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**Master's Thesis of International Studies  
(International Cooperation)**

**FINDING SOLUTIONS TO ROAD  
TRAFFIC CONGESTION OF ACCRA  
IN GHANA:**

**A COMPARATIVE STUDY WITH THE URBAN  
TRANSPORT SYSTEMS OF CAIRO, NAIROBI,  
TUNIS, CAPE TOWN AND LAGOS**

August 2021

Development Cooperation Policy Program  
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Seoul National University

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**Finding Solutions To Road Traffic  
Congestion Of Accra In Ghana:**

**A Comparative Study With The Urban Transport  
Systems Of Cairo, Nairobi, Tunis, Cape Town And  
Lagos**

A thesis presented

By

**Martin Narteh Nortey**

A dissertation submitted in partial fulfillment  
of the requirements for the degree of  
Master of International Studies

**Graduate School of International Studies  
Seoul National University  
Seoul, Korea**

# **Finding Solutions To Road Traffic Congestion Of Accra In Ghana:**

**A Comparative Study With The Urban Transport Systems  
Of Cairo, Nairobi, Tunis, Cape Town And Lagos**

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# **ABSTRACT**

## **Finding Solutions To Road Traffic Congestion Of Accra In Ghana:**

### **A Comparative Study With The Urban Transport Systems Of Cairo, Nairobi, Tunis, Cape Town And Lagos**

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Traffic congestion has increasingly become a widely discussed subject globally. It is believed that this phenomenon will only worsen progressively. Many developed and underdeveloped countries all over the world are adopting various policy measures to deal with this phenomenon. The most affected cities of the world such as Sao Paulo in Brazil are notoriously known by what characterizes the early morning and evening drive. African cities in countries such as Egypt, Nigeria and to relatively lesser extent, Ghana also endure this same challenge. This paper examines the causes of vehicular traffic congestion in Accra, the administrative capital of Ghana and suggests feasible policy

recommendations based on a comparative analysis with urban transport systems of the selected cities.

The paper is in six parts. The first part covers introduction, the second part covers the literature review, the third part covers methodology, and the fourth part, an analysis of the Accra case. This is followed by the fifth part which covers a comparison of Accra with the above-mentioned cities, with summary, conclusions, recommendations as well as limitations forming the sixth part.

**Keywords: Urban Transportation, Urban Planning, Urban Governance, Traffic Congestion**

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# CHAPTER 1

## INTRODUCTION

### 1.1 Background

The role of transportation in the socio-economic development of a country cannot be overemphasized. Among other functions, a good and well linked transportation network, apart from saving time and money, readily provides access to essential services and amenities that are required for productive and healthy living in the areas of employment, education, health services and leisure. (Ahmed, Lu, & Ye, 2008) notes that an efficient transportation system plays an important role in catering for the daily necessities in the lives of people. Globally, all forms of transportation are combined as an essential part of logistics and movement of people. It is a facilitator of trade between continents, regions and countries all over the globe.

Road transportation remains the dominant mode among the four main modes of water, land, air and rail in Ghana with most journeys undertaken by road (Musah, Peng, & Xu, 2020). This makes the country largely reliant on roads for mobility. This, coupled with increasing rate of motorization, has resulted in negative externalities such as urban mobility challenges of road traffic congestion in urban centers across the country. Between 2017 and 2018, the rate of vehicle registration increased by 25.5% from 139,472 thousand vehicles to 175,103 thousand (Driver and Vehicle Licensing Authority, Ghana).

Traffic congestion in this context is the situation that arises when the entry of one vehicle into a traffic flow increases the journey time of other vehicles using the road (Bull & Thomson, 2002). An application of economic theory suggests that at that point, the demand for road space outstrips supply. To mitigate traffic congestion therefore, the aim would be to reduce the number of vehicles entering the road system, hence, a reduction in the demand for road space.

The capital city of Ghana, Accra, experiences very severe vehicular traffic congestion on a daily basis and especially during rush hour periods, to the extent that waiting times could be extended by over a hundred per cent. The effect is a loss of time and therefore man-hours, translating into higher cost of transportation. In terms of time loss, “the urban sprawl facilitated by motor vehicles has been regarded as normal and modern, and the inefficiency created by rapidly increasing congestion and time losses has been dismissed as a temporary problem which can be solved by building more streets and parking facilities” (Whitelegg, 1993). This is however creating further challenges and not solutions.

## **1.2 Problem Identification**

The entire region of Greater Accra has a population of close to 4.943075 million people on a land area of 900 square kilometers (Ghana Statistical Service, 2019). Of this figure, the Accra metropolis which is situated in the southern part of the region occupies an area of 225 square kilometers with a current population of 2,052,341 persons (Ghana

Statistical Service, 2019). It is the administrative and commercial capital of Ghana and an economic hub in the West African region. Like most developing countries, urbanization and economic development have contributed to a rapid rise in population growth rate with the urban part of the capital city experiencing a growth rate of about 19 per cent between 2010 and 2019.

The city of Accra is occupied by the country's Ministries, Departments and Agencies, the most vibrant market, Offices of international Organizations such as the World Bank, Headquarters of State-owned enterprises and privately owned enterprises among others, thus, making it an area of utmost significance. These organizations are located within or close to the Central Business District which means that people and therefore vehicles are drawn in from the peripheries to this area on a daily basis. The result is a recurring form of traffic congestion which peaks during rush hour periods and worsens during holiday periods when commercial activities increase dramatically. In addition, the centralized nature of public institutions located within this area adds to increasing levels of traffic on roads linked to this area. For example, due to the inability of citizens to obtain essential services and documents such as valid passports from other regions of the country, applicants are forced to trip to this area in pursuit of such documents.

Furthermore, the high level of youth unemployment in the country has resulted in the youth seeking job opportunities in the capital city where it is thought that job opportunities abound (Yeboah, 2020), a major economic driver of migration. A greater proportion of these migrants live close to the Central Business District, majority of

whom live in slums due to the scarcity and high cost of accommodation in the capital city. This has significantly contributed to the rapidly increasing population in the capital city which has put more pressure on the existing transport facilities.

Finally, the underdeveloped transportation system characterized by limited rail network, inadequate facilities for non-motorized transport, an inefficient and ineffective public mass transit system dominated by paratransit, as well as high and increasing levels of privately owned vehicles have significantly contributed to the worsening traffic situation in Accra, and confirm the direct positive relationship between externalities and inefficiency.

The combined effects of the issues outlined are increased waiting time in traffic for motorists in general and delays in all commercial activities which rely on efficient transportation systems to thrive including logistics. This notwithstanding, neither traffic-speed nor traffic-count data are readily obtainable in Accra, although one unpublished study reports that official traffic counts have been obtained for some selected roads (Møller-Jensen, Kofie, & Allotey, 2012). Thus, the relatively low level of attention given to this challenge.

The urban transportation system of any city provides access and mobility for people and goods within it and comprises public transit (collective transport); non-motorized transport (pedestrians, cyclists) and freight. As noted by Harriet et al (Harriet, Poku, & Emmanuel, 2013) effective urban transport systems are essential to economic activity and quality of life. By implication, any city and more generally country that fails to



maintain an effective and efficient urban transport system risks economic decline and poor quality of life for its citizens since cities could be seen as forming the skeletal framework that holds the rest of the country together. The negative repercussion of congestion is not just limited to a drain on the economy but loss of lives. When vehicles' urban traffic speeds are decelerated by half, it brings about 50% rise in NOx emissions from bigger vehicles (Musah et al., 2020).

In analyzing the particular situation of Accra, we will look at urban planning in a broader sense which also comprises, urban transport planning and governance, Transport Services, Transport Infrastructure and Traffic Management and Control. These elements are necessary to uncover the roots of the challenge which is evidenced by inadequate non-motorized transport facilities, an outdated traffic management system, lack of a single metropolitan transport authority with jurisdiction over vehicles and roadways, dominance of mini buses (paratransit) in the public transport system and limited (single line of 60km of which only 24km is functioning) rail network constructed during the colonial period which has seen no major improvement.

### **1.3 Comparison with other cities in Africa**

Across Africa, five of the most densely populated cities, Cairo in Egypt, Nairobi in Kenya, Cape Town in South Africa, Tunis in Tunisia and Lagos in Nigeria are well known for their relatively higher level of development, high population densities and traffic congestion. Cairo with a population of over fifteen million residents certainly has

a tall order of ensuring urban mobility and has over the years, put in place several structures as an effort to achieve this. Lagos, currently the largest city in Africa has had very rapid growth over the years. This growth has also encouraged an enormous increase in transportation (Fakinle, Odekanle, Olalekan, Odunlami, & Sonibare, 2018), hence the direct relationship between growth in population and transportation needs.

The selected cities have challenges of their own, they have also made several strides at employing some of the most advanced measures of traffic management. In terms of organization, transport services, Transport infrastructure and Traffic Management and Control, these cities are relatively more developed and may provide important lessons for improving the Urban Transport system of cities with less developed elements such as Accra. This research, therefore, may not only provide lessons for the city of Accra but is also expected to add to the knowledge in this field and help mitigate similar challenges in other rapidly growing cities with similar characteristics across the region and beyond.

#### **1.4.1 Objective of the research**

The overall objective of this research is to identify the causes and impact of traffic congestion in Accra, examine the urban planning processes, and to suggest feasible policy recommendations for mitigation of this phenomenon through a combination of solutions.

The specific objectives are to;

1. Explore the causes of traffic congestion in the city of Accra in Ghana and its impact on the functioning of the metropolis.
2. Examine the process of urban planning in the selected cities.
3. To come up with feasible policy recommendations to address the issue.

### **1.4.2 Research questions**

To ensure a guided and effective research, while still establishing the boundaries of this research, the following questions are put forth.

1. What factors account for the vehicular traffic congestion typically in Accra and how do these impact on the functioning of the metropolis?
2. How is urban planning undertaken in the selected cities?
3. What feasible policy recommendations, including those that can be adopted from the selected cities, can address this challenge?

### **1.4.3 Significance of the research**

The increasing rate of motorization particularly in Accra and the resultant use of unapproved commercial motorbikes to avoid traffic congestion by commuters has raised debates of how to bring a lasting solution to this phenomenon. The alarming rate of increase in motorcycle accidents is particularly worrying, with a reported increase of 12.74% in crashes from 3,487 to 3,903 cases between 2017 and 2018.

This thesis seeks to help bring together solutions from other African countries managing similar situations and inform policy makers on the subject.

#### **1.4.4 Research Methodology**

The methodology entails the use of both qualitative and quantitative data. A comparative analysis of the urban transport system of the city of Accra in Ghana with cities of the five other African countries earlier mentioned with specific focus on Urban Planning, Urban Transport Governance, transport services, Transport Infrastructure and Traffic Management and Control. Various options would then be developed as measures of mitigating traffic congestion of Accra in Ghana. Out of these options, feasible solutions would be identified through evaluation of these options. The result would form the basis of our policy recommendations.

#### **1.4.5 Scope of the Research**

The study is limited to the Accra Metropolis and its immediate environs and focuses on road traffic congestion. As road traffic congestion is intertwined with other issues such as planning and mobility, these areas will also be highlighted in the study. Issues that border on road management such as accidents are not the focus of this study although reference may be made to them in the course of the study.

### **1.4.6 Anticipated problems and limitations**

Current data from selected cities may be difficult to obtain and there will be reliance on journals and other secondary data for the analysis. Generally, traffic data in relation to developing countries like Ghana are virtually nonexistent and this may pose some difficulties going forward. The current situation of covid-19 may also pose challenges and result in delays.

## **1.5 Organization of the study**

The study covers six main chapters. Chapter one deals with the background of the study, statement of the problem, objectives of the study, research questions, significance of the study, scope of the study and organization of the study. Chapter two entails a review of relevant literature on the study with emphasis on themes on managing road traffic and the general impacts of congestion on road users.

Chapter three is the methodology of the study which presents the conceptual framework as well as the methods employed in the research, the strength of this method and also the weakness. Chapter four focuses on analysis of the Accra case, the study area, followed by the comparative analysis with the afore-mention cities and summary in chapter five. We conclude with Chapter six which provides some policy recommendations, conclusions as well as limitations of the study.

## **CHAPTER 2**

### **LITERATURE REVIEW**

#### **2.1 Introduction**

This chapter consists of a review of relevant literature in relation to the study. The chapter consists of a look at the Urban Transport system, Urban Governance in Africa, Definition of traffic congestion; general causes of urban traffic congestion; Urban Transport System of Africa, Transport Infrastructure in Africa, effects of traffic congestion; traffic management measures and a look at cases of the afore-mentioned cities located in Africa.

#### **2.2 Definition of Urban Traffic Congestion**

Popular among several theories and models which have been advanced in an attempt to explain travel behavior is the microeconomic utility theory. This has been the underpinning theory upon which most travel behavior-related studies have been undertaken (Handy, Boarnet, Ewing, & Killingsworth, 2002). The theory suggests that people are forced to make trips due to the non-uniform spatial distributions of activities. Thus, the demand for travel is derived out of the need to engage in activities outside an individual's current location (Oppong-Yeboah & Gim, 2020). Therefore, the coinciding need for travel by commuters on the same road space with a total number of motor vehicles above the road capacity to reach their individual destinations thus results in

traffic congestion. In this regard, several definitions of traffic congestion have been advanced.

The Organization for Economic Co-operation and Development (OECD) report of 2007 on managing urban traffic congestion, argues on the absence of a single generally agreed definition of traffic congestion owing to its physical and relative characteristics.

As a physical phenomenon, traffic congestion is defined as a condition in which demand for road space exceeds supply and is reflected by slower speed, longer trip times and increased queuing of motor vehicles (Institute of Transport Engineers, 1989). This states the primary consequence of traffic congestion in addition to pollution, superfluous energy consumption and in some cases road accidents.

In relative terms, this phenomenon can be defined as the difference between the performance of the road and expectations of road users. It is a relative phenomenon when there is a difference between road performance and road user's expectations (Downie, 2008). Thus, amplifying the importance of perception of the road user in facilitating understanding of the phenomenon and in acknowledging that it exists.

Traffic congestion may be seen as an unavoidable consequence of scarce transport facilities such as road space, road signals and ineffective traffic management etcetera (Blanco et al., 2009). There are two main aspects of urban traffic congestion, namely, passengers and freight, which utilize a common infrastructure. This argument suggests that inadequate infrastructure is the cause of traffic congestion, however, advanced countries with adequate and state of the art infrastructure endure traffic congestion

though relatively lower levels in some cases, confirming the inevitability of traffic congestion with industrialization and development.

Thus, traffic congestion on road networks occurs as a result of increased use of road infrastructure beyond capacity and is characterized by a reduction in speed, prolonged trip hours and increased queueing by motor vehicles. Any city that is economically active and vibrant will most like experience some form of traffic congestion (Yildirim, 2001). The focus should therefore be on mitigation of this phenomenon.

A review of the above definitions elucidates the absence of a universally accepted definition of traffic congestion and secondly, that traffic congestion as defined takes into account the perception of road users. It also gives an indication of the effect of demand for road space in relation to the amount of road space (supply) on the entire traffic situation. With a fixed supply of road space in the short-run, increased demand for road space due to a rise in the number of vehicles would lead to traffic congestion.

### **2.3 The characteristics of urban transport that cause congestion**

Bull and Thomson, in noting the special conditions under which urban transport systems operate including provision of urban land for transport infrastructure, enumerated the following characteristics of the urban transport system which leads to traffic congestion (Bull & Thomson, 2002);

1. The demand for transport is derived and not an end in itself (Ortuzar and Willumsen,



1994), and that journeys are rarely made because of a desire to travel as such but result from the need to go to places where different activities are carried out (such as work, shopping, study, recreation, leisure, etc.), all of them in different locations. This is a common cause of traffic congestion, largely unavoidable human existence depends on such daily trips.

2. There is a highly variable demand for transportation and with peak times when several trips coincide, for reasons such as routine activities and an opportunity to meet with others.

3. In the short term, the roads on which goods and people are transported cannot be expanded and it is on these restricted roads which are fixed in the short term that traffic congestion occurs. The high cost of expansion in infrastructure precludes changes in the short-run.

4. The means of transportation with the most desirable features such as safety, comfort, reliability and autonomy, for example the car, take up considerable road space for each passenger that uses the road. Inefficiency and ineffectiveness of mass transit systems in most countries often results in a large number of privately-owned vehicles occupying the roads. There is thus a competition for road space between the mass transit and these other forms of transportation.

5. Generally, there is a high cost of road infrastructure provision to supplement existing road space in urban areas. With the onset of development in urban areas, the cost of increasing road space increases as land availability is also a challenge as the urban centre

may be saturated with all forms of infrastructure. Consequently, demolitions may have to be conducted in some cases just to provide the needed land for road construction. This adds to the total cost of the project to be undertaken.

The highlighted factors above contribute in a large measure to urban traffic congestion in urban centres, with the impact this has in terms of pollution, substantial expenditure of private and social resources including time, and diminished quality of life.

## **2.4 Urban Governance in Africa**

Governance or simply the multifaceted approaches by which groups and individuals engage each other to make and implement decisions (Smit, 2018), is an issue of great concern as it affects all facets of Urban and rural life. Urban governance in Africa, a vast and diverse continent which supports viable socio-economic growth in urbanization dynamics and governance conditions with international and national differences, has gone through several transformations over the years. It is also worthy of note that the diversity of significant urban governance inclinations in Africa is highly variable.

Africa, recognized as the most rapidly urbanizing region of the world and with enormous urban challenges, such as increasing slums and increasing poverty and inequality is also impacted negatively by weak government capacity (UN-Habitat, 2014). A clearer picture of urban governance is presented when it is defined in terms of decentralization, entrepreneurialism, and democratization” (Fuseini & Kemp, 2015). Decentralization involves the transfer of specific functions, fiscal responsibilities, and representation from

central to sub-national governments. The three aspects of administrative, fiscal, and political decentralization are more often not equally transferred but rather organized differing across states (Falleti, 2005).

Decentralization has in recent times been embraced as a priority for the rapid development of Africa and hence top on the development agenda. It is worthy of note that out of recently reviewed Poverty Reduction Strategy Papers for Africa 25 countries stated decentralization as a key objective in achieving ‘good governance’ (Resnick, 2014). Enhanced governance has is one of two rationalizations for devolution. Brinkerhoff & Azfar note that making individuals feel part of any process, especially in the case of citizens has a high tendency of promoting both upward and downward accountability in respect of elected decision makers and citizens (Brinkerhoff & Azfar, 2010). Secondly, decentralization is also seen as a step towards improving service delivery and enable local governments to identify required services for their communities while promoting healthy competition(Oates, 2006).

There is widespread fragmentation of responsibility regarding urban governance issues in Africa among several government stakeholders often with inadequate capacities and conflicting interests. One way of surmounting these challenges is the promotion of collaborative efforts in respect of governance stake holders to conjointly develop and operationalize new strategies which are mutually beneficial in several aspects (Smit, 2018). Four dominating aspects of urban governance: land use management, provision of basic services, transport/mobility, and food safety are somewhat functional in Africa

though faced with poor coordination between actors in most cases namely; the central government, the private sector, traditional leadership, international agencies and civil society groups. The interest of each actor in terms of organizational development and planning differ, however, goals of urban governance actors are usually shared. These may include access to water, improved sanitation and solid waste management, improvement in transportation systems and the achievement of Sustainable Development Goals (SDG) in general.

The importance of Land use management cannot be overemphasized and ineffectiveness in this aspect has often precluded a successful urban planning process. The existence of multiple land administration systems in most African countries; formal systems of deed registries with freehold and leasehold title; officially recognized customary tenure systems; and informal, extra-legal tenure in informal settlements (Smit, 2018) has been a challenge in revolutionizing the land use management regime. The lack of enforcement of building regulations in areas with customary land tenure have proliferated ‘unregulated peri-urban land development’ (Kombe, 2005). This has also limited the local government’s ability to regulate sprawling in such areas leading to the development of unplanned settlements.

In terms of transportation, the key elements of urban transport systems are the provision and maintenance of roads, managing traffic, and ensuring the roadworthiness of vehicles. In most parts of Africa, and particularly in sub-saharan Africa, road transportation is the main mode of transportation, conveying over 75% of passengers and freight. However,

over 50% of these roads are poorly conditioned and maintained due to inadequate finance (Beuran, Gachassin, & Raballand, 2015). More importantly, intra-regional connectivity by road is poor. Vehicles are generally inadequate and outmoded with defective parts. Adherence to safety precautions are often non-existent with failure of systems put in place to check these. Petty corruption among police officers also leads to little action being taken against perpetrators (Kumar & Barrett, 2008b). The combined effect of this is cities with severe and often recurring vehicular congestion.

It is an undeniable fact that the emergence of both public and private public transport operators create healthy competition which facilitate enhancement of the urban transport sector, however, promotion of Public-Private Partnership through the creation of an appropriate institution framework must be encouraged in view of the limited resources available to governments in mainly underdeveloped economies (Sridhar, Gadgil, & Dhingra, 2020), and also a way of promoting inclusiveness and participation. The centralized nature of Governance in Africa poses serious challenges to the development of strong partnerships between the state and investors in various sectors of the economy and transportation is no exception. The role of the state in this regard should be the creation of an enabling environment to attract private capital which would help propel the country towards achieving its (Obeng-Odoom, 2017). It therefore behooves on government to create the conducive atmosphere for the development of Public Private Partnership (PPP).

## **2.5 Urban Planning in Africa**

Urban Planning is a central socio-economic task that provides a context to streamline and transmute the sustainable economic and social environments for generating economic growth, prosperity, safety, and well-being for all (UN Habitat, 2015). As the propensities of globalization surges, the level of social and economic inequality between the urban and rural areas widens, hence, the development paradox which is a characteristic of many developing countries in Africa.

Development theory presupposes that development leads to urban growth which has both positive and negative impacts and requires effective urban planning in Africa due to its all-encompassing impact on growth and transformation (UNECA, 2020). Africa is however a step behind in matters of urban planning leading to a decline in important aspects of city life. In the absence of proper planning regarding waste disposal, sustainable energy, adequate food supply, effective logistics systems and efficient public transport, just to mention a few, several African cities find it difficult, if not impossible, to adequately plan and provide for these essential aspects of cities. As a result, growth has a devastating impact on cities in Africa.

To ensure positive impacts of urban growth, there is the need to decrease public spaces and facilitate the urban planning process by means of ownership and from the government's involved harmonization with public-private partnership (Africa Renewal, 2012). One way of surmounting obstacles associated with urban planning is by involvement of the private sector in developing resilient cities that can stand the test of

time including natural disasters. This would also ensure welfare of inhabitants. Sustainable urban development ensures collaboration across different disciplines and also enhances efficiency through the inclusion of the departments of energy and water utilities, land use and transportation planning, building and infrastructure, public space greening and maintenance, waste, air and water resource management, brownfield management, food systems, as well as open space management such as parks, in an integrated approach (Pardo, Jiemian, Hongyuan, & Mohanty, 2010).

The actual impact of policies directed to achieve efficient urban planning would be felt more in cities with marginalized poor who reside in the peripheries and therefore are not beneficiaries of past projects which are often undertaken in the localities of elite groups in the urban centres (Watson, 2016). Urban planning must therefore take into consideration all these various elements to better serve the vulnerable groups of inhabitants in cities.

## **2.6 Urban Transport Planning in Africa**

Urban transportation planning is aimed at providing individuals with more opportunities for interaction with people and places to support the artistic dynamics, livability, and effectiveness of cities (Campbell, Rising, Klopp, & Mbilo, 2019). Effective urban transport planning stresses on comfort and timeliness with respect to transportation of people and freight. Another important feature is accessibility for all inhabitants of the city and outside the city. As an essential feature, urban planning should be linked to

reducing high levels of disintegration, social and spatial inequity as well as investing in and also implementing projects and endeavours to attain the Sustainable Development Goal 11.2, which is provision of access to safe, affordable, accessible, and sustainable transport systems for all (UN Habitat, 2016) information to which most African countries including Ghana, align their urban transport policies.

Major cities in Africa, as an important part of African countries, emerged while many traffic surveys had already been implemented in the major cities of Asia until the early 2000's. Urban transport master plans were offered based on numerous traffic surveys, of which Person Trip (PT) survey provided the important information for decision making, such as;

- Car and motorcycle ownership, and household membership (household characteristics)
- Individual information e.g. age, sex, occupation, etc. (individual characteristics),
- Person trip information by transport modes, travel purposes, individual characteristics and origin and destination, and
- Level of services of transport modes

However, city authorities in underdeveloped countries continue to pursue car-oriented transport development patterns made in the past (Pardo et al., 2010). It is also evident that many cities in developed countries are avoiding car-dominated transportation systems by directing their efforts at the development of infrastructure for public transport and non-motorized transport as opposed to infrastructure for privately owned vehicles.



A direction which some African countries such as Tunisia, Egypt and more recently Ghana are following to liberate their urban centres from extreme traffic congestion and its attendant external costs.

Urban transport planning is however mostly fragmented in terms of organization and implementation of projects. For instance the city of Nairobi, in the 2014 Integrated National Transport Strategy created the Nairobi Metropolitan Area Transport Authority in 2017 but has largely remained inactive since its establishment. In addition, project implementation is not harmonized but also fragmented with different funding sources and companies undertaking the implementation (Boutueil, Lesteven, & Nemett).

### **2.7.1 Urban Transportation in Africa**

Transport in Africa's urban centers is the product of colonial and historical legacies of governance and decision making regarding urban form, exclusive access, and limited infrastructure. Most urban infrastructure came about as a result of slave trade and transportation of raw materials which were necessary to support industries in the countries of colonial masters and imperialists. For example, railway lines constructed in Ghana to link mining and plantation areas with the port during the colonial era have not seen much change since independence. Subsequently, rapid urbanization and increasing motorization particularly in urban centres are pushing outmoded urban transport systems beyond their capacity.

At present, the dominant mode of transport in the region is by road, and this includes private vehicles, buses, and paratransit. These paratransit often mini bus taxis provide employment for a large number of low-income populations (Fenta, 2014). For rising middle and upper-income populations, private vehicles are the preferred mode of transport which is costlier to both the individual and the state but provides a higher level of comfort and reliability. It is also believed that it is seen as a status symbol in some communities. In Accra, Lagos, and Nairobi, road-based transport mainly privately-owned vehicles and paratransit, contributes to severe congestion, thereby impacting negatively on general output and sustainability of transportation systems.

The conventional practice in most developing countries which face urban traffic congestion is an attempt to increase road with or construct new ones. The challenge is that after a few years, the influx of more vehicles onto the road space will result in congestion again and reach a point where further expansion of road space would be impossible (Abdel Wahed Ahmed & Abd El Monem, 2020). This has resulted in congestion most cities of Africa over the years with severe consequences.

Increases in externalities from transportation include air pollution, fatalities and injuries inflicted through road accidents, excess energy consumption and inaccessibility for the poor {Pojani, 2018 #135}. Public transport is receiving increasing attention in African cities as an integral element of urban systems and one of the factors that determine socio-economic and spatial development of cities (UN Habitat, 2014). Perhaps African cities

have realized the need for a much more sustainable transportation system which poses less externalities and facilitates the attainment of SDGs.

Cities such as Cairo, Tunis and Lagos have demonstrated this through the construction and expansion of BRT and rail networks. Globally, urban transport contends with increasing motorization, spatial mismatches between housing and economic opportunity, extreme traffic congestion, and deteriorating environmental conditions.

### **2.7.2 Overview of Urban Transportation in Ghana**

Urban transportation in Accra dates back to the year 1927 when ten Dennis buses were introduced by the British to the then Gold (Okoye, Sands, & Debrah, 2010). With an increase motorization at the latter part of the colonial period, the country's first law on transportation, the Road Traffic Ordinance (1952) was enacted and subsequently, the first licensing authority was created to register vehicles and issue licenses to drivers as well as regulate the use of motor vehicles in the country. Subsequently, the Omnibus Service Authority was established after the replacement of the Road Traffic Ordinance of 1952 by the Ghana Local Government Act of 1961, to spearhead the development of urban transport infrastructure (Brookins, 2019).

This was followed by the development of major roads from the Central Business District to other parts of the city and beyond, a pattern typical of road networks of British colonies, and these have been maintained for several years. These road networks have extended to the port areas hence accelerating the rate of development of these areas

(Banjo & Dimitriou, 1983). The density of roads in Accra have since increased, reaching a point where no further expansion is possible. A situation which now calls for an alternative to road transportation.

Three main state-owned establishments; the State Transport Corporation (STC), the City Express Service (CES) and the Omnibus Services Authority (OSA), were responsible for the operation of bus services under the Ministry of Transport and Communication of the time, which together, formed the public transport service of the country (Fouracre, Kwakye, Okyere, & Silcock, 1994). The State Transport Corporation and City Express Service undertook inter-city services within the country and beyond to other neighbouring countries (Brookins, 2019). The Omnibus Services Authority undertook intra and inter-city transport services within the urban centres of the country. They were deemed to be safe and reliable transportation options for passengers in general. Financial losses, issues of mismanagement as well as overwhelming competition from private transport operators which gradually led to their collapse. The state's ability to spearhead development was questioned when the economic recession of the late 1970s and 1980s hit the country amidst poor management and an overwhelmingly large public (Fouracre et al., 1994) and donor institutions at the time became extremely critical of state practices. Consequently, structural adjustment programs were prescribe for the country in an effort to reduce government's role by promoting privatization, with divestiture of state enterprises being the most stringent decision owing to restricted access to loans due to attached conditions (Kwakye and Fouracre, 1998). The challenges of these periods and loss of these service providers, the paratransit services rose to provide the needed

services.

Public transport and hence Urban transportation was transformed into a privatized sector after terminals were handed over to the Ghana Private Road Transport Union (GPRTU) by the then government under the leadership of Jerry John Rawlings. This further drained revenue and authority from the local government. Ministry of Transport and Communications was subsequently established as the central authority over the transport sector. who had oversight responsibility over the sector with the privately-operated transport system equipped with enough power to compete with future public transport interventions, a turn of events which continues to haunt the country presently.

### **2.7.3 Urban Transportation in Lagos, Nigeria**

The urban system of Nigeria consists of Lagos, described as a mega city, 7 metropolitan areas with more than 1 million inhabitants, 15 large cities with between 500,000 and 1 million inhabitants, 19 cities considered to be medium in size with between 300,000 and 500,000 inhabitants, in addition to several smaller towns (World Bank Group. 2016: From Oil to Cities: Nigeria's Next Transformation). Three main geographical areas constitute the Lagos metropolis; Lagos Mainland, Lagos Island and the suburban areas. The inhabitants of the Lagos Mainland makes up 15% of the population of Lagos Metropolitan Authority and is made up of Ikeja: an elitist, low density expanse and the capital of the state; Ajegunle, a congested shantytown inhabited by the poor, as well as Apapa, Ilupeju, Surulere, Oshodi, Festac town, Agege, Mushin and Iddo notably

medium to high density areas inhabited by mainly the middle class professionals and expatriates. Lagos Island is home to about 10% of the population of Lagos Metropolitan Area, within which the Central Business District is located as well as Victoria Island and Ikoyi which is also a low concentration expanse that houses banks, residences of expatriates and the rich, domestic and multinational corporations. The suburban expanses; Ojo, Alimosho and Agege which are gradually extending into Ogun State constitute over 75% of the population of Lagos Metropolitan Area and comprise dwellings of middle class and poor citizens (Aluko, 2010). Figure 1 below is a map of the Lagos Metropolitan Area.

**The three main geographical areas of Lagos, Nigeria**

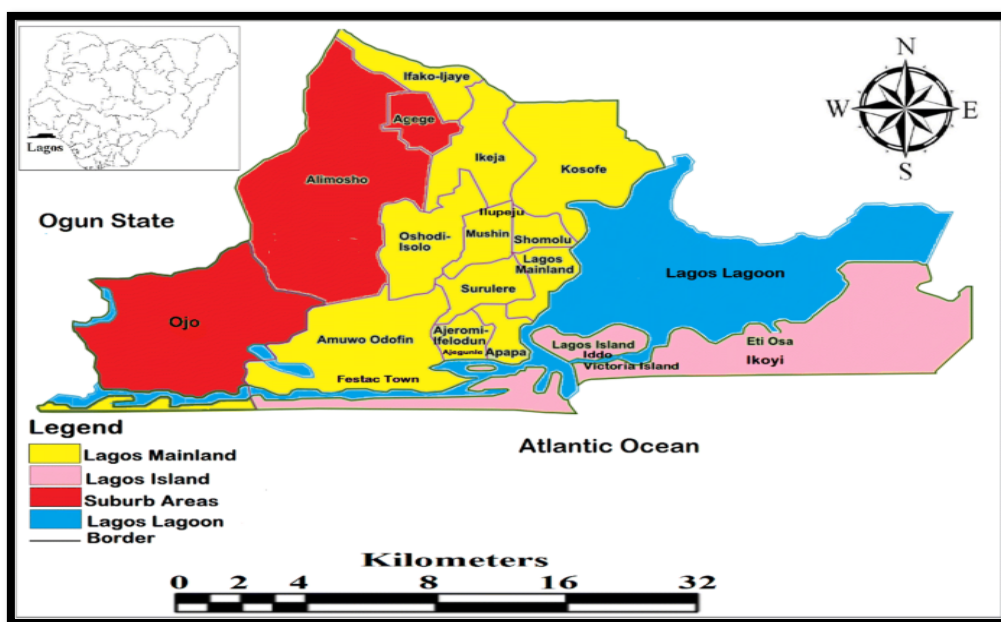


Fig 1.

Source: (Dano, Balogun, Abubakar, & Aina, 2020)

Authorities have been faced with the herculean task of improving the quality and capacity of the existing transport facilities in addition to ensuring the provision of additional services to augment existing capacity for a growing urban population. In light of this, the Government of Lagos State embarked on infrastructural investments in public transport over the last two decades. As part these measures to improve the transportation system of the LMA, a strategic transport master plan was developed in the year 2006 to create a state of the art public transport system within two decades, spearheaded by the Lagos Metropolitan Area Transport Authority, henceforth LAMATA, which was mandated to manage all aspects of the urban transport system of Lagos, including road infrastructure maintenance and road safety in collaboration with the World Bank (Abubakar & Doan, 2017).

As part of improvements in the systems in line with the growing population of the Lagos Metropolitan Area, the capital of Nigeria was relocated to Abuja from Lagos (Abubakar & Doan, 2017). The metropolis of Lagos currently has about 2600 km of roads used by more than a million vehicles daily, with the density of paved roads at about 400 meters per 10,000 of the population as at 2008 (UN Habitat 2013). Vehicular density stood at about 200 vehicles per square kilometer in 2010 putting the Lagos Metropolitan Area above all other cities in terms of vehicular density. With a figure of about twenty times more than the global average of 11 vehicles per square kilometer traffic congestion is unavoidable in areas such as Ebute Meta, Mushin, Surulere, Agege, Oshodi, Yaba and Ikeja (Ibitayo, 2012).

The Lagos Metropolitan Area, henceforth LMA, also possesses public rail transport and ferry transportation services but these are obsolete as well as underutilized, thus, increasing the pressure on road transportation which accounts for more than 80% of the transportation demand and traffic in LMA. Further worsening the situation of these areas is the poor state of the roads, damaged traffic signals and dilapidated vehicles which break down regularly on these roads, a situation which accounts for much of the traffic in the area (Ibitayo, 2012). This is a common condition experienced by most African cities which have failed to adequately develop their rail network after independence.

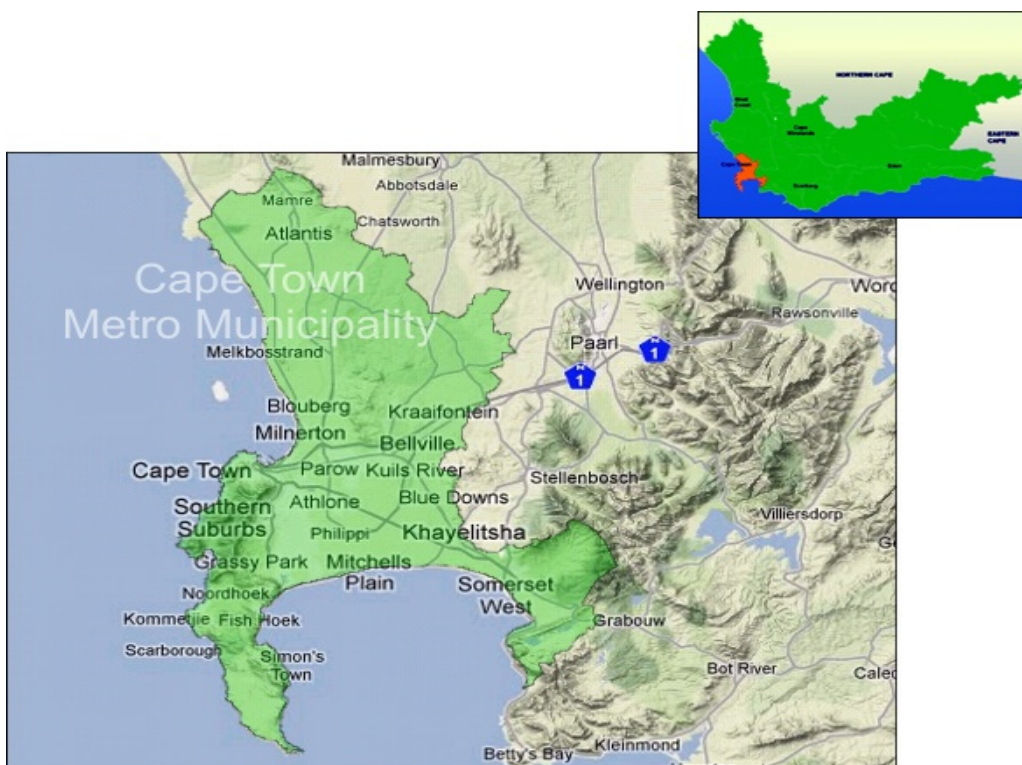
In addition, the Lagos State Traffic Management Authority was established to manage traffic and deal with congestion within the metropolis. The resultant introduction of the Bus Rapid Transit (BRT) system by LAMATA during 2008 greatly improved the public transport system of LMA including an easing of traffic congestion, evidenced by the transportation about 200,000 passengers daily at 30% cheaper fares, 30% less commuting times and 40% less waiting times over a distance of 22 km. while providing 1000 direct as well as 500000 indirect jobs (Habitat, 2013). The BRT system currently operates on two different lines over a distance of 35.5 km of route and transports over 350,000 commuters daily (Otunola, Kriticos, & Harman, 2019).

#### **2.7.4 Urban Transportation in Cape Town, South Africa**

As at 2005, Cape Town, a highly developed South African city had an improved public transport system different from all other cities in South Africa. At the time, its suburban



rail service was a dominant mode in the city with a 54% share of total daily commuting by passengers in comparison with 29% by the mini-bus taxis and 17% by transport services with scheduled buses. In other cities, minibus-taxis generally have become the overwhelmingly dominant mode, supplying as much as two thirds of the daily public transport passenger market, with commuter rail and scheduled bus services limited to varying proportions of the remaining third (Wilkinson, 2010). The figure below (fig 2) shows the location of the city (metropolis) of Cape Town in South Africa.



**Fig. 2**

***Geographical location of the city of Cape Town***

The city of Cape Town developed its BRT and heavy rail through a framework document in accordance with the national Integrated Rapid Public Transport Network (IRPTN). This IRPTN necessitated the introduction of the BRT system popularly known as MyCiti, while outlining a multi-phase implementation of a network of trunk and feeder routes across the municipal area (Schalekamp & Behrens, 2013). As part of the project, a fleet of state of the art buses replace existing scheduled buses and unscheduled minibuses. Buses along trunk routes also run in dedicated lanes to resolve conflicts with other road users for road space.

The next phase of the MyCiti project termed the MyCiTi Public Transport Reform Project was embarked upon with a goal to establish a new public transport system that would operate in the entire city and include other existing public transport operators. The agreements in 2013 and 2014 led to a 3-year N2 Express service contract. Capacity building programmes were thus held to for existing public transport operators to incorporate them into the new scheme (MyCiti). Under this scheme, Transport for Cape Town which is the municipal transport authority and the Joint Venture partners (scheduled bus operators in the area) were involved in the negotiations to operationalize the scheme which begun in Mitchells Plain and Khayelitsha. This was aimed at equipping these operators with the skills to run and own MyCiTi vehicles operating companies (VOCs) through the assistance of the municipality to replace the paratransit services (Schalekamp, 2017). This arrangement would prevent loss of jobs associated with the elimination of the paratransit service.

A bicycle rental service commissioned in 2013 after a feasibility study for a public bicycle system was another important intervention launched within the central city of Cape Town and the V&A Waterfront. The purpose of this was to announce feasibility studies by Transport for Cape Town into the most appropriate business model of a bike-sharing transport service (Jennings, 2015). Under this system initially operated by Up Cycles, a privately owned company, a user may rent a bicycle at one hub and return it to another hub. This was however manually operated and staffed with no registration, security or deposit required, in addition to receipt of a loyalty card by frequent users. This system however requires planning to ensure safety through provision of bicycle routes especially in countries with few or no bicycle routes; a common characteristic of developing countries in Africa.

### **2.7.5 Urban Transportation in Nairobi, Kenya**

Nairobi, the capital of Republic of Kenya, was founded under British rule on the Uganda-Mombasa railway. Since the independence of Kenya in 1963, the population in Nairobi City has grown to approximately 3.1 million. Similar to the many metropolitan cities in low and middle income countries, Nairobi's paratransit system is mostly composed of mini bus, 14-seating matatus<sup>1</sup> that are owned privately and operated individually or cooperatively. Opposed to a formal public transit system, the matatu's operations are on

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<sup>1</sup>Matatu, which literally means 30 cents being the minimum required for a ride, makes use of road space less efficiently than buses with minimum seats of 50 passengers.

flexible schedules, undecided stops and routes, and unclear how to provide increased accessibility in the city (Campbell et al., 2019).



*Fig. 3*

*Geographical location of Nairobi*

Nairobi as a capital and land-locked city of Kenya needs to strengthen well-established and equipped inclusive transportation system to reduce extremely heavy vehicular traffic which has complicated traffic movement patterns from the sub-urban to urban center and downtown areas.

Even with the current road infrastructure that hardly accommodates for the number of matatus, the city is still growing rapidly through the increasing urban population. With

city expansion that highly relies on the demanding matatus, technical difficulties of mobility in these areas indicates higher population density. In a field survey undertaken in 2013, the market share for the movement patterns is primarily by walking (39.7%), matatus (28.4%), private car (13.5%), bus (12.2%), rail (0.2%) and others (5.9%) (Tembe, Nakamura, Tanaka, Ariyoshi, & Miura, 2019).

A fascinating aspect of Nairobi's urban transport system is that there is availability of motorbike renting services popularly known as Bodaboda in every corner of Nairobi city. Boda bodas are fast, efficient, flexible and relatively affordable means of transport which makes life easier and movements comfortable for many Nairobi residents at affordable cost. Bodabodas for many Nairobi residents who do not own cars is a necessity to avoid the heavy vehicular traffic (Varshney, 2020).

In 2008, the Government of the Republic of Kenya established the Ministry of Nairobi Metropolitan Development, and in 2010, the new constitution created new local governments which were granted autonomy for planning. Under this new arrangement, former districts corresponded to the boundaries of the counties. In 2016, new highway system was launched to give more authority for managing local highways at county levels. In 2017, with the lessons from 2016, the President of the Republic of Kenya launched the National Metropolitan Area Transport Authority as a joint transportation authority between five counties in Nairobi Metropolitan region and central government. One major challenge was that there was non-existence of transportation planning for transportation planning in both national and local levels.

In 2006, the Ministry of Roads and Public Works and the Ministry of Local Government commissioned the Japanese International Cooperation Agency (JICA) to produce a study on a Master Plan for Urban Transport in the Nairobi Metropolitan Area, which was the first of its kind since the 1973 Master Plan that was never implemented. The study presented an unprecedented diagnosis of the mobility system, including information of buses/matatus, road, and rail networks conducted from traffic, environmental and social condition survey in Nairobi Metropolitan area to plan the Master Plan spanning until 2025. This diagnosis study was successfully used by the public authorities for ranking transportation projects to support high level of metropolitan service and better metropolitan access by 2025 (Tanaka et al, 2014).

In 2008, the Ministry of Nairobi Metropolitan Development launched a long-term metropolitan scale strategy named “Nairobi Metro 2030”, that was broadly to secure Nairobi Metropolitan Region (see figure 4) as “a world-class and sustainable African metropolis” with main key strategies and actions in achieving this goal.



Fig 4 Nairobi Metropolitan Region

Infrastructure would be a significant component of the strategy and transit-oriented development was presented as a means of achieving these objectives. “Nairobi Metro 2030” play the same role in metropolitan level as “Kenya Vision 2030” played in national level provision on a long term vision and associated objectives through supporting and ensuring legitimacy for the projects.

In relation to traffic management, the transport department of the Nairobi County Police are mandated to ensure legal use of roadways. The state of the art installed traffic management systems and control room assist in the effective discharge of their duties, but it is not sufficient and consequently, officers spend an average of 10 hours in traffic management {Mukaria, 2017 #151}

### **2.7.6 Urban Transportation in Cairo, Egypt**

Cairo, with rich and long history of civilization, is the capital city of Egypt, North Africa. With a total population of 15 million people in Cairo, the city also has high levels of road traffic congestion similar to other developing countries. Cairo has additional advantage of alternative transportation modes, such as, inland water transport using the Nile river.

“Nile ferries are often used as means of transportation and are publicly owned” (Ahmed {Abdel Wahed Ahmed, 2020 #53} as Nile river is in the centre of Cairo (see fig.5).





Figure 5. Geographical location of Cairo

Public transport structure in Cairo, Egypt is classified by ownership (Abdel Wahed Ahmed & Abd El Monem, 2020) (see table 1).

Public Ownership	Private Ownership	Public & Private Ownership
Bus, Metro, Train,	Micro bus, Taxi,	Mini bus
Airplane, Nile Ferry,	Uber, Careem,	
Tram,	motorcycles, bus	
	between governates,	
	bicycles, tuktuk,	
	Suzuki, animals	
	(horse, carmel), boats	

Table 1 . Classification of transport ownership in Cairo, Egypt

Cairo’s urban public road transport is provided by one single public authority, the Cairo Transport Authority (CTA). However, the majority of informal or private minibus companies with collective taxis are involved in public road transport. In 2010, with a ratio of 9 CTA staffs per vehicle, the operated number of minibuses and taxis were far above the number of vehicles; approximately 80,000 minibuses and 60,000 taxis were operating (Houpin, 2010).

Although, the CTA is responsible for the Cairo Governorate, it is also a major mass

transit operator to the regions of Giza and al- Qalyūbiyya in Greater Cairo.

Apart from the CTA operating its own buses, there was a separately governed subsidiary, the Greater Cairo Bus Company which was in charge of a fleet popular called “Carter buses”, named after former President Jimmy Carter since the project was by USAID (El Khateeb, 2018). It additionally monitors concession routes granted to a number of private operators in the Great Cairo, whereas Giza Governorate monitors the concession routes running in its territories (World Bank 2000; DRTPC, 2009). Additionally, CTA operates Nile ferry lines and runs what remains of the tram system, after the governorate of Cairo removed more than 60% of it in October 2014 (Urban Mobility in Cairo: Governance and Planning, February 1, 2017) .

The Greater Cairo Metropolitan Area (GCMA) is one of the largest megacities in the world and it is Egypt’s largest agglomeration (home to 27% of Egypt’s population). The level of pollution and congestion in GCMA is one of the highest among urban agglomerations in the world (Parry & Timilsina, 2012). The means of transport in the GCMA varies from one governorate to another depending on several factors such as; the number of population, rural or urban governorate, economic status, main city or not, etc. For example; in rural areas of GCMA, residents rely on bicycles, motorcycles, animals (mainly donkeys) and walking rather than vehicles and buses, as opposed to the urban areas where vehicles are predominantly used.

A host of actors undertake decision-making, operation, and monitoring of the transportation sector. Greater Cair Region, although publicly acknowledged as one city,

is administratively divided into the governorates of Cairo, Giza and al-Qalyūbiyya. Within each of these governorates is a local technical Directorate of Roads and Transport directly under the technical supervision of the Ministry of Transport (MoT), but under the governorate, administratively. The directorate is primarily responsible for street maintenance. The Traffic Unit within the Directorate of Housing and Utilities in the governorates is responsible for engineering and design services for specific projects. The directorate of Housing and Utilities falls administratively under the governorate and technically under the Ministry of Housing, Utilities and Urban Communities.

There is additionally a Traffic Police Department within each governorate, which technically falls under the Ministry of Interior but not under the direct supervision of the Governor although it reports the Governor (World Bank 2000). The Traffic Police departments issue drivers' and vehicle licenses and enforce traffic laws. They also participate in the approval of traffic management schemes, such as speed limits and parking restrictions, the monitoring of which is then done by the police departments. Microbus routes are licensed by the governorates in which a route runs in coordination with the relevant traffic police departments (Urban Mobility in Cairo: Governance and Planning, February 1, 2017).

### **2.7.7 Urban Transportation in Tunis, Tunisia**

Road transportation accounts for more than 80% of transportation of cargo and persons (Achour & Belloumi, 2016), although the authorities of Tunisia continue to make important strides at modernizing the city since its independence in 1956.

Tunisia is a Mediterranean city with alternative passenger transport means of predominantly bus and light rail managed by a single public establishment out of the merger of the National Transport Company (SNT) and the Tunis Light Railway Company (SMLT) . The Tunis Transport Company (STT), established in 2003 carries a total of 460 million passengers annually and has dominated the transportation sector with 35 routes and 4 different operators. The use of minibuses for inter-urban and sub-urban trips in addition to intra-urban trips by the light rail network enabled the public transport sector dominate the urban transport sector in the city of Tunis (Houpin, 2010). The figure below shows the geographical location of Tunis.

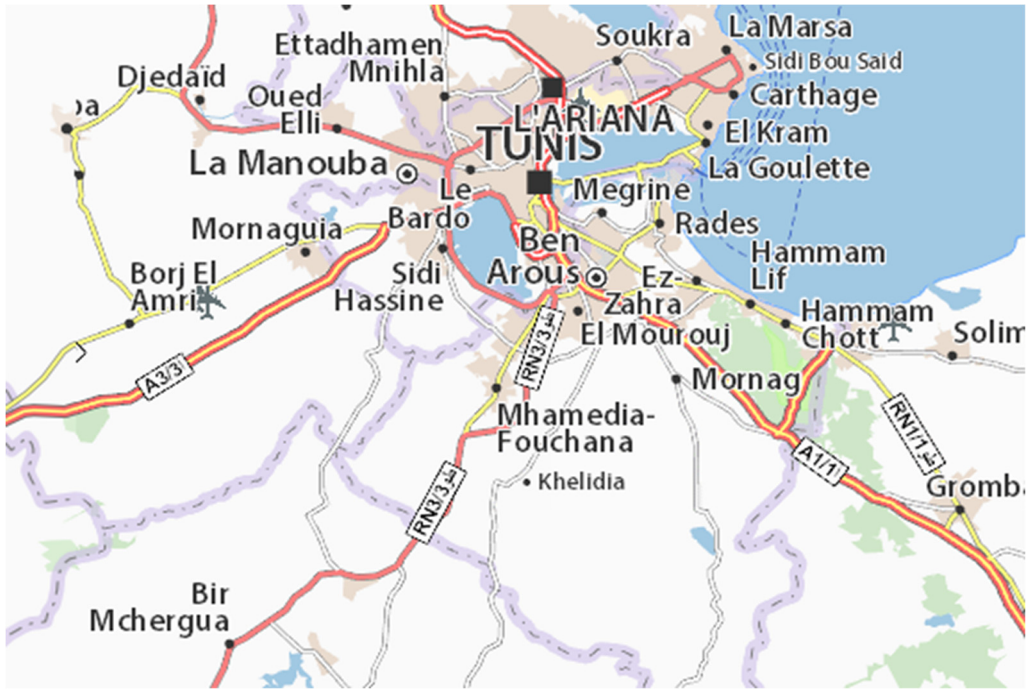


Fig. 6

*Geographical location of Tunis*

Though there exists a tram network (the heart of the city’s transport system) and a bus service, these only cover a portion of the city and are reaching the limits of their capacity. To mitigate this, the Tunisian government embarked on a mission to add an urban rail system to the existing tram and bus network which could support the transportation of hundreds of people from one point to the other quickly and in an environmentally friendly way (Urban Mobility: strategies for liveable cities, 2016).

The competence of the Tunis Traffic Unit is demonstrated in the swift handling of traffic management duties, and has often made the city of Tunis an exception in this regard, dating back as far as the late 1970s. Traffic Units such as these ought to be well established in developing countries where sophisticated equipment for traffic

management require huge investments to install, whereas personnel are widely available at a lower cost. The argument is personnel in place of equipment for effective functioning of the system at a relatively lower cost. However, Traffic Management Units in most African cities still require monitoring through these sophisticated equipment and this is the fundamental issue which leads to huge expenditure often at the expense of paid labour.

## **2.8 Transport Infrastructure in Africa**

The contribution of Infrastructure services to the socio-economic development of human settlements cannot be overemphasized due to its ability to facilitate urbanization and uniform spread of development. Transportation infrastructure in this way influences settlement patterns of people by creating possibilities for swift mobility between the core and the periphery of urban centres (Achour & Belloumi, 2016). To attain Sustainable Development Goals, there is the need to improve transportation infrastructure which is linked directly or indirectly to all other goals of development. However, the growing demand for transport infrastructure creates a herculean task for governments and a challenge for Africa as a whole as it affects integrative efforts of states by determination of imports. Generally, road density is low across the African continent (see table 2) as compared with developing countries in other parts of the world, thus, increasing transaction cost of transporting cargo between African countries.

**Table 2** **Road Network of Africa**

Region	Existing Network (km)	% Share	Paved Roads (km)	Paved Roads (% of total)	Paved Roads in Good Condition (%)	Road Network Density Per Population (km/1,000 persons)	Road Network Density Per Land Area (km/1000km <sup>2</sup> )
Central Africa	344,083	12.1	79,139	23	58.7	2.1	36.5
Eastern Africa	850,710	30.0	250,959	29.5	49	1.2	127.9
Southern Africa	998,334	35.3	353,410	35.4	47.8	5.5	99.8
Western Africa	638,982	22.6	116,934	18.3	43.2	2.3	83.7
Sub-Saharan Africa (Total)	2,832,109	100	800,442	28.3	48.6	2.7	-

Source: Urbanization and Industrialization for Africa’s Transformation, UNECA 2017 and Exim Bank Calculations

A 2013 report by the African Development Bank suggests that the cost of transporting goods in in Sub-Saharan Africa (SSA) as at the time was the highest in comparison with all other regions of the world (AfDB, 2013). This situation is worth resolving as African countries are characterized by low wages which does not support high recurrent expenditure. Secondly, this condition impacts adversely on the competitiveness of African goods on the international market due to high cost of transportation which adds to the overall cost of production, coupled with poor standards at sea ports in Africa.

The advantage of Air transport in terms of speed, over other modes of transport makes it essential in all regions of the world to facilitate swift transportation of persons and cargo. However, the generally underdeveloped air transport infrastructure across the region in addition to high initial cost of setting up airlines precludes the establishment of reliable airlines in all parts of the continent and hence international connectivity across African states.



Railways have the potential to transform the continent but currently play an insignificant role in Africa with rail density of 2.8 km/1000km<sup>2</sup> (United Nations Economic Commission for Africa). The rail network is characterized by limited interconnection with very little electrified outside South Africa. Significant investment is therefore required to address major transport infrastructure deficit in the African continent. Increased budgetary constraints in the public sector for investment and maintenance of transport infrastructure have increased the need for effective transport infrastructure policies to attract private investment.

The collaboration between Africa's leading continental organizations, UNECA, AUC through the NEPAD Planning and Coordinating Agency and the African Development Bank (AfDB) is designed to address the transport infrastructure deficit. The 12th Assembly of Heads of State and Government adopted Declaration requesting the African Union Commission (AUC) to formulate the Programme for Infrastructure Development in Africa (PIDA).

# **CHAPTER 3**

## **METHODOLOGY**

### **3.1 Introduction**

This chapter revisits the research questions and provides more detail on the research design and approach, data sources, strengths and weaknesses of data obtained will be discussed. It presents the conceptual framework for the study to illustrate and ease understanding of the subject matter as well as provide a view of the current situation of the urban transport system of Accra, Ghana. The methodology entails both qualitative and quantitative data although limited to secondary data.

### **3.2 Research questions**

The research was organized around the following research questions which are aimed at uncovering the extent of the challenge in the city of Accra in Ghana and to assist in the identification of courses of action or policy implications for the city of Accra in Ghana.

1. What factors account for the vehicular traffic congestion typically in Accra and how do these impact on the functioning of the metropolis?
2. How is urban planning undertaken in the selected cities?
3. What feasible policy recommendations, including those that can be adopted from the selected cities, can address this challenge?

### 3.3 Study Area

Accra, the study area, is the administrative and commercial capital city of Ghana. It covers an area approximately 225 square km or nearly 40 per cent of the area of the Greater Accra Region. Since 1877 when the city replaced Cape Coast as capital of the country, it has expanded very rapidly in size, in population and in the socio- economic front (Abane, 1993). It currently has a population of approximately 2.052 million inhabitants (Ghana Statistical Service, 2019). Fig 7. Shows the map of Accra with boundaries as well as major roads within.



Fig 7. Map of the Study Area Showing major road network and boundaries

### 3.4 Comparative Research

Comparison is characteristic of all sciences, including the social sciences, in which

comparative research has played a momentous role in the development of these now scientific disciplines. However, there are divergent views within the social sciences concerning whether the comparative method should be considered a distinct subfield or as a methodology (Methodology in comparative studies - Peter Johan Lor p. 2). Divergence of views on this method however does not downplay its effectiveness in establishing facts across different areas of comparison.

The focus of comparative research, as stated by Ragin (1987, p.6) is to identify the similarities and differences among macrosocial units. Knowledge of this provides the key to understanding, explaining and interpreting diverse historical events and developments as well as their import for current similar situations. Ragin notes that cross-societal similarities and differences constitute the most significant feature of the social landscape, and, therefore, researchers in this field prefer explanations that cite macrosocial phenomena. The cases studied by most researchers in this field are significant to the researchers in terms of their differing particular historical experiences.

The nature and objectives of this research therefore necessitate the use of the comparative method to carefully dissect the relevant issues as well as elements (variables). This research also makes it the most appropriate method to use in reaching clear conclusions regarding the transportation systems across the selected cities and provides room for further analysis.

### **3.5 Research Design**

The research employed quantitative analysis in analyzing the case of Accra and qualitative analysis in arriving at key findings of the research. This exercise entailed a comparison of the urban transport system of the city of Accra in Ghana with cities of the five other African countries, Nairobi in Kenya, Lagos in Nigeria, Cape Town in South Africa, Tunis in Tunisia and Cairo in Egypt with a focus on Urban Planning, Urban transport governance, transport services, Transport Infrastructure and Traffic Management and Control. All cities were chosen from Africa and the choice of these cities was to minimize issues of internal diversity which may exist for instance between Accra and cities located in Europe. This would help develop various options as measures from which feasible options would be recommended for the city of Accra in Ghana.

The purpose of this comparison is to examine the status and functioning of the various variables or elements of comparison in the five selected cities and to determine how Accra is applying these elements from the theoretical and empirical researches undertaken on these case studies. Generally a major problem in comparative research is that the data sets in different countries may define categories differently. However, in this research, the difference in the size of populations across these cities is what was most prominent in determining the exact impact of various interventions undertaken by transport authorities in these cities. In addition, data after major interventions were not available for verification.

### **3.6 Secondary Data Sources and tools of analysis**

Data on vehicle registration was obtained from the ten main regional registration centres located in the regional capital cities of Ghana, through the Driver and Vehicle Licensing Authority in Ghana. The data was analysed using Microsoft Excel. However, other secondary data for this research were obtained from a number of online sources and public documents, particularly reports pertaining to the six cities. These reports cover a wide range of subjects and were very useful in the research, however, preferred more recent documents could not be obtained due to unavailability in some cases. Secondary data that focused on conditions leading to road traffic congestion was obtained from journals, articles, reports, the internet, as well as conference and working papers. These were used to back claims made in the course of the study.

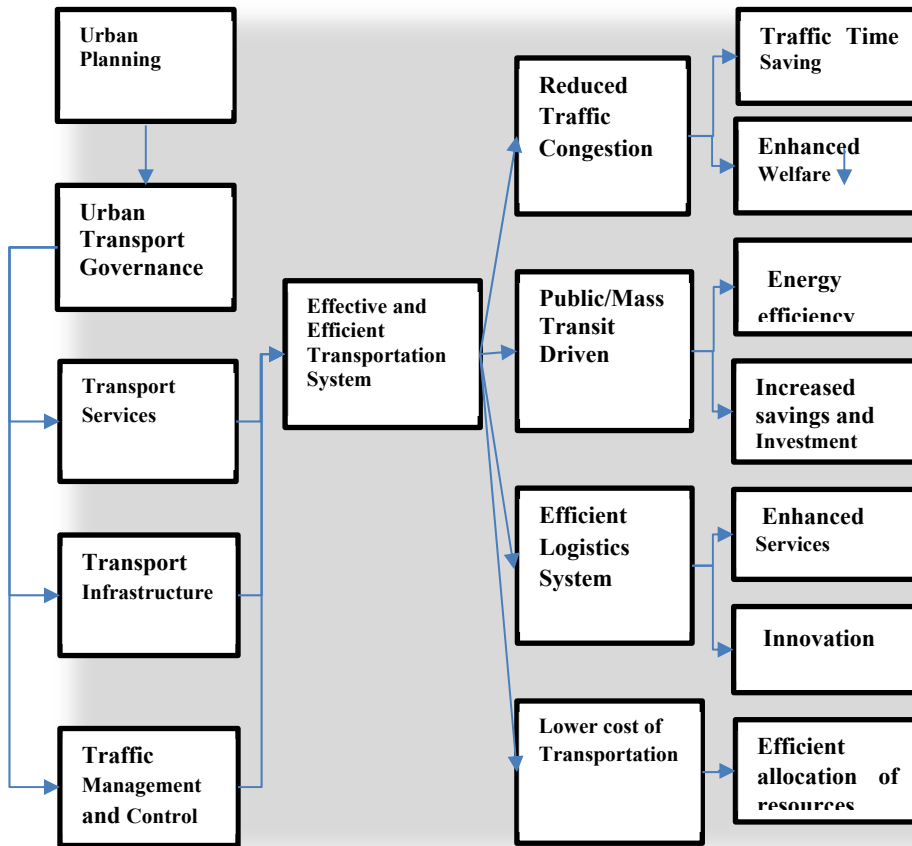
### **3.7 Strength and limitations**

Overall, the data provides an idea as to the nature of the problem identified its inability to adequately cover earlier years in the case of some categories of vehicles does not affect the analysis as the phenomenon was not as prevalent during those earlier years though it would have helped for internal comparison. Absence of traffic data as well as data on infrastructure however impacted adversely though minimally on the research findings.

### **3.8 Conceptual Framework**

The conceptual framework in fig. 8 provides a graphical model of the relationship between the elements of comparison and the expected outcome when these variables together, function effectively within the urban transport system. It seeks to explain the link between effective urban planning and urban transport governance and their relationship with transport services, transport infrastructure and traffic management and control, which together, ensure an effective and efficient transportation system, with the latter being the dependent variable.

Under the broader urban planning is urban transport governance which is also directly related to transport services, transport infrastructure and traffic management and control mechanisms. The effectiveness of these variables result in an efficient and effective transport system with benefits in the form of decreased traffic congestion, leading to traffic time saving and improved welfare; a reliable mass transit driven system which leads to a decrease in privately owned vehicles for road transportation, decrease in energy demand and increased savings and investment; an efficient logistics system which leads to enhanced services and innovation; and finally a reduction in the overall cost of transportation which ensures an efficient allocation of scarce resources. However, the ineffectiveness of these elements as outlined above would invariably result in an ineffective and inefficient transport system with an adverse impact on the entire urban system.



**Fig. 8 Conceptual Framework** (Adopted and modified from Harriet et al)



# **CHAPTER 4**

## **AN ANALYSIS OF THE ACCRA CASE**

### **4.1 Introduction**

This chapter analyses in more detail, the case of Accra and attempts to bring to bear the nature of the problem of vehicular traffic congestion in the city, drawing from various sources such as journals, reports and public data sources.

### **4.2 Urban Planning**

Urban Planning in a broader sense is the responsibility of the National Development Planning Commission (NDPC), a body specifically set up for the purpose of developing long term plans for the entire country. It performs this role in consultation with various stake holders such as the Ministries, Departments and Agencies concerned, and the private sector where necessary. It also works closely with the Ministry of Transport and Ministry of Roads and Highways on issues related to transportation planning and urban transportation planning in particular. Transport sector plans are developed by the aforementioned Ministries in consultation with the NDPC and other stake holders concerned with the plan. Issues related to the mandate of the Ministry of Transport such as provision of services are handled by the Ministry and its agencies. These entities meet regularly to facilitate the preparation of these plans as and when required (usually once every quarter

of the year)

The Greater Accra Metropolitan Area (GAMA) is made up of fifteen contiguous local government districts. Each of these districts is managed as a separate administrative and planning entity, which means GAMA is not managed as an established metropolitan area with strong economic, environmental and social connections. The Greater Accra Region does exist but its clear mandate is unknown. Planning of Accra is undertaken by the by the Department of Physical planning of the Accra Metropolitan Assembly (Future Cities Africa Ghana, 2010).

### **4.3 Urban Transport System**

The urban transport system in Accra is dominated by the paratransit and non-motorized means. Its congested routes and often extended travel times are partly responsible for the growing number of privately owned vehicles for comfort and reliability. Nonetheless, walking remains a major means of transport forming about a third of trips undertaken and majority (47%) of the remainder are undertaken by informal minibuses (trotros) and taxis. The increasing number of private vehicles is another worrying challenge as it has led to an unbearable situation of urban traffic congestion.

Efforts at development of a reliable public transport system led to the establishment of the Metro Mass Transit limited (MMT), a partially state-owned transport company which engages in intra-city and inter-city transport services. Accra has been deeply affected by urban sprawl, a situation necessitated by the centralized systems and

governance, among other factors. The result is vehicular traffic congestion with the central business district being the most affected as it draws in commuters from the peripheries.

The rapid urbanization of the mid-1980s was a major contributing factor to urban expansion within Ghana's most prominent cities. While cities in developing countries typically have higher densities, urban expansion has led to the flattening of urban density, mimicking the sprawling pattern of developed cities (Cervero, 2013). Poor infrastructure coupled with inadequate land use and transportation planning have encouraged sprawling through encroachment on public spaces such as roads and walkways, leading to increased congestion.

As urban residents move further into peripheries of cities, they increasingly require reliable transportation options for mobility to and from the city or urban centre to access economic opportunities and social amenities in most cases. This condition ensures that economic and political activity is concentrated in Accra's CBD, as the primary location of major companies and government offices (Agyemang, 2017). The CBD also houses Accra's largest market and which hosts a large number of private businesses. The informal sector of the economy supports 70 percent to 80 percent of Ghana's labor force, which implies a large amount of the population commutes to the CBD daily for the purpose of engaging in economic activities (Brookins, 2019). Urban sprawl, as an effect, has increased overall trip distances, pushing up the price of transport that implies an increasing cost. Fig. 9 below shows the degree of urbanization in Accra as of 2017.

## Degree of urbanization of Accra, Ghana

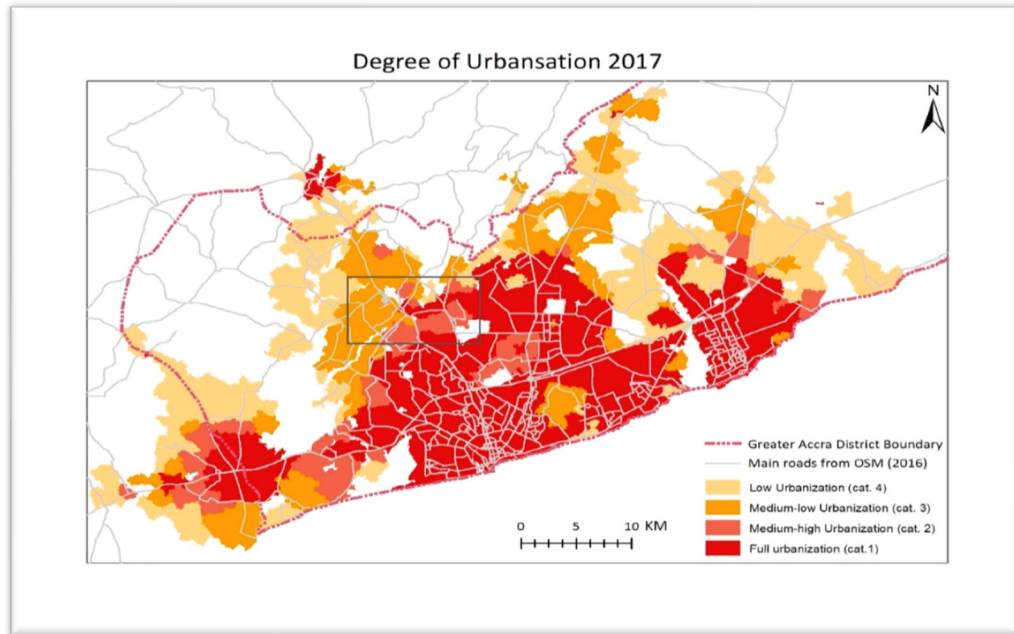


Fig 9.

Source: (Moller-Jensen, Allotey, Kofie, & Yankson, 2020)

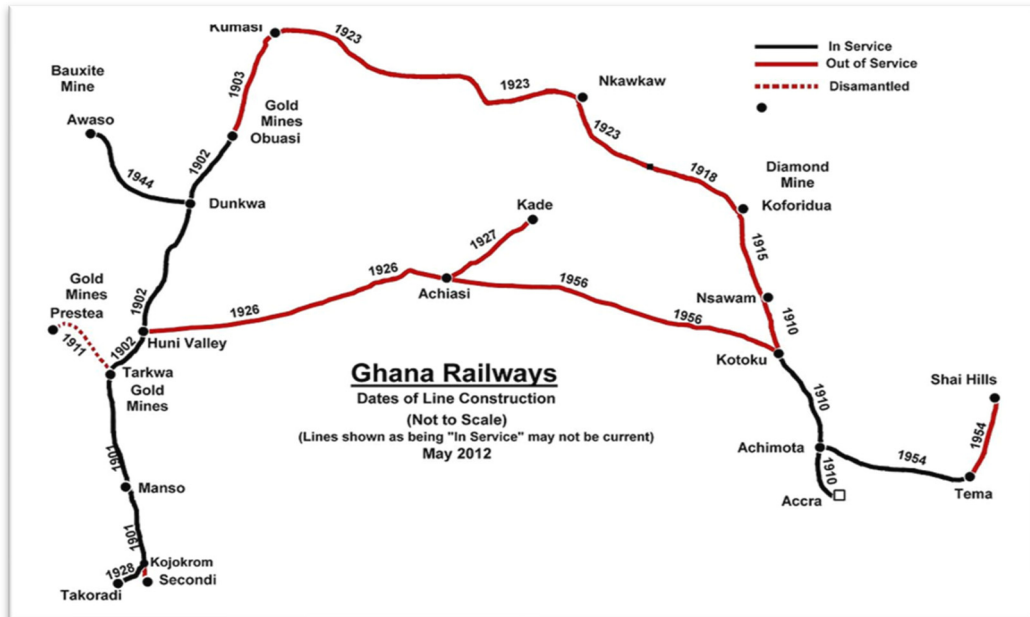
### 4.4 Factors Contributing to Traffic Congestion in the Accra Metropolis

A number of factors have led to the severe traffic situation which persists in the city of Accra and also affects its surrounding areas. These factors or conditions are not new but have existed since independence even though their adverse effects are now being felt by inhabitants of the city. They include infrastructure deficiencies, archaic technologies as well as economic factors.

### 1. Limited Rail Network

The rail network of Ghana is very limited and in some cases dilapidated in some areas across the country and this has resulted in rail transportation becoming the least utilized mode of transportation in the country. The total rail network of Ghana consists solely of an estimated 947 kilometer line which was constructed during the colonial era in the then Gold Coast, with 60 kilometers located within Accra. Apart from this 60 kilometer line which is used for passenger transport, the rest of the railway line is in disrepair (Ministry of Railways Development, Ghana). The deficiency in rail infrastructure has put tremendous pressure on road transportation by both motorized and non-motorized modes of transport. The current state of Ghana’s railway network is shown below in Fig. 10.

**Existing Railway Network of Ghana and Date of Construction**



(Fig. 10)

Source: Global Construction Review

## ***2. High Concentration of Vehicles in the Urban Centre of Accra***

The total road network of Ghana in length is approximately 109,515 km. It consists of 13,787 kilometers of paved roads (2019 figures), 95,728 kilometers of unpaved roads (2009). In terms of country comparison to the world, Ghana stands at 45 (Ghana Statistical Service, 2019). An Increase in the number of vehicles may not be the major factor but the concentration of these vehicles in the urban centres of the country is a major determinant of the undesirable traffic situation.

This is due to the absence of alternative means or modes of transport, specifically mass transit services and infrastructure such as Bus Rapid Transit, light rail or tram and concerns over the safety of the paratransit system. The figure below (figure 11) was constructed with data from the Driver and Vehicle Licensing Authority of Ghana (table 3) and it shows the total number of registered vehicles in Ghana from the year 2000 to 2019. Table 1 and figure 3 give an indication of the increasing rate of motorization in the urban centres, with the most affected city being Accra consecutively throughout the entire period, which has seen continuous years of increasing motorization. The year 2000 was characterized by the registration of 23,01 vehicles.

**Table 3. Vehicles registered in the Regional Capitals (Urban Centres) of Ghana (2000-2019)**

REGION/ DISTRICT	YR 2000	YR 2001	YR 2002	YR 2003	YR 2004	YR 2005	YR 2006	YR 2007	YR 2008	YR 2009	YR 2010	YR 2011	YR 2012	YR 2013	YR 2014	YR 2015	YR 2016	YR 2017	YR 2018	YR 2019
ACCRA	23,021	18,092	20,884	19,136	21,458	24,884	31,269	41,593	48,410	41,364	41,442	48,930	45,321	38,837	21,008	18,634	21,822	36,721	43,024	44,488
KUMASI	7,762	6,425	5,936	5,739	7,845	8,960	11,481	11,537	12,119	11,569	11,553	15,373	18,691	23,094	20,664	14,293	14,232	18,218	19,120	20,649
TAKORADI	2,301	1,344	1,551	1,544	1,641	2,161	2,180	2,534	2,706	2,706	2,870	3,971	5,706	6,082	6,948	3,183	2,314	2,502	2,359	2,301
SUNYANI	1,143	774	1,150	826	1,566	1,757	3,673	2,233	2,063	2,131	2,245	3,511	2,316	2,968	2,608	1,605	1,719	2,513	3,248	3,539
K'DUA	1,704	1,317	1,286	624	827	821	1,267	1,522	1,544	1,315	1,356	2,155	3,234	2,948	1,832	1,257	1,377	1,781	2,013	3,117
CAPE COAST	806	783	739	408	801	790	956	1,259	1,539	1,350	1,223	1,968	2,431	2,373	2,188	1,201	1,824	3,076	2,567	2,732
HO	353	292	166	224	366	685	880	1,256	1,683	2,084	2,650	3,703	5,069	5,731	3,955	2,718	2,523	3,388	4,762	3,600
TAMALE	881	1,037	904	2,484	3,879	3,209	2,824	2,510	4,536	5,456	7,280	9,559	9,557	10,013	6,231	4,889	5,370	6,638	8,793	7,216
BOLGA	469	404	461	916	1,645	2,489	3,060	4,416	4,812	3,637	4,996	8,953	10,774	11,655	6,972	5,342	5,605	7,206	10,199	10,856
WA	171	82	96	746	1,949	1,685	2,384	2,924	3,236	4,222	5,141	8,538	11,199	9,996	7,288	7,560	7,286	7,342	8,130	8,188

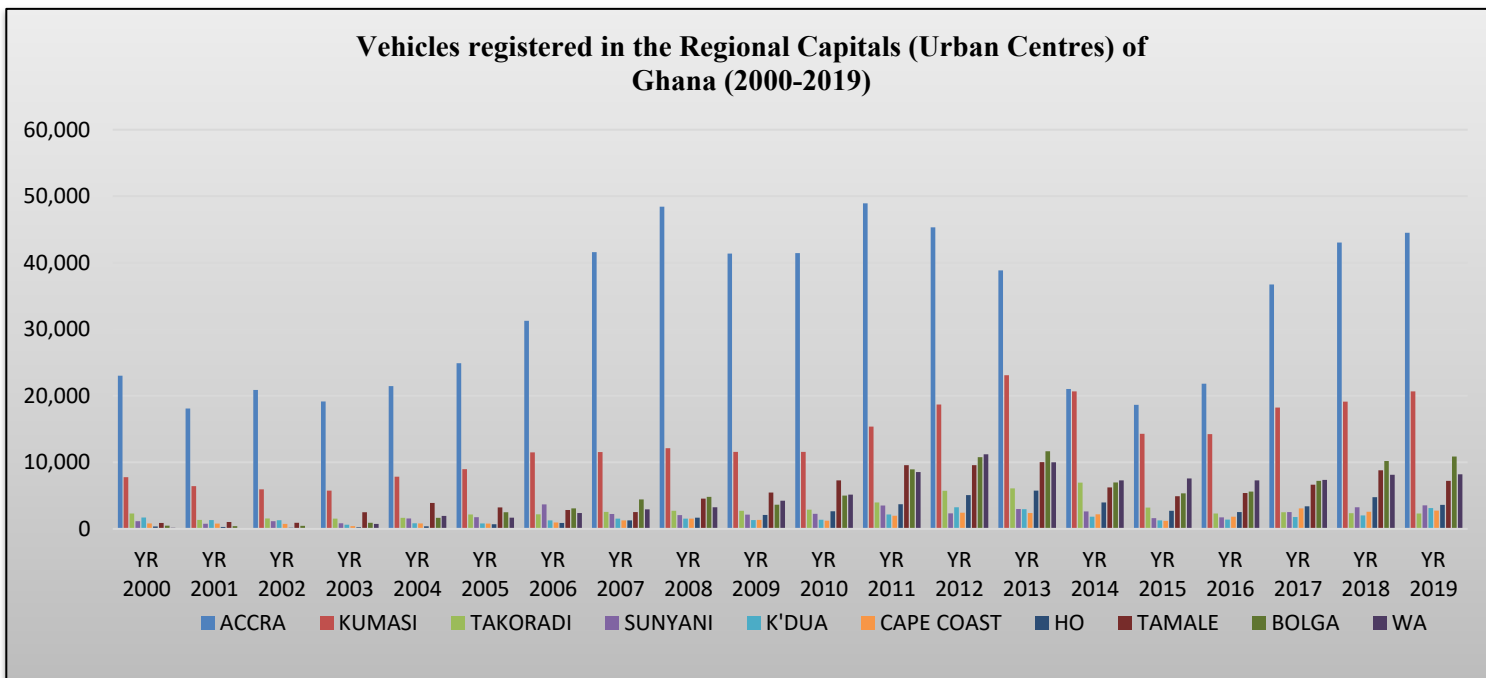


Fig. 11: Author's preparation

Data source: DVLA, Ghana



The most recent annual statistics also reveal that out of a total number of 106,686 vehicles registered in the year 2019, Accra recorded the highest number of 44,488 vehicles (Driver and Vehicle Licensing Authority, 2020). By end of June this year (2020), 29052 vehicles had been registered in Accra. This gives an indication that the rate of entry of vehicles into the transport system is following a similar trend thus far.

### ***3. Outmoded Traffic Management System***

Traffic Management involves putting in place measures to ensure an unimpeded traffic flow or movement of vehicles. It may range from prioritizing public transport to ensuring free movement of pedestrians and other forms of non-motorized transport such as bicycles. The term “traffic management” comprises a variety of techniques for dealing with highway and traffic – related issues. As a concept, it is a process for planning and operating a system of urban highway and street network (Atubi, 2010). Most African countries possess underdeveloped traffic management systems, that is, lack state of the art equipment and rely on the outmoded analog systems which require intensive human effort to run effectively and Ghana is no exception

Ghana’s Traffic Management System mainly consists of analogue traffic lights with timers as well as traffic wardens who assist in areas where the traffic light fails or which are characterized by a high level of indiscipline. The year 2020 however saw a shift from the old system particularly in Accra, to a new system involving a remote traffic control centre. The first phase involved the installation of 44 signaled intersections from

Amasaman (a suburb of Accra) to the Central Business District of Accra as well as the construction of a centralized traffic monitoring centre at the Motor Traffic and Transport Division (MTTD) of the Ghana Police Service and the Department of Urban Roads. (<https://www.ghanaiantimes.com>)

The upgrade includes the changing of traffic controllers from ‘isolated intersection controllers’, which could not communicate with each other, to ‘interconnected adaptive controllers’. This allows the controllers to communicate with each other along the corridor. With the use of detectors buried in the road, information is carried in real time to the traffic management centre. This allows engineers to observe directly the traffic flow pattern along the corridor, and address any incident on the road that will impede the flow of traffic.

Furthermore, the engineers can directly change the signal timings from the centre instead of the old system, where they had to carry their tools directly to the field to effect the change. with integration with the Public Transport system, like the “Ayalolo” buses, so that priority can be given to public transport at the intersections. Cameras are also being installed to capture traffic light violations, meaning that the Police Service will have in their possession real-time evidence to help them in their prosecutions of motorists, who jump red lights, and, thus, help bring sanity to the roads (<https://constructionreviewonline.com/>)

These improvements in the traffic management system are worth noting, however, this is inadequate to ensure a radical shift from the current state of affairs which is

characterized by long waiting times and disruption of free flow across the urban areas of the city. In making considerable efforts at mitigation, some major decisions would have to be taken in the direction of policy interventions in a strategic manner so as not to distort the current harmonious relationship between the private transport operators and the government of the day. This may seem normative in economic theory but the practice of positive economics by government more often than not results in agitation which endangers the peaceful coexistence in societies concerned.

#### ***4. Urban Transport Governance Challenges***

As suggested by Kumar & Barrett, the creation of a Metropolitan Transport Authority greatly enhances the functioning of transport systems (Kumar & Barrett, 2008a). The current state of affairs requires the establishment of an institution solely dedicated to Urban transportation in the study area to have some meaning and rapid improvements. This however seems farfetched in the short-run as it requires massive restructuring of several institutions concerned.

Before 2016, governance of the Ghana Transport Sector was divided between two entities; the Ministry of Transport (MoT) and the Ministry of Roads and Highways (MRH) which together, were expected to ensure the running of the transportation sector through collaboration at all levels. Currently, governance of the Ghana Transport Sector is divided between four Ministries, Ministry of Roads and Highways (MRH), Ministry of Transport (MoT), Ministry of Aviation (MoA) and Ministry of Railway Development

(MoRD). This was necessary, according to the current administration, to ensure a speedy development of these two seemingly neglected sub-sectors and facilitate their rapid development without any hindrance. An action which requires replication in relation to governance of the urban transport sector to ensure focus and maximum efforts at solving the severe traffic situation plaguing the urban centre of Accra.

### ***5. Rural Urban Migration***

In a recent study conducted by (Yeboah, 2020) on rural-urban migration involving 30 young migrants in Ghana, more light was thrown on the reasons why youth migrate to the urban centre of Accra. These reasons were summed up in the future aspirations of these youth who engage in economic activity as a means to ends such as higher education to gain formal employment in the near future or to establish their own small scale businesses in the capital where they are most certain they would be successful. The economic activities undertaken by these youth include head portering (Kayeyei), construction work, scrap dealing, driving (includes being a paratransit drivers assistant or bus station worker), photography, item repairs or multiple jobs just to realize their dreams. If successful, remittances from these youth to their communities will encourage more youth to “try their luck” at achieving success in Accra, hence, the cycle continues.

## **4.5 Impact on the Metropolis**

### ***1. Proliferation of unapproved means of transport***

Traffic congestion in the Accra metropolis is forcing a shift in the medium of transportation from the regular public transport services to motorcycle by most road users who do not want to get caught in the traffic. This is however a challenge as the road traffic regulation of Ghana {L.I. 2012 (L.I. 2180), regulation 128 (1,2,3)} prohibits the use of motor bikes for commercial purposes. Nonetheless, the unbearable nature of traffic congestion is gradually establishing and entrenching the motorcycle or “okada” as it is popularly called, as a means of transport in the metropolis. Table 4 and Figure 12 show the vehicle registration in Ghana by categories with motor cycles taking the largest proportion of number of registrations annually, followed by Private Motor Vehicles of up to 2000 Cubic Capacity (cars).

**Table 4. Vehicle registration by category (2000-2019)**

TRICYCLE	PTE MV UPTO 2000CC	COMM MV UPTO 2000CC	PMV ABOVE 2000 CC	CMV ABOVE 2000 CC	PRIVATE BUSES & COACHES	COMM BUSES & COACHES	R/C TRUCKS UPTO 16TONS	R/C TRUCKS FROM 16-22 TONS	R/C TRUCKS ABOVE 22 TONS	ART TRUCKS UPTO 24 TONS	ART TRUCKS ABOVE 24-32 TONS	ART TRUCKS ABOVE 32 TONS	TRACTOR & EQUIPMENT	COMBINE HARVESTERS	CONS EQUIP	MINING EQUIP
	27,552	5,104	5,196		5,469		1,428	395	229	120	305	126	337	30	149	1
	17,953	5,568	5,343		2,676		861	367	234	136	251	122	303	4	136	2
	18,512	6,015	7,143		2,601		1,044	300	281	138	201	168	206	36	172	10
	20,564	5,110	7,778		2,916		914	292	326	116	447	510	158	77	46	29
	20,333	7,642	7,189		4,882		2,065	603	442	447	376	489	510	20	56	11
	22,949	6,686	8,715		5,585		2,457	420	543	551	374	454	140	192	68	7
-	<b>23,806</b>	<b>7,249</b>	<b>11,127</b>	-	<b>7,399</b>	-	<b>2,747</b>	<b>475</b>	<b>1,024</b>	<b>269</b>	<b>188</b>	<b>637</b>	<b>320</b>	<b>154</b>	<b>489</b>	<b>16</b>
-	<b>29,633</b>	<b>7,757</b>	<b>15,296</b>	-	<b>9,791</b>	-	<b>3,586</b>	<b>669</b>	<b>1,240</b>	<b>160</b>	<b>342</b>	<b>659</b>	<b>259</b>	<b>154</b>	<b>151</b>	<b>11</b>
-	<b>31,628</b>	<b>7,040</b>	<b>17,374</b>	-	<b>11,737</b>	-	<b>3,997</b>	<b>861</b>	<b>1,303</b>	<b>89</b>	<b>284</b>	<b>566</b>	<b>171</b>	<b>266</b>	<b>287</b>	<b>19</b>
-	<b>25,128</b>	<b>7,868</b>	<b>17,414</b>	-	<b>8,810</b>	-	<b>3,130</b>	<b>933</b>	<b>1,120</b>	<b>134</b>	<b>414</b>	<b>352</b>	<b>1,411</b>	<b>195</b>	<b>159</b>	<b>17</b>
-	22,444	8,321	17,442	-	9,506	-	3,898	1,509	907	334	380	533	305	171	325	6
-	44,220	14,208	14,530	484	2,958	4,793	4,315	2,368	967	241	676	1,120	625	137	344	13
-	30,294	23,181	22,886	763	4,290	6,950	3,497	2,609	2,796	78	374	856	957	0	0	0
-	35,099	29,971	29,074	969	5,390	8,731	3,318	1,995	2,214	325	458	821	995	0	0	0
-	36,253	16,933	22,465	749	3,631	5,882	2,398	1,562	1,363	246	808	240	1,181	0	0	0
-	27,073	12,215	20,822	694	2,918	4,726	2,745	686	1,096	287	148	355	701	0	0	0
-	26,391	12,800	22,760	758	2,316	3,752	3,820	1,143	1,632	320	3,307	2,168	423			
8,174	32,619	12,873	21,607	746	2,628	4,964	1,841	1,004	1,199	503	450	234	226	34	36	306
20,650	37,142	14,582	22,742	1,209	2,341	6,820	3,247	2,586	2,325	1,712	973	671	403	13	344	253
22,600	35,858	15,800	19,922	230	1,503	5,960	1,192	1,793	1,048	283	416	596	449	12	523	1,606

Data source: Driver and Vehicle Licensing Authority, Ghana

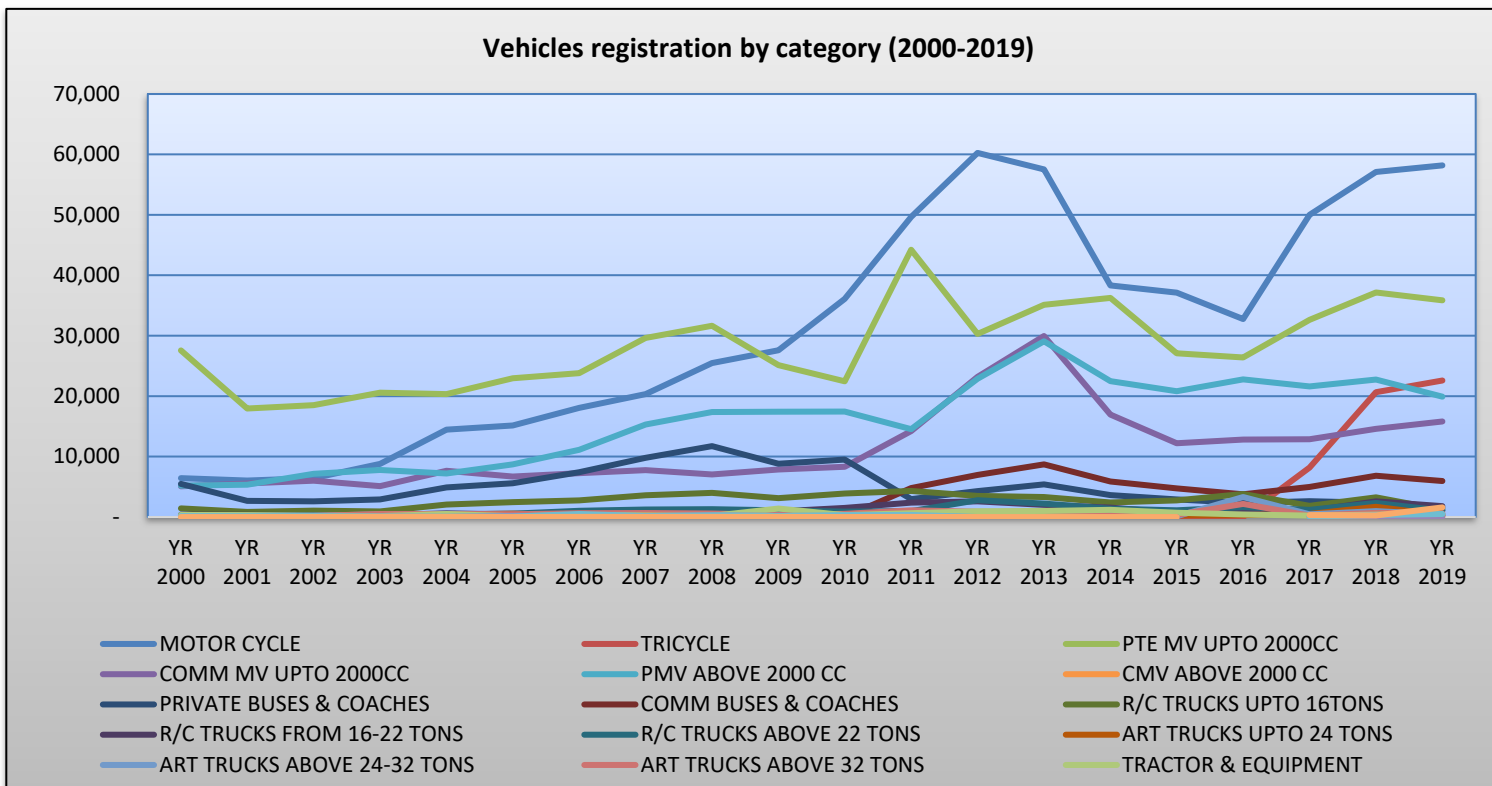


Fig 12

Source: DVLA, Ghana

● Motor Cycle	-	Motor Cycles of All Categories
● PTE MV up to 2000cc	-	Private Motor Vehicles Up to 2000 Cubic Capacity
● COMM MV up to 2000cc	-	Commercial Motor Vehicles up to 2000 Cubic Capacity
● MV above 2000cc	-	Motor Vehicles above 2000 Cubic Capacity
● Buses & Coaches	-	Buses & Coaches of All Kinds
● R/C Trucks up to 16tons	-	Rigid Cargo Trucks up to 16 Tons
● R/C Trucks From 16 - 22 Tons	-	Rigid Cargo Trucks from 16 -22tons
● R/C Trucks above 22tons	-	Rigid Cargo Trucks Above 22 Tons
● Art Trucks up to 24tons	-	Articulator Trucks up to 24 Tons
● Art Trucks from 24-32tons	-	Articulator Trucks from 24-32 Tons
● Art Trucks Above 32 Tons	-	Articulator Trucks above 32 Tons
● Agric Equip	-	Agricultural Equipment
● Combine Harvesters	-	Combine Harvesters
● Cons Equip	-	Construction Equipment

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*Fig 4: Authors preparation*

*Data source: Driver and Vehicle Licensing Authority, Ghana*

Concerns have been raised due to the numerous dangers associated with the use of these motorcycles for commercial purposes. Particularly the increasing spate of road accidents involving motor bikes or Okada which almost always ends in fatalities or permanent disability. Attempts by traffic management authorities to clamp down on this unapproved alternative have proven difficult if not impossible due to its popularity among commuters as the best means of avoiding the rush hour traffic. The shift from public transport means such as scheduled buses and paratransit considerably reduces revenue to these services resulting in loss of revenue to the state in general. The low patronage of some these interventions by the state has also necessitated the grounding of several buses which could not sustain their operations.



## ***2. Time loss and associated challenges***

Time loss is a major impact of traffic congestion and this impacts on supply and logistics as well as schedules of activities in the metropolis. It also creates uneasiness and adversely affects output of employees in the metropolis who often arrive to work late and exhausted. However, the most noticeable impact is the inability of scheduled buses within the area to run the scheduled system to perfection or close to perfection. This is due to frequent delays resulting from traffic congestion arising from competition from other motorists, making it unattractive to commuters within the metropolis. Every aspect of life and function within the metropolis is adversely affected by the worsening state of traffic congestion in the Accra metropolis as all these are interrelated.

# **CHAPTER 5**

## **URBAN PLANNING ACROSS THE FIVE SELECTED CITIES**

### **5.1 Introduction**

As noted by Kumar & Barrett, the effectiveness of an urban transportation system is directly linked to urban planning, construction and maintenance of infrastructure and the organization of transport services (Kumar & Barrett, 2008a). This chapter therefore takes a detailed look at urban planning in the five cities, highlighting some of the major features which have implications for the area of focus for this research. The elements of comparison will be discussed in detail in relation to these cities and a summary of findings presented by means of a table.

The purpose of this comparison is to examine the status and functioning of the various elements of comparison in the five selected cities and to determine how Accra is applying these elements from the theoretical and empirical researches undertaken on these case studies.

### **5.2 Urban Planning**

The urban system contains a city's history, traces of different urban growth, significant planning and social processes etcetera with each formation producing some specific

properties and relationships worthy of being studied to foster understanding of underlying processes that molded the city (Rejeb Bouzgarrou, Claramunt, & Rejeb, 2019). In addition, urban planning involves a decision-making process in which goals and objectives are established, existing resources and conditions analyzed, strategies developed, and controls enacted to achieve the goals and objectives as they relate to city and community development (Davidson & Dolnick, 2004).

Urban planning evolved as a complex set of ideas that guide both planning decision making processes and urban outcomes, aimed at achieving some social, political or environmental objectives. It is an activity that can solve many major urban problems and is a significant management tool for dealing with the unprecedented challenges facing 21st-century cities and attaining the goals of sustainable urbanization (UN-Habitat 2009)

Rapid urbanization necessitates formidable urban plans to ensure sustainable city life and protection from all forms of hazardous effects on cities and inhabitants. The most recently developed term to foster this goal is resilience, describing the ability of a city to withstand all forms of shocks as a formidable unit. The composition of a city are various systems such as waste treatment and environmental protection; transportation system; food supply system; water supply system; early warning system; health, wellbeing and housing system; transport, communication and accompanying infrastructure, energy as well as risk reduction for floods, landslides and sea inundation, which together, ensure its sustainability (UNDRR-UNOSSC-PAHO, 2020). It is therefore essential that each system functions at optimum level for the attainment of this goal.

The cities in question, are located in countries with increasing urban populations with the exception of Egypt, which exhibits a declining trend from 42.797% to 42.704% as depicted in Figure 13. The figure also depicts that Tunisia has the highest urban population in relation to its overall population, followed by South Africa as compared with the other countries, with Ghana also following a very rapid trend. From the chart, Kenya has the least urban population relative to its overall population. Finally, Nigeria has a higher urban population than Egypt, in relation to the overall populations but less than Ghana relatively. Thus, with the exception of Egypt, the chart depicts increasing urban populations across these countries.

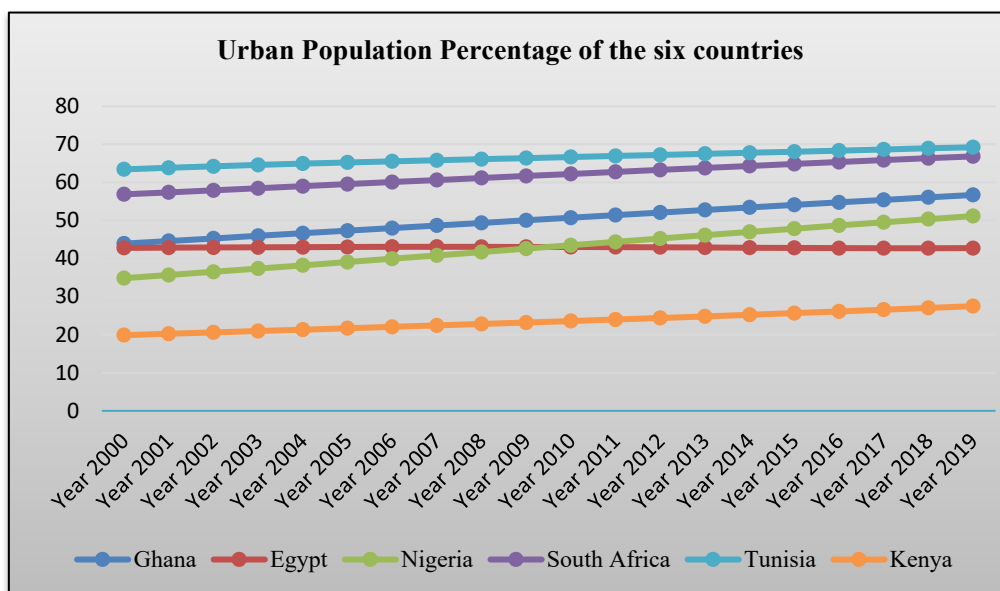


Figure 13 (Author's preparation)

Data source: World Development Indicators

### **5.3 Urban Planning in Nairobi, Kenya**

As at 2019, Nairobi's population was estimated at approximately 4.4 million (Statistics, 2019). High inequality between rich and poor, water and sanitation challenges as well as electricity due to difficult access to basic facilities are some of the socio-economic challenges Nairobi is facing (school and public health services), with a limited functional public space. Like many capital cities, rural-urban migration has been closely associated with Nairobi's rapid urban population growth which has in recent times transformed into natural urban increase. Adding to Nairobi's population is a large population of refugees, considered part of the total urban population.

Subsequent to the development of the national development plan, VISION 2030, which emphasizes society, economy, and politics as its main areas of focus, the Kenyan government sought to develop, first and foremost, develop Nairobi city into an economic hub to facilitate the development of the rest of the country in a sustainable manner, however, a revision of the Nairobi urban development master plan has failed to materialize since its completion in 1973. This has adversely impacted on many other issues and decision in relation to most recent urban development strategy for Nairobi city (TANAKA et al.).

As part of plans to accelerate the development of the city, there was the establishment of the Ministry of Nairobi Metropolitan Development and creation of the counties in 2008 and 2010 respectively. As far as planning is concerned, the new local government has some autonomy and boundaries of the county were created to correspond to that of

the previously existing districts. Another important feature is the introduction of the highway classification system in 2016, thus, empowering the counties to manage local highways. The creation of the Nairobi Metropolitan Area Transport Authority followed in 2017 and was a joint transportation authority consisting of the five counties in the Nairobi Metropolitan Region as well as the central government.

With the assistance of the Japan International Cooperation Agency (JICA), Kenya has been successful in the development of an Urban Master Plan using traffic surveys involving information on car and motorcycle ownership, and household membership (household characteristics); individual information e.g. age, sex, occupation, etc. (individual characteristics); person trip information by transport modes, travel purposes, individual characteristics and origin and destination (OD), and level of services (LOS) of transport modes (TANAKA et al.).

Participatory urban planning has been a major feature in Nairobi involving Non-Governmental Organizations, government and community-based organizations under the technical guidance of United Nations Habitat from 2013. Under this program, the Minecraft technology has been employed as a community participation instrument involving application of three-dimensional models and "Block by Block" method or approach. Three main projects have been undertaken in Kibera, Dandora and Ruiru by utilizing community participation to create safer communities through renovation of public parks (Jeevanjee Gardens), streets (Dandora model street) and pedestrian areas (Ruiru Pedestrianization Project) (Block by Block, 2015).

Following the implementation of the Structural Adjustment Programmes of 1980s, there was a shift towards government deregulation and an enablement approach which also influenced major shifts in urban planning practice and urban governance. The role of private sector has since increased. In contemporary urban development, private sector actors have increased their stake in decision making on matters related to land use planning, and the provision of public goods such as infrastructure, services and amenities (Habitat, 2018).

#### **5.4 Urban Planning in Lagos, Nigeria**

Lagos is the largest city in Africa by population. Like most capital cities, Lagos witnessed rapid population and urban growth prior to its replacement with Abuja and in subsequent years. This is as a result of far-reaching economic activities that draw immigrants into the city. Lagos remains the only Nigerian city to have reached a total population of one million by 1965, maintaining that status until the end of 1970 (Abubakar & Doan, 2017). Between 1980 and 2010 the population of Lagos increased from 2.57 million to 10.78 and it is expected to reach approximately 16.17 million by end of 2020 and to 24.24 million by 2030, equating twice the added populations of Kano and Ibadan cities. This is seen as highly probable due to an annual growth rates of 5–13%, which is seen as capable of increasing the population of Lagos to reach 33.63 million in 2050 and 61.03 million in 2100, making it the sixth largest city in the world by population (Hoornweg and Pope 2014, pp. 9–12).

Most recent statistics indicate that about 90% of the population of Lagos State reside and work in Lagos Metropolitan Area, representing approximately 7.5% of the total population of Nigeria (Abubakar & Doan, 2017). Development of the Lagos Metropolitan Area was based on the 1979 master plan, which included a framework for planning and developing the metropolis. Among its recommendations is the expansion of existing public infrastructure and amenities to withstand the impact of increasing population on same, setting up economic centers and construction of 1.4 million housing units (Morka, 2007). Full implementation of this plan however did not occur over the years and until its expiration in the year 2000, very little infrastructure coupled with under 10% of the identified housing requirements were constructed (Abosedo, 2006). A number of factors were responsible for the failure of governments to fully implement these plans and ranged from internal to external factors.

The external factors were centred around the economic embargo placed Nigeria by the international community as a result of political instability in the country between 1993 and 1999 which led to inadequate funding of projects. Oil revenue and foreign direct investment were negatively impacted by this situation. The internal factors were in the form of lack of proper procedure in the design and intended implementation of the plan including a neglect of slums and areas inhabited by the poor to favour elite vicinities (Elias & Omojola, 2015). Another factor was the disregard for town planning approval as unapproved developments were widespread especially with collusion from agency officials (Oduwaye 2009).



A recent effort at resolving the urban planning challenges of the Lagos Metropolitan Area is the Lagos State Development Plan (LSDP) from 2012–2025, that prescribes sustainable urban development through economic, social and infrastructure development as well as security (Nwagwu & Oni, 2015). Unfortunately, the fate of this plan did not seem different from the older master plan after five years of its birth (Dano et al., 2020).

In addition, the Lagos Geographic Information System (LAGIS) was introduced to facilitate decision making in relation to urban management specifically in the area of neighborhood and transportation planning by employing digital mapping techniques and Geographical Information System database for Lagos Metropolitan Area (Agunloye & Oduwaye, 2011). The database provides essential information about existing properties to Planners and surveyors who require them and precludes multiple sale of properties. There are however accessibility challenges as this database could only be accessed by a few officials at the initial stage (Dekolo & Oduwaye, 2011).

## **5.5 Urban Planning in Cairo, Egypt**

In relation to urban planning in Cairo, General Organization for Physical Planning (GOPP) of the Ministry of Housing, Utilities and Urban Development (MOHUUD) is mandated to formulate the general policy for planning and sustainable urban development; prepare plans and programs for this purpose at national and regional levels and also revise urban plans at the local level. A regional center under GOPP is responsible for planning and urban development in each economic region of the country.

The regional center ensures that departments in governorates receive technical support and pursue the operation of plans of cities and villages. Greater Cairo Region Urban Planning Center (GCRUPC) as the regional center, takes responsibility for GCR (JICA). Cairo Transport Authority (CTA), an affiliate with Cairo Governorate is most of all an economic agency . Provision, operation and maintenance of mass public transit is the sole responsibility of the Cairo Transport Authority. Among its vehicles for operation are large buses, minibuses, and means of river transport such as ferries. In addition, regulation of the modes of transportation owned and operated by the private sector under the name of the ‘Mass Transit Project’ in the Greater Cairo region is its responsibility. Another important function of the CTA is the specification of routes for the private sector companies to operate on. All private companies are expected to pay fees annually for eligibility to use CTA bus stops and terminals (Abdel Wahed Ahmed & Abd El Monem, 2020).

One shortcoming of the planning and decision-making for transport projects even with the numerous actors involved in this process is that long-term transportation planning is not integrated with strategic urban development planning (World Bank 2000). The nonexistence of a complementary agency for General Organization for Physical Planning (GOPP), responsible for enormous land-use and urban development plans, makes long-term harmonization between transport and urban development plans rather absent (Ibid). This condition has adversely impacted on the planning of new satellite cities constructed nearby Greater Cairo (Urban Mobility in Cairo: Governance and

Planning, February 1, 2017) .

There are varying means of transport across governorate due to factors including population size, extent of urbanization , economic standing, city status, etcetera. As such in rural areas, motorcycles, bicycles , animals (mainly donkeys) and walking are preferred to vehicles or buses, unlike in the urban areas. Ownership of means of transportation are classified as follows in Egypt: Nile Ferry, Train, Tram, Metro and Buses are by public ownership; Mini-bus are by public & private ownership; Micro-bus, Taxi, Uber Careem, Motorcycles, Bus between governorates, Bicycles, Tuktuk, Suzuki, Animals (horse & donkey) and Boats are all by private ownership (Abdel Wahed Ahmed & Abd El Monem, 2020). For the purpose of this paper however, we focus on the forms that utilize the land and rail modes of transportation.

On traffic management and control, a Traffic Unit under the Directorate of Housing and Utilities in the governorates responsible for engineering and design services for specific projects is mandated to carry out this responsibility. Complementing the effort of this unit is a Traffic Police Department within each governorate. This department though technically falls under the Ministry of Interior is not under the direct supervision of the governor but reports to the governor nevertheless (World Bank 2000). The Traffic Police departments are responsible for the issuance of drivers' and vehicle' licenses as well as enforcement of traffic laws. Above all, they partake in the approval process of traffic management schemes like parking restrictions and also speed limits, which are monitored by the police departments. Licensing of Microbus route is done by

governorates in whose jurisdiction that route runs in accordance with the relevant traffic police departments (Urban Mobility in Cairo: Governance and Planning, February 1, 2017).

## **5.6 Urban Planning in Tunis, Tunisia**

City management in Tunisia is governed by the Land and Town Planning Code (CATU). Its determination of environmental planning and management instruments is based on a model passed on from the French tools and methods. Since the year 1990, town and transport planning exercises for the Tunis metropolis have multiplied. Among important plans is the Greater Tunis Urban Development Plan (SDA) which is scheduled to run until 2021 and initiated in 1995 in matching with the drafting of the national land planning programme and the Regional Transport Master Plan (PDRT), tailored according to the Greater Tunis SDA. Planning of the urban transport systems in Tunisia is based on the periodic collection of data such as domestic surveys and Urban Travel Plan-type methodological approaches copied from the French model (PDU)(Houpin, 2010).

Urban development has gradually made it to the outside of city centers in Tunisia. This caused a discrepancy in the geographical distribution of economic activity (workplace) and residential centers. Thus, it put undue pressure on roads leading to the city center, for example, the western peripheral covers 37% of the population of Greater Tunis and offers only 12% the jobs of its population. This development required a reorganization

of the supply of transport links and the conduct of large investments accordingly. The efforts were made through the network extensions of the metro, with the future “Fast Rail Networks” and “the Sfax metro” projects. In addition, the car park has almost doubled between 1996 and 2008 to over 1.3 million vehicles, at the end of 2013. The park has about 1.74 million vehicles. Car registration was at a rate of 10,000 vehicles per year in 1960, at the moment; it concerns nearly 60,000 vehicles per year since 2006. The increase in the fleet has resulted in a growing use of individual cars. The share of individual transport in Tunis and two other cities of Sfax and Sousse was about 60-70% against 30-40% for public transit. This finding has negative impacts on various parameters, for example, the increasing fuel consumption due to a difficulty of driving on the congestion road, the risk of accidents and the decreasing of the efficiency of public transportation with more irregularity and less punctuality

The inequity in the distribution of economic centers and residential areas also created a high demand for movement. These repercussions demonstrated the appeal of introducing a sustainable transportation concept throughout the urban planning process. As a way of preventing any imbalances between supply and demand for transport, the UDM created projects for development of public transportation in urban areas, with the aim of organizing and controlling the private cars of major cities in urban Tunisia. The UDM developed strategies to limit the access of individuals' cars in the cities center by the implementation of major public projects. Projects that were planned include the project

implementation of Fast Rail Networks to serve the towns surrounding the city of Tunis (Borj Cedria Fouchana, Mouhammdia, M'nihla, North Aiana, Ezzouhour, Zahrouni, Sejoumi). This network will provide one-third of public transit in Greater Tunis. Other projects include the extension of Metro lines towards the Ennasar and Ain Zaghouan neighborhoods and Implementing auto fleet management software in the public transport operators. The planning process in Tunisia provides that each city has its own management plan.

Finally, the Tunisian National Police and National Guard are tasked with the responsibility of regulating traffic and ensuring road safety(Lutterbeck, 2015). For this reason, it is a well-known fact that Tunisia has one of the best Traffic management and law enforcement units in Africa.

## **5.7 Urban Planning in Cape Town, South Africa**

Cape Town is a rapidly growing middle-income city of approximately 4.2 million residents. It has an ethnologically diverse population consisting of 46% Black Africans, 40% people of mixed parentage, 13% Whites and 1% Indians/Asians. The city has an annual population growth rate of 2.4%, mainly resulting from emig ration from South African rural areas and other African countries. It is characterized by high levels of poverty and acute income inequality (which is highly correlated with race) from past Apartheid policies. Consequently, the Gini index for Cape Town is among the highest in the world, at 0.62 in 2017 (Pfeiffer, Rabe, Selod, & Vigiúí, 2019)

South Africa's past continues to impact the country's drive towards democratized habitation. Cape Town's spatial splits of colonialism and apartheid contribute to an unequal and segregated geospatial existence. In an effort to address this urban challenge, the Cape Town Partnership developed the Central City Development Strategy (CCDS), a ten-year plan that calls for the densification of the central city to re-plan Cape Town into a much more all-inclusive and sustainable city. In a critical examination of the role played by all-inclusive housing policies, public transportation, and increased economic opportunities in a more sustainable form of urban development, Fleming & Makalima-Ngewana emphasise the need to expand the way in which planners approach urban design to take on a more holistic and partnership-based approach (Fleming & Makalima-Ngewana, 2013)

Cape Town thrived as the administrative and economic hub of the Cape Colony, and also as the legislative capital of the country. It had numerous media, logistics, cultural, educational, property, manufacturing, financial and tourism activities (Bickford-Smith, Van Heyningen, & Worden, 1999). During this period, textiles and clothing were particularly and predominantly important. Cape Town also grew with the head offices of large companies in financial services, business services in retailing and oil refining. Mining also impacted immensely on social and political transformations, not forgetting the harsh apartheid system of legalized racial discrimination and subjugation. This influenced urban development for a century through various forms of socio-spatial engineering. A notable feature was the 'pass' system, which is a means of population registration which made it mandatory for blacks to acquire and carry permits {Turok,

1994 #209}. The aim of this system was to discourage employees from contravening their employment contracts and restricted the movement of blacks to urban areas, The colonial (apartheid) policies of racial segregation left a legacy of fragmented urban form with unequal access to job opportunities, basic social amenities and services. The aftermath of apartheid has seen no changes due to the robustness of the established status quo, power of vested interests, pervasive income inequalities with regard to races and no or restricted upward mobility {Todes, 2018 #210}.

As of 2016, Cape Town had 11,700 km of roads, making it a vehicle-centred city in which paratransit dominated (TCT, 2016). The share of transit options for the city were divided into (i) privately owned cars (48%), (ii) minibus taxis (15%), (iii) passenger trains (11%), (iv) contracted buses for public transport (7.9%), and (v) Bus Rapid Transit (percentage not available), and non-motorised transit (percentage not available) (TCT, 2016). 21% of the Cape Town's population identified walking as their primary means of transportation (TCT, 2016). Cape Town has experienced rapid transformations in its transportation system, mainly from implementation of the Myciti Bus Rapid Transit network which contributed 15,175,980 passenger trips in 2015, in comparison with an estimated 621,833 passenger trips daily by passenger rail, amounting to about 13 million passenger trips per month counting weekdays alone (TCT, 2016). In an attempt to completely revolutionize the entire transportation system of Cape Town, the Transport for Cape Town Directorate (TCT), launched in 2012, set out to operationalize a data-based transit plan for the city of Cape Town.



In relation to other major South African cities, Cape Town's public transport system was significantly different, especially in the degree to which the peripheral passenger rail service had been sustained as the dominant mode in the city, contributing to 54% of the daily public transport passenger trips, in comparison with 29% supplied by all minibus-taxis and 17% by scheduled bus services. In other cities, minibus taxis are dominant as a means of transportation, contributing to as much as two thirds of daily public transport passenger trips. In this case, the passenger rail and scheduled bus services are limited to varying proportions of the remaining third (Wilkinson, 2010).

The city of Cape Town, the oldest city in South Africa, upon realizing the immense benefits of the Bus Rapid Transit System and the heavy rail, developed a framework document to implement the principles laid out in the national Integrated Rapid Public Transport Network (IRPTN) which necessitated the introduction of the BRT system popularly known as MyCiti, while outlining a phase-by-phase implementation of a network of trunk and feeder routes across the municipal area (Schalekamp & Behrens, 2013). A fleet of modern buses then replaced existing scheduled buses and unscheduled minibuses, and trunk-route buses would run in dedicated lanes. This separation was expected to resolve conflicts with general traffic for road space, and ensure the replacement of all road-based services with an integrated, contracted bus service without the past level of competition. Furthermore, capacity building programs were organized for paratransit operators for absorption into the newly established government transport services to serve the people of Cape Town (Schalekamp, 2017)

The City's transport authority (Transport for Cape Town), also commissioned feasibility studies into an appropriate business model of a bike sharing service (Jennings, 2015). In an initially operated model by Up Cycles, a private establishment, users rent bicycles at one hub and return it to the other. This system was however manually operated and would perhaps pose challenges in other parts of Africa if the model is replicated without modification to the mode of payment.

The Cape Town Metro Police work to enforce traffic laws, regulations and general crime prevention procedures and processes . Their function is different from that of the South African Police as their emphasis is more on crime prevention and mitigating causes. Crime investigation is not within their mandate but in addition to enforcing traffic laws, they assist in combating crimes such as murder, rape, theft and illegal drug use.

## **5.8 Table of Comparison**

Below is a table of comparison of Urban planning across the six cities with further details in terms of the specific variables being compared which form the fundamental elements of urban transport systems.

**(Table 5) Table of Comparison of Transport Systems across the Six Cities**

<b>City</b>	<b>Urban Planning</b>	<b>Urban Transport Governance</b>	<b>Transport Services</b>	<b>Transport Infrastructure</b>	<b>Traffic Management and Control</b>
<b>Cairo</b>	<p>General Organization for Physical Planning (GOPP) of Ministry of Housing, Utilities and Urban Development (MOHUUD) is the body responsible for urban planning.</p> <p>Greater Cairo Region Urban Planning Center (GCRUPC) as the regional center takes responsibility for GCR. It provides technical support for departments in governorates and sees to the operationalization of the plans of cities and villages</p>	<p>Cairo Transport Authority (CTA), is an economic agency allied with Cairo Governorate.</p> <p>Responsible for ; Providing, operating, and maintaining mass public transit.</p> <p>Regulating the modes of Transport.</p> <p>Operates buses and Nile Ferries. Directorate of Roads and Transport which falls under Ministry of Transport is responsible for street maintenance</p>	<p>Bus (public ownership); Mini-bus (public &amp; private ownership); Micro-bus (private ownership); Metro (public ownership); Taxi, Uber, Careem (private ownership); Nile Ferry (public ownership); Tram (public ownership); Motorcycles (private ownership); Bus between governorates (private ownership); Bicycles (private ownership); Tuktuk (private ownership); Suzuki (private ownership)</p>	<p>Functional but inadequate railway system as well as dedicated lanes for BRT buses</p>	<p>Traffic Unit within the Directorate of Housing and Utilities in the governorates which is tasked with engineering and design services for specific projects</p> <p>Traffic Police Department within each governorate, which technically falls under the Ministry of Interior sees to enforcement of traffic laws.</p>

<b>Cape Town</b>	Cape Town City Council responsible for planning of the city of Cape Town. Working with ten-year plan that seeks densification of the central city to re-plan Cape Town into a more livable, inclusive and sustainable urban space	Transport for Cape Town (TCT), Integrated Rapid Public Transport Network (IRPTN)	Integrated Rapid Public Transport Network (IRPTN), introduced BRT service.  Proportion of transport forms: (i) private cars (48%), (ii) minibus taxis (15%), (iii) passenger trains (11%), (iv) contracted buses (7.9%), and (v) rapid bus transit (no proportion offered), and non-motorized transit (no proportion offered) (TCT, 2016). 21% of the population identify walking as their primary form of transportation. Estimated 621,833 passenger trips per day by passenger rail. Passenger rail offers 54% of the daily public transport passenger market, as against 29% supplied by minibus-taxis and 17% by scheduled bus services 15,175,980 passenger trips in 2015.	Fully functional railway system and dedicated lanes for BRT buses. Also possesses adequate infrastructure for NMT. 11,700km of roads	The Cape Town Metro Police, work to enforce traffic laws, by-laws and to prevent crime within the city in general.
<b>Lagos</b>	Lagos Geographic Information System (LAGIS) was introduced to aid decision making for urban management, including community and transportation planning through digital mapping and enterprise GIS database for the entire State. Lagos State Development Plan (LSDP) for 2012–2025 that recommends sustainable urban growth via socioeconomic and infrastructure development and security	Lagos Metropolitan Area Transport Authority (LAMATA), established to manage Lagos urban transport projects and enhance the State's ability to resolve its transportation challenges, such as road infrastructure maintenance and rehabilitation, road safety and the environment.	Roughly 70 percent of motorized trips are undertaken via paratransit and are divided as follows: buses (82 percent), taxis and cars (13 percent), and motorcycles (5 percent).BRT system ensured 35% reduction in commuting and waiting times, respectively, and providing 1000 direct and about 0.5 million indirect jobs between 2008 and 2013. Currently supports over 350000 commuters daily  Over 83,000 molues (buses), 75,000 danfos (minibuses), bus rapid transit, 8,000,000 okadas (motorcycle taxis), Keke NAPEPs (tricycles), ferries and limited rail network.	Designated routes for BRT buses, road network of at least 2600 km of roads plied by over one million vehicles daily km and paved road density of 400 meters per 10,000(2010).With vehicular density of about 200 vehicles/km2. Functioning but limited rail network	Lagos State Traffic Management Authority (LASTMA) tasked with traffic management to ease congestion within the metropolis

<b>Nairobi</b>	Ministry of Nairobi Metropolitan Development established to resolve challenges of institutional fragmentation. Two main kinds of document: strategic “Vision” documents and “Master Plans.” Long-term metropolitan scale vision document named Nairobi Metro 2030. Transportation planning is incorporated into broader planning documents. 2003 transport plan concentrated on road and railway transport infrastructure. 2006 Master Plan for Urban Transport in the Nairobi Metropolitan Area (for 2025)	Nairobi Metropolitan Area Transport Authority, a joint transportation authority between the five counties in the Nairobi Metropolitan Region and central government. Highway classification system created in 2016 to authorize counties to oversee local highways	Over 350,000 matatus (mini-buses,buses), 1.2 million Boda bodas (bicycle and motorcycle taxis), State-owned BRT and Ride-hailing services (Uber, Little, Taxify, Dubai-based Mondo Ride, MaraMoja, and SafeBoda).	Functional but inadequate railway system as well as dedicated lanes for BRT buses	Transport Department of the Nairobi County Police, standard traffic control room.
<b>Tunis</b>	City management is governed by the Land and Town Planning Code (CATU), which determines the environmental planning and management instruments according to a model inherited from French tools and methods. Currently on the Greater Tunis Urban Development Plan (SDA) to run until 2021	Societe des Transports de Tunis (TRANSTU). A consulting company for management of Regional Transport Master Plan (PDRT), tailored according to the Greater Tunis SDA public transport of Tunis.  Planning of the urban transport systems is based on the periodic collection of data such as domestic surveys and Urban Travel Plan-type methodological approaches copied from the French model	Tram which forms about 80% of public transport. It carries an annual total of 460 million passengers.  In addition, collective taxis and Bus Rapid Transit.  Most areas of Tunis are accessible by walking.	Functional but inadequate railway system. Connects the urban centre with the outskirts. Dedicated lanes for BRT buses. Availability of light rail.	Tunisian National Police and National Guard Regulate traffic and ensure road safety
<b>Accra</b>	National Development Planning Commission (NDPC) in consultation with stakeholder institutions develop long term National Developmental	Ministry of Transport and Ministry of Roads and Highways.	Metro Mass Transit Ltd. (Intra and Intercity), Intercity STC Ltd., Single Limited Rail Network, Volta Lake Transport Ltd. (Inland Water	Narrow roads in most areas with no designated route for BRT due to abandonment of BRT service in 2007.	Motor Traffic Transport Department of the Ghana Police Service responsible for enforcement of road

	<p>plans.</p> <p>Urban Planning of Accra is undertaken by the by the Department of Physical planning of the Accra Metropolitan Assembly</p>		<p>Transportation along Volta River), Paratransit (trotro), taxis</p>	<p>Railway line of 24 km, Limited routes for NMT</p>	<p>regulations. Mainly manually operated traffic lights with traffic control room overseeing few number of traffic lights.</p>
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## **5.9 Discussion**

The answer to the question of why the urban transport system of Accra seemingly lags behind in relation to the above comparison lies in the history of urban transport in Ghana which began in Accra in 1961 with the enactment of the Local Government Act of 1961. This led to the establishment of the Omnibus Service Authority (OSA) to develop infrastructural facilities such as bus terminals, buses, and rolling stocks for the movement of freight and passengers in Ghana's urban centers.

Unlike these other African cities, three state-owned transport operators under the then Ministry of Transport and Communication, namely; the State Transport Corporation (STC), the City Express Service (CES) and OSA which were established to improve the sector later collapsed due to financial losses and mismanagement. Going forward, conditional access to loans to revamp certain sectors in the 1980s required divesting state-owned enterprises which led to the divestiture of the OSA causing the informal or paratransit sector to fill the niche created.

In the 1980s, the government of the republic of Ghana ensured unionization of the paratransit sector and handed operation of terminals over to the largest paratransit (trotro) union, the Ghana Private Road Transport Union (GPRTU). Additionally, the local government which had authority and revenue to establish a sustainable urban transport system lost its revenue and authority hence development urban became reliant on government funding which apart from being inadequate has several other alternative

uses.

The GPRTU has subsequently grown very powerful in terms of influence and competition that all efforts at establishing a sustainable urban transport system fail mainly due to difficulties implementation, calling for a change in mode transportation.



## **CHAPTER 6**

# **CONCLUSION, RECOMMENDATIONS AND LIMITATION OF STUDY**

The objectives of the study was to identify solutions to the vehicular traffic congestion facing the city of Accra in Ghana by comparing cases with five other African cities, namely; Lagos, Cape Town, Nairobi, Cairo and Tunis.

### **6.1 Summary of findings**

The findings on Urban planning, Urban transport governance, transport services, transport infrastructure and traffic management and control in respect of the selected African cities give an indication that road expansion, construction of parking spaces and other conventional methods often employed in an attempt to mitigate this occurrence are not the most appropriate for the city of Accra in that cities facing these challenges are resulting to more sustainable solutions.

These findings suggest that urban planning methods have evolved in these cities and particularly in Lagos where the application of the Lagos Geographical Information System (LAGIS) helps in neighbourhood and transportation planning through digital mapping. There is no indication of such as system being utilized in Accra as queries generally take a considerable amount of time to generate results.

In addition the study found that cities facing severe traffic congestion are moving towards establishing metropolitan authorities to manage urban transportation rather than a host of interrelated bodies often with duplicated functions. Such cities have relatively performed better in terms of organization than cities that have more than one entity responsible for urban transport.

In addition, the study identified that, in terms of transport services availability, the BRT system has been an essential part of public transportation in all the cities with the exception of Accra. The most successful of these cities in relation to urban transport is Cape Town which has successfully developed mass transportation means with rail transportation conveying a significant 621,833 passenger trips per day by passenger rail making up 54% of share of public transport. Transport infrastructure is widely available for these cities with the exception of Accra which has failed to maintain a dedicated route for a BRT service. The study also identified an extensive use of motorbikes in Nairobi to augment transport means and surmount the traffic situation. However, this solution is not feasible as the road traffic regulation of Ghana, Legislative Instrument 2180 of 2012, prohibits the use of motorbikes for commercial purposes.

In terms of transport infrastructure, these other cities have developed their BRT services and also possess dedicated lanes for this purpose. Another observation is that these other cities have developed and are progressively expanding their railway systems though some may be limited in terms of function, for example, the case of Nairobi. Cape Town has the most transport-related infrastructure in terms of adequacy for the cities. The

Tunis light rail has also achieved its objective of cutting down the number of car importation and

Finally, it is evident that traffic management and control is taken seriously by all these cities, thus, in the hands of the law enforcement agencies with traffic signals and control being developed or upgraded to standard requirements in all cases studied.

## **6.2 Conclusion**

Urban transportation in the city of Accra has been marred with several downturns resulting from inappropriate policy decisions as evidenced by the historical account and current state of the urban transport system. These decisions, in addition to precluding efficient running of the transportation system, have also impacted negatively on transport infrastructure designed to facilitate urban mobility and promote economic activity within the urban centres. It has therefore become necessary to design new ways of dealing with the challenge, and this we sought to do by examining the urban transportation systems of Lagos, Cairo, Tunis, Cape Town and Nairobi and come up feasible policy recommendation for the city of Accra.

As per the findings, the study concludes that the mass transit system of the city of Accra is underdeveloped in relation to all the other cities. The lack of a good passenger rail system and BRT system has put undue pressure on the roads in comparison with the passenger transport by BRT and passenger rail in the city of Cape Town. The study also

revealed that the establishment of a metropolitan transport authority should be the next step for Accra if the city intends to commit itself and a dedicated institution to rapidly mitigating the current level of traffic congestion experienced by commuters in general. Finally, the study concludes that the Motor Traffic Transport Department responsible for the enforcement of traffic regulations needs to be complemented with a standard traffic management system in all jurisdictions, in order to perform effectively and efficiently.

### **6.3 Recommendations**

Interventions in any situation must be self-sustaining and generally sustainable when dealing with developing countries; a lesson learnt from the implementation of projects which require huge funds to initiate but do not have the ability to rake in adequate revenue to run themselves particularly in Ghana. A specific example is the BRT system which had to be abandoned because it was not self-sustaining in the face of a less comfortable but a well-entrenched paratransit service. This notwithstanding, efforts must be made at improving the quality and reliability of transportation systems in the urban centre to improve the quality of life of people. For these reasons, the following recommendations are put forth as much more sustainable measures for the study area based on the findings:

## *Short-term measures*

### **1. Prioritization of Transportation Research**

Current data from transportation research based on which vital decisions could be made are unavailable. Specifically, data on trip duration, traffic congestion in the urban centres and its impact on the lives of inhabitants in relation to variables such as the cost per household, time loss, preferred means and mode of transport etcetera could go a long way in aiding decision-making processes in the urban transport sector. As practiced by Tunis, this could facilitate the development of the urban transport sector by providing the right information in relation to the impact of the current situation on commuters and help determine the appropriate forms of interventions to mitigate the current trend.

### **2. Enforcement of Bus lane**

The study recommends the enforcement of a bus lane and dedicated route for the BRT service which also has the advantage of transporting mass number of people and thus discouraging the use of privately-owned vehicles and less organized paratransit services. Currently, the lack of a dedicated lane (bus lane) on the roads creates room for competition between buses and especially the paratransit service. The impact is undue delays experienced by commuters who choose to patronize the Metro Mass Transit service. A dedicated lane with fares slightly lower than the going market fares would create an advantage for public transport buses and discourage

the patronage of other forms of road transport. In addition to creating a reliable and sustainable transport system, it would also raise the level of safety of commuters on our roads.

### **3. Absorption of paratransit drivers and assistants into the state-owned BRT**

In addition, in revamping and expanding the BRT system, paratransit operators should be recruited and trained to run the buses in order not to cause wide spread unemployment of paratransit drivers and their assistants (mates), a major reason for the retention of the paratransit service in the urban centres at the expense of a well-organized and safer transport form. This training would also ensure that operators in general act professionally in the discharge of their duties as opposed to the current trend in paratransit services. In so-doing, means of livelihoods would not be lost in the process of running the system. The city of Cape Town in South Africa was successful in applying this policy to enhance its urban transport system as suggested by the findings.

### **4. Development of Non-Motorized Transport (NMT)**

Non-Motorized Transport (NMT) in the form of bicycle sharing as introduced by the city of Cape Town should be developed in the city of Accra which has some level of NMT infrastructure though inadequate. This intervention however requires the development of walk and bicycle ways in the city with partnership from the

private sector in the running of this service. In addition to providing a cheaper means of transport for commuters in the city centre, it would also cut down on energy consumption and promote the health of commuters, being forms of exercise.

### *Long-term measure*

#### **5. Development of the Railway mode**

As a long-term measure the findings also suggest that the expansion of the city's railway system as a first step in developing a more robust and sustainable mass transit system is urgently needed. From evidence in Cape Town, this would reduce the number of vehicles entering the road system by transporting a larger number of people within the metropolis. Realizing that the cost involved in expanding the said railway network may be too high for government, we further recommend that Public-Private Partnership under Build, Operate and Transfer (BOT) be considered in achieving this objective. BOT has the advantage of ensuring the transfer of knowledge regarding operation, maintenance and efficient running of the system to employed Ghanaians who would later run the service unguided. For this reason, any agreement in furtherance of this must include a clause ensuring the recruitment of local staff by the proposed company.

### **6.3 Limitation of the Study**

In general the research helped realize some very useful findings on the subject and has brought about more understanding in relation to the history behind the current situation in the city of Accra. However, the research did not progress without challenges and these challenges border on the following areas:

- Unavailability of disaggregated data

First of all, available data on road infrastructure in respect of the six cities was aggregated in national terms and irrelevant for current year comparisons, thus, the study cannot effectively provide answers with complete accuracy for the selected cities even though it provides a general idea in relation to the situation in a broader sense.

- In addition, preferred traffic data for Accra and the selected cities were unavailable. This is another challenge which precludes the identification of the impact of road traffic congestion on the area in more detail. As a result, the impact of this phenomenon could only be described in a general sense without specific data. Further research is therefore required involving an analysis of traffic data on roads connecting the area with the peripheries for more accuracy in the fact-finding discourse.



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## 국문 초록

**가나 아크라의 도로 교통 체증 해결책 탐색: 카이로, 나이로비, 튀니스, 케이프타운, 라고스의 도시 교통 시스템 비교 연구**

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국제협력전공

교통 체증은 세계적으로 널리 논의되고 있는 주제이다. 이 현상은 점차 더 악화된다고 여겨지고 있다. 많은 선진국과 개발도상국을 포함한 전 세계에서는 교통 체증을 해결하기 위해 여러 정책과 전략들을 채택해오고 있다. 브라질의 상파울루와 같은 교통체증의 가장 많은 영향을 미치는 도시들은 새벽 및 야간 운전이 여러모로 악명 높다. 이집트, 나이지리아와 같은 아프리카 도시들과 상대적으로 더 작은 면적인 가나에서도 위와 같은 현상을 겪고 있다. 본 연구는 가나의 행정 수도인 아크라의 차량 교통 체증의 원인을 분석하고 선택한 5개 도시 (카이로, 나이로비, 튀니스, 케이프타운, 라고스)의 도시 교통 시스템의 비교 분석을 토대로 실현 가능한 정책을 제안한다.

본 연구는 총 6 장으로 구성되어 있다. 제 1 장은 도입부분, 제 2 장은 선행 연구, 제 3 장은 연구 방법론, 제 4 장은 아크라 케이스의 분석으로 구성되어 있다. 제 5 장에서는 위에 언급된 도시들과 아크라와의 비교 요약과 마지막으로 제 6 장에서는 결론, 제안과 연구의 제한점으로 본 연구를 마무리한다.

**키워드: 도시 교통, 도시 계획, 도시 거버넌스, 교통 체증**