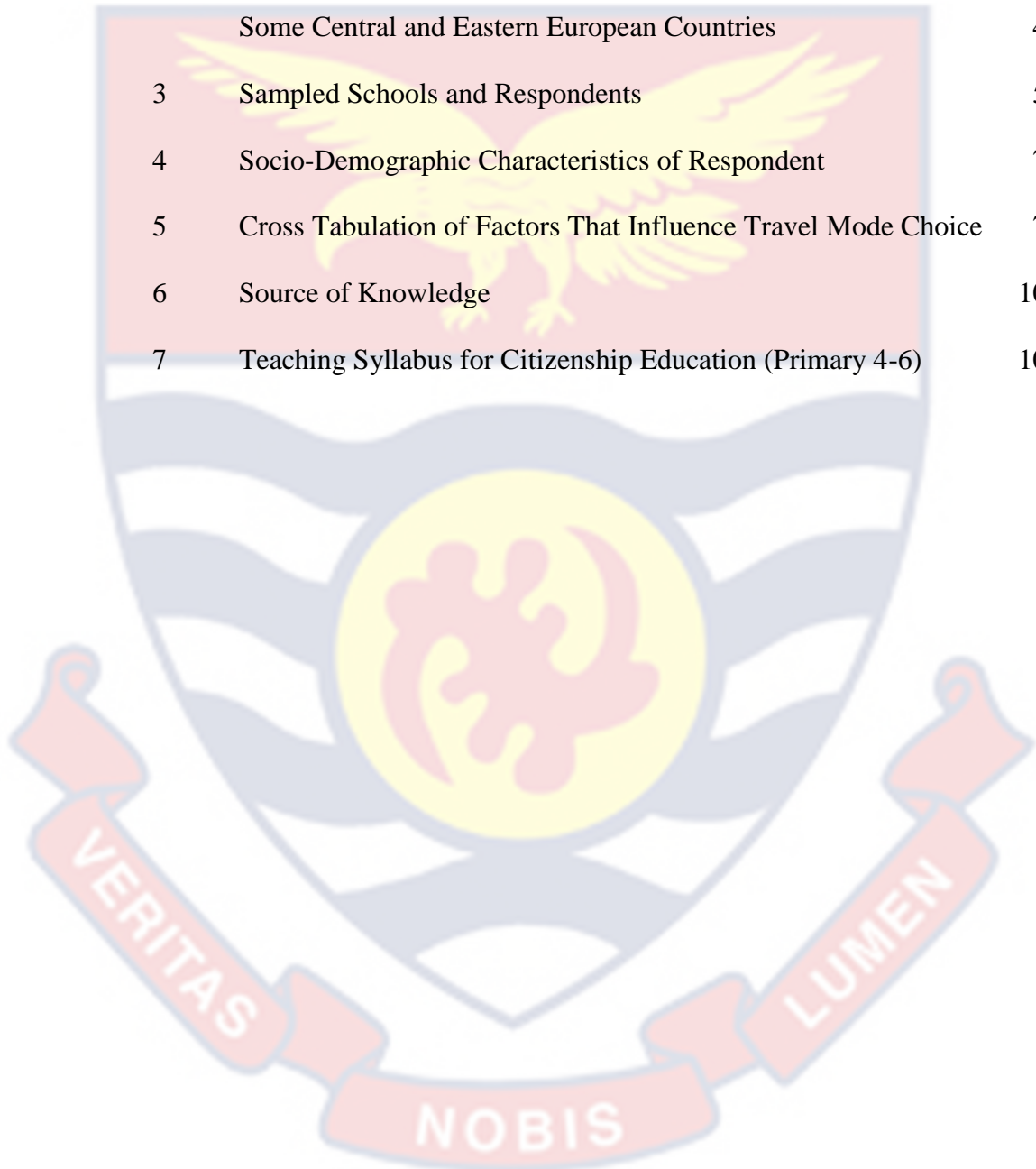
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LIST OF ACRONYMS

ATS	Active School Travel
DVLA	Driver and Vehicle Licensing Authority
FGD	Focus Group Discussion
GPRTU	Ghana Private Road Transport Union
IRB	Institutional Review Board
IR4	Inter-Regional Road
KMA	Kumasi Municipal Assembly
LI	Legislative Instrument
LUSPA	Land Use and Spatial Planning Authority
MTTD	Motor and Traffic and Transport Directorate
OTMA	Old Tafo Municipal
OWOP	Our World Our People
PROTOA	Progressive Transport Owners Association
RSE	Road Safety Education
RTC	Road Traffic Crashes
WHO	World Health Organisation

CHAPTER ONE

INTRODUCTION

Background of the Study

Globally, children are part of a growing population segment in many urban areas. Children may travel for several reasons which include; sightseeing, sports, recreation, walking, shopping, load carrying, visiting people; visiting the hospital, playing, and religious purposes using several transport modes (He & Giuliano, 2017). Recently, decisions on travel mode choice among children have been widely discussed in many western contexts (Ermagun & Levinson, 2017; Faulkner, Richichi, Buliung, Fusco, & Moola, 2010; Mehdizadeh, Nordfjaern, & Mamdoohi, 2019; Shengxiao & Pegnjun, 2015; Porter, G., Hampshire, K., Abane, A., Munthali, A., Robson, E., Mashiri, M., & Lives, M. Y. 2017). The journey to and from school, as part of the day-to-day routine for most children forms the basis of movement of children over several miles (Pooley, Turnbull, & Adams, 2005). Children travel to school using several modes. Whereas, motorized transport forms the highest mode of transport in developed countries (although particular emphasis is placed on the shift from motorised transport to more active travel due to its health benefits i.e reducing obesity) (Cerin, Leslie, & Owen, 2009; Rezasoltani, Behzadfar, & Said, 2017; Scheiner, 2016); in developing countries, walking still remains the most dominant mode of transport for school journeys (He & Giuliano, 2015; Mitra, 2013; Poku-Boansi, Amoako, & Obeng, 2019; Mponya, 2015). This may be partly due to inadequate funds to cater for transport fares among competing needs of families (Poku-Boansi, Amoako, & Obeng, 2019).

Paratransit often forms an important component of the journey to school, serving a greater percentage of the transport needs of children in urban and rural areas of most developing countries (Cassius, Deeb, Sorour, & Turner, 2021). In the context of this study, paratransit may be defined as a system of public transport with a passenger carrying capacity between one and four for small vehicles (e.g., tricycles and motorbikes) and above four but not more than twenty-six passengers for large buses (e.g., 'trotro') that run along a defined route and stop to pick up or drop off people upon request. These modes serve as a source of employment for drivers many of whom might otherwise have no alternative reliable means of livelihood and market for spare part dealers and food vendors who sell to operators. Despite the potential of paratransit mode in addressing the transport deficit, there are several safety concerns in the use of these modes. In most developing countries such as Ghana, and Nigeria. Paratransit is often poorly organised with weak regulations which provide inefficient service to the largest captive users (Behrens, McCornick, & Mfinanga, 2016). Sietchiping et al., (2012), explain this as partly a result of the increase in different paratransit modes operations worsening transport issues rather than improving them. Most of the operators of these modes exhibit dangerous driving behaviour such as over speeding, overtaking, and overloading in their quest to get more passengers to generate more income. It is to this that World Bank (2002) describes the behaviours of paratransit operators as adding to the transport problem rather than solving it. AMEND & FIA Foundations (as cited in Janmohammed, Van Niekerk, Samuels, Naidoo, & Van As, 2019) observed that Africa has the most dangerous roads which are attributed to the absence of pedestrian walkways,

parking spaces, poor maintenance of road infrastructure, and lack of speed control, safe crossing point, and lack of street lights. Poor conditions of paratransit modes coupled with poor road infrastructure contribute to high road traffic crashes among adolescents (Singh & Vasudevan, 2018).

Every year, more than 1.25 million people die as a result of traffic accidents around the world with Sub-Saharan Africa recording the highest number of deaths (World Bank, 2018). Road traffic accidents are the leading cause of death among young people aged 15 to 24 with most of these crashes occurring on their way to and from school (Silverman & Saul, 2015). According to the World Health Organisation (WHO), every four minute, a child is lost on the roads of the world and many more are injured, often severely. Many of these children are killed while walking to or using paratransit modes.

Where and how children travel, what they do while they travel, and how long they travel, affect their experiences, mood, and cognitive performances (Westman et al., 2017). Thus, the availability and quality of transport facilities and services exert significant influence on the ability of children to commute safely and conveniently to and from school (Adom-Asamoah., 2015). It is imperative to note that this research is part of a broad project awarded to the Department of Geography and Regional Planning, UCC in collaboration with University of Nairobi, Kenya on Urban Spaces Design, Mobility and Transport Safety of Children: A Comparative Study of Nairobi and Kumasi Cities. The project was funded by Volvo Research and Educational Foundation (VREF).

Statement of Problem

As the second most populous city, Kumasi has transport challenges such as traffic congestion, and pollution that are militating against its growth and development. The impact of urbanisation and the value placed on education has resulted in the influx of numerous basic schools and a variety of paratransit modes that connect children to these schools in both rural and urban areas such as Kumasi (Adom-Asamoah, 2015). With the development of a car-oriented lifestyle, an increase in the number of employed mothers, and changes in attitudes toward children's independent mobility, factors that influence children's travel behaviour have changed over time (Mackett, 2017). The proportion of students who use motorised transportation to get to school rather than walking or cycling has increased significantly in recent decades, which is in line with the increase in the average distance between home and school (Easton & Ferrari, 2015). Despite the dominance of walking, Adom-Asamoah, Okyere & Senayah (2015) point to rising patronage of 'trotro' (26 %), taxi (5 %), and 'pragia' services by school children given the lower cost of usage, particularly for children whose home is far from school in Kumasi.

However, the unequal distribution of space and weak transportation regulations, in general, impede children from safe and healthy access to various destinations in most urban areas (UNICEF, 2018). Recently, the public transportation landscape of the country especially in urban areas such as Kumasi has seen the emergence of paratransit such as tricycles (popularly called 'pragia') and motorcycles ('okada') which currently have no legal backing. These new entrants have been observed to appeal to urban commuters including children due to their affordability, ability to manoeuvre

through traffic situations, and terminate journeys closer to the commuter's destination. This may indicate high patronage of these modes by children for school journeys in the future. With weak operations guiding paratransit operations and the absence of child travel to school policy, child mobility in urban spaces using paratransit modes can be potentially endangered (Ghana Statistical Service, 2012; Amoako-Sakyi, 2014; Abane et al., 2018). Regardless of the importance ascribed to the creation of a safer walking environment, the omission of paratransit users significantly ignores the safety concerns associated with this travel mode. It is against this backdrop that this study is undertaken to find answers to the following questions;

Research Questions

1. What factors influence paratransit mode choice for school journeys among basic school children in the Kumasi Metropolitan Assembly (KMA) and Old Tafo Municipal Assembly (OTMA)?
2. What are the transportation challenges faced by children using paratransit modes for school journeys in KMA and OTMA?
3. How effective is child road safety education among basic school children in KMA and OTMA?

Research Objectives

The main objective of this study is to explore the use of paratransit services for journeys among basic school children in the Kumasi Metropolitan Assembly (KMA) and Old Tafo Municipal Assembly (OTMA)

Specifically, the study seeks to:

- 1) Examine the factors that influence mode choice for school journeys among basic school children in KMA and OTMA.

- 2) Explore the challenges children face in using paratransit modes for school journeys in KMA and OTMA.
- 3) Assess the efficiency of child safety education among basic school children in KMA and OTMA.

Significance of the Study

Transport and mobility issues are frequently an important component of school trips, though the precise pattern of transportation and mobility constraints experienced by school children, as well as how transport factors interact with other constraints, varies by region. However, they observe the following trips on a daily basis as pedestrians or occupants of moving vehicles in transit in this harsh and unfriendly traffic environment. First, by focusing on children, this study is expected to contribute to knowledge from a child-centred perspective. This will help identify the travel needs of basic school children who use paratransit for school journeys. The study will go further to identify the various challenges and difficulties children go through in patronizing paratransit for school journeys.

Furthermore, a review of the literature shows there is limited literature on child transportation safety, especially in Sub-Saharan Africa. Again, findings from the study are likely to provide useful theoretical and methodological insights for future studies on safer travels for children using drawing from cities in Ghana. Furthermore, the information generated will be useful to policy makers in advancing the following:

- a) Developing safety policies on children's transportation for cities in Ghana.

- b) Improving children's transportation safety awareness among different stakeholders such as child passengers, drivers, school authorities, law enforcement officers, and urban space planners.
- c) Advocacy and championing children's safety within the urban transport systems and spaces.

Lastly, provide insights into possible future research pathways on child passenger safety.

Delimitation of the study

Geographically, the study was limited to the Greater Kumasi Area. The Greater Kumasi Area is a hub of business administration and education in the Ashanti region. Specifically, the study was limited to Kumasi Metropolitan Area (KMA) and Old Tafo Municipal Area (OTMA) stretch. The area has a major road network with various educational services. Therefore, focusing on these areas will bring the dynamics of the study. A study like this could be conducted in all Municipal Assemblies in Ghana, however, factors such as time constraint and lack of resources limits the success of this study in the Greater Kumasi Area

In terms of conceptual scope, this study will concentrate on exploring the use of paratransit services for journeys among basic school children in the Greater Kumasi Area. Specifically, it will focus on factors that influence the choice of mode for school journey among basic school children, challenges of utilizing paratransit modes and the efficacy of road safety education in the Greater Kumasi Area. The issue of paratransit can be linked with health, accessibility, safety, and many others. However, factors such as time and resources will not make this feasible.

Organisation of the study

The study is organised into five chapters. Chapter One encompasses the introduction, statement of the problem, research questions and objectives, the significance of the study, delimitation of the study, and organisation of the study. Chapter Two deals with a review of related literature. In this vein, it focuses on the theories and conceptual issues regarding the topic and also discusses empirical literature related to the study. The chapter also indicates my ability to integrate and synthesise the existing literature, provide new theoretical insights, and discuss the conceptual framework for the research.

The third chapter focuses on the methodology used in the study. The chapter concentrates on the study area characteristics, research design, data and sources, target population, sampling procedure and sample size, data collection instruments, data processing, and analysis. The fourth focuses on results and discussion. Data collected on the demographic characteristics of respondents, child safety policies and regulations on school journeys in Ghana, attitudes, policies, and institutional dynamics guiding paratransit operations in the Kumasi Metropolis, factors that influence the choice of mode for school journey among basic school children in the Kumasi Metropolis and safety mechanisms on utilisation of paratransit services in Kumasi Metropolis will be analysed, presented and discussed in this chapter. Chapter Five discusses the summary, conclusion, and recommendation.

Summary

This chapter covered the differences in modes of transportation for school trips between developed and developing countries, as well as the

factors that impact mode selection and safety concerns. It also outlined study objectives and established the study's significance.



CHAPTER TWO

LITERATURE REVIEW

Introduction

This chapter provides a theoretical and empirical background to the research. It does so by reviewing literature on concepts and theories relating to paratransit and child mobility to and from school. The chapter begins with a look at the definition of paratransit and highlights the difference in paratransit in developed and developing countries and children's travel behaviour. The chapter further considers theories related to the topic and provides a conceptual framework on the subject matter. It concludes by reviewing literature on factors that influence paratransit modes, children's travel issues, and road safety initiatives for basic school children.

“Paratransit” What Does it Mean?

The term paratransit is coined from a Greek word ‘para’ (beside or next to) and an American word ‘transit’ word (public transport, usually buses). Literally, “paratransit” is termed as “alongside-of” transit (Domarchi, Coeymans & Ortúzar, 2019; Sun, 2016). However, the concept of paratransit differs in the context of developed and developing countries (Neumann, 2014; Zinia, Parvez & Hasan, 2021). According to Ferro, Breuil & Allaire (2015), “In developed countries, paratransit services are most commonly associated with demand-responsive transport systems in environments where conventional public transportation services are not viable, and often more specifically with 'dial-a-ride' systems provided for people with mobility disabilities; whereas in developing countries, "paratransit encompasses a variety of transport modes and service facilities falling in between the

conventional transport service and the private vehicle" (Ferro, Behrens & Wilkinson, 2013; Behrens, 2019). Paratransit may also be defined differently according to the institutional framework of each country. For example, the term "paratransit" was first used in the United States of America in the late 1960s and early 1970s to refer to unscheduled services that supplement mass public transportation systems (Behrens, McCormick & Mfinanga, 2016; Bruun & Behrens, 2016; (Plano, Behrens, & Zuidgeest, 2020)

In North America, paratransit primarily serves target markets of specially identified subsets of potential transit users (Das & Pandit, 2013; Imaz, Habib, Shalaby & Idris, 2015; Mulley, Nelson, Teal, Wright & Daniels, 2012). In Sub-Saharan African cities, public transport systems rely heavily on paratransit services, which compete directly with fixed-route transit providing more flexible alternatives (Bruun & Behrens, 2016; Cervero & Golub, 2011; Kent & Dowling, 2016; Saddier, Patterson, Johnson & Wiseman, 2017).

According to Brehrens et al. (2016), "paratransit" is a term used to describe a flexible mode of public passenger transportation that does not adhere to fixed schedules, typically in the form of small- to medium-sized buses. Paratransit is defined as an urban passenger transportation service that is typically provided by highway vehicles on public streets and highways with mixed traffic. Their services are provided by private or public operators, and they are also available to specific groups of users or the general public, but they are adaptable in their routing and scheduling to individual user desires to varying degrees (Mabazza, 2019; Parikesit & Susantono, 2012 Phun & Yai, 2016; White, 2016). Broadly defined, the term can and often is applied to any mode of public transportation that falls somewhere between traditional bus

services and taxis (Behrens, 2016; Zegras, Eros & Mehndiratta, 2015). Angkot and Bajaj in Indonesia, matatus in Kenya, jeepneys and tricycles in the Philippines; 'trotro', taxi, tricycles ('pragia' and aboboyaa) in Ghana; cyclo, motodops, and remarks in Cambodia, sidecars in Myanmar, keke Napep and taxis in Nigeria, and tempos in Nepal are examples of paratransit modes. This study contextualizes paratransit as a system of public transport that uses a variety of vehicles with a passenger capacity (1 to 4 passengers) for a small automobile and that of a large bus (of more than 4 but less than 26 passengers) such as 'trotro', motorcycle, taxis and 'pragia' that run along a defined route and stops to pick up or discharge passengers on request hence a demand-responsive transit.

Differences in Paratransit System: Developed versus Developing

Countries

The rapid growth of the urban population, leading to increase travel demand and inadequate public transport in developing countries raised the popularity of paratransit (Verseckienė, 2015; Wright, Tangwell & Dick, 2021). As a result, paratransit modes are regarded as an essential component of urbanism. In most urban areas, paratransit provides a personalized and flexible transportation service to people of various income levels, ranging from the poor to the wealthy (Phun & Yai, 2015; Tarigan, Susilo, & Joewono, 2014). However, the service characteristics, structure, and management of paratransit differ between developed countries and developing countries. Several authors have used different variables in describing the characteristics of paratransit. Ferro et al (2015), used transport supply and characteristics of operating companies; the business model of the sector; planning, and

regulation to describe the characteristics of paratransit. Shimazaki & Rahman (1996), classified paratransit into non-motorised and motorised transport in which both types are again sub-classified into three groups based on their seating capacity. Shimakazi & Rahman (1996) state that non-motorised paratransit includes both human- and animal-powered types (for instance, 'tonga' in India and Pakistan, 'calesa' in the Philippines, and 'dokar' or 'delman' in Indonesia) (for example hand rickshaw). As a result, there is not a clear name that accurately sums up the range of services available due to the wide variety of paratransit systems. The main characteristics of paratransit system in developing countries, according to Silcock (1981), become most obvious when contrasts are made between those of developed and developing nations.

In developing nations, paratransit accounts for more than half of all public transportation (Phun & Yai, 2016). Modern Sub-Saharan African cities heavily rely on paratransit services, which are typically provided by small buses run by unofficial businesses (Behrens et al., 2016). As shown in Table 2.1, Silcock (1979) divided the differences in paratransit between developed and developing countries into four categories: business structure, supply and demand conditions, and external effects. According to the study, the size of the operating companies is the most important difference in business structure. Western bus systems are large, monopolistic, and bureaucratic in their management, especially when they are publicly owned. This could be attributed to market expansion, governmental controls, ownership structure, and labour flexibility. Whereas developing countries are distinguished by a frequently competitive market with lax government controls (Mathias n.d.).

Paratransit services are typically provided on a much larger scale for the general population in developing countries, often by unregulated or illegal operators in the informal sector (Behrens et al., 2016). Most paratransit operators (such as taxi drivers in Ghana) prefer negotiated fare structures because they are easier to collect fares and do not require any special technology, such as a fare collection system, which is commonly used for operating paratransit in developed countries (Phun & Yai, 2015). A driver first establishes a fare level for a given trip, and a passenger then determines whether the fare is reasonable by bargaining until an agreed-upon price is reached before the journey begins. A fare is determined by several factors, including (subjective) trip distance, number of passengers, driver and passenger characteristics, traffic condition, time of day, and weather conditions (Phun & Yai, 2015). The flat fare for flexible paratransit modes is negotiable, as opposed to fixed-route paratransit service (except for taxis with fare metres). Western countries, on the other hand, have a non-negotiable fare structure, with meters used to rate the fare per distance travelled.

Table 1: Paratransit in Developed and Undeveloped Countries

Aspect of system	Developed Countries	Developing world paratransit system
Business structure		
Number of sellers	Few (often monopolistic)	Many (often competitive)
Market entry	Very difficult	Generally easy (but can be expensive)
Source of labour	Union-controlled often short supply	Union-controlled but weakly regulated often abundant supply
Ownership	Usually single ownership, often government	Diffuse, often family ownership
Accounting methods	Audit, often publicly accountable, detailed budget-control	No audit, little accountability, little to no budget control
Government control cost	Strong, easy to implement	Weak, difficult to enforce
Cost structures	High fixed cost	Low fixed cost
Supply conditions		
Service type	Scheduled	Demand responsive
Price	Controlled	Market responsive, although nominally controlled
Demand conditions		
Method of purchase	Fixed-price	Often negotiable (generally with respect to accepted base)
Travel demand	Slow rate of decline	Rapid rate of increase
Price elasticity	Moderate (say 0.5)	Low
External effect		
Employment opportunities	Moderate institutionalized and skills required	Many open markets, limited skills
Economic impact	Deficit operations but seen as essential	Profitable business, avenue for entrepreneurs
Social aspect	Anonymous big business, prone to bureaucratic inefficiency	Prone to corruptions

Source: (Silcock, 1981)

Paratransit System in Ghana

Over the years, the private sector's provision of paratransit has dominated Ghana's public transportation system, serving approximately 95 percent of public transportation needs, frequently using shared taxis and minibuses ("trotro") motorcycles, with the recent emergence of 'pragia' (Kommei, Maazu, Adjei, & Issah, 2019). Paratransit modes play an important role in providing transportation for schoolchildren and adults, particularly those with low incomes. The paratransit sector provides low service capacity to both rich and poor people, making it the most dominant mode of transportation used by the majority of the population. Their dominance, among other modes, causes congestion, journey delays, discomfort, and a high level of environmental pollution (Yobo, Kunawotor, Apau, & Osei, 2015). Paratransit modes in Ghana include 'trotro', taxi, motorcycles, and a new entrant (tricycle) which is commonly known as 'pragia' in Accra and Cape Coast, 'Motto Kia' in Kumasi, 'Yellow-Yellow' in Tamale, 'Mahama Camboo' in Wa, and 'Camboo' in Ho.

Paratransit modes are the key mobility options for the urban poor and middle-income earners as it provides cheap transport service as low as GHc1 cedi per trip. Among the various paratransit mode used, 'trotro' is the most widely used and this may be attributed to the easy access that they offer to destinations at reasonable fare and their relative frequency. In terms of travel time, 'pragia' seem to satisfy many users because of their ability to penetrate traffic congestion and narrow urban streets at a considerable speed compared to other paratransit modes (Jing, Dzoagbe, Amouzou, & Ayivi, 2019; Mani,

Pai, & Aggarwal, 2012). App-based third-party taxi services such as Uber, Yango, Bolt Taxify, and others are also developing as customised taxis.

In Ghana, paratransit is dominated by private enterprise. The industry provides about 95 percent of transport services to both urban and rural dwellers. As being purely private, paratransit operators receive no direct operational or capital aid from the government. The market is mainly attributed to free entry and exit when facing unfavourable business outcomes at any time. In terms of ownership, drivers may own vehicles although they are frequently rented by absentee owners for a predetermined charge or a part of daily earnings. In addition, services are created and priced following market demand.

Paratransit operations in Ghana are subjected to minimum regulations in terms of coverage area, permission to operate as commercial vehicles, operation requirements, vehicle maintenance, and related emissions. Thus, their services are controlled and coordinated through rather formal institutions such as cooperatives and route associations such as Ghana Private Road Transport Union (GPRTU) and Progressive Transport Owners Association (PROTOA). These unions serve as regulators of the driving conduct of their members. Unions are often associated with particular stations. Their operations often take time to load but less time to unload, arrive more often and make few stops. Studies show that passengers also tend to feel more secure in paratransit modes associated with stations. However, there exist some operators who are not associated with any union or organisation commonly called 'waawaa' thus operate privately under no regulations. These

modes often pick up passengers as they ply the road and often make frequent stops to pick up or drop off passengers.

In terms of the type of vehicles used, small vehicles usually dominate the sectors in comparison to conventional buses and other modes of the formal sector. These vehicles range with a seating capacity of from one (such as a motorcycle) to sixteen passengers (such as 'trotro'). In addition to being small, paratransit modes are often old and poorly maintained, having been acquired second or third hand. Mostly the cost of genuine spare parts is too high and prohibitive. Unfortunately, there is a lack of technical know-how as technicians manning wayside garages lack adequate technical skills for vehicle maintenance. Sometimes available spare components to maintain the vehicles are antiquated and unfit for vehicle maintenance. These circumstances have given rise to the concepts of fabrication, improvisation, and "trial and error" in maintenance workshops, particularly "wayside" workshops (Kommey, Maazu, S. Adjei, & Issah, 2019). As a result, paratransit operations viability and continuity are jeopardised to the point where replacing vehicles, particularly those towards the end of their useful lives, becomes extremely difficult. As the age of the vehicle increases, the expense of operations and maintenance rises, and its activities finally come to a standstill.

Again, the service quality of paratransit mode is often low. Lack of finance to support paratransit operators often lead to operators resorting to the use of second-hand and third-hand vehicles in order to meet their budget. Vehicles are often crowded, with uncomfortable interior conditions such as piercing metals and poorly maintained seats (Agyeman, Kwarteng, & Zurkalnaine, 2019). Also, because of the high expense of road development

and maintenance, substandard roads continue to constitute a larger share of Ghana's roadways. Most roads in major in Ghana are often characterised by potholes, lack of road signs, zebra crossing, and traffic lights. Road inadequacy also contributes to the problem of congestion due to the lack of appropriate traffic control systems (Ronald, Thompson & Winter, 2015). Traffic congestion is at an all-time high, particularly in cities, and demands on the country's existing paratransit service have outgrown the country's capacity, making travel by all modes of road transport during peak hours extremely frustrating and disgusting, resulting in long, uncomfortable commutes that reduce worker productivity.

Paratransit not only provides mobility alternatives for adults and children, but it also provides a significant source of employment for others such as fuel attendants, food vendors, spare part sellers, and drivers. Despite its multiple advantages, paratransit is connected with several drawbacks, including irresponsible driving and speeding, as well as a lack of legislation to govern their actions. One significant problem of paratransit operations is that owners provide services with the intent of profit and do not always provide dependable transportation (Van Zyl & Labuschagne, 2008). Because paratransit services continue to be poorly regulated resolving the public safety issue remains complex and challenging (Schalekamp & Behrens, 2013). Poorly maintained public transportation, driven by badly trained drivers on poorly maintained highways, is likewise going to be a serious concern (Oxley & Whelan, 2008).

Theory of Routine Mode Choice Decisions

The Theory of Routine Mode Choice Decisions propounded by Robert J. Schneider in 2013 describes how people select transportation modes for routine travel purposes such as local shopping or other errands. The theory was developed with the assistance of qualitative in-depth interviews of shoppers traveling in the San Francisco Bay Area of California and was founded on travel behaviour research on the factors that influence walking and bicycling (Schneider, 2013). It combines findings from the fields of travel behaviour and psychology, as proposed by Van Acker, Van Wee, & Witlox (2010). Schneider's theory is supported by several psychological theories, including the Theory of Interpersonal Behaviour, the Normative Decision Model, the Comprehensive Action Determination Model, the Theory of Planned Behaviour, and the Trans theoretical Model. The psychology field described the thought process involved in choosing a mode of transportation, including intentions and habits.

The theory proposes a five-step decision process, as shown in Figure 2.1. The first part, (1) awareness and availability, determines which modes are available for selection and which rational trade-offs are then made. Individuals can consider modal options when they are aware of the availability of vehicles. The theory's next three steps, which are: (2) basic safety and security, (3) convenience and cost, and (4) enjoyment, are where situational trade-offs between the considered modes occur, either simultaneously or sequentially. In the third step, people also compare the costs of each mode, including money, time, and effort, as well as its convenience. In the fourth step, individual, social, enjoyment and global advantages may make certain modes of

transportation more alluring. For instance, cycling might offer health advantages from exercise. In the fifth and final step, habit, closes the decision loop and allows past decisions to have an impact on present choices.



Figure 1: Theory of Routine Mode Choice

Source: Schneider (2013)

Socioeconomic factors, according to Schneider (2013), explain differences in how individuals perceive each stage of the process. Demographic, socioeconomic, and life stage characteristics all play indirect roles in travel decision-making. The impact of the needs hierarchy on travel behaviour varies depending on demographic, socioeconomic, and life stage characteristics. For instance, lower-income travellers might put cost-cutting ahead of other needs like pleasure and safety/security, whereas higher-income travellers might choose to satiate their desire for pleasure without considering cost.

One major strength of the theory is that it incorporates multiple levels of analysis, including individual, household, and contextual elements. The theory further acknowledges that decisions about mode of transportation are influenced not only by individual tastes and habits, but also by broader social, economic, and environmental variables. Thus, the theory provides a more thorough framework for analysing mode choice behaviours by integrating these different levels of research. Again, the theory recognizes that routines can alter over time as a result of life events, changes in the built environment, or changes in personal circumstances. It recognizes that people's mode choices are not set and can be subject to changes and adaptations. This dynamic viewpoint therefore enables a better understanding of how routine mode choices evolve and adapt to changing conditions.

Despite the strength of the theory, it focuses solely on individual behaviours and ignores the impact of external factors such as urban planning, transportation policies, and infrastructure. According to critics, the theory fails to reflect the intricate interactions between individuals and their surroundings, resulting in an insufficient explanation of transport mode choice. Furthermore, Schneider's theory was established primarily using data from a single place or environment, limiting its applicability to other situations. Critics contend that because travel behaviours differs among populations and geographic places, a theory based on a single setting may not be generally applicable.

The Theory of Routine Mode Choice Decisions perfectly suits this research since it draws on other studies that provide clues to how people choose between automobiles, public transit, bicycling, and walking in certain

situations and as well bring out the dynamics of the research objectives. However, the study did not factor in children and their travel needs.

Developing a Conceptual Framework

The study adapted and built on Schneider's theory of routine mode choice decisions to develop a conceptual framework that suits factors that influence the paratransit mode for school journeys among basic school children. The framework proposes three sequential decision-making processes namely; 1) modal influencing factors. 2) Internal factors and 3) external factors, that influence travel mode choice for school journeys.

Modal influencing factor: as explained in Schneider's theory, the awareness and availability of a mode, how safe or secured a mode is perceived to be, the cost of accessing a mode, and enjoyment (satisfaction) derived from using a particular mode may influence the decision-making process in using a particular mode. People may travel with a particular mode of transport not as influenced by their individual characteristics only but as well as factors affecting the mode. Literature has established that the availability and awareness of transport, characteristics of available alternatives, characteristics of the individual decision-maker, and the decision rule affect mode choice for commuting to various destinations (Esztergár-Kiss, Shulha, Aba & Tettamanti, 2019). Individuals who are aware of and have access to several modes of transportation have more modal alternatives when it comes to traveling (Gehrke, Felix & Reardon, 2019; Arbués, Baños, Mayor & Suárez, 2016). Attributes of transport modes make them unique from others and thus may influence the choice of a particular model. Each alternative in the choice set is characterised by a set of attributes that may be specified or generic. Specified

attributes are those characteristics of each alternative that differ greatly hence making them unique from others and affecting choice (for example travel time, travel cost, waiting time, number and ease of transfers, comfort, and many others). Generic attributes are those attributes that apply to all alternatives equally. Basic safety and security are also crucial factors that influence the choice of mode. How safe or how secure a transport mode is may deter or attract people from patronising it. Convenience and cost play a vital role in influencing the choice of mode for commuting by children.

Internal factors: Parents play a key role in the decision-making process for the choice used for school journeys, especially among basic school children.

However, their decision may be a result of the perception (either by personal experience or experience of others) built around a particular mode, socioeconomic factor, and demographic (age, sex) of children, neighbourhood, and the built environment. According to Singleton (2013) demographic, socioeconomic, and life stage characteristics such as household income, occupation, ethnicity, and education have several indirect roles to play in the travel decision-making process. For children, distance, age, and gender are the main moderators of travel decision for school journeys. Research has suggested that children are much more likely to walk or cycle to school if the distance is short. Again, age is an important moderator of children's travel behaviour. Literature has established that parents make travel mode choices for their children at a certain age, but as these children grow to some level, they begin to commute independently and thus can make decisions concerning their mode choice in commuting to school (Ahern, Arnott, Chatterton, de Nazelle, Kellar & McEachan, 2017). As older children may be able to

influence their travel mode decisions, the younger ones tend to depend solely on parents assisting with their school travels (Fusco, Moola, Faulkner, Buliung & Richichi, 2012; Cooper & Cooper, 2016). In terms of gender, boys may be allowed to commute more independently than their female counterparts (Zhou, Wang & Wu, 2018; Pont, Wadley, Ziviani & Khan, 2013). Other authors revealed that boys are more likely than girls to walk or bike to school. For example, parents are more likely to allow their male child to influence their travel decision than girls of the same age (Sener, Lee & Sidharthan, 2019).

Characteristics of households such as income level, vehicle availability, occupation, and education of parents may influence mode choice for school journeys (Kamargianni & Polyd60oropoulou, 2013; Larsen, Gilliland & Hess, 2012). Parents with vehicles are more likely to drive their children to school than households without vehicles (McDonald, Brown, Marchetti & Pedroso, 2011). For instance, parents with low income will factor out the cost over any other attributes such as enjoyment in choosing a mode for their children to school. The higher household income increases, the higher it will be to adapt to more motorised transport. Furthermore, attributes and perceptions of the built environment may also influence travel mode decisions. Availability of transport infrastructures such as sidewalks and zebra crossings may attract more active transport for school journeys. Again, parental attitudes such as attitudes towards transport modes and attitudes towards environmental and climate conditions influence the decision-making process. Thus, parental characteristics and attitudes are important in determining their perceptions of the environment as well as their decisions regarding travel modes (Sener et al., 2019; Woldeamanuel, 2016).

However, the perception of the environment may differ from that of children and parents. For instance, places that may be perceived to be safe for a child who uses a particular route for commuting to school every day may not be the same for parents. According to Tarța, Plăiaș, Martinez, & Martinez, (2020), consumers increasingly place a high value on visual impact when evaluating vehicle choices. The complete experience of colour, form, sound, and texture provides a first impression of a travel mode. In terms of aesthetics, the colour of a mode, form, colour, arrangement of seat (e.g. face to face), and interior of a vehicle may influence children to prefer certain modes over the choice made by their parents. Again, friends and the curious nature of children may also influence them in preferring certain modes (Romero, 2010).

External factors: external factors such as policies and educational factors may influence travel mode choice for the school journey. Policies guiding paratransit as well as policies guiding child commuting to school may influence the choice of mode for children in commuting to school (Müller, Mejia-Dorantes & Kersten, 2020; Sultana, 2019). Again, school policies that affect travel decisions, for example, policies on the ban of children on the use of auto rickshaws in some countries such as India may be seen as illegal to use for commuting to school, while in others, parents and youth can freely make their choice on such modes (Saravanan, 2018). How these policies are enforced will influence the decision on the type of mode to commute with. Again, education programmes may also influence the decision of mode choice in commuting to school (Yang, Abbott & Schlossberg, 2012).

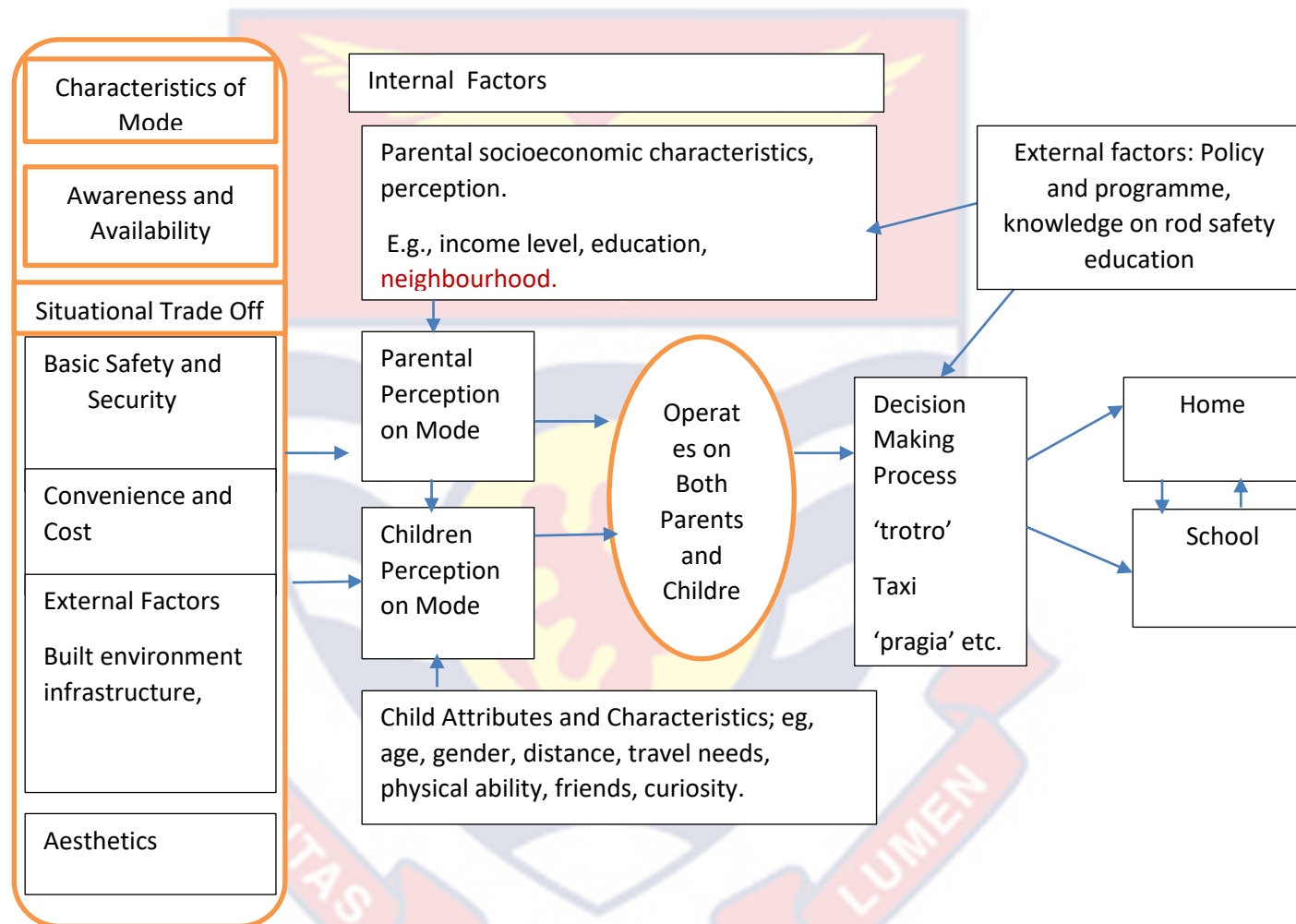


Figure 2: Conceptual framework describing paratransit mode decision for students

Source: Adapted from Schneider (2013)

As illustrated in Figure 2, considering the various factors that influence the choice of mode, the decision rule made by the individual will determine the type of mode to use for commuting. The decision rule then becomes the value placed on the various factors in the selection process taking into consideration the outcome (safe/unsafe travel) of the trip. For instance, literature has shown that parents place a high value on safety and security in selecting a mode for commuting to school for their children. The model translate into a linear model as present choice may not lead to future choice as seen in Schneider's theory. Present choice may not always lead to future choice as other factors may influence the choice for future decision. However, the perception of these factors may thus vary among different individuals.

Empirical Review

The empirical review is organised along with the following sub-themes; factors that influence mode choice among children; children's travel issues and; and programmes that promote children's safe travel to school

Factors Influencing School Mode Choice among Children

The journey to and from school forms an essential component of children's life. Children may travel to school using several modes such as walking, cycling, private vehicles, motorcycle, school bus, or use of paratransit modes. The availability of alternative modes gives parents and their children several options of modes to decide on. As a parent may prefer to drop off his/her child, another may prefer his /her child to walk to and from school. What then influences the type of mode for school journeys?

Majority of children in developed countries resort to motorised means of transport for school journeys including school buses. However, in developing countries walking remains the most dominant mode of transport for school journeys (Abane, Amoako-Sakyi, Owusu, & Odame, 2019; Adom-Asamoah, Okyere, & Senayah, 2015; Poku-boansi, Amoako, & Obeng, 2019; Rezasoltani, Behzadfar, & Said, 2017). For instance, in South Africa, over 70 percent of school children walk to and from school (Ipingbemi & Aiworo, 2013). Delft schools in Cape Town also revealed walking as a predominant mode for school journeys representing 91 percent and 86 percent of children who walk to and from school respectively (Muchaka, Brehrens & Abrahams, 2011). A study in Nairobi (Kenya) and Dar Es Salam (Tanzania) found that 68.9 percent and 48.6 percent of children travel to school using non-motorised transport respectively (Schultmann & Sunke, 2007). This may be partly due to parents' inability to fund transport fares for their children in the context of more pressing demands given the limited resources available (Porter et al., 2015). However, western literature tends to focus on the positive impacts of walking on cognitive development, physical health, mental well-being, environmental awareness, and knowledge (Scheiner, 2016; Summers, Smith, Case & Linthrust, 2012). Several authors have identified factors that influence travel mode choice for school journeys. These include the socio-economic characteristics of parents, sociodemographic characteristics of children, distance, built environment, perception of safety, and policy (Hawley, Witten, Hosking, Mackie & Smith, 2019; He & Giuliano, 2017; Mehdizadeh, Zavareh & Nordfjaern, 2019; Scheiner & Holz-Rau, 2012; Scheiner, Huber &

Lohmüller, 2019; Sidharthan, Bhat, Pendyala & Goulias, 2011; Singh & Vasudevan, 2018; Spinney, Maoh & Millward, 2019).

Distance is one major factor that influences travel mode choice decisions. How far or short a person may assume a distance to be influences the decision to walk or use motorised transport. However, it is imperative to note that distance is relative depending on who is making the trip. For instance, one may see a distance of 1km as far and may require motorised transport while another may not. A literature search uncovered four previous studies relating mode choice on the journey to school to build environmental factors. The authors collectively suggested that children are more likely to walk or bike to small schools in walkable neighbourhoods than to large schools in remote locations (Banerjee, Uhm & Bahl, 2014; Mehdizadeh, Mamdoohi & Nordfjaern, 2017; Mitra & Buliung, 2014; Pojani & Boussauw, 2014). Studies have revealed that children are most likely to travel motorised with a distance of more than 1km from school to home and are more likely to use nonmotorised transport for journeys less than 1km (Ipingbemi & Aiworo, 2018; Porter et al., 2015)

Another factor that influences travel mode choice decisions for school journeys is household characteristics. According to Adom-Asamoah et al., (2015) decisions on travel mode choice for school journeys are fundamentally dependent on that of the household. Shengxiao & Pegnjun (2015) posited that household attributes such as income level and education level, and parent perception of safety act as a key role in the process of decision-making for school mode choice. Adom-Asamoah et al., (2015) also argued that the economic status of parents or family defines which travel mode is favourable

for school journeys. The study identified household income and car ownership as the two main socio-economic characteristics that affect the decision on mode choice for school journeys. For instance, households with high income and car ownership will tend to depend more on motorised transport (relative to distance of travel) for school journeys as compared to households with low monthly income levels (Easton & Ferrari, 2015; Salis, Slymen, Conway, Saelen, Cain, & Chapman, 2011). Again, results from Adom-Asamoah et al., (2015) revealed that in Nyhiaeso, 67 percent of the households owned a car, revealing that 55 percent of children in this sub-metro travelled to school by private cars, taxis, and school buses in situations where private cars were not used. The study explained this as a result of the ability of a parent to afford the cost of travel due to their economic background.

Other authors also identified the size of the household placing particular emphasis on the number of siblings as another factor that also affects travel mode choice (Mccarthy, Delbosc, Currie & Molloy, 2017). The study showed that children with more siblings depended less on cars than those with fewer siblings. This may be because children serve as escorts to each other, especially in the case where they all attend the same school or use the same route to school. Parents will therefore prefer sending their children to less distant school rather than face the difficulty of sending a lot of children individually to a more distant school as siblings often play a role in these children's companies. A child's travel mode may also be influenced by the occupation of parents (Shokoohi, Hanif & Dali, 2012). A study asserted that skilled workers may prefer their children to use motorised transport to school than their unskilled workers (McDonald, 2008b). Adom-Asamoah et al, (2015)

asserted that the influence of household on mode choice directly affects an aspect of school life such as punctuality, ability to indulge in other activities, regularity, and activeness.

Furthermore, parental perception of safety also plays a crucial role in the travel mode decision process for school journeys. However, how parents perceive safety may differ significantly from how children perceive their safety. Safety concerns expressed by parents include fear of road crashes especially within the use of motorised transport and as pedestrians (Adom-Asamoah et al., 2015); and fear of abduction (Faulkner, Richichi, Buliung, Fusco, & Moola, 2010) which has raised major concern and panic over the past few years specifically in Ghana. For instance, a study in Kumasi by Adom-Asamoah et al, (2015) reveals that 48 percent of parents identified safety as a reason for their decision to drop off their children at school. Again, the perceived nature of the road may also influence travel mode choice to school. The absence of protective measures on-road such as zebra crossing road signs, traffic lights, and sidewalks among others may deter parent from allowing their children to walk or cycle to school.

Additionally, age and gender of children are the two major sociodemographic attributes affecting mode choice for school journeys. As most school-going teenagers may influence travel mode choice decisions for school journeys, school trips of younger children are decided solely by their parents. Most studies have found an increase in the tendencies to influence mode choice among school children with an increase in age (Easton & Ferrari, 2015; Ermagun & Levinson, 2017). Similarly, other studies reveal a relationship between age and shift from one mode to another. A study

conducted in Dar Es Salam on the determinant of school travel revealed a negative relationship between age and motorised transport (Bwire, 2020). The studies posit that an increase in age will lead to children reverting from motorised transport to non-motorised transport. However, some studies identified an inverse (Wadud, MacKenzie & Leiby, 2016; Bertolini, 2017) or no relationship between age and travel mode choice (Wilson, 2010). Regarding gender, several authors have found that girls are less likely to walk than boys (Johnson et al., 2010; Hatamzadeh et al., 2017). In contrast, other authors found no relationship between gender and children's modes of travel to school. Su et al. (2013) argued that gender differences at the age of elementary school may not yet be a determinant factor in influencing children's walking-to-school rates (Bopp et al., 2012; Ermagun & Samimi, 2012; Wilson et al., 2010).

Moreover, other authors have also examined the effect of different attributes of the built environment on travel behaviour. For instance, several studies revealed that a dense and diverse urban form with good accessibility to local destinations leads to more transit use, less car use, and more active modes including walking and cycling (Broberg & Sarjala, 2015; Ermagun & Levinson, 2017; Scheiner, Huber, & Lohmüller, 2019). Lin & Chang (2010), in their study on the effect of the built environment among primary pupils in Taipei concluded that high building density, shade-tree density, sidewalks, and high car density could increase the probability of children walking to school. Previous authors have reflected that motorised modes are preferred over non-motorised modes with longer home-to-school distances (Broberg & Sarjala, 2015; Poku-Boansi et al., 2019; Scheiner, 2016). Shengxiao & Pegnjun

(2015), revealed that distance to school, car ownership coupled with the built environment affect travel mode choices for children. In contrast, Mcmillan (2005), asserted that urban form variables have a relatively less impact on school travel mode choice compared to other variables such as vehicular traffic conditions, socioeconomic attributes, and distance. However, a study posited that given a reasonable walking distance, parental perceptions and concerns about the built environment are not statistically significant for children who walk (Waygood & Susilo, 2015). Further another study revealed that once the distance is accounted for, safety concerns were not statistically significant (Mehdizadeh, Nordfjaern & Mamdoohi, 2018). Boarnet et al. (2005), found out that improvement of crossing point, side walk, and traffic control enhancement increases walking and cycling thus less use of motorised transport for school journeys. Similarly, Ewing et al. (2004), identified street walk coverage to be the most significant influence on walking. Nonetheless, they revealed that none of the other urban form variables that proved important in earlier studies like street tree coverage and neighbourhood population density proved significant.

In sum, the travel decision-making process of children differs fundamentally from that of the adult perspective. Younger children are more dependent on adults assisting them due to their inability to make travel decisions (Mackett, 2017). Nonetheless, individual preference for certain modes of transport develops as one grows from childhood to adulthood. In developed countries, much focus has been given to increasing the safety of school travel modes specifically among younger pupils who walk to school (Stark, Beyer, Fritz, Unbehaun, & Hössinger, 2018).

Children transportation issues

Children's travel is an important component of travel analysis. Their access and transportation needs differ from those of the general population. Children have a close-knit travel destination, which makes it easier to solve their transportation problems and access needs. For many Ghanaians, urbanization has created mobility and access challenges (Obeng-Odoom, 2010). With a shaky public transportation system, Ghana's vehicle population has risen in tandem with the country's rapid urbanization. Commuting for young children has become increasingly difficult in some cities, such as Accra and Kumasi, drastically altering people's lifestyles. Young children are forced to leave home with their parents at dawn in order to beat the current traffic congestion challenges and arrive on time at school (Obeng-Odoom, 2010). According to the current National Household Transport Survey report, the majority of children (74.4%) walk to school, while others ride their bikes (6.7%), "trotro" (3.6%), or school bus (4.1%). A very small proportion used Metro Mass Transit and public taxis to get to school (0.2% and 2.5%, respectively). About 79 percent of those who took public transportation to school spent less than 15 minutes getting there. A little above 19 percent waited between 15 and 40 minutes, and about two percent waited longer than 40 minutes to get to school. Bad roads during the wet season (36.6%), followed by bad roads in all seasons (22.9%), and long distances to school (10.7%) were the three main challenges respondents faced in getting to school (Ghana Statistical Service, 2012). According to data on the patterns and frequency of road traffic crashes (RTAs) in Ghana, a sizable portion of RTAs happen during school break times, which raises unsettling questions about

children mobility and safety, especially in urban areas (Poku-Boansi et al., 2019). Since children use this same route to travel to school, whether by walking or using paratransit, parents are left with serious concerns due to the poor condition and inadequate infrastructure. According to Ipingbemi and Aiworo (2013), providing infrastructure is not enough; it must also be usable and convenient for both vehicles and pedestrians.

Transport to school in Ghana may vary based on the geographical area and how urbanized the community is. In the northern part of Ghana, the use of bicycles and walking tend to be very popular. Within bigger cities, some school children use mini buses and for a relatively small number, taxis to school. In the southern section of the country, walking tends to be popular in communities outside the big cities. Available transport infrastructure as well as the quality of service have great impact on children's ability to conveniently and safely travel to and from school (Adom-Asamoah, Okyere & Senayah, 2015). Though such trips are made by children, the younger ones are dependent on their parents' preferences even though these children may resist their parents' choice in their quest to seek some level of autonomy (Barron, 2014). Many children in Africa face mobility challenges concerning access to school, health, and leisure (Porter, 2010; Amoako-Sakyi & Owusu, 2011). Children frequently run into a variety of issues while traveling to school. These include, among others, poor drivers' behaviour, dilapidated walking and crossing facilities, fatigue as a result of long walks as well as crime and insecurity. By their development limitation, the physical, social development, and cognitive deficiencies of younger children expose them to traffic injuries since their smaller stature makes it difficult for drivers to see them and also

makes it difficult for such children to appreciate the danger in their surroundings (World health organisation, 2008).

Additionally, younger children have been identified to endure difficulties in identifying and interpreting sights and sounds and this limitation impairs children's judgment relating to the speed, direction, and proximity of approaching vehicles. Similarly, a study by Nguyen-Hoang and Yeung, (2010) found out that impulsive behaviour and short attention spans by young children also heighten children's struggle in coping with everyday challenges in making responsible decisions especially when it comes to the road environment. For instance, over 90 percent of the issues faced by schoolchildren traveling to school in South Africa were related to difficult crossings and subpar walking infrastructure (Ipingbemi & Aiwo, 2013). Road safety was identified as the most significant problem encountered by students walking to and from school in Rondebosch schools in Cape Town, while fear of crime was identified as the most significant problem in Delft schools (Muchaka, Behrens & Abrahams, 2011). It has been observed that children who walk or take public transportation to school are vulnerable to anti-social behaviour and crime, which causes general fear and anxiety (Ipingbemi & Aiwo, 2013). Their research also found a strong link between crime and the physical environment, with users of public transportation and non-motorised transportation being more likely to suffer the consequences of crime and social behaviour than automobile users. They also claimed that the significant amount of time spent traveling further away from homes increases the likelihood of victimization while walking or taking public transportation.

Children, according to the OECD (2004), cannot be expected to comprehend aspects of the built environment and respond to stimuli in the same way that adults do. According to a study conducted in Kumasi by Adom-Asamoah et al., (2015), school children faced challenges due to a lack of adequate and dilapidated transportation infrastructure and amenities in many parts of the city. Almost 80 percent of school students who use public transportation spend less than 15 minutes getting to school (Abane et al., 2019). When it comes to walking to school, there has been a significant decrease among children in developed countries. Nonetheless in many Sub-Saharan countries like Ghana, walking to school is still a dominant mode of commuting to school despite the many risks that school pupils are exposed to (Amoako-Sakyi, 2016; Poku-Boansi et al., 2019).

Child Safety Initiatives for Basic School children

In the majority of developing countries, hundreds of thousands of school children travel to and from school every day on risky roads or in crowded, poorly maintained buses. Bennett et al., (2014) study on the Global Burden of Disease (GBD) released in December 2012 by the Institute for Health Metrics and Evaluation, and the World Health Organisation's Global Status Report on Road Safety 2013, both released in March 2013, estimate the total number of annual deaths on the world's roads at almost to 1.3 million. There are, however, significant differences between high- and low-income countries and regions, as well as between different age groups within regions. According to the GBD study, the number one killer of boys and men between the ages of 10 and 29 worldwide is road injury. Thus, all governments in the world place a high priority on road safety.

One of the foundational tenets of the Sustainable Development Goals is to ensure that everyone has access to transportation and education. By 2030, all people should have access to a safe, affordable, accessible, and sustainable transportation system. This will improve road safety, particularly by expanding public transportation, and will pay particular attention to the needs of those who are most at risk, such as women, children, people with disabilities, and older people. Numerous efforts have been made to address this issue in both developed and developing nations. This initiative has taken the form of safe mobility-related policy, programs, campaigns, and education.

In developed countries, there is a lot of emphasis on shifting from motorised transportation to active travel because of the health benefits, such as lowering obesity and (Reynolds, Winters, Ries & Gouge, 2010; Sietchiping, Permezel & Ngomsi, 2012). As a result, the majority of initiatives for child school travel are geared toward increasing active travel. These initiatives aim to improve the environment, knowledge, policy and enforcement, and behaviour on the school bus. Unlike in developing countries, the majority of children travel to school by motorised means, particularly the school bus system. In order to improve safe mobility, strict regulations regarding speed limits, bus condition, colour, design, and seating layout are enforced.

Furthermore, policies and educational initiatives like Safe Route to School (SRT), School Travel Planning (STP), and Vision Zero are in place to ensure safety. For instance, the Safe Route to School (SRT) program, which was started in the 1970s in Odense, Denmark, aims to increase the safety of children who walk and ride bicycles to school (Capps, McCabe & Fix, 2012; Moudon, Stewart & Lin, 2010). SRT spread internationally with programmes

developing in other parts of Europe, Australia, Canada, and the United States (Capps, McCabe & Fix, 2012; Lundy, Kilkelly, & Byrne, 2013). The programme provides funds to states to substantially improve the ability of primary and middle school students to walk and ride bicycle to school safely (Moudon, Stewart & Lin, 2010). The SRT adopts the Six E's framework to promote safety in walking and bicycling to and from school. The Six 'E' includes 1) engagement (SRT projects start by listening to children, families, teachers, and school leaders, as well as collaborating with existing community organisations, and then incorporate intentional, continuing involvement opportunities into the programme framework.), 2) equity (ensures that all demographic groups benefit from Safe Routes to School initiatives, with a focus on ensuring safe, healthy, and equitable results for low-income children kids, students of colour, students of both genders, and students with disabilities.), 3) engineering (making physical changes to streets and areas to make walking and bicycling safer, more comfortable, and more convenient.), 4) encouragement (increasing student interest in walking and bicycling through events, activities, and programmes), 5) education (giving students and the community the skills they need to walk and bike safely, educating them on the benefits of walking and cycling, and teaching them about the various modes of transportation available) and (assessing which ways are more or less successful, ensuring that programmes and efforts support equal outcomes, and discovering unintended consequences or chances to improve each approach's efficacy). The Six E's of Safe Routes to School summarize the key components of a comprehensive, integrated approach to ensuring safety in walking and bicycling to school (Burbidge & Planning, 2019).

School travel planning (STP), which is implemented in Canada, aims to increase active school travel (AST) among elementary school students (i.e., those between the ages of 6 and 14) (Mammen, Faulkner, Buliung & Lay, 2012; Dawson & Boase, 2001). The intervention involves school-level committees made up of a lead facilitator and participants from a range of fields, such as planning, safety, health, education, and transportation (Mammen et al., 2012; Fraser & Lock, 2011). Together, these parties analyse, record, and address barriers to Active School Travel (AST) by using a "school travel plan" (Fraser & Lock, 2011; Villa-González, Barranco-Ruiz, Evenson & Chillón, 2018). Another initiative for promoting child travel safety is Vision Zero (Aboelata, Yanez & Kharrazi, 2017; Amit, Arason, Mussell & Woolsey, 2016; Chillón & Mandic, 2020; Mammen, 2016). The goal of the Vision Zero strategy is to end all traffic fatalities and serious injuries while enhancing everyone's access to equitable, safe, and healthy mobility (Aboelata, Yanez & Kharrazi, 2017; Amit, Arason, Mussell & Woolsey, 2016). The movement started in Sweden in the 1990s, spread to other parts of Europe, and is now gaining traction in significant American cities (Aboelata et al., 2017; Amit et al., 2016). The moral conviction that everyone has a right to move about their communities safely and that system designers and policymakers share responsibility for ensuring safe travel systems forms the basis of Vision Zero (Amit et al., 2016). Roadway design, speeds, behaviour, technology, and policies are just a few of the many factors that contribute to safe mobility, and Vision Zero sets forth clear objectives to achieve the common goal of zero fatalities and severe injuries (Fleisher, Wier & Hunter, 2016). Therefore, the program is based on the idea that people will occasionally make mistakes, so

the road system and related policies should be designed to prevent those mistakes from leading to serious injuries or fatalities (Wegman, Zhang & Dijkstra, 2012). Therefore, system designers and policymakers are expected to improve the road environment, regulations (like speed management), and other related systems in order to lessen the severity of crashes. Priorities for Vision Zero include controlling speed, putting equity first, and involving the community (Wegman et al., 2012). In Australia, Hector the cat is a fictional cat created to aid road safety in the form of road safety songs, cartoons, and solving mystery codes. In the United Kingdom, the Green Cross Code is a step-by-step procedure designed to enable pedestrian's cross streets safely (Szczurowski & Smith, 2018).

In industrialised nations, road safety education and training for children is prioritised in national traffic safety policies. Furthermore, children in primary schools, or those between the ages of 6 and 9, are required to receive instruction in road safety in the majority of nations. Road safety education is organised differently in each country, though, depending on responsible authorities, educational materials, methods, levels of intensity, mediators, etc. For instance, in France, primary and secondary schools are required to teach students about road safety. *Attestations Scolaires de Sécurité Routière* (ASSR), which covers pedestrians and two-wheeled vehicles in traffic, are required of all ninth-graders. At the age of sixteen, students are required to obtain another ASSR, which covers broader road safety. Furthermore, in New Zealand, instruction in road safety is scheduled at specific times throughout the year. Sessions are typically two or four weeks long and include roadside practical application with the assistance of Police

Education Officers. In the Netherlands, the curriculum for teaching children about road safety is structured to help them learn the laws of the road, understand how to read traffic signs, apply this knowledge to real-world traffic situations, and participate safely in traffic as pedestrians, cyclists, and independent users of public transportation. Schools are free to choose the approach and the number of hours they spend implementing road safety education, and they are not required to test whether these training objectives are met or not. Although not all primary schools do it, the majority of them conduct a voluntary theoretical and practical (cycling) exam in the seventh or eighth grade (Rose 25 Country report, the Netherlands). The effectiveness of road safety education in schools in central and eastern nations, including Croatia, Estonia, Latvia, Lithuania, Belarus, and the Czech Republic, was researched by Dragutinovic & Twisk (2006). The study found that, despite some nations offering special road safety education to both students and teachers, there was no parental education offered in any of the six nations, as shown in Table 2.2.

Table 2: The Overview of the Organisation of Road Safety Education in Some Central and Eastern European Countries

	Croatia	Estonia	Latvia	Lithuania	Belarussis	Czech Republic
What age group is covered by primary school?	7-15	7-11	7-15	6-10	6-10	
Is traffic education compulsory in primary schools?	Yes	Yes	No	Yes	Yes	
If yes, how is traffic education structured (special lessons or integrated)	Integrated	Integrated		Special lessons	Integrated	
How many lessons a week?	2 hours	None		15 hours	1-8 hours	
Do special teachers-trainers exist?	No	No	No	No	No	Yes
Are manuals for teachers available?	Yes	No	No	Yes	No	Yes
Are manuals available for parents?	No	No	No	No	No	
Are programmes and manuals based on results of (scientific) investigation?	Yes	No	No	No	No	
Are special budgets allocated for traffic education?	Yes	No	No	No	No	
Could you describe programmes and manuals	Theoretical education for participating in traffic (integrated into some subjects)	Rules of the road		RSE is integrated practically in all subjects; many schools have special equipped rooms and grounds for teaching		

Source: (Dragutinovic & Twisk, 2006)

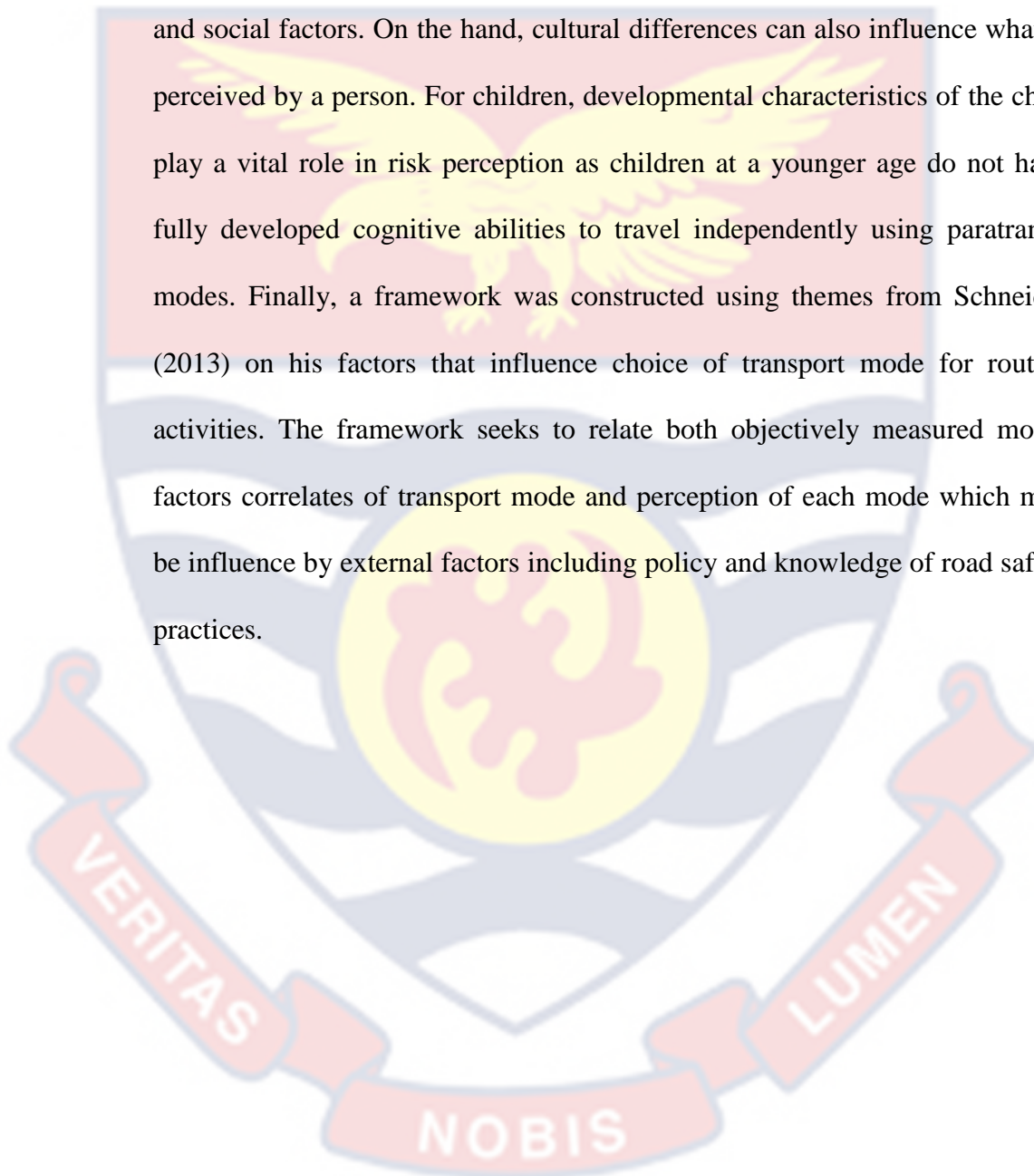
Children are a particularly susceptible group of road users in many poor nations; however, few schools integrate Road Safety Education in any of their curricula (Sayer and Downing, 1996). This may be due to a lack of teaching tools and teachers' lack of expertise on how to teach road safety and

what should be taught. Although there are several initiatives to reduce road crashes, particular emphasis on journeys to school is mostly placed on child active travellers. However, few developing countries have developed child travel policies and integrated road safety education into national curricula to curb road traffic crashes. For instance, in Kenya, the School Safety Standard manuals comprehensively spell out guidelines on pedestrian safety, bicycle safety, safety in public transportation, and guidelines for schools with transport services.

In Ghana, the National Road Safety Education (NRSA), Driver License Authority (DVLA), and Motor Traffic and Transport Department (MMTD) are the key agencies in ensuring road safety. The Road Traffic Act, 2004 (Act 683), its amended version Road Traffic Regulation, 2012 (L.I 2180), and the Ghana High Way Code are the key books used by MTTD for road traffic enforcement. Specifically, NRSA is responsible to conduct education programmes for road safety education. This they do through distributing road safety manuals to schools, visits to schools to educate pupils on road safety issues, conducting road safety programmes, and also providing training for drivers. For instance, National Road Safety Authority (NRSA), in partnership with the Bloomberg Philanthropies Initiative for Global Road Safety (BIGRS) developed a road safety campaign in 2021 in Accra and Kumasi that focused on drivers by sending out messages on speed reduction as well as the reduction in some risky driving behaviours (Bliss, T., & Breen, 2012; Slyunkina, Kliavin, Gritsenko, Petruhin, Zambon, He & Hyder, 2013; World Health Organisation, 2015).

Summary

This chapter examined some theoretical underpinnings on the factors that influence travel mode choice. Some factors that were found to be associated with parental factors, safety, convenience and comfort, aesthetics and social factors. On the hand, cultural differences can also influence what is perceived by a person. For children, developmental characteristics of the child play a vital role in risk perception as children at a younger age do not have fully developed cognitive abilities to travel independently using paratransit modes. Finally, a framework was constructed using themes from Schneider (2013) on his factors that influence choice of transport mode for routine activities. The framework seeks to relate both objectively measured modal factors correlates of transport mode and perception of each mode which may be influence by external factors including policy and knowledge of road safety practices.



CHAPTER THREE

RESEARCH METHODOLOGY

Introduction

This chapter focuses on the methods used in collecting data and their underpinning philosophies for the conduct of the study. It first discusses the issues on epistemology and philosophies relevant to the study. The chapter further describes the characteristics of the study area, various types of data collected, sampling procedures, and methods of data collection and analysis. The chapter finally, considers ethical issues guiding the data collection processes.

Research Design

Instead of focusing on a philosophical paradigm that looks at a phenomenon from one angle, the study employed both positivist and interpretivist ideologies to ensure a better understanding of factors that influenced paratransit mode choice for school journeys. According to Bashir (2017), the application of both inductive and deductive logic in a single study can improve the results and allow researchers to draw more confident inferences. The inductive and deductive logic of inquiry enables researchers to conduct hypothesis testing concurrently without sacrificing one for the other. Similarly, Creswell & Plano (2011), posit that equal divides between two approaches using many data sources and analysis provide strongly opposing viewpoints and outcomes. Using both interpretivism and positivist paradigms embraces the two extremes and offers a flexible and more reflexive approach to research design (Feilzer 2010; Morgan 2007; Pansiri 2005).

The concurrent mixed method research design was used because it allows for the use of multiple methodologies, different worldviews, and different assumptions. It also allows for the expansion of knowledge regarding both new and ongoing phenomena, such as the difficulties children encounter when using paratransit modes (Creswell & Creswell, 2018). In a concurrent mixed research approach, quantitative and qualitative data are combined or converged to provide a thorough overview of the study problem. In this design, the researcher simultaneously gathers both types of data and incorporates that data into their analysis of the overall findings Creswell & Plano (2011).

According to Grey (2004), the research design determines the methods to use for data collection and analysis as well as how all of this will be used to address the research question. In the case of children who use paratransit modes for school trips, surveys that call for the researcher to elicit information from knowledgeable people about a specific situation were deemed appropriate for the study. The study also used secondary data analysis to examine the curriculum's coverage of various topics related to teaching kids safe driving habits. The concurrent mixed-method design was used in the study for two main reasons. First, it is preferred because it excels at combining qualitative and quantitative research while minimizing their respective flaws. Second, mixed methods can be used to compare various viewpoints on the use of paratransit for the commute to school that are inferred from quantitative and qualitative data. This method offers insights and a thorough understanding of the circumstances that define, determine, and shape children's transport safety

in the study area. It is best suited to address the "how" and "why" questions of children's transportation in urban settings.

Particularly, data that was both quantitative and qualitative was gathered simultaneously. This suggests that during data collection in the field, both qualitative and quantitative data were gathered at the same time (single phase). At roughly the same time, qualitative and quantitative data were gathered, examined, and interpreted. According to Morgan (1998), the weighting in a study is based on the strength of which data collection method is best suited to address the study goals or purposes. Relatively, greater emphasis was placed on qualitative data than quantitative data to understand the experiences and challenges children face while traveling to school using paratransit modes.

Study Area

The Greater Kumasi, Ghana's second-largest city after Accra, is the administrative, commercial, industrial, and cultural centre of the Ashanti region. Specifically, the study was conducted on the IR4 stretching from the Asafo market through to the Old Tafo Municipal Assembly and the Kumasi Municipal Assembly. The Kumasi Metropolitan Assembly is 250 to 300 meters above sea level and is located between Latitude 6.35°N and 6.40°S and Longitude 1.30°W and 1.35°E. It has a surface area of approximately 254 square kilometres, accounting for approximately one percent of the region's land area. It is bounded on the north by Kwabre East and Afigya Kwabre district, on the west by Atwima Kwanwoma and Atwima Nwabiagya district, on the east by Asokore Mampong and Ejisu-Juaben Municipality, and on the

south by Bosomtwe District. It received the title of "Garden City of West Africa" due to the area's stunning layout and lush surroundings.

In addition to being the epicentre of Ghana's Asante culture, Kumasi Metropolitan Assembly is a significant commercial hub that draws visitors from all over Ghana as well as from nearby African nations like Burkina Faso, the Republic of Côte d'Ivoire, Mali, Nigeria, and Togo. Asawasi, Asokwa, Bantama, Kwadaso, Manhyia, Nhyiaeso, Oforikrom, Suame, and Subin are among the nine sub-metropolitan areas that make up Kumasi's metropolitan area. It is reachable from everywhere in the country due to its unusual central location. The first and most crucial area is the Central Business District (CBD), which is home to the Adum Shopping Center, Central Market, and Kejetia Lorry Park. Other economic nodes include the Suame Magazine (Vehicle Repair Centre), the Kaase/Asokwa Industrial Area, and the Anloga Wood Market. The majority of enterprises involved in timber processing, logging, food processing, and soap production are located in the Kaase/Asokwa Industrial Area. Asafo Market, Bantama Market, Oforikrom Market, and Atonsu Market are some of the city's satellite markets.

The city has a 1,700km road network infrastructure, but the fraction of decent roads is insufficient and does not match the needs of the people, particularly in low-income neighbourhoods. 'Trotro' with a passenger carrying capacity of 14 to 23, and shared taxis carrying four passengers, are the most common modes of transportation in Kumasi. The operators' preferences, which are frequently correlated with the state of the roads, determine how many vehicles are distributed along routes, which leads to an uneven

distribution of transportation services. Drivers' route choices are also influenced by the level of congestion.

With a total land area of 2,603 square kilometres and a population of 443,981 people, the metropolis is home to 213,662 men and 230,319 women (GSS, 2021). There are 30,420 non-household residents and 413,561 households in the area. Children aged 0-14 constituted about 33 percent, 15-64 years constituted about 63 percent whereas 65 years and older was 61,457 and forms about four percent of the population. The Metropolis has a total number of 440,283 households with an average household size of about four persons. Children constitute the largest proportion of the household members accounting for about 40 percent. The city is an important educational centre, boasting of 919 pre-schools, 967 primary schools 597 junior high schools, 52 senior high schools, two top public universities, and over 200 private educational institutions.

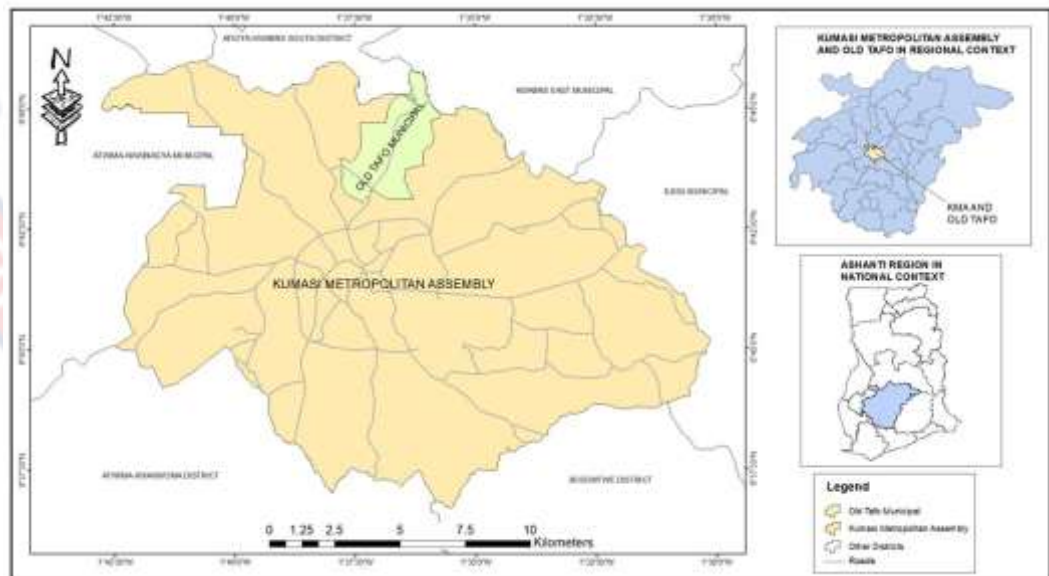


Figure 3: Map of Kumasi shows the study area in the regional and national context

Source: GIS and Cartographic Unit, University of Cape Coast

Old Tafo Municipal Assembly is one of 38 newly created and upgraded District Assemblies from the Kumasi Metropolitan Assembly in 2018. The Old Tafo Municipal Assembly was founded with LI 2293 and its capital is Old Tafo. On March 15, 2018, it was inaugurated alongside the other 37 newly created districts. Tafo is the capital of the municipality, which is in the central part of the Ashanti Region. It is located on latitude 6°44'9"N and longitude 1°36'29"W. According to Ghana Statistical Service (2021), the municipality has a total population of 114368 which represent two percent of the entire population of the Ashanti region. The municipality is dominated by females representing about 52 percent while about 48 percent represent males. The municipality covers 5 square kilometres and population density of 20880.2 per square kilometres and an average household size of about four percent. Old Tafo municipality has 35,030 number of household and non-household number of 23,321.

Target Population

An array of actors contributes to children's mobility. This includes parents and guardians who decide on children's mobility options, availability of different transport modes, infrastructure and policy, safety, sociocultural and economic factors. The study targets different respondent among which are both upper primary and Junior High School (JHS) children aged below eighteen years who travel to school who use paratransit. Children in basic school were targeted, however, the use of children in upper primary and JH were used because the study needed children who could understand and respond to the issues. To explore the variations between school types both private and public basic schools were taken into consideration.

Parents play key role in travel mode choice decision especial among young children. Their perception and experience of a particular mode may influence them to prefer a particular mode over another. Parents were therefore targeted to understand factors that contributes to their decision in influencing the type of mode to be used by their children for school journeys. Convenience sampling was used to select parents for the study. Again, as situated in the conceptual framework; modal factors, parental factors and external factors influence paratransit mode choice for school journeys among basic school children. It is to this that the study considered stakeholders including, National Roads Safety Authority (NRSA), drivers, and Ghana Education Service (GES). The purpose of targeting stakeholders such as NRSA, GPRTU, LUSPA, and MTTD was to explore the response to the needs of children in using paratransit modes for school journeys. Furthermore, knowledge on road safety education is crucial in ensuring safety of roads especially for children who have little control over their traveling environment. Thus, targeting GES was important to explore road safety educational lessons in schools.

Sampling Procedure

In terms of sampling procedure, probability and non-probability sampling procedures were employed for this study. The initial stage was to do a buffer operation as used in Amoako-Sakyi (2017), along the IR4 road passing through KMA to OTMA stretch to choose schools for the user perception survey. This stretch was chosen because it is an area that has a mixture of all forms of paratransit modes including motorcycle, 'trotro', taxi and 'pragia' being used and one stretch of the road with high incidence of road

crashes in Greater Kumasi. Mandagere (2010) as cited in Amoako-Sakyi, (2017) defines buffer operation as the creation of zone of a specified width around a line, point or polygon area and sometimes referred to as a zone of specified distance around coverage features. The procedure entails creating a buffer around existing geographic features and then identifying or selecting features based on whether they fall inside or outside the buffer's perimeter. Buffer allows the determination of entities that occur within or beyond the defined buffer zone. A buffer of 200 meters along the IR4 stretch starting from the Asafo market through KMA to OTMA was created. Buffering techniques was employed to check for probable overlaps, and these overlapping sections were eliminated.

After the buffering operations the next stage was to select schools that fell within the 200-meter buffer. A list of 16 schools along the IR4 stretch linking KMA to Old Tafo was obtained from the Directorate of Ghana Education Service. Out of the list, 10 schools fell within the 200-meter buffer and were therefore used for the study. In a case when two or more schools fell within a single buffer, one school was selected randomly using the simple random sampling procedure. Out of the 10 schools that were selected, it was realized that 60 percent fell within the OTMA and 40 percent fell within KMA which gave a fair proportional representation of students in the two districts as shown in Figure 4 and 5.



Figure 4: Map Showing Selected Schools in the Old Tafo Municipal Assembly (OTMA) on the IR4.

Source: GIS and Cartographic Unit, University of Cape Coast

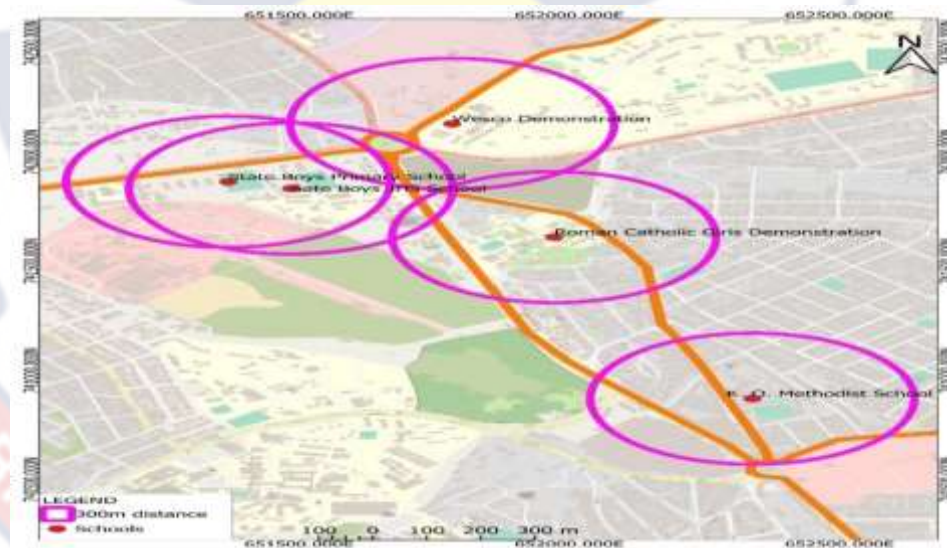


Figure 5: Map Showing Selected Schools in the Kumasi Municipal Assembly (KMA) on the IR4 Road

Source: GIS and Cartographic Unit, University of Cape Coast

The study adopted the “rule of 5” approach by Hair, Black, Babin and Anderson (2010) to arrive at the desired sample size for the study. This rule proposes that the sample size be equal to the number of items on the questionnaire (25 items for this study) multiplied by 5. Therefore, for this

study, a sample size of 125 ($25 * 5$) was used to be able to provide more accurate mean values, identify outliers and provide a smaller margin of error. The justification of the sample size was informed by a review of some previous global researches carried out where researchers have used comparably large and smaller sample sizes ranging from about 100 to 1000 respondents (Machin et al., 2018; Westfall & Yarkoni, 2016). I then decided to draw an average of 10 percent of total of the sample size from each school which was done by using the simple random technique (lottery method).

As a probability sampling technique, simple random sampling specifically lottery method was employed for selecting pupils from each school. The simple random technique first involved numbering all units in a sequential order starting from one to the last unit. After which, the assigned numbers are written on pieces of papers, folded, and mixed up in a bowl to be randomly picked until the n^{th} number is picked. An average of 12 pupils were drawn from each school. In all, a total of 125 pupils were selected from 10 schools for the user perception survey (Table 3).

Table 3: Sampled Schools and Respondents

Municipal	Name of School	Number of Respondents
KMA	Wesco Demonstration School	13
	State Boys primary school	12
	Roman Catholic Girls Demonstration	13
	K.O. Methodist School	12
Old Tafo	Old Tafo MA	12
	McNelius SDA	12
	Tafo Pankrono MA JHS	13
	St. Joseph R/C Primary	12
	Scales Adventist Preparatory School	13
	Rockanje Presbyterian School	13
	Total	

Source: Field survey, (Bekoe 2021)

Non-probability sampling was employed selecting both participants for FGD's and in-depth interview. Pupils who use paratransit modes for school journeys were conveniently sampled for the focus group discussion and agreed to take part in the discussion. Convenient sampling was again used for selecting drivers and this was because their work was such that they could only give responses when it was convenient and this was basically when their vehicles were on scale waiting to be loaded. Purposive sampling, specifically the maximum variation purposive sampling technique was employed to select a representative from NRSA, LUSPA, MTTD, and head teachers. Maximum variation sampling technique allows a researcher to collect a wide range of perspectives on the topic under research. By using this technique, the study

aimed to get greater insight into the response of stakeholders on the travel needs of children by looking at it from various angles and identifying common themes that are evident across the sample.



Figure 6: FGD with Upper Primary Pupils

Source: Field Image (2021)

Data collection instruments

In consonance with the research philosophy, approach, and design, interview schedule, interview guide, and questionnaires were developed to collect the primary data from the field. These instruments were chosen because they were the most appropriate. The study employed two research instruments for data collection;

- i. User perception survey for subjective assessment
- ii. Focus group discussion guide and interview guide for an in-depth (find answers to how and why) understanding of the survey result

User perception survey

The survey employed questionnaires that had 25 questions categorised under 5 thematic areas targeted at answering the research questions. Under each theme were sub-themes that hinted on specific issues relevant to the subject matter. The first theme looked at the background information on the respondent and took into consideration demographic information such as age, gender, school type, travel time and parents' occupation. The second theme (Mode Choice) investigated the type of paratransit modes often used for school journeys and factors that influenced the choice of such modes. Pupils were also asked about their preferred mode. This was to ascertain whether there existed any variation between modes frequently used and modes preferred by the respondents. Lastly, the third theme explored the efficacy of road safety education in basic schools. The researcher under this study investigated knowledge of road safety practices and the main source of acquisition of knowledge. Specifically, it investigated the content of road safety education in subjects mentioned by the pupils. This was to explore the duration, content, and comprehensiveness of such lessons.

With respect to the qualitative data, semi structured interview guide was used to conduct in-depth interviews with parents and stakeholders to understand the factors that influenced the choices they made in determining their children's choice of paratransit modes and responses on child mobility needs as well as child road safety issues. Because of its well-known benefits of fostering a good rapport, fostering a relaxed and healthy environment in which respondents easily cooperate, answer questions, and clearly express misperceptions about any aspect of a study, the semi-structured interview

schedule was employed. Additionally, it allowed the researcher to observe the respondent's actions while they interacted. This allowed the researcher to interpret the meaning of their actions. The semi-structured interview schedule was created with open-ended questions. This allowed the researcher to probe for more understanding. New questions about the objectives that emerged were added and asked in subsequent interviews. In addition, semi-structured interview guides were used to conduct FGDs with participants. The semi-structured interview guide included open-ended questions that were derived from and supplemented the survey instrument. This provided the researcher with the opportunity to investigate and gain in-depth knowledge on issues related to the objective.

Data collection procedure

First an introductory letter was obtained from the Department of Geography and Regional Planning at the University of Cape Coast, and the researcher went on to declare her intention to all appropriate sections. Letters to express intention including copies of instruments (questionnaire and interview guide) were sent to the head teachers of all the 10 selected schools and these schools were visited after being granted permission to conduct the survey and FGDs. Seven field assistants were employed. A two-day training session was conducted for the field assistants. To familiarise themselves with the research instruments and on data management skills.

As of the period for data collection, GES had introduced the shift system in basic schools to reduce physical contact thus a reduction in contact hours for children. Again, in the first week, JHS pupils were to go on break by the end of the week. Therefore, we first collected data from the JHS students

and then went back to collect data from pupils in Upper Primary. This may affect the distribution of respondents across various levels. In order not to interfere with classes, researcher first resorted to collecting data after close school which was between 2 pm to 3 pm. However, this period was not favourable for students as most complained about getting home late and others being hungry. The team then resorted to taking data very early (between 6-7:0am) in the morning before the start of lessons and during break time. All data collection team worked together at a time in one school to ensure the number of pupils required for each school is reached. Pupils were given snacks to compensate them for engaging them during break time for data collection.

The survey instrument was uploaded into the KoboCollect App and administered electronically using tablets. KoboCollect is an open-source Android survey data collection app. The app enables one to download deployed forms from KoboToolbox to other devices, as well as send data collected via the App back to the server. The KoboCollect App was used because it allows conducting a paperless research, and data recording in complex formats such as numeric data, descriptive data, photos, videos, sounds, and coordinates. It also allow making form changes while conducting research, and displaying interactive applications. Field assistant administered questionnaires to participants using tablets to prevent them from getting destroyed. An average of 12 questionnaires with a duration of 30 minutes were administered in each school totalling 125 respondents.

In conducting in-depth interviews, the various stakeholders were contacted for an appointment where they were briefed on the purpose of the study. After the successful booking of the appointments, on the actual day of the data collection. Permission was sought from participants before recording conversations. Parents whose children used paratransit modes for school journeys were also interviewed at their convenience. However, some parents did not agree to be recorded so discussions were written verbatim. These incidents, however, were few and did not affect the data collection process in any way. Each interview lasted for about one hour. This procedure offered more information because there was no third party to influence the responses of participants.

Additionally, the researcher carried out three separate FDGs for people who use paratransit, one in each of three randomly selected schools throughout the study area. According to Flick (2018), using multiple focus groups enables the focus group researcher to gauge the degree to which saturation has been attained. At this point, the researcher can anticipate information occurring so frequently that gathering additional data will appear to have no additional imperative value. According to Morgan (1998), three to six different FDGs, each meeting once or more, are sufficient to reach data saturation and/or theoretical saturation. Focus groups with a good design typically last one to two hours and have six to twelve participants Baumgartner, Strong, & Krueger, (2000) (as cited in Onwuegbuzie, Dickinson, Leech, & Zoran, 2009)

To set a conducive environment for the FGD, a request to the head teachers to locate a place for the FGD's on the school compound which had less noise, good ventilation, and had doors. Most schools provided their library

or staff common rooms for the activity. Seats were arranged in a circular form where everybody's face could be easily seen. Notepads and a recorder were made available for the moderator and the assistant moderator to jot down notes and record respectively while the discussion was in session. After setting up the place for the FGD, I selected an average of nine to twelve participants who had homogenous characteristics such as same sex, level of education and use paratransit modes for school journeys. A moderator and an assistant moderator facilitated the FDG's. Pseudonyms were used to identify participants by assigning numbers to them so that individuals could be identified anonymously as they made comments. The moderator as the lead of the discussion, prompted members to speak, requesting voluble members to let others talk and encouraging all members to participate. The moderator also took notes that informed potential engagement questions to ask. The assistant moderator, on the other hand, recorded the session (by audio) took notes, created a conducive environment. During the session body language such as nodding or shaking of head of each participant was taken into consideration as this may be interpreted an agreement or disagreement to a point. Each discussion lasted for one hour. These were conducted early in the morning before the start of normal class hours.

Data analysis

The data from the study were analysed using mix-methods (quantitative and qualitative analysis). With quantitative analysis, data obtained from the survey was analysed using descriptive statistics and presented in tables, bar graphs and pie charts for easy interpretation with the aid of Statistical Package for Service Solutions (SPSS-Version. 24.0). The

researcher proceeded to analyse the data using the 125 questionnaires. For the qualitative analysis, information obtained from the in-depth interviews and focused group discussion was transcribed, summarized, and coded according to different thematic areas identified relating to the research objectives. The coding took place immediately upon return from the field. The qualitative data was subsequently complimented with quantitative findings in the different sections of the study, either to explain or corroborate the results.

Braun and Clarke (2006) contend that thematic analysis is helpful for developing a thorough understanding of the social phenomenon being studied. This analytical approach also enables the researcher to critically evaluate latent themes in addition to analysing participants' descriptions of reasoning and understanding. As a result, it enabled the analyst to go beyond superficial readings of the accounts and search for patterns, distinctions, and connections to theory to develop a deeper understanding of the phenomenon in question.

With the focus group discussion, the researcher employed conversational analysis which is categorised into three stages. First a code assigned to each of the units before categorising them. Following that, themes that expressed the content of each of the groups were created. Themes that emerged were consistent across all three focus group discussions. Many, "most," "frequently," "several," "never," and other similar terms are frequently used by qualitative researchers. Although reporting and describing the themes that emerge from a focus group analysis can also be misleading and result in unjustified generalisations, using counts alone can still be problematic (Onwuegbuzie, Dickinson, Leech, & Zoran, 2009). Frequency data was used to help disaggregate focus group data, which is consistent with the notion of

treating each focus group member as a unique and important study participant. In this regard I counted the number of people who agreed or disagreed to the topic being discussed.

Ethical issues

This study ensured that the highest ethical standards were maintained throughout the study. First, ethical clearance was sought from the Institutional Review Board (IRB) of the University of Cape Coast. Once the clearance was gained, during the data collection, the researcher, together with the field assistant obtain informed consent from the participants after explaining the purpose of the study and their roles. Participation in the study was voluntary and there was no coercion. The study participants were informed that they could withdraw from the study at any time, and this did not affect them in any way. Considering the FGDs for the children, consent was taken from parents and guardian and the school's authorities, and assent from the children were obtained. Confidentiality, anonymity, and privacy were observed at all levels of the research process, and there was no individual identification of the research participants in the data analysis. There was no monetary compensation from the study. Respondents were informed that there is no direct benefit, however, their participation was likely to help the study find more about the use of paratransit among basic school children in Ghana. Respondents were informed that results from the study would be published so that other interested people or entities may learn from the study.

Summary

The study emphasized the need of combining the strengths of positivist and interpretivist ideologies, giving the study a mixed design. This further minimised the impact associated with using a particular design as their impact were thought to have been mitigated by the strengths of the other giving the study the opportunity of harnessing the strengths of both methods in understanding the decision for the choice of paratransit modes for school journeys.



CHAPTER FOUR

RESULTS AND DISCUSSION

Introduction

This chapter primarily presents the main findings of the study and contextualises them within the theoretical and conceptual framework in four parts. The first part covers the socio-demographic characteristics of respondents. The second part covers the factors that influence travel mode choice decisions for school journeys; the third part explores the challenges basic school children face in accessing paratransit modes for school journeys and the fourth part investigates the efficacy of road safety education for school journeys. This chapter, however, precedes with a discussion of the participants' socio-demographic characteristics.

General Characteristics of Study Respondents (Surveys)

The background characteristics of an individual play a key role in decision-making for travel mode choice. This is essential when it comes to primary school children's travel decisions because socio-demographic characteristics play a crucial role in the decision-making process. Pupils were chosen from a variety of socio-demographic backgrounds. They did, however, share one major characteristic: they were all self-reported paratransit users and travelled independently to and from school without an accompaniment of an adult. The socio-demographic variables covered in this study included age, sex, type of school, parent occupation, household vehicle availability, stage at school, living arrangement, and the number of siblings. Although pupils may have used other modes of transportation for various reasons which includes parental drop-offs, convenience, or financial constraints, they all reported

paratransit as their most frequently used mode of transportation for school trips. It is imperative to note that instead of the 125-respondent used as sample size for the quantitative data, only 123 were used for the analysis because two respondent used private motor bikes to school that was commercially used by their parents thus did fit into the criteria for selection.

From Table 4, out of 123 pupils who were selected from two municipalities, about 63 percent were selected from Old Tafo while about 37 percent were from KMA. Of all the schools selected, about 83 percent represented public schools and about 17 percent were from private schools. Like any other essential factors such as sex, and age are key factors in studying travel decisions for school journeys among basic school children as they help in better understanding of issues such as travel patterns and perceptions on safety and security. According to Broberg & Sarjala (2015), children aged nine years and above may be recognized as matured to travel independently without any adult interference and this is mostly dependent on the level of maturity exhibited by the child and the perceived built environment. In Ghana, age above 18 years is regarded as legally matured and can make decisions without any adult interference. Respondents in this study were, therefore, ranged from 9 and 17 years. Children were ranged between 9 years, 10 to 14 years, and 15 to 17 years. These according to WHO are age ranges in which children are most liable to road traffic crashes, especially in developing countries. The data revealed that majority of the respondent (62.6%) were aged 10-14 and this is because most basic school children fell within this age group in Ghana (Amoako-Sakyi 2017). About 22 percent of the

respondents fell between 9 – 10 years and about 15 percent of them were between 15-17 years.

Moreover, there were a high number of females (62.6%) than male (37.4%) respondents in this study. It is evidenced in some studies that girls are less likely to walk than boys (Cooper et al., 2003; Marten and Olds, 2004; McMillan et al., 2006; McDonald, 2008; Johnson et al., 2010; Hatamzadeh et al., 2017). It is also consistent in the study of Bwire (2020) that female school children would prefer to use motorised transport modes over non-motorised transport. However, the result is not in line with previous findings by Ermagun & Levinson (2017) which reported that boys are more likely to use paratransit modes more than girls for school trips.

Furthermore, about 46 percent of pupils were in upper primary (class 4-6) while about 55 percent were sampled from Junior High School (JHS1-3). Additionally, concerning the child living arrangement, about 93 percent reported they live with their parents, about seven percent with their guardians while less than one percent reported living alone. A study revealed that the flexibility of work patterns of children directly influences the choice of mode for school journeys thus plays an important role for travel mode decision among basic school children (McDonald, 2008a). In terms of parental occupation, the International Standard Classification of occupations 2008 (ISCO-08) which provides a system for classifying and aggregating occupational information was used to classify the occupation of parents. ISCO, a four-level hierarchical structure, allows all jobs in the world to be classified into a 436-unit group which are aggregated into 130 minor groups, 43 sub-major groups, and 10 major groups based on their similarities in terms

of the skill level and skill specialization required for the jobs. As shown in Table 4, the majority, about 79 percent and 33 percent of mothers and fathers respectively were service and sales workers. About five percent reported that their father was deceased or had travelled overseas.

Table 4: Socio-Demographic Characteristics of Respondent

Variables		Percentage
Municipality	OTMA	62.6
	KMA	37.4
School type	Public	86.2
	Private	13.8
Age	9- 10 years	22
	11- 14 years	62.6
	15-17 years	15.4
Gender	Male	52.8
	Female	47.2
Stage	Upper primary	45.5
	JHS	54.5
Living arrangement	Parent	92.7
	Guardian	7.3
Number of siblings	0-3 siblings	53.7
	Above 3 siblings	46.3
Vehicle availability	No	65.0
	Yes	35.0
Travel time	1-30 minutes	50.4
	31 – 60 mins	36.6
	Beyond one hour	13.0
Frequently used modes	‘trotro’	76.4
	Taxi	17.1
	‘pragia’	6.5

N=123

Source: Field work (2021)

Also, according to Singh & Vasudevan, (2018) a bigger household size is expected to enhance the likelihood of children being accompanied to school (including being dropped off in personal automobiles). Similarly, the presence of siblings has also been used as a proxy for family/household socioeconomic status. Barry (2006), posits, pupils with fewer siblings are likely to receive more parental attention and have greater access to resources than those from large families. Data from the study revealed that about 54 percent of the respondent had 0-3 siblings as about 46 percent had more than 3 siblings. The study further reported on the availability of vehicles (both motorised and non-motorised) in participant households and found that 65 percent of pupils representing different households reported the non-availability of a means of transport in their homes. According to Ermagun & Levinson (2017), when it comes to distance, families without household vehicles will rely more on paratransit modes. Distance plays a significant role in the choice of mode for all journeys. How far or short a distance is, will determine the type of mode to travel with (holding all other factors constant). In this study time spent traveling to and from school was used as a proxy for measuring distance as most basic school children could not actualize their distance from home to school. From Table 4, about 50 percent of the respondent spend 0-30 minutes traveling from home to school while about 37 percent and 13 percent spend 30- 60 minutes and beyond one hour, respectively.

Lastly, among the various paratransit mode available in the Kumasi Metropolis, pupils were asked to select their most frequently used paratransit modes including 'trotro', taxi, 'pragia', and motorcycle for their school

journeys. The report from the data however showed that only two children out of 125 used motorcycles for school journeys and thus was taken out of the data. This study is therefore limited to only three paratransit modes which include 'trotro', taxi, and 'pragia'. As presented in Table 4, most of the children travelled by 'trotro' (76.4%) with the use of taxi recording about 17 percent and few (6.5%) others who use 'pragia'. Adom-Asamoah et al., (2015) associated the greater percentage of 'trotro' patronage as a result of its cheap cost, availability, and easy access.

Factors Influencing Mode Choice

A better understanding of the factors that influence individual travel behaviour can reveal changes in preferences and attitudes, provide insights into existing travel patterns, improve transportation planning, prepare for future infrastructure needs and services, and assist in the better design of sustainable and inclusive transportation policies that meet emissions reduction goals and improve travel equity (Ng & Acker, 2018). How far children travel to and from school is a major determinant of the kind of mode to use that is whether to walk, cycle use school bus or paratransit modes. Several studies point out that distance over 1km contributes to a higher rate of use of motorised transport (Adom-asamoah et al., 2015; McMillan, 2007; Poku-Boansi et al., 2019; Sharma, 2014). The first substantive section of the questionnaire dealt with the factors that influenced paratransit mode choice for journeys to school. This section thus aims to uncover factors that influence the use of specific paratransit modes as means of travel over other alternatives for school journeys. It should be noted however that the factor variables were

measured on a multi-dimensional scale thus a respondent could choose one or more variables as factors that influenced mode choice.

Pupils were asked to select among several factors that are most likely to influence their paratransit mode. As presented in Figure 7, majority (87%) identified aesthetics as an important factor that influenced their paratransit mode for school journeys. According to available literature, parents are key players in decision-making, especially among basic school children. From the study about 85 percent of the pupils revealed their parents influenced their paratransit mode choice. The ease with which one travels may influence the decision for a particular choice mode. From Figure 7, about 80 percent of pupils revealed convenience as a factor that influences their decision on the type of paratransit mode for school journeys. Again, 52 percent of the pupils pointed out economic conditions as a factor that influences their choice of mode. This confirms most studies on factors that influence mode choice (Adom-Asamoah et al., 2015; Bwire, 2020; Mehdizadeh, Nordfjearn, & Mamdoohi, 2018). The condition of mode, which is how suitable a mode may appear such as the nature of seat, door, or window, among others may attract people to it. From the study, about 36 percent of the pupils revealed condition of mode as an influencing factor in their choice of mode.

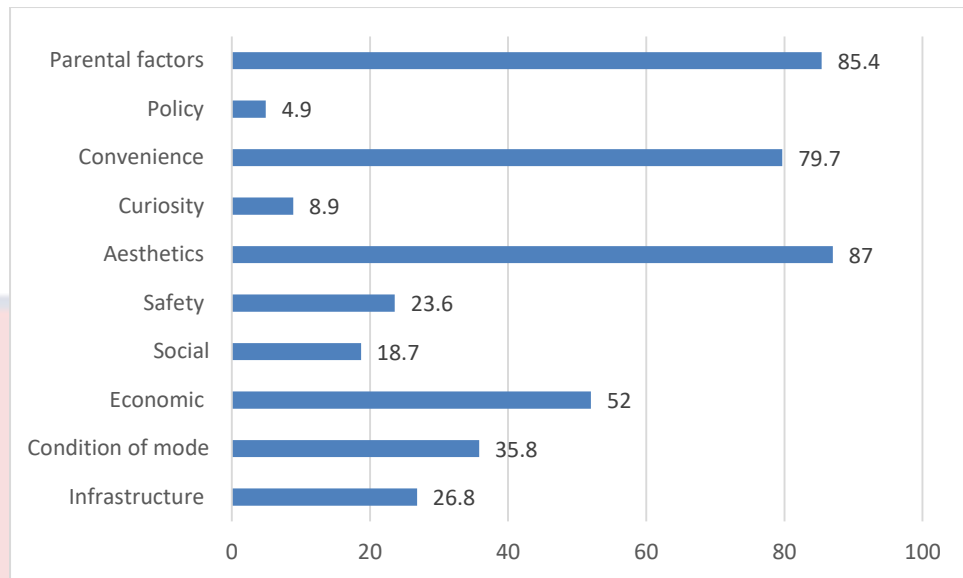


Figure 7: Factors that Influence Mode Choice

Source: Field Survey (2021)

From Figure 7, about 24 percent of pupils revealed safety as a factor that influence mode choice. The study further revealed that about nine percent reported on curiosity. Curiosity in this context looks at how children embrace the emergence of new modes, modes seen on television or mode used by friends. The study further revealed that about five percent of pupils mentioned policy as an influence on their travel mode choice for school journeys.

To better understand the issues in the KMA and OTMA Municipalities, the study used a cross-tabulation descriptive and chi test of association to elaborate on the factors that influence mode choice. To determine whether there is a statistically significant association between the two categorical variables, the Chi-Test of Association is used. This method is used to determine whether there is a relationship between any two categorical research parameters. In this study, a test was run to see if there was any significant relationship between the different kinds of paratransit modes and any significant mode choice influencing factors. The chi-square test results revealed that among

other factors, parental and aesthetic factors significantly affect mode choice. As a result, the study concentrated on the two factors and only briefly covered the others. It should be noted however that the factor variables were measured on a multi-dimensional scale thus a respondent could choose more than one factor that influenced mode choice. The results from the analysis showed that only two factors including parental factors, and aesthetics were significant as presented in Table 5. Thus, this study centred much on these factors.

Table 5: Cross Tabulation of Factors That Influence Travel Mode Choice

Variable	Category	Frequently used most (%)				Chi-square (p-value)
		'pragia'	Taxi	'trotr'	Total	
Parental factors	No	27.8	11.1	61.1	100	15.758 (0.000***)
	Yes	2.9	18.1	79.0	100	
Policy	No	6.8	17.9	75.2	100	1.946 (0.378)
	Yes	0.0	0.0	100	100	
Convenient	No	4.0	20.0	76.0	100	0.461 (0.794)
	Yes	7.1	16.3	76.5	100	
Curiosity	No	5.4%	17.0%	77.7%	100%	2.800 (0.247)
	Yes	18.2%	18%	63.6%	100%	
Aesthetics	No	25.0	18.1	56.3	100	10.684 (0.005**)
	Yes	3.7	16.8	79.4	100	
Safety	No	5.3	17.0	77.7	100	0.941 (0.625)
	Yes	10.3	17.2	72.4	100	
Economic	No	10.2	23.7	66.1	100	6.865 (0.32)
	Yes	3.1	10.9	85.9	100	
Condition of mode	No	5.1	19.0	75.9	100	1.185 (0.553)
	Yes	9.1	13.6	77.3	100	

Source: Field Survey (2021)

NB: *** implies significant at 99% confident level ** implies significant at 95% confident level

Parental factors

Parents have a significant impact on their children's travel behaviour. Their confidence about a child's physical and cognitive capabilities, age, and gender among others exert the amount of influence placed on travel decisions. Among all the various factors that influence school travel mode decisions, parental influence was the second highest representing about 85 percent of the factors that influence the choice of paratransit modes for school journeys. Testing at a 95 percent confidence level, the study revealed that parental influence was significant at one percent. This implies that parental influence is associated with the type of paratransit mode used by children for school journeys. This confirms the findings of most studies on travel mode choice for children. However, there were variations between the types of paratransit modes used. Out of about 85 percent of pupils who reported parental factors as an influence on their choice of mode, 79 percent reported that their parents made them choose 'trotro' over any other paratransit mode. The high record of 'trotro' was partly because parents perceive this mode to be safer because of the presence of other travellers giving their children much protection (Bwire, 2020). Again the cheap cost and easy accessibility of the 'trotro' make it more appealing to commuters than the other modes of transport (Adom-Asamoah et al., 2015). From Table 5, about 18 percent reported parental influence on the use of a taxi. However, only three percent said their parent asked them to pick 'pragia' and this was basically because of the association of dangerous riding behaviour of most 'pragia' riders. To many of them who use this mode, 'pragia' is the only available means of transport for school journeys in their community despite the dangerous driving skills exhibited by the riders.

Specific influences of parental factors on paratransit mode choice for school journeys.

Here, the study tried to elucidate some of the specific parental factors that shape the decision to use a particular paratransit mode instead of another.

Children were therefore asked to identify among various specific parental factors such as perception of safety, cost of travel, convenience, security, mostly used mode paratransit mode by parents, and parents preferred mode that shapes their travel mode choice decisions.

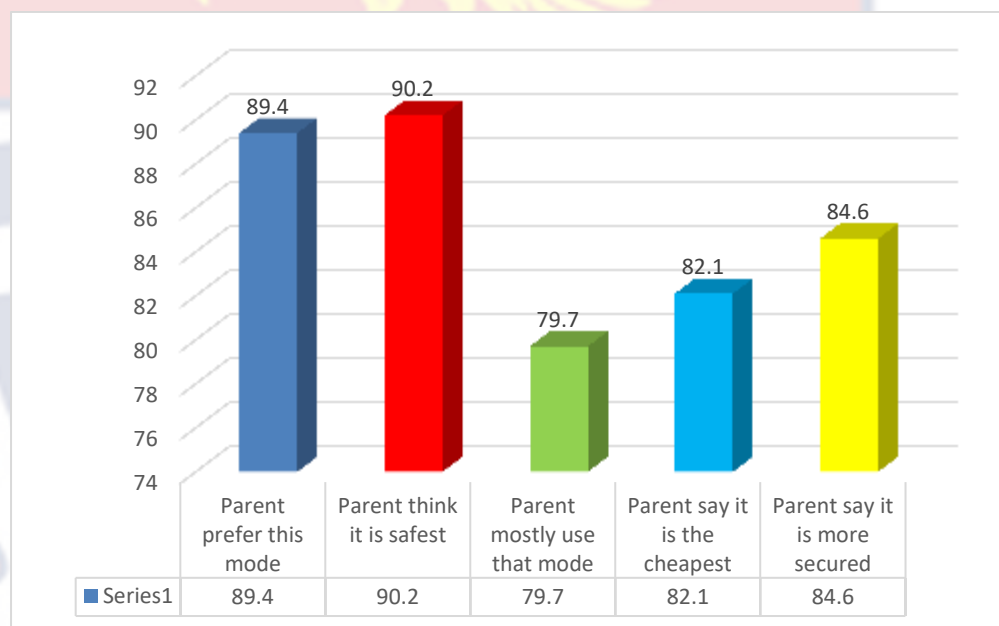


Figure 8: Factors influencing parental choice of mode of paratransit

The urban environment may influence travel in several ways. Mostly, parents' perception of safety and security on road is a key contributor, especially for children who travel to school independently. In terms of safety, parents are very conscientious when it comes to travel mode choices for school journeys. Much attention is paid to the volume of traffic on the road, nature of the road, driving behaviour, and the nature and condition of mode to be used. From Figure 8, about 90 percent of the children indicated safety as

the most important concern of parents in influencing mode choice. For instance, a 12-year-old JHS 2 pupil narrates that:

I come to school with 'trotro' because my mother tells me to come with 'trotro' since the 'pragia' is not safe especially when a 'trotro' can easily push the 'pragia' off the road. But if you come with a 'trotro' and the drivers decide to drive with caution, it won't end up in an accident. In the case of a 'pragia', the drivers can easily run into an accident or fall. So, my parents always tell me to come with 'trotro' because that one is safer than the 'pragia'. I always obey those instructions.

Again, the experiences of parents and others in the use of paratransit modes played a significant role in how parents influenced their children's travel mode for school journeys. A 13-year-old female in JHS 2 explains that:

My mother instructs me to board a 'trotro' than the 'pragia' because something had happened. At the Angloga junction, a young boy was killed by a 'pragia'. And my mother told me that 'trotro' is safer than the 'pragia' and so every day I should go by 'trotro'. And my grandmother too told me the same.

To most parents, the fear of abduction was a great concern when it comes to child independent travel to and from school. From Figure 8, about 85 percent of pupils revealed security as one of the major concerns of their parents when it comes to traveling independently to and from school. For instance, for those who used 'trotro' for school journeys, children were asked to look out for the presence of passengers on board before they pick such vehicles. A class 6 pupil narrates:

My mother advised me not to pick a 'trotro' when there are no passengers in it. Last Friday, when I was going home from school, I heard 5 school children boarded a taxi and told the driver they were going to Breman but then the driver took them to a destination beyond Breman to a bushy area with macho men waiting there. So, a girl among them asked permission to urinate and placed her phone in her underwear. So, when she was excused to use the washroom, she called her father and informed him and the father in turn also called the police, that's why my mother advised me not to board a 'trotro' without passengers on board.

A parent narrates her fear for her children as they travel to school.

Today the world is very strange and dangerous to live in. Should someone kidnap a child, because they mostly act immaturely, he/she can't defend for him/herself. A stranger could easily ask them to join a car, and because they are not mature, they will just join. So, for the small ones their parents take them to school but for the elderly ones they go on their own and we tell them to be careful about strangers especially with these 'okada' riders. It is only God who protects our children oo!

Furthermore, about 80 percent of the children revealed that preference for certain paratransit modes by parents for school journeys was because most parents used those modes for their daily activities as illustrated in Figure 8. This falls in line with the study by Adom-Asamoah et al., (2015). Available literature found that mothers more than fathers are likely to influence travel mode choice decisions. Parents may prefer their children to use their

frequently used mode over others. For instance, it is very likely for a mother who frequently uses 'trotro' for her daily errands to influence her child to use the same for school journeys using the same route, holding all other factors constant.

Again, the condition of the road may also affect the extent of influence of school travel mode decisions by parents. The study observed that most of the roads in KMA and Old Tafo had no child crossing signs, and lack bus stations, as well as zebra crossings. This, to some parents, influence their choice of paratransit modes rather than walking. A parent explained that:

I prefer my children pick a car rather than walk because our road isn't wide enough and there is no pedestrian walkway. In some instances, too, children can just appear in front of a car that is parking or they just cross the road without checking for oncoming vehicles which normally results in accidents so I feel picking a car to school is convenient for them.

Another parental-level influence on school travel outcome that was identified is household travel behaviour and attitudes. From Figure 8, about 85 percent of the children revealed that the mode they use is what their parents preferred over other modes. The flexible work pattern of parents, particularly the time they leave for work also influenced the type of mode used for school journeys. This is often associated with the availability of vehicles in the household. For some children with household vehicles, they are dropped off based on the flexibility of their parent's work schedule and pattern therefore resort to other alternative paratransit modes sometimes. A 14-year-old girl in JHS 1 narrated that: *'Sometimes my father brings me to school usually on*

Wednesday and these are days that my father goes to a programme. So, he assists me by bringing me to school. But I mostly come to school by 'trotro'.

The study further revealed that, even among parents, there were variations in the perception of paratransit modes. A 14-year-old JHS 2 pupil narrates that:

My mother will consider that I should take 'okada' but my father will not. My father rides a motor and knows how these young boys use the 'okada'. My father works at Allabar and there are a lot of 'okada' there. My father will not allow me because he knows how they ('okada' riders) are. Even for me, I am scared when I pick 'okada' especially when I see how they ride it. Even in cases where the road is not in good condition, you will see the 'okada' shaking like a snake that has been hit by a human being.

However, variations in the perception of paratransit modes may result in children preferring other modes to what they have been asked by their parents to use for their school journeys. To some children, even though safety was an important issue, they rather considered their comfort and convenience in their choice of mode above their parent's concerns about safety and security.

A 12-year-old class 6 pupil narrate:

Madam, even though I have been asked to use 'trotro', for the 'pragia', there is more comfort in it than the 'trotro' because there is more space to put my leg and feel free in it. Again, I am able to get to school on time. As for the 'trotro' it really delays so I sometimes use the 'pragia'.

However, the study further revealed that some parents had little or no knowledge of the type of paratransit modes used by their children to and from school. A 15-year-old boy in JHS 1 narrates: *‘Madam as for me, my parents don’t know the kind of car that I choose for school.’* In answer to the question on parental knowledge on the type of paratransit mode used by their children for school journeys a parent narrates that:

ooh for me, I give my son money as transportation fare in addition to his chop money for school. Whatever mode he takes is in his hands, but I always caution him not to follow bad friends when he closes from school. I can’t be following him to school every day besides, he is a grown-up now. His friends will even laugh at him if I do that.

Another parent also narrated:

For questions on the type of mode used by my children for the school journey, you would have to ask them themselves. They go to school and know the type of mode they use. I just give them their money and that’s all.

She narrated calling out for her children to come and respond. To such parents, what was deemed as important to them was just giving their children their transportation fare for them to get to school and back home. Again, joining bad company was also a key issue raised thus the choice of mode for school journey was not deemed important thus nothing to worry about.

Aesthetics

Children are sensitive and may react to stimulants created or presented by the environment. As used in this study, aesthetics refers to the beauty of the

paratransit mode. It takes into consideration the colour, shape, emerging model, and seat arrangement among others that is pleasing to the eye. Pupils were asked to choose among the specific aesthetic factors that influence their mode choice.

Surprisingly, amongst other factors such as safety, pupils identified aesthetics as the most important factor (87%) that influenced their mode choice. Testing at 95 percent confidence level, the study revealed a significant relationship (significant at 5%) between aesthetics and the various mode of paratransit modes. This may be because children conceive that the basis of influence of paratransit modes by parents is tailored by factors such as safety, socio economic status etc. thus, making them prefer other factors other than safety. Again, how children perceive safety, convenience among other factors may be different from adults' perspective. Variations from the type of mode used reveals that about 79 percent of pupil who used 'pragia' was influence by aesthetics. Pupils gave particular attention to the neatness and the colour of the 'trotro' before boarding especially while going home. Again, about 17 percent revealed aesthetic as a factor to their choice for taxi for school journeys. However, only about four percent reported aesthetics as a factor that influences them in using 'pragia' for school journeys. Although some pupils may have preferred 'pragia' because of its cute nature, dangerous riding behaviours exhibited by these riders may result in them rating their safety over aesthetic factors.

Further to investigate the specific factor of aesthetics that influences mode choice, pupils were asked about the specific aesthetic factors that influenced their mode choice. As illustrated in Figure 9, 21 percent reported

that statutory colours of the transport mode influenced their mode choice. Again, 79 percent of the respondent identified unique arrangement as a factor that attracts them to using a particular mode.

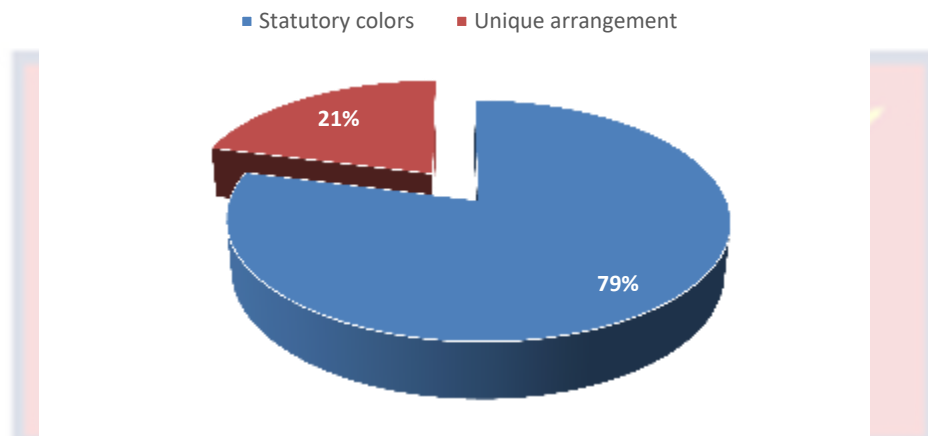


Figure 9: Effect of Aesthetics on Choice of Paratransit Mode

Source: Field Survey (2021)

Policy, Convenience, Economic Safety, Curiosity, and Condition of the Mode

As presented in Table 5, Policy, Convenience, Safety, and Condition of Mode did not show any significant relationship among various paratransit modes. This may be because parents as key role players in the decision-making of school children are being influenced by these factors. Children thus, focus less on such factors since to some extent they are limited by the choice they make. In Ghana, there are no policies on travel to school as seen in other countries such as Kenya. However, 100 percent of pupil revealed policy as an influence on the choice of 'trotro' for school journeys. This may be as results of restrictions given by parents to children in using other paratransit modes. Despite the absence of policy on child travel to school, some schools restrict the use of modes for school children paying critical attention to the type of mode that it is been used, some schools disallow the use of specific modes and

discourage children from using such modes to school. A head teacher narrates that:

I think coming to school with the school bus is the best, but parents can't pay thus allowing their children to use 'pragia' for school journeys. Even as a grown man, I am very scared to use this mode considering the dangerous riding behaviour they exhibit on our roads. There have been crash injuries from the use of 'pragia' and it sometimes happens just in front of the school. There is no school zone sign, bus stop, or pedestrian walkways, thus these riders just misbehave on the road. We have reported this incident to the Assembly, yet nothing is done about it. You see, parents are aware but because of inadequate funds they still allow their children to use this mode. Even though we do not have strict laws or regulations in this school on the use of 'pragia' for school journeys, we always discourage parents from allowing their children to use this mode during Parents-Teachers -Association (PTA).

In terms of convenience, the study revealed most (76.5%) pupils use 'trotro' to school because it is convenient compared to other modes while about 16 percent and seven percent reported on taxi and 'pragia' respectively. Because children are often dependent on their parents giving them money to school, what they are given is what they use as transport fares. As children from high-income households may enjoy convenient modes to school, children from low-income households may not. For children from low-income families, even though they may prefer modes that are more convenient to travel with,

inadequate finance among pressing needs may hinder them from using such modes. Among those who use 'trotro', about 64 percent of pupils revealed curiosity as one of the factors that influence their choice while 18 percent and about 18 percent reported on taxi and 'pragia' respectively. Users' choice of paratransit mode for safely arriving at a destination is closely linked with the level of traffic risk that they perceive. In terms of safety about 72 percent used 'trotro' because of safety while about 17 percent and about 10 percent reported on taxi and 'pragia' respectively. The condition of mode used to travel may affect the ease with which one travels with thus plays a crucial role in decision making of paratransit mode choice. From Table 5, about 77 percent of pupil revealed the condition of mode influenced their choice of travelling with 'trotro' to and from school while about 14 percent and nine percent reported on taxi and 'pragia' respectively. However, this did not fall in line with most studies which rated the condition of service of taxi to be better than 'trotro'. Even though children would have wanted to travel with other modes of transport other than what they use, the absence of available alternatives makes them limited to just one type of mode.

The role of children in making travel mode decisions for school journeys.

Understanding the ways children with different life experiences come to terms with day-to-day context and constraints in the journey to school is essential for travel decision-making for school journeys. Children were asked about their role in the decision-making process for school journeys. The majority of the children revealed that they had little or played no role at all in their travel mode choice decision for school journeys. Although they had no role to play a few of the children explained that certain situations on their

journey make them go contrary to what they have been told to use. A 14-year-old boy in JHS3 narrates that:

Sometimes I am forced to make my own decision to board to pick a 'pragia' because when I am even going to school, my mother will not see me board the 'trotro' she instructs me to use. I always prefer 'pragia' because it is faster.

In answers to the open question, children indicated how they influence their travel mode decision for school journeys. The study revealed traffic conditions on the road while going to school as an important factor in the role children play in the travel mode decision-making process. A 16-year-old boy in JHS 3 narrates:

Sometimes I tell them (referring to his parents) that getting a vehicle to school is difficult. You can stand at the station for hours and you may not have gotten a car to school. Sometimes I wait up to 7 am and I am still stuck up at the station.

Objective Two: Challenges Faced by Children Using Paratransit Modes for School Journeys

This section discusses challenges children face while using paratransit modes to and from school. With the absence of child travel policy and weak regulation of paratransit modes, the safety of children to and from school is threatened. The findings were based on personal experiences and observations made by pupils using paratransit modes for school journeys. In this regard, the themes that emerged from the discussion were the presence: condition of paratransit mode and infrastructure and driver and mate behaviour towards children.

Condition of mode

Throughout the study, the most predominant challenges observed to hinder mobility were the condition of mode. The study observed that most of the paratransit modes especially were in very poor condition. Old and rickety buses with poor seating conditions conveyed these children to and from school. Some of the vehicles had protruding metals which are very risky to use. All members of the three FDG groups revealed that paratransit modes were mostly in poor condition, especially with 'trotro' with one member vividly recalling:

One day, I was rushing for a car on Monday and it was difficult to get a car on that day. While rushing to get a car, a boy pushed me, and I was injured by an exposed metal in the 'trotro'. I just hid the scar and came to school like that. That car was in poor condition and appeared weak and I don't know who would be riding such a car.

Another female in class 5 added that:

The other day, I was boarding 'trotro' when I sat down, I unknowingly sat on metal and when I stood up the metal tore my dress. I had to go back home and couldn't go back to school since I was late and would have been punished if I did. So, I will admonish you (referring to her colleagues) to always check whether there is a metal on the seat before you sit.

A male in class 6 also recounted that:

Some 'trotro' have a lot of holes in the roof and when it rains you will be surprised at the extent to which you will be beaten by the

rain. The last time it rained, I wished it had not rained. While I was in the 'trotro', I was severely beaten by the rain so much that my clothes were completely soaked in water when I alighted.

Very eager to share his experience, a 13-year-old boy in JHS 2 recounted that:

'There are a lot. Sir, look at my leg' (showing me a scar of his injury from scratch of protruding objects)



Figure 10: Scar of Injury from a Protruding Object while Using Paratransit

Source: Field Image (2021)

Pupils further revealed that most often drivers and mates cared less about and neglected children who had been injured by protruding objects and it sometimes took the intervention of other passengers before being given the attention needed. First aid boxes were absent in most of the vehicles and those who had them, had no drugs but papers and other materials.

Poor condition of seat was also mentioned as a challenge in using paratransit modes and this was very common among 'trotro' vehicles as observed in the study. Throughout the study, it was observed that most seats were torn, weakly fitted or seats were replaced with planks. In confirmation of the condition of seat as observed, an account of a male in class 6 is as follows:

The other day, the seat I sat on was poorly fitted and instead of repairing it, the driver only placed a plank of wood to adjust it.

Unfortunately, the driver had to slam his break to prevent an accident, and immediately after he did that, I slipped and fell to the ground. Most of the 'trotro' here are not in good condition and drivers do not have time to repair or fix them. However, the drivers appear to be in a hurry to overload their vehicles or even carry goods that are supposed to be carried by cargo vehicles. All this hastiness accelerates the rate of dilapidation and weakens the capacity of the vehicle.

Again 7 out of 10-member group, 9 out of 9-member group, and 6 out of 12-member group agreed that legroom space was a challenge in most 'trotro'. However, 'pragia' was identified to have the most comfortable seating condition and legroom space. This, however, was not justified in terms of safety. 6 out of a 10-member group expressed fear in its use as a result of the lack of doors. On account of the issue of small legroom space in 'trotro', a 13-year pupil in JHS 3 narrated that:

Sir for some of the cars the seats are so close, especially the sprinter, so if you are sitting in it, you must squeeze your leg to fit in, or else by the time you alight, you will be having pains in your knee.

In agreement with the issue of small legroom space, an 11-year boy in class 6 also narrated that:

Yes, because as for the 'trotro' most of them have small legroom space and they put car tires in the car so whenever I sit in, I get tired; my leg. But as for the 'pragia', there is more space for me to put my leg and feel free in it.

Expressing worry on her face while mentioning ‘comfort’ with the use of ‘pragia’, the moderator further probed the reason for such expression. The pupil explained as follows: *‘The ‘pragia’ has no doors so when something happens, you can just fall easily. But as for the ‘trotro’, you cannot fall easily.’* (All members in the group nodded to confirm this.)

Though there are regulations that specify the condition of the vehicle to be used for commercial purposes, weak enforcement and gaps exist in the regulation paving way for vehicles in dangerous conditions to be used for commercial purposes. For instance, Section 80 of the Road Traffic Act, 2004 (ACT 683) highlights the use of vehicles in dangerous conditions. Subsection 1 (i.e., A to D) describes a vehicle to be dangerous if the condition of the vehicle, the purpose of its use, the number of passengers carried, and how they are carried, the weight, position, or distribution of its load is such that the use of the motor vehicle involves danger of injury to any person or damage to property. The term ‘condition’ is loosely defined and thus becomes difficult to measure. Regulation 5 of the Road Traffic Regulation, 2012 (L.I 2180) mandates all vehicle owners to undertake the test of the condition of motor vehicles which should be conducted every six months in respect of commercial vehicles and once every year in respect of private vehicles. According to Subsection (3) of regulation 5, a test shall be conducted to determine if:

- a. The motor vehicle conforms to prescribed requirements relating to the construction and condition of the motor vehicle, its accessories and other equipment and

- b. The condition of the motor vehicle is such that its use on the road will not involve danger of injury to any person or property.

When drivers were asked if they had conducted the test on the condition of their vehicles, some said it was the first time they were hearing about such regulations. This is evident as the Byelaws for regulating the operation of commercial vehicles, commonly used as a guide for regulating commercial transport unions lacked the presence of tests on the condition of vehicles. In recounting the incidence of handling vehicles that are in poor condition, a station master narrated that:

Some of the cars are indeed in bad condition but the drivers don't have enough money to buy a new one or fix them. And the 'pragia' riders are making things worse by crashing our cars with their indiscipline riding behaviour. The drivers have families to look after and need to work with these vehicles and save till they get a better car. We cannot stop them from working with such vehicles. Most often we make fun of the drivers when passengers are boarding and encourage them to fix them.

Poor infrastructure

The indiscipline behaviour of drivers coupled with a bad road network exposes paratransit users to a high risk of road crashes. Observations during the survey showed such cases as, the absence of bus stops and terminals, the absence of sidewalks along several roads close to the schools surveyed, zebra crossing, cycle paths, and, road signs on neighbourhood roads. The poor condition of roads characterized by ditches and potholes has also affected the

ease of movement across the metropolis. This condition is common on several roads in Ghana.

Indiscipline driver behaviour

Another challenge identified by pupils in using paratransit mode for school journeys is indiscipline driver behaviour which includes speeding, overtaking, overloading, the use of a phone while driving, and verbal abuse. Over speeding, unnecessary overtaking, and riding in the wrong lane were emerging themes that were used to describe 'pragia' riders. All participants agreed to the indiscipline behaviour of 'pragia' riders on road. Although 'pragia' is the most preferred mode especially during peak hours because of their ability to manoeuvre between heavy traffic, the indiscipline behaviour of riders deters most pupils from their use. Pupils also mentioned that most 'pragia' riders play loud music on their tricycles to prevent passengers from drawing their attention to their indiscipline riding behaviour. Not only do these riders put in danger the life of passengers especially children but the nuisance they create on the road puts other road users in danger. A driver recounting poor driver behaviour by 'pragia' riders stated that;

For us, ('trotro' and the taxi drivers) we have unions that regulate our conduct so we don't drive carelessly. Those who drive carelessly are the 'waawaa' vehicles' (vehicles without a station). The 'pragia' riders are the biggest problem. They ride recklessly especially when there is traffic and very dangerous for children to use. They are not under any regulated body and are mostly wee smokers. When you confront them about their riding behaviour, they will gang up and beat you mercilessly. You see, people,

including children, will like to board these tricycles during peak hours and a few boards the 'trotro' thus passengers must wait till the 'trotro' is filled up before we can move. Passengers complain a lot about being late for work, school, and their various destinations. The 'pragia' drivers are damaging our cars. They are always crushing our cars. The police do not even arrest them when they see them exhibiting such dangerous driving behaviours because most of the tricycles belong to them. You can be careful on the road as much as possible but these riders would easily put you into trouble.

'Trotro' and taxi drivers on the other hand were revealed to obey road traffic regulations. However, 3 of a 10-member group revealed the use of mobile phones by both 'trotro' and taxi drivers while driving. A 13-year-old JHS 1 pupil vividly narrated that:

Sir it's left with one more thing. The other time I picked a 'trotro' and the driver was chatting on WhatsApp. I almost wanted to tell him to put a stop to it. If I say it, he might tell me to get off the bus.

In terms of boarding and alighting, pupils also revealed that 'trotro' particularly do not wait for passengers to board or alight from vehicles before moving their vehicles. In their quest to maximize profit drivers tend to compete with each other for passengers by dropping off and picking up passengers to replace those who alight while the vehicle is in motion. Again, it was noted that most drivers disregard the condition of the pick-up point i.e., whether safe or unsafe. A 15-year JHS 2 boy recounted that:

For some of the mates so long as there are many passengers on the way, they won't have patience for you at all. They are in a hurry to pick the next person ahead so as soon as you board the vehicle, they won't make you sit comfortably before the car moves rather, they set off and if you are not careful you might fall. The other time I nearly got hurt, the driver started moving immediately when I entered the 'trotro'. The passengers had to scream at the driver before he stopped.

Pupils were further asked about how they are treated by drivers and their mates in paratransit modes. Across the 3-focus group conducted, 5 out of 10-member group, all members of a 10-member group, and 7 out of 10-member group revealed that they were mostly treated badly in 'trotro'. They associated such behaviour with shouting at them (verbal abuse), cheating in terms of transport fares, being inconsiderate about their age i.e., being treated like any other passengers on board, and neglect in the case of injury. A member (11-year-old in class JHS 1) vividly recounted that:

Some do have patience for us but others do not. Some of the mates will scream at you. Even when you haven't sat down the driver will move the vehicle and you might slip in the vehicle. The thing is that we also have many people struggling to get into the vehicle so they won't have patience for you.

Another member, a 10-year female in class 5 also narrated that:

Some of the drivers think that we are children and they won't listen to us. One day, I heard that when a driver is speeding, we should talk to him to reduce it. So, I was sitting in a car and the driver

was speeding so I took it upon myself to tell the driver to reduce the speed. Surprisingly, the driver got angry and accused me of being disrespectful and even insulted me. In fact, the mate also joined in the insult and also reprimanded me for speaking up to the driver. I really felt ashamed and sat quietly. And so, anytime I sit in the car and the driver speed, I always keep quiet and don't want to talk so that they will insult me.

However, a member revealed that although there is no reservation for children in paratransit modes, some drivers were considerate, especially during peak hours (children have to join long queues to catch a paratransit mode). A member recounted that:

Madam, students do not have a special seat in the 'trotro'. But at times when you are wearing a uniform and it is late, they can say oh! Come and sit in because you are a student. [2 members nodded in agreement with this]

When asked between drivers and mates who is most considerate in 'trotro', the children revealed that drivers were more considerate than their mates. They described some of the mates as cheats, as they sometimes give their seats to adult passengers and squeeze them to share their seats but take the full fare or are made to pay double transport fare. Regulation 23 (excess passengers on board) of the bye-laws for the Kumasi Metropolitan Assembly stipulates that a commercial vehicle shall not carry any number of persons above the number allowed to be carried by the vehicle provided that for this Bye-law an infant in arms shall not count as a person. The regulation specifically states that children aged twelve years and above are to be counted

as one person and thus must occupy one seat. Despite the existence of this regulation, specifically ‘trotro’ drivers and their mates were noted to overload passengers. A member vividly recounts that:

The other day, I joined a ‘trotro’ and this ‘trotro’ was overloaded with passengers where the mate had even sold his seat to a female passenger and this happened during the COVID era. While approaching a police checkpoint, the mate quickly alighted from the car since we were more than the approved carrying capacity of the car. The mate walked past the police checkpoint and later joined us. Witnessing how crowded the car was, I wasn’t even aware of the presence of a protruding metal until my dress got torn and had a scratch after I stood up. Even when I alerted the mate of my injury, he totally ignored me and asked me to take care of it myself. Thankfully, other passengers intervened and asked the mate to provide remedies but he still refused until another passenger offered me cotton to cover my wound

Another member (a 13-year-old female in JHS 2) added that:

Sometimes the mate even tells us to sit at their place. Then the two of us will share one seat. Despite sharing their seat, they will go on and charge the full fare which is not good. I feel very uncomfortable anytime this happens.

Pupils expressed this comfort in this situation and mentioned that they sometimes feel tired before getting to school. However, 2 out of a 10-member group revealed that they always pay for one seat but shared with two of their siblings. This they do because they are only given money for just one seat and

asked by their parents to plead with the mate to allow them to share a seat. The pupil mentioned that some drivers easily understood but others prevented them from boarding their vehicles. Nodding in agreement with what was discussed, one member (15-year-old JHS2 male) also revealed that sometimes they got hungry after school and therefore spent their transport fare and share a seat with their friends.



Figure 11: Excess Passengers on Board

Source: Field Image (2021)

In contrast, drivers revealed that overloading children is a major challenge in their operations. Intentionally overloading children in vehicles was noted to be in consideration given to children but not a habit as according to them the law discourages such behaviours. Most drivers showed discomfort with children sharing seats as they were mostly arrested for overloading. It was also mentioned that as much as some may want to assist these children, getting arrested and fined deterred them from doing that. Again, passengers also tended to complain about such situations.

One of the biggest challenges in transporting children is children paring seats. Sometimes parents come to us with about 3 or 4 to occupy a seat in the car. You see, when you don't consider them, they will say you are wicked. 'oo a lot of my fellow drivers try

helping by picking up two to three school children to occupy one seat but the police on the road wouldn't see it as you helping the school children but rather arrest you the driver and when it happens this way, you have no one to defend you. Some passengers will also not understand the situation and complain thinking we have intentionally taken money from the children and packed them into the car like that. So, this is a problem. Sometimes I force the parents to pay for an extra seat for the children.

When participants were asked to mention unsafe paratransit, modes used for school journeys, pupils referred to 'pragia' as the most dangerous mode for commuting to school. 'Pragia' riders were attributed to dangerous riding behaviours. Most pupils were advised by their parents about the use of 'pragia' for commuting to school. However, this mode was preferred by others because it was fast to travel with because of its ability to manoeuvre through heavy traffic, especially during peak hours.

Throughout the study, taxi was mentioned just a few times as it was identified as the safest mode of transport but the most expensive compared to the other modes of transport. Taxis were attributed to convenience, comfortable seats, and fast, obeyed traffic regulations more than other paratransit modes. Although identified as the safest mode, prices charged for their services constrained its use. Excerpts from the study, however, revealed that there was a lot of fear of abduction and kidnapping with the use of a taxi. This arises from the experience shared by other people who had been victims. Pupils mentioned that they took into consideration 'who is in the taxi (old or young),' and 'how friendly the person looks' and look out for the sex of other

occupants (adult male or female). A lot of fear was associated with male adult passengers as this deterred them from using this mode.

Objective Three: Efficacy of Road Safety Education

One potential strategy for lowering the number of fatalities or injuries among young road users is to provide road safety education (RSE) in schools. This section reviews the strategies and methods used by RSE programme in schools and provides some feedback on their efficacy.

To assess RSE in the Greater Kumasi Area, a total of 123 pupils were first asked about their knowledge of road safety education. The survey revealed that about 97 percent were knowledgeable about road safety whereas about three percent did not know anything about road safety as illustrated in Figure 12.

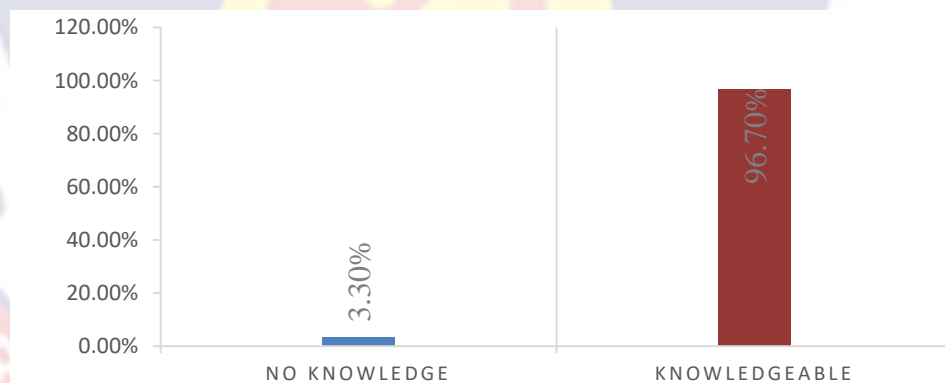


Figure 12: Knowledge of Road Safety

The study further investigated the sources from which knowledge of road safety was acquired. The study revealed that school was primarily the major source of road safety education representing about 60 percent of the total respondents. This was followed by parents/guardians who reported 25

percent as their source of knowledge, about 18 percent stated mainstream media (this included TV and radio), and about two percent indicated social media as their most important source of knowledge as illustrated in Table 6. Those who indicated social media as their main source of knowledge revealed Facebook as their main source of knowledge from social media and this was most common among JHS pupils basically because most of them had access to mobile phones and had enough knowledge on how to operate them.

Table 6: Source of Knowledge

Source of knowledge	Percentage
Mainstream media (TV/Radio)	17.9
Parents/ Guardian	20.3
School	60.2
Social media	1.6
Total	100

Source: Fieldwork

The school as a major source of knowledge revealed by pupils, the study further ascertained the subject in which road safety is taught in school. Pupils were asked to identify their important source of knowledge among the various courses taught in school. Courses such as citizenship education, creative arts, our world our people, English, Home economics, Religious and moral education, science, and social studies had components of road safety education. Pupils also mentioned visits from the National Road Safety Authority to their schools to educate them on road safety practices.

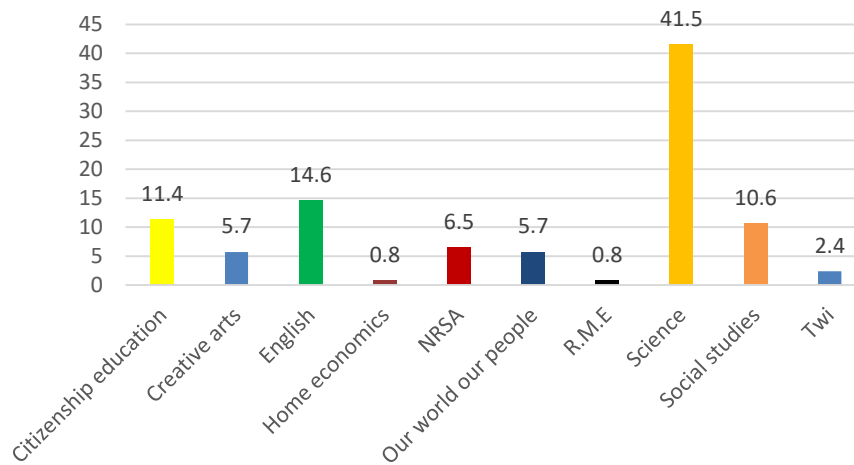


Figure 13: Subjects' Road Safety

Source: Field Survey

Among the various subjects identified, about 42 percent of the respondent's revealed science as their major source of knowledge from school while about 11 percent reported citizenship education, six percent from creative arts, about 15 percent from English, one percent from home economics, seven percent from NSRA, six percent from our world our people, one percent from RME, 11 percent from social studies and two percent from 'Twi'.

The study further probed to investigate what the curriculum exactly mentions with regard to road safety education in schools. Educating children on how to conduct themselves on road is an essential practice as this will enhance safety to and from school. From Figure 13, the majority of the children (94.3%) knew how to keep safe on the road which included walking on sidewalks and not playing on the road. On safe crossing points, children were given picture albums to identify zebra crossings and traffic lights as well as how to interpret them. About 77 percent of the respondent knew safe crossing points as taught in school. On observation of the major routes to

school using there was the absence of zebra crossing and even with those that had one, the markings had faded off. Some sang rhymes to confirm what was taught in school.

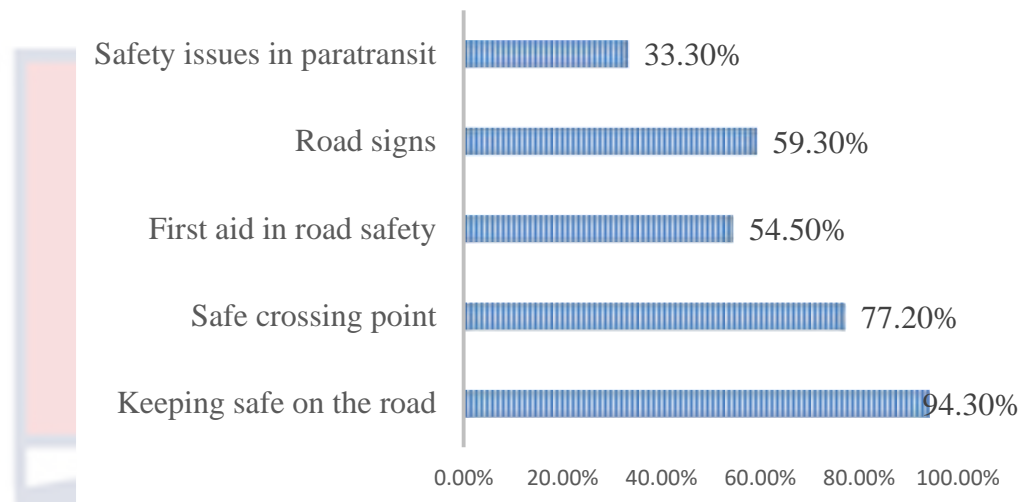


Figure 14: Content of Road Safety Education According to Pupils
Source: Field Survey (2021)

Efficacy of Road Safety in Upper Primary and JHS Curriculum

Road safety education in schools is one potential method of minimizing the incidence of fatalities or injuries among young road users. Integrating road safety education into the curriculum at all levels of education is therefore essential for enhancing safe conduct on roads either as passengers or pedestrians. A review of the curriculum revealed that among the various subjects that were mentioned by pupils as their major source of knowledge, only citizenship education (a subject in the old curriculum) and Our World Our People (OWOP) had contentment with road safety education.

Citizenship Education

Citizenship education integrates knowledge and information from many areas of study including Civics, Hygiene, Social Studies, Life Skills, and Religious and Moral Education (Ghana Education Service, 2017). The goal of

the subject is to create knowledgeable, self-awareness, civic-minded, and involved citizens who will support the growth of their communities and their nation in a spirit of democracy and patriotism. The curriculum aims to promote critical thinking, a sense of national consciousness, unity, and development, as well as the development of attitudes and values to address societal issues and the acquisition of desired characteristics of a Ghanaian patriot. The curriculum emphasises the child's function as an involved and active member of the democratic political community. The curriculum is set up to cover the three years of Upper Primary in such a way that each year's work is divided into four sections, each of which contains a unit on numbers. The course material is divided into four themes:

- 1) The individual: the curriculum is structured to assist students in coming to terms with who they are and in cultivating the knowledge, principles, and behaviours that will make them responsible citizens.
- 2) Responsibility: in order for students to become responsible students, it is important for them to understand the value of responsibility as well as to develop their knowledge and analytical skills.
- 3) Authority: focuses on what authority and power are, how to respect authority, how to develop the skills and knowledge necessary to elect people to positions of authority, and how to respect one's own authority. Additionally, they will be able to research the sources of authority and compare its advantages and disadvantages.
- 4) Justice: the curriculum aims to help students understand and apply the values of fairness to those around them, develop virtue in being

truthful and honest, identify gender stereotypes and other forms of injustice, and develop the skills to confront injustice.

Five 30-minute periods a week are allotted for citizenship education.

Table 7: Teaching Syllabus for Citizenship Education (Primary 4-6)

P4	P5	P6
SECTION 1: THE INDIVIDUAL	SECTION 1: THE INDIVIDUAL	SECTION 1: THE INDIVIDUAL
Unit 1: Knowing Myself Unit 2: Relationships With Each Other	Unit 1: The Individual, Education, and Work Unit 2: Peer Groups and Nation Building	Unit 1: Young People and Nation Building Unit 2: Preparing for Life
SECTION 2: RESPONSIBILITY	SECTION 2: RESPONSIBILITY	SECTION 2: RESPONSIBILITY
Unit 1: Values and responsibilities in our community Unit 2: Our National Symbols	Unit 1: Safety in our home and Unit 2: One People, One Nation Unit 3: Attitudes and Responsibilities for Nation Building	Unit 1: Sustainable Management of the Environment Unit 2: Avoiding Waste at Home, School, and Work Unit 3: Domestic Violence and Conflict in the Family
SECTION 3: AUTHORITY	SECTION 3: AUTHORITY	SECTION 3: AUTHORITY
Unit 1: My Community Unit 2: Skills for effective citizenship Unit 3: How my community is Ruled Unit 4: How we are Governed	Unit 1: Governance in Ghana Unit 2: How to become a Democratic Citizen	Unit 1: Ghana and Her Neighbours
SECTION 4: JUSTICE	SECTION 4: JUSTICE	SECTION 4: JUSTICE
Unit 1: Basic Rights of Human Beings	Unit 1: Gender Relations in the Community Unit 2: Ethnicity and National Development in Ghana	Unit 1: Peace-building and Democratic Living Unit 2: Social Auditing

Source: (Ministry of Education Science and Sports, 2007)

The study revealed that only class 5 had road safety education content, as shown in Table 7. Section 2 (Responsibility) Unit One (Safety in our

Community) of the primary 5 Citizenship Education curriculum included information on road safety. The unit's goal is to make students aware of ways in which their safety in the community is jeopardized, to appreciate the common characteristics that unite Ghanaians, and to foster positive attitudes toward nation building. The key concept of unit 1 (Safety in our Home and Community) holds that safety ensures that people in the community are protected from accidents, crime, and disease. Unit one's objective 1 identifies ways in which lives are endangered at home and in the community. The content of this objective focused on ways in which lives are endangered at home and in the community, citing examples such as domestic accidents, theft and armed robbery, the occurrence of natural or man-made disasters (e.g., floods, earthquakes, bush fires), filthy environment, sexual harassment (rape), domestic violence, conflicts, and child traffic. Objective 2.1.2 depicts various methods for ensuring community safety. The content is centred on ensuring community safety and includes: being cautious when crossing the road or riding a bicycle alongside the road, watching the traffic to make sure the pedestrian cross light is on before you cross, reporting any crime act to the police or neighbourhood watch-dog, not starting bush fires, dumping refuse in appropriate places, facing oncoming vehicles when walking, refusing gifts or lifts from strangers, and saying "No" to people who try to con you. Although road safety issues were brought up in this unit, they only dealt with child pedestrian safety. Once more, the content of road safety was insufficient.

Our World Our People

Road safety education was barely mentioned in a new subject (Our World Our People) that was added to the new basic education curriculum

(Ministry of Education, 2019). Despite being cited by students as a source of information about road safety procedures, a review of the curriculum revealed only a passing reference to road safety as an exemplar. A curriculum called Our World Our People (OWOP) combines social studies, geography, and citizenship training. A sustainable lifestyle and environmental protection are among the goals of the OWOP curriculum, which aims to produce morally upright Ghanaians. The four columns in the new curriculum—which cover the strands, sub-strands, content standards, indicators, and exemplars—are arranged in a grid format. For ease of reference, the learning indicators are numbered in each column with the help of a special annotation.

Strands are the broad areas of subject content, while sub-strands are the topics organised within each strand. The term "content strands" refers to the predetermined level of knowledge, skills, and or attitude that a learner achieves by completing a specific stage of education. Indicators are clear outcomes or milestones that learners must meet in order to meet the content standard expectation, whereas exemplar support and guidance clearly explains the expected outcomes of an indicator and suggests what teaching and learning activities could take to assist facilitators in curriculum delivery. The curriculum is divided into five integrated learning areas that are grouped under five strands, including "All about us," "All around us," "Our beliefs," "Our nation, Ghana," and "My global community." The only course that covered road safety education was basic four. Road safety education was covered in Strand 2 (All about us), Sub-strand 1 (The environment and the weather). Content strand B4.2.1.1 in particular demonstrates understanding of environmental safety and explains how to make the environment safe.

However, in this instance, concerns about road safety were mentioned right under exemplars, which was used as an example. The unit even used the phrase "good road" as an example under which topics pertaining to road safety will be covered. As a result, specific issues of road safety practices that needed to be discussed were missing. Unlike the previous curriculum (Citizenship Education), which highlighted some road safety practices, the new curriculum had no road safety content at all levels, except as an example under exemplars in B4.2.1.1.

Despite the fact that the NRSA's school visits and the distribution of road safety booklets were mentioned by both students and the teacher. These books, however, were distributed to teachers without any kind of workshop to teach them how to use the booklet in instructing their students. Despite students' claims to the contrary, the NRSA did make occasional trips to their schools to instruct students on road safety procedures. However, the NRSA director disclosed that schools that expressed interest in teaching students about road safety were frequently contacted to do so. She mentioned that one of their main difficulties in implementing road safety programs in schools was a lack of funding for road safety programs.

Summary

This chapter reveals the factors that influence the use of paratransit mode for school journeys among 123 basic school children in KMA. It also sheds light on the challenges basic school children face using paratransit modes for school journeys to school and finally explores the efficacy of road safety education in basic school curriculum. The study revealed that economic factors, aesthetics, and parental factors are the key influencers of decision

making for paratransit modes. Parents serve as the main decision-makers for school journeys among basic school children. On challenges children face using paratransit mode's themes that emerged from the focus group discussion conducted included driver and mate behaviour and condition of mode and nature of infrastructure. Most children mentioned they had been injured using paratransit modes and attributed their major source of injury as due to the condition of the vehicle, especially with 'trotro' and dangerous driving behaviour exhibited by drivers. 'pragia' was noted to be one of the dangerous modes for school journeys while taxi was mentioned as the safest mode for school journeys. With regards to the efficacy of road safety education only two subjects had content of road safety education. This includes the old curriculum for Citizenship Education (Basic 5) and the introduction of a new subject in the new curriculum (Basic 4) for OWOP. Road safety education in the curriculum tends to focus much on active travel living little room for those who use paratransit modes.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATION

Introduction

This chapter presents a summary of the major findings of the study, the conclusions and recommendations. It also presents the contributions of the study to knowledge and some areas for further research.

Context of study

The main objective of the study was to explore the use of paratransit modes among basic school children for school journeys in KMA. Specifically, the study sought to:

- 1) Examine the factors that influence mode choice for school journeys among basic school children in the Greater Kumasi Area.
- 2) Explore the challenges children face in using paratransit modes for school journeys in the Greater Kumasi Area.
- 3) Assess the efficiency of child safety education among basic school children in the Greater Kumasi Area.

Employing an exploratory research design, a total of 123 school pupils drawn from upper primary and JHS, as well as key stakeholders including NRSA, GES, and transport unions (GPRTU and PROTOA) provided information for the study. Motorcycles were excluded because only one person used it for school journeys during as at the time of data collection. Students for the FGD were selected using convenience sampling and stratified sampling was used to select those who answered the questionnaires. Maximum variation purposive sampling was used to select key stakeholders for the study. The research instruments used for the study were questionnaires,

semi structured interview guides and a semi-structured focus group discussion interview guide. Data collected included the factors that influence paratransit travel mode, the efficacy of road safety education, the incidence of injuries and travel needs as well as the role of stakeholders in responding to the safe mobility of these children. Data collected was analysed and presented using frequencies, percentages and direct quotations which put participants' comments into proper context.

Summary of findings

The main findings of the study were as follows:

1. Parents played a key role in decision making for paratransit modes. Safety was one of the major concerns in choosing paratransit mode for their children.
2. How children perceive safety and convenience may be different from an adult perspective, this may lead to preferring modes different from that of their children. The data revealed that, although parents are key decision-makers to travel mode, some children disagree with their choices. In cases where children travel independently, they are forced to and take their preferred mode instead of what they were asked to use. Some parents also had no idea about the type of paratransit modes used by their children to school.
3. In terms of economic factors, the decision on which mode of transportation to use for a school trip is determined by the household income. Among the specific economic factors that influenced mode choice, the majority resorted to the cheap cost of travel as the most influencing factor of the paratransit mode decision making process.

4. The safety of students would best be ensured when vehicles meet the safe condition to be used on roads. Observation made on most paratransit modes had protruding objects with very poor seating conditions.
5. The pupil also identified aesthetics as one of the major factors influencing decision making on paratransit modes. This meant children pay attention to the colours and stature of paratransit modes. The newer and more colourful a mode is the more likely it is to attract its use for school journeys.
6. Poor road condition, absence of speed calming measures, dangerous driving behaviours, lack of bus stops, road signs, zebra crossings and bus stops pose a serious threat to both pedestrians and passengers. From the study many of the pupils had been injured using paratransit modes for school journeys. The study reported that the condition of most paratransit modes such as the presence of protruding objects due to the use of old and rickety objects often leaves scars on passengers who often get injured by them.
7. Pupils identified condition of mode, infrastructure and driver and mate behaviour as the major challenges in using paratransit modes for school journeys.
8. Road safety education is one of the key options for reducing road safety education especially among children. However, the study revealed that road safety is virtually absent in the new curriculum for both upper primary and JHS. Only the class five syllabus of the Our World Our People subject had road safety measures mentioned under exemplar.

Conclusion

Among the various factors that influence travel mode choice among basic school children for school journeys, parents as confirmed by most studies play a significant role in travel mode choice decision making. Safety is one of the major drivers to such decisions. Road infrastructure and driving behaviour present the most challenge among basic school children using paratransit for school journeys in KMA.

Unfortunately, the road infrastructure in KMA and other urban areas in Ghana often serves as death traps for both passengers and pedestrians. Coupled with the bad road network dangerous driving behaviours exhibited by most paratransit drivers in their quest to make more profit often aggravates the situation. Children who travel independently, are left in the hands of these dangers of which they have little control. Drivers stop to pick up or drop off children without paying attention to the condition or the nature of the environment.

Paratransit characterized by free entry and exit to the market attracts untrained drivers who put the lives of children at stake. Even with paratransit that has regulatory bodies, strict regulation management is often relaxed and becomes a major problem since strict adherence to regulations will mean others taking advantage to make more profit. Even though there exists road traffic education to ensure safe mobility to school, education tends not to be sufficient as most are concentrated on active walkers leaving a huge gap for those using paratransit modes.

Recommendations

Based on the findings and conclusions of the study, the following recommendations are made:

1. Understanding how children currently travel, their opinions on different transport modes and their attitudes towards travel is crucial for policy-makers such as MTTD, and DVLA. For instance, children's views on travel mode should be considered in local mobility projects. This will help bring to light their needs and challenges that hinder school travels using paratransit.
2. Policymakers must consider revising traffic management schemes and practices. There is the need for the metropolitan authorities in collaboration with the Ghana Education Service (GES), National Road Safety Authority (NRSA), and the Motor Transport Traffic Division (MTTD) of the Police Service to educate parents, drivers, and children on the safe boarding of paratransit modes.
3. The findings of this study may be used by transport operators and policymakers to improve the level of public transport services. The activities of the operators need to be checked to promote efficiency and effectiveness; therefore, unions should be formed in various communities in the Municipality to regulate their activities. With that, paratransit operators will be adequately controlled.
4. Government regulators such as the NRSC, MTTD, and the DVLA should ensure that the activities of tricycle operators in the transportation sector are improved, sustained, and adequately regulated. To ensure safety, manufacturers should improve the quality of the tricycles by fitting doors

to enhance the safety of passengers. Further studies should focus on determining how the tricycle business can be enhanced to make the business more lucrative in the future without compromising safety.

5. The National Road Safety Authority in collaboration with MTTD and driver unions should increase road safety education campaigns in and around school on the use of paratransit modes. Behavioural change amongst both motorists and child passengers must be targeted.
6. The Ghana Police Service should improve on their accident data collection methods by capturing exact GPS locations of paratransit crashes and demographic data of occupants to aid in improved mapping out of such crashes in future. The existing practice of identifying crossroads and "between two nodes" areas as accident hotspots distorts mapping and should be abandoned. In most circumstances, such listed places are likely to be several meters distant from the actual hotspot. However, the use of basic existing technologies, such as Open Street Mapping (OSM), provides a better understanding of crash hotspots, allowing for the construction of appropriate and unique engineering remedies for such places. The Ghana Police Services' Information Technology (IT) Department should explore developing a more robust and user-friendly programme to help in the collecting of crash reports.
7. The Directorate of Physical Development should ensure that streets have bus stops and also set regulations for their use. The department should again make provision of speed calming measures such as ramps, traffic lights among others to regulate speed on road.

8. Parents should discourage their children from using paratransit for school journeys.

Contributions to Knowledge

Silverman (2000) asserts that a study's contribution to knowledge could be determined in four areas namely; developing a concept or methodology, thinking critically about an approach, building on an existing study, and being prepared to change direction. In line with the assertion above, this study's contribution to knowledge is three-fold. First, the study has brought to the light incidence of crashes using paratransit. Second, the study has also revealed inadequacies in the regulation of paratransit mode and the need for child travel policy when it comes to meeting the transport needs of children. Finally, the study developed a conceptual framework that exclusively explores the use of paratransit modes among basic school children.

Suggestions for Further Research

This study focused on the lived experiences of basic school children using paratransit modes for school journeys to school in KMA. The study subsequently examined the role of key stakeholders in meeting the mobility needs of these children. Further studies can be undertaken to review the content of the curriculum of courses in which road safety is taught and the NRSA handbook to assess the efficiency of content.

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APPENDIX A

Table 11: Specific Factors for Modal Factors

Modal factors	Percentage (%)
Station is safe	70.7
Stop is safe	38.2
Stop close to my house/school	62.6
No waiting time	63.4
Vehicle condition is safe	74.0

Source: Field Survey

Table 12: Specific Factors for Safety

Safety	Percentage
Safe designated seat for children	19.5
enough space to ensure social distancing	27.6
Seat is secured with seatbelt	11.4
Seats are well arranged	57.7
Drivers adhere to road traffic regulations	58.5
Never been attacked on board	44.7
Never seen another attacked	38.2
Threatened while on board	42.3
Assisted to board	33.3

N=123

Source: Field Survey

Table 13: Specific Factors for Convenience

Convenience	Percentage
Get to school on time	75.6
Only available mode	11.4
Walk for short distance to access	49.6
No waiting time	40.7
Seats are very comfortable	63.4
Disability friendly	56.1
Driver does not stop frequently	19.5
Enough leg room space	55.3

N= 123

Source: Field Survey

Table 14: *Specific Factors for Curiosity*

Curiosity	Percentage
Emerging transport	1.6
Seen people use it on Tv	8.9
All my friends use it	13.8

N= 123

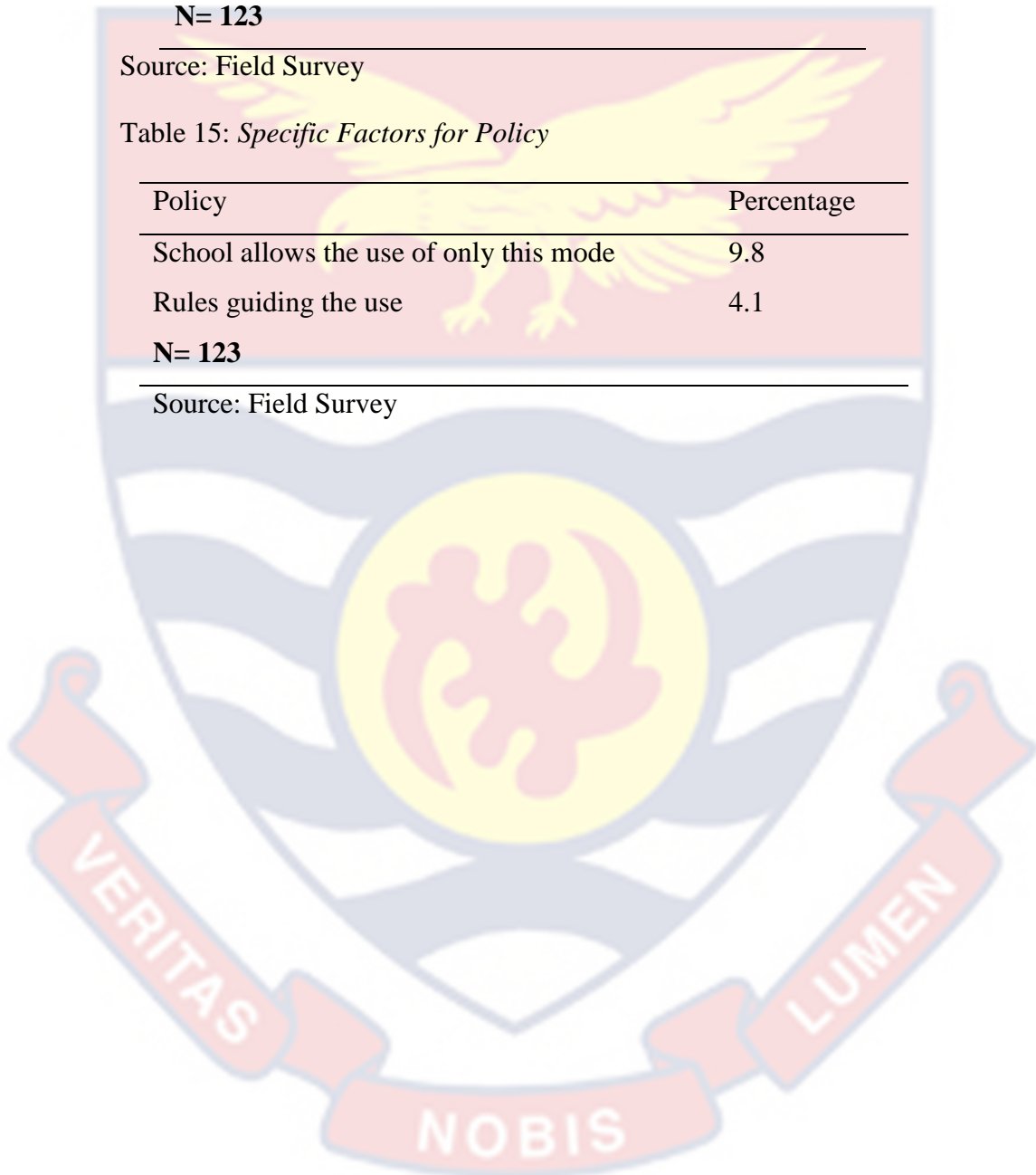
Source: Field Survey

Table 15: *Specific Factors for Policy*

Policy	Percentage
School allows the use of only this mode	9.8
Rules guiding the use	4.1

N= 123

Source: Field Survey



APPENDIX B

UNIVERSITY OF CAPE COAST

COLLEGE OF HUMANITIES AND LEGAL STUDIES

FACULTY OF SOCIAL SCIENCES

QUESTIONNAIRE

Exploring the Use of Paratransit for School Journeys among Basic School Children in Kumasi Metropolis

Good morning/afternoon. My name is Matilda Ohenewaa Bekoe. I am a postgraduate student at Department Geography and Regional Planning, University of Cape Coast (UCC). We are conducting research on *Exploring the Use of Paratransit for School Journeys among Basic School Children in Kumasi Metropolis*. I am asking you to take part in this study because I am trying to learn more about your travel experiences, as you travel to school from home and back, and whether you experience any difficulties with regards to issue of safety. I would also wish to understand how you travel to school and other places and how this decision is made. For example, whether you use a school bus/van, taxi, using a motorcycle; and who decides on this. We would be glad to get your general views about children travel safety in Kumasi, and whether there is anything that can be done to ensure that children travel safely to and from school. The information which you are going to share with us will not be shared with anyone else. We have selected you because your parent and/or school principal has given me permission to talk to you. If you however do not feel comfortable to talk to us, please let us know. If you refuse to talk to us, please note that you will not be punished in any way, either by your parent or school. We are not going to share any information about our discussion

with you, your parent or school principal or teachers, or with anyone else. We are not giving any rewards for participation in the study. We thank you for your willingness to take part in this study. This interview should take about 15 minutes. Please confirm that you have understood why we are doing this study and whether I can continue with the interview. If you need get any other information, please contact Matilda Ohenewaa Bekoe via email matilda.bekoe@stu.ucc.edu.gh (0201004843).

A. Background Information

Municipal Assembly	
Type of school [Pub/Prvt]	
Name of School	
Location of school	
Age of child	
Sex	
Stage	
Any disability	
Child's living arrangement	a) Parent [] b) Guardian [] c) Self []
Parent/guardian' occupation	a)Mothers Occupation..... b)Fathers Occupation.....
Number of siblings	
Number of siblings currently in Basic school	
Location of Home	
Vehicle availability in household	a)None [] b) Bicycle [] c) Motor cycle [] d) Tricycle [] e) Private car [] f) Taxi/'trotro' [] g) other.....
How do you travel to school (select all that applies)	a)Walk [] b) Bicycle [] c) School bus [] d) Private car [] e) Motorcycle (private) [] f) Taxi []

	g) 'trotro' [] h) Tricycle/'pragia' [] i) Motor cycle ('okada') [] k) other.....
Which mode do you frequently use?	a [] b) Bicycle [] c) School bus [] d) Private car [] e) Motorcycle (private) [] f) Taxi [] g) 'trotro' [] h) Tricycle/'pragia' [] i) Motor cycle ('okada') [] k) other.....
Time taken to get to school	
Who do you usually travel to school with?	a) Parent(s) [] b) Other adults (eg. Friend's parents) [] c) Sibling (s) [] d) Friends [] e) Alone []

B. ROUTE CHOICE

1. How many routes are there to your school from your house?
a) 1 [] b) 2 [] c) 3 or more []
2. Indicate the type of route (most frequently used route)
a) Exclusive pedestrian path [] b) Multi-modal routes []
c. Combination
3. What is the nature of the route to school?
a) Paved [] b) Unpaved []

C. MODE CHOICE

4. Who decides on how you should travel to school?
a. Parents/Guardians [] b) School Authorities []
c) Self [] d) Other (Specify).....
5. What is your most preferred mode?
a) Walk [] b) Bicycle []

- c) School bus []
- d) Private car []
- e) Motorcycle (private) []
- f) Taxi []
- g) 'trotro' []
- h) Tricycle/'pragia' []
- i) Motor cycle ('okada') []
- k) Other.....

6. How often do you use your preferred mode?

Mode	How often do you use your preferred mode				
	Always	Most days	At most twice a week	Once a week	Never
Walk					
Bicycle					
School bus					
Private car					
Motorcycle (private)					
Taxi					
'trotro'					
Tricycle/'pragia'					
Motor cycle ('okada')					

7. What is the cost of travelling to school using your frequently used mode?

- a) No cost
- b) Less than C1
- c) C1 - C2
- d) C2-C3
- e) C3-C4
- f) C4-C5
- g) More than C5

8. What other alternative means of transport are available in your community?

- a) Walk []
- b) Bicycle []
- c) School bus []
- d) Private car []
- e) Motorcycle (private) []
- f) Taxi []
- g) 'trotro' []
- h) Tricycle/'pragia' []

Factors that influence choice of paratransit modes		Yes	No
Modal factors	Vehicle condition is safe enough to use		
	Station/stop is safe		
	Station/Stop close to my house/school		
	There is little or no waiting time for vehicle		
	Paratransit is often clean.		
Economic factors	The cost of travel is cheap compared to other modes		
	There is free access for school children		
	The proportion of my pocket money spent on fare is low		
Safety	Children have safe designated seats on the paratransit		
	There is enough space to ensure social distancing		
	My seat is secured with a seatbelt		
	Seats are well arranged and safe to sit on		
	Drivers adhere to road traffic regulations		
	I am assisted to board		
	I have never been attacked/threatened while onboard		
	I have never seen someone attacked/threatened while onboard		
	I have never felt threatened while on board		
Convenience and comfort	I get to school on time when I use it.		
	It is the only available mode of transport in my neighbourhood.		
	I walk for a short distance to access it		
	There is little or no waiting time		
	The seats are very comfortable		
	It is disability friendly		
	The driver does not stop frequently to pick or		

- b. Do the crossing drill before crossing the road []
- c. Use the zebra crossing []
- d. Use the traffic light []
- e. Cross the road after alighting from a vehicle []

15. What does the school curriculum cover on road safety education?

- a. Keeping safe on the road []
- b. Safe crossing points []
- c. First aid in road safety []
- d. Road signs []
- e. The use of paratransit and school buses []
- f. Others [] (specify).....

16. Under which subject area do you have road safety education?.....

This section seeks to investigate safety issues relating to paratransit use to/from school. Please indicate by ticking a response that best fit the following statements.

		Response		Efficacy	
		Yes	No	Yes	No
Safety Issues relating to Paratransit					
Vehicular design	There are no protruding objects (already asked)				
	The vehicle boarding platform is low				
	Seats are spacious				
	There is enough leg room space				
	It has functional doors				
	The windows are functional				
	The vehicle has an emergency exit				
Routes	Routes are tarred				

	There are no or little potholes				
	There are traffic lights and road signs regulate movement				
	Speed ramps to control the speed of vehicles				
	Designated areas for stop and pick-up point				
	Dedicated lanes				
Service	There is designated board/stop point				
	The driver does not overspeed				
	The driver obeys traffic regulations				
Safety education	I have been educated to always put on my seatbelt				
	I have been educated on what to do in case of an emergency				
	I have been educated not to stick my head out while in a vehicle				
	I have been educated on road signs and their interpretations				

Of your most frequently used **paratransit**, identify your travel needs and indicate if the driver/conductor pays attention to these needs.

Travel Need	Child's needs		Driver is Concerned	
	Yes	No	Yes	No
Seating position				
Child restraint/seat belts				
Quality of the seats				
First Aid				
Adaptive vehicle design (floor to feet height)				
Speed of vehicle				
Helmet (for motorcycle and bicycle users)				
Presence of pick up/Drop-off points				
Disembarking safety and support				
Manoeuvring safely after disembarking				
The vehicle is associated with specific station				
Vehicles can easily be identified				
Vehicles have many people on board				
Other (Specify)				

F. INCIDENTS OF ROAD TRAFFIC CRASHES

20. Has you/___a friend ever had an accident or been injured while travelling to/from school?

- a) Yes b) No

21. If “Yes “to Q20, what type of accidents occurred?

- a) Vehicle-Pedestrian Crash b) Fell on the sidewalk
 c) Vehicle to bicycle Crash d) Fall in an open drain
 e) Tripped on a pathway obstruction f) Other (Specify).....

22. What is the level of injury?

- a. Slight (bruise) b) Serious (required hospitalisation)

G. OPTIONS FOR PROMOTING SAFE ACCESS AND MOBILITY

23. Is there a need for CHILD TRAVEL TO SCHOOL POLICY covering the following in Ghana? Tick all that applies

- a) Speed limit in the (case of a school bus)
 b) Banning of specific paratransit mode from roads
 c) Seat belt/child restrain
 d) Seat restrictions for children

24. Which of the following modes do you think is unsafe for school journeys?

- a) Walk b) Bicycle
 c) School bus d) Private car
 e) Motorcycle (private) f) Taxi
 g) 'trotro' h) Tricycle/'pragia'
 i) Motor cycle ('okada')
 k) other.....

25. Which measures do you think will enforce your safety while traveling to/from school? (Tick all that applies)

a. Safety and supervision while boarding/exiting (eg. opening/closing door) by drivers/conductors

b. Supervising pupil in case of emergency whiles onboard

c. Safe spaces in seating arrangement

d. Restrictions on the use of specific mode to school (e.g., 'okada')

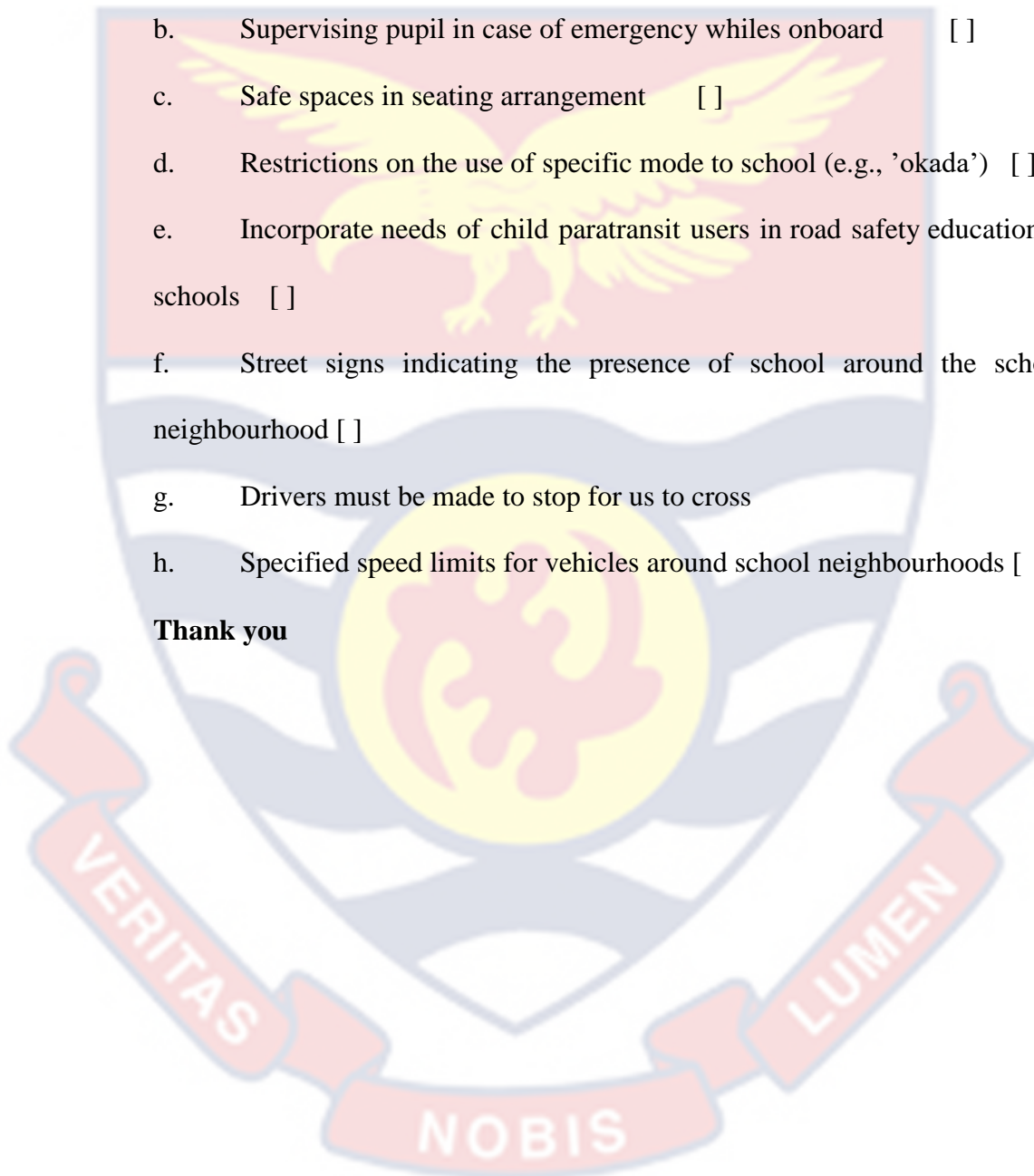
e. Incorporate needs of child paratransit users in road safety education in schools

f. Street signs indicating the presence of school around the school neighbourhood

g. Drivers must be made to stop for us to cross

h. Specified speed limits for vehicles around school neighbourhoods

Thank you



APPENDIX C

UNIVERSITY OF CAPE COAST

COLLEGE OF HUMANITIES AND LEGAL STUDIES

FACULTY OF SOCIAL SCIENCES

DEPARTMENT OF GEOGRAPHY AND REGIONAL PLANNING

FOCUS GROUP DISCUSSION FOR SCHOOL CHILDREN

Exploring the Use of Paratransit for School Journeys Among Basic School Children in Kumasi Metropolis

Good morning/afternoon. My name is Matilda Ohenewaa Bekoe. I am a student reading MPhil Geography and Regional planning at Department Geography and Regional Planning, University of Cape Coast (UCC). We are conducting a research on *Exploring the Use of Paratransit for School Journeys Among School Basic Children in Kumasi Metropolis*. We want to understand how children travel and whether they are safe as they do so. We are interested in understanding about your travel experiences, as you go to school from home and back, and whether you experience any difficulties. We would also wish to understand how you travel to school and other places and how this decision is made. For example, whether you use a school bus/van, taxi, using a motorcycle; and who decides on this. We would be glad to get your general views about children travel safety in Kumasi, and whether there is anything that can be done to ensure that children travel safely. The information which you are going to share with us will not be shared with anyone else. We have selected you because your parent and/or school principal has given me permission to talk to you. If you however do not feel comfortable to talk to us, please let us know. If you refuse to talk to us, please

note that you will not be punished in any way, either by your parent or school. We are not going to share any information about our discussion with you, your parent or school principal or teachers, or with anyone else. We are not giving any rewards for participation in the study. We thank you for your willingness to take part in this study. This interview should take about 15 minutes. Please confirm that you have understood why we are doing this study and whether I can continue with the interview. If you need get any other information, please contact Matilda Ohenewaa Bekoe via email matilda.bekoe@stu.ucc.edu.gh (0201004843).

A. **BIO-DATA**

- 1) Name of Municipality
- 2) Name of School.....
- 3) Date of interview...../...../ 20.....
- 4) Name of interviewer.....
- 5) Number of participants..... 7) Time Started: 8) Time Ended.

B. **BACKGROUND ISSUES**

- 8) Let pupils tell you about themselves (Age, Class, Place of residence, parent(s) or guardian living with and their occupation, etc.

Probe for how long they have lived in the community and how long they have been in the school.

C. **CHILD'S MODE CHOICE**

- i. How do you usually travel from home to school (mode choice)?
- ii. Which one do you use frequently?

- iii. What influences your mode choice for school (Probe for vehicular or walking environment factors including safety, security, attractiveness, convenience, and others such as economic factors, policy, parental control etc.)
- iv. What mode is less likely preferred? Tell us why
- v. With no constraints, will you consider other modes of paratransit to school? (Probe for reasons)
- vi. What is your role in the decision on how you get to school? (Probe for power balances between child and parent/guardians)
- vii. Are you given a choice of how you would like to get to school? Would you like to decide how you arrive to school?

D. ACCESSING SAFETY ISSUES ON PARATRANSIT FOR SCHOOL JOURNEYS

1. Modal factors

How would you describe the condition of your most frequently used paratransit? Probe for:

- i. protruding objects
- ii. vehicle boarding platform
- iii. Nature/quality of seats (size, floor to seat height, arrangement, how seat is fixed in metal, nature of seat cover, etc.)
- iv. Leg room space
- v. Doors and windows
- vi. Emergency exit
- vii. First aid kit

2. Routes

- i. How would you describe the nature of road? (e.g., tarred/untarred, potholes)
- ii. traffic lights, speed ramps and road signs to regulate movement
- iii. Designated areas for stop and pick-up point, dedicated lanes for vehicle movement

3. Service

I. Describe how you are often treated while using paratransit for your school journeys.

- a. Pre boarding and boarding services (probe for designated pick-up point, distance of pick-up point in relation to home/school. Probe if child is assisted to board.)
- b. Whiles on board
 - Child's seating position
 - Supervision of child's behaviour and actions
 - Interactions with driver/conductor
 - Fare concessions and discount
 - driver's adherence to traffic regulations
- c. Alighting (probe for designated drop off point, distance of drop off point in relation to home/school)

4. Safety education

- I. Discuss what you have been taught about the following either in school or by your parents (NB if in school, probe for specific subject)
 - i. seat belt/ child restrains
 - ii. what to do during emergence case

iii. seat restrictions

iv. education on road signs

II. Do you think what you have been taught is enough to promote safe travels with paratransit?

E. **TRAVEL NEEDS**

1. Discuss your travel needs in travelling with paratransit to/from school. Ask for efficacy of each need mentioned
 - a. Pick up point (designated stops)
 - b. Boarding safety and support
 - c. Seating position
 - d. Child restraint/seat belts
 - e. Quality of the seats
 - f. First Aid
 - g. Adaptive vehicle design (floor to feet height)
 - h. Speed of vehicle
 - i. Helmet (for motorcycle users)
 - j. Drop-off point
 - k. Disembarking safety and support
 - l. Manoeuvring safely after disembarking
 - m. The vehicle is associated with specific station
 - n. Vehicles can easily be identified
 - o. Vehicles have many people on board
 - p. Probe for others outside this list

F. POLICIES

Discuss the need for a child travel to school policy covering the following

- a. Safety and supervision while boarding/exiting (eg. opening/closing door)
- b. Speed limit in the (case of a school bus)
- c. Supervising pupil in case of emergency while in board
- d. Seat belt/child restraint
- e. Seating arrangement
- f. Restrictions on the use of specific mode to school (e.g., 'okada')
- g. Probe for others outside this list

G. ROAD SAFETY EDUCATION

- f. What do you know about Road Safety?
- g. Where did you obtain knowledge on road safety? (Probe for sources and have them indicate their most important source is, further probe their knowledge on child paratransit passenger]
- h. What does the school curriculum cover on road safety education? (Explore for possible topics covered and the subject area under which it is covered)
- i. Is it enough? (Explore other areas of need for children in road safety education).

APPENDIX D

UNIVERSITY OF CAPE COAST

COLLEGE OF HUMANITIES AND LEGAL STUDIES

FACULTY OF SOCIAL SCIENCES

DEPARTMENT OF GEOGRAPHY AND REGIONAL PLANNING

SEMI-STRUCTURED INTERVIEW GUIDE FOR PARENTS

Introduction and Informed Consent Statement

Good morning/afternoon. My name is Matilda Ohenewaa Bekoe a postgraduate student of the Department of Geography and Regional Planning, University of Cape Coast (UCC). The purpose of this interview is to gather information on *Exploring the Use of Paratransit for School Journeys Among Basic School Children in Kumasi Metropolis*. The study seeks to understand how children travel and whether they are safe as they do so. With regards to ethical guidelines underlying scientific research involving human participants, formal consent is required. The information which you are going to share with us will not be shared with anyone else. I humbly, want to seek your consent to participate in this study. Your participation is voluntary and you may refuse to participate in or withdraw from this study at any time. However, your participation in this study is key since the intention is to aid in policy drafting and implementation. The interview will last between 30 to 40 minutes. Thank you for your willingness to take part in this study. Please confirm that you have understood why we are doing this study and whether I can continue with the interview. If you need to get any other information, please contact **Matilda Ohenewaa Bekoe** via email: matilda.bekoe@stu.edu.gh (0201004843)

A. **BIO- DATA**

- a. Age:.....
- b. Sex.....
- c. Any disability? [just observe]
- d. Marital status.....
- e. Number of children: ___ M [___] F [___]
- f. Number of children in primary school
- g. Occupation:
- h. Level of education:

B. **FACTORS THAT INFLUENCE CHILD' CHOICE OF MODE**

- a. Where does your child school?
- b. Do you own a vehicle? [probe to find out the number of cars available in the household]
- c. If you drive to school, how many children are usually in the car? [probe to find out the number of own children and that of others]
- d. How is the journey to school usually like? [probe to find out if journey is specially to take child to school/ combined journey/part of car sharing arrangement]
- e. What mode of paratransit does your child frequently use to school?
- f. What are the main reasons he/she travels with this mode to school?
- g. Does your child influence the decision on mode choice to school?
How?
- h. How satisfied are you with the mode your child travels to school with?
- i. How easy or difficult would it be for your child to travel with other modes? [probe for reasons]

j. If you had no constraint, what mode will you prefer your child travels to school with? [probe to find reasons for the choice]

k. Has your child ever used the school bus? [probe for reasons for/not for patronizing]

l. Is there sufficient information available regarding school bus transport arrangements in your child's school?

m. What are some of the challenges your children face in patronizing school bus?

n. How do you think school bus operations can be improved?

C. **SAFETY ISSUES**

o. What are your concerns over your child traveling to/from school using paratransit? [probe for condition of mode, routes, service, safety education e.t.c.]

p. Are you aware of the challenges your child faces in using paratransit to and from school? [probe for coping strategies]

q. What considerations do you think should be given to children who use paratransit to/from school?

r. Are there modes you think should be banned for school journeys? Why?

s. What effective ways could be used to ensure safe travel to school using paratransit?

D. **POLICY**

t. Do you restrict your child on the use of specific paratransit mode? If yes how and why?

- u. Are you aware of any actions or initiatives being taken by your child's school to encourage more sustainable travel patterns? [probe to find out about the initiatives]

Promoting options for safe mobility

Is there a need for CHILD TRAVEL TO SCHOOL POLICY covering the following in Ghana? (Probe for the following:)

- a. Speed limit in the (case of a school bus)
- h. Banning of specific paratransit mode from roads
- i. Seat belt/child restrain

What is your view about safe measures on paratransit covering the following?

- j. Safety and supervision while boarding/exiting (eg. opening/closing door) by drivers/conductors
- k. Supervising pupil in case of emergency whiles in board
- l. Seating arrangement
- m. Restrictions on the use of specific mode to school (e.g., 'okada')
- n. Other (specify).....
- o. Incorporating road traffic safety covering child using paratransit into educational curriculum

APPENDIX E

UNIVERSITY OF CAPE COAST

COLLEGE OF HUMANITIES AND LEGAL STUDIES

FACULTY OF SOCIAL SCIENCES

DEPARTMENT OF GEOGRAPHY AND REGIONAL PLANNING

IN-DEPTH INTERVIEW GUIDE FOR NATIONAL ROAD SAFETY

AUTHORITY (NRSA)

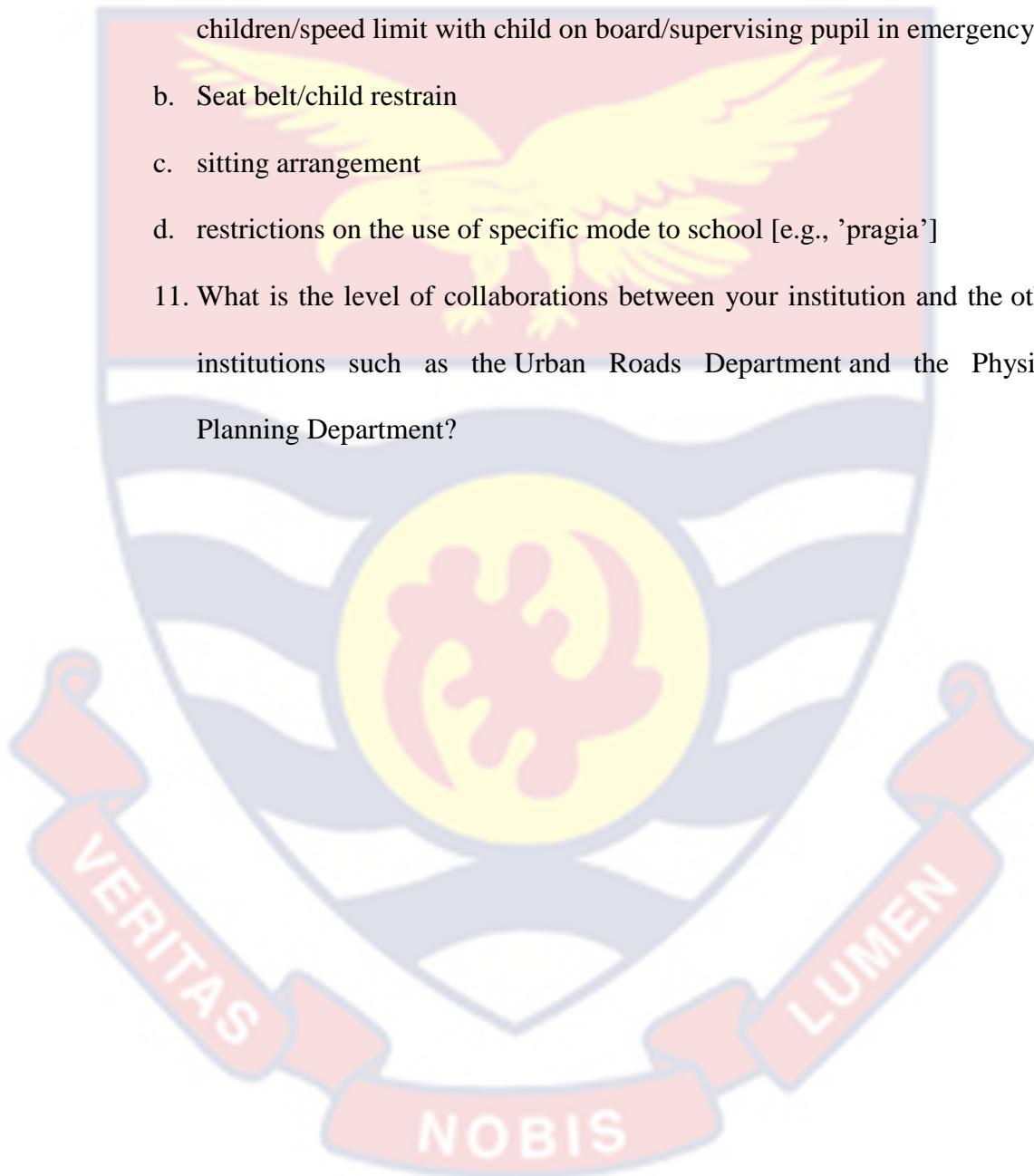
Introduction and Informed Consent Statement

Good morning/afternoon. My name is Matilda Ohenewaa Bekoe a postgraduate student of the Department of Geography and Regional Planning, University of Cape Coast (UCC). *Exploring the Use of Paratransit for School Journeys Among Basic School Children in Kumasi Metropolis* Specifically, the study seeks to interrogate children transport safety regulations in Ghana and how these are implemented to ensure children safety during travel. Further the study aims to assess the travel needs of children in Kumasi, as well as the mobility options and factors influencing travel choices in relation to urban spaces planning. The study will further assess the efficacy of children safety measures and education programmes to explore options for promoting safe access and mobility for children in the Metropolis. We have selected you because you are a key actor in the transportation sector. We would be glad to get your views and perspectives about children safety in Ghana and more specifically Kumasi, and how this can be enhanced. We would also be glad to know whether there are any ongoing efforts that you may be aware off that are aimed at improving children safety during travel to schools and other places. The information which you are going to share with us will be treated with

confidentiality and used only for the purpose of this research. Please note that participation in the study is voluntary and there will be no direct benefits to you or monetary compensation. We thank you for your willingness to take part in this study. This interview should take about 60 minutes. Please confirm that you have understood why we are doing this study and whether I can continue with the interview. If you need additional information, please contact **Matilda Ohenewaa Bekoe**, Department of Geography and Regional Planning, University of Cape Coast via email: matilda.bekoe@stu.ucc.edu.gh (0201004843).

1. Brief background of yourself and your role at NRSA
2. What is the mandate of the NRSA?
3. What are your views with children's travel?
4. How would you describe the incidence of child pedestrian crashes within the Kumasi Metropolis?
5. What are your plans for ensuring the safety of children's school travel in urban environment?
6. Does the department take into consideration the role of urban design in shaping travel needs of children's school travel? (Probe for the provision of pedestrian walkways, bicycle lane and safety measures long school neighbourhoods)
7. With the emergence of micro mobilities such as skates, scooters, e-bikes etc, what sensitization programmes do you have for all road users?
8. Are there any sensitization programs / instruction on safety measures for ensuring sustainability of safe trips to and from school? [probe for how it is implemented]

9. What has already been done, what had worked and what had not worked before? [probe for reasons]
10. Do you think there is the need for child travel policy on the following?
- safety and supervision on transport [opening door/closing door for children/speed limit with child on board/supervising pupil in emergency]
 - Seat belt/child restrain
 - sitting arrangement
 - restrictions on the use of specific mode to school [e.g., 'pragia']
11. What is the level of collaborations between your institution and the other institutions such as the Urban Roads Department and the Physical Planning Department?



APPENDIX F

UNIVERSITY OF CAPE COAST

COLLEGE OF HUMANITIES AND LEGAL STUDIES

FACULTY OF SOCIAL SCIENCES

DEPARTMENT OF GEOGRAPHY AND REGIONAL PLANNING

IN-DEPTH INTERVIEW GUIDE FOR DEPARTMENT OF URBAN

ROADS

Introduction and Informed Consent Statement

Good morning/afternoon. My name is Matilda Ohenewaa Bekoe a postgraduate student of the Department of Geography and Regional Planning, University of Cape Coast (UCC). The purpose of this interview is to gather information on *Exploring the Use of Paratransit for School Journeys Among Basic School Children in Kumasi Metropolis*. Specifically, the study seeks to interrogate children transport safety regulations in Ghana and how these are implemented to ensure children safety during travel. Further the study aims to assess the travel needs of children in Kumasi, as well as the mobility options and factors influencing travel choices in relation to urban spaces planning. The study will further assess the efficacy of children safety measures and education programmes to explore options for promoting safe access and mobility for children in the Metropolis. We have selected you because you are a key actor in the transportation sector. We would be glad to get your views and perspectives about children safety in Ghana and more specifically Kumasi, and how this can be enhanced. We would also be glad to know whether there are any ongoing efforts that you may be aware off that are aimed at improving children safety during travel to schools and other places.

The information which you are going to share with us will be treated with confidentiality and used only for the purpose of this research. Please note that participation in the study is voluntary and there will be no direct benefits to you or monetary compensation. We thank you for your willingness to take part in this study. This interview should take about 60 minutes. Please confirm that you have understood why we are doing this study and whether I can continue with the interview. If you need additional information, please contact **Matilda Ohenewaa Bekoe**, Department of Geography and Regional Planning, University of Cape Coast via email: matilda.bekoe@stu.ucc.edu.gh (0201004843).

1. Brief background of yourself and your role at the Department of Urban Roads.
2. What role do you play in Ghana's transport sector and have you been involved in children transport issues?
2. In your view, what are the key concerns that you have regarding children safety and measures taken to ensure this?
3. Does the assembly have a local policy on travel to school with the use of paratransit?
4. What do you consider as the most critical issues related to children travel and safety and what suggestions can you make to enhance this safety?
5. What options for promoting safe access and mobility for children in these cities.
6. What should be done to ensure that children travel safety to schools and other places that they need to travel?
7. Is there anything else that you would like to share with me?

APPENDIX G

UNIVERSITY OF CAPE COAST

COLLEGE OF HUMANITIES AND LEGAL STUDIES

FACULTY OF SOCIAL SCIENCES

DEPARTMENT OF GEOGRAPHY AND REGIONAL PLANNING

IN-DEPTH INTERVIEW GUIDE FOR TRANSPORT PROVIDERS

Introduction and Informed Consent Statement

Good morning/afternoon. My name is Matilda Ohenewaa Bekoe a postgraduate student of the Department of Geography and Regional Planning, University of Cape Coast (UCC). The purpose of this interview is to gather information on *Exploring the Use of Paratransit for School Journeys Among Basic School Children in Kumasi Metropolis*. The study seeks to understand how children travel and whether they are safe as they do so. With regards to ethical guidelines underlying scientific research involving human participants, formal consent is required. The information which you are going to share with us will not be shared with anyone else. I humbly, want to seek your consent to participate in this study. Your participation is voluntary and you may refuse to participate in or withdraw from this study at any time. However, your participation in this study is key since the intention is to aid in policy drafting and implementation. The interview will last between 30 to 40 minutes. Thank you for your willingness to take part in this study. Please confirm that you have understood why we are doing this study and whether I can continue with the interview. If you need to get any other information, please contact **Matilda Ohenewaa Bekoe** via email: matilda.bekoe@stu.edu.gh (0201004843)

A. BASIC DEMOGRAPHIC INFORMATION ON RESPONDENT

- a) Name/Identity of interviewee
- b) Age:
- c) Location of interviewee's residence:
- d) status: [Driver/Conductor]
- e) Educational level
- f) Status/Position held:
- g) Years of experience of operation:
- h) Ownership:

B. SAFETY ISSUES REGARDING THE USE OF PARATRANSIT

1. What are the policies guiding your operations? [probe for local policies on school transport]
2. Is there any priority given to child passengers? Please tell us how?
3. Are there arrangement on sitting position for school children [probe for designated seat for children and children with special needs]
5. How do you ensure safety of children who board your vehicle? [observe for first aid kit, seat belt, physical appearance of the vehicle]
6. What are the challenges faced with child passengers on their journey to and from school?
7. How do you cope with these challenges?
8. What is your view on child travel policy? [probe for policy options on child restraint, pre-boarding, boarding and disembarking safety and speed limits]

APPENDIX H

UNIVERSITY OF CAPE COAST

INSTITUTIONAL REVIEW BOARD SECRETARIAT

TEL: 0558093143 / 0508078309
E-MAIL: irb@ucc.edu.gh
OUR REF: UCC/IRBA/2016/1111
YOUR REF:
OMB NO: 0990-0279
IORG #: IORG:0009096

1ST OCTOBER 2021

Ms. Matilda Ohenewaa Bekoe
Department of Geography and Regional Planning
University of Cape Coast

Dear Ms. Bekoe,

ETHICAL CLEARANCE – ID (UCCIRB/CHLS/2021/32)

The University of Cape Coast Institutional Review Board (UCCIRB) has granted Provisional Approval for the implementation of your research titled *Exploring the Use of Paratransit for School Journeys among Basic School Children in Kumasi Metropolis*. This approval is valid from 1st October 2021 to 30th September, 2022. You may apply for a renewal subject to submission of all the required documents that will be prescribed by the UCCIRB.

Please note that any modification to the project must be submitted to the UCCIRB for review and approval before its implementation. You are required to submit periodic review of the protocol to the Board and a final full review to the UCCIRB on completion of the research. The UCCIRB may observe or cause to be observed procedures and records of the research during and after implementation.

You are also required to report all serious adverse events related to this study to the UCCIRB within seven days verbally and fourteen days in writing.

Always quote the protocol identification number in all future correspondence with us in relation to this protocol.

Yours faithfully,

Dr. Samuel Aseidu Owusu,
UCCIRB Administrator

ADMINISTRATOR
INSTITUTIONAL REVIEW BOARD
UNIVERSITY OF CAPE COAST

NOBIS