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The Impact of Transportation Infrastructure on Nigeria's Economic Developmeny

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2016

Abstract

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by

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MA, Southern Illinois University, 1981

BSBA, University of Missouri, 1976

Dissertation Submitted in Partial Fulfillment

of the Requirements for the Degree of

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Abstract

The United Nations Development Programme (UNDP) described Nigeria's road networks as one of the poorest and deadliest transportation infrastructural systems in the world. Data from the UNDP and the World Bank (WB) show that Nigeria has suffered transportation infrastructure deficits; these data also illustrate Nigeria as one of the lowest indices in economic development in the last decade. This qualitative case study addressed the impact of a lack of investment in transportation infrastructure in the form of road networks on Nigeria's economic development. The purpose of the study was to understand the relationship between the investment in road networks and economic development in Nigeria. The theoretical framework comprised Solow's economic growth theory and Frischmann's transportation infrastructure theory. Data were collected through personal interviews with a purposeful sample of 20 Nigerians including previous and current public and private sector transportation-linked individuals directly involved in investment, management, and policy administration. Interview data were compiled and organized using qualitative software for content analysis. Recurring responses were identified and patterns and trends documented from the data. Findings revealed corruption in awarding roads contracts, lack of contracts monitoring, and inefficient governance hindering economic development in Nigeria. This study supports positive social change by informing decision-makers that by investing in network of roads, that time to project completion and financial savings may promote economic development, thus improving the standard of living of Nigerians.

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Dedication

This doctoral study is dedicated to the loving memory of my parents, Chief Gorden Johnson Agbigbe and Madam Itoro Orru Agbigbe. They both instilled in me the value of hard work and persistence. Their kind words motivated and guided me through the course of this research.

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With profound gratitude, I would like to thank God Almighty for giving me the fortitude to stay through the course of this PhD. My very special thanks to my committee chair, Dr. Robert DeYoung, and committee members, Dr. Godwin Igein and Dr. Salvatore Sinatra, for working with me to ensure this study met Walden University's rigorous academic requirements. I am especially grateful to my committee chair, Dr. Robert DeYoung, for his words of encouragement, telephone calls, and countless feedback. Next, I would like to thank my previous chair, Dr. Bharat Thakkar, who could not see me through due to illness, and Dr. Aqueil Ahmad, my previous committee member who left Walden University, for their dedication and advice at the early stage of the journey. Along this journey, there were some who said it could not be done and attempted to discourage me from advancing, and some who supported and offered encouragement. I say thank you. I wish to extend my gratitude to my wife, Vera Agbigbe FNP-BC, my little princess, Ivie Agbigbe, and my son, Ovie Agbigbe. I wish to thank them for their support through the course of this long journey and giving me much needed inspiration and encouragement. Thank you all for your support and love.

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Chapter 1: Introduction to the Study

Road transportation infrastructure has been recognized by many scholars in recent years not only as an important economic growth facilitator, but also as the backbone of economic development activities for many industrialized countries (Bagchi & Pradhan, 2013; Lakshmanan, 2011; Smith, 1880; Weber, 1928). In a wide body of literature, researchers have supported the relationship between transportation infrastructure investments and a society's political, social, and economic development (Akhmetzhanoy & Lustoy, 2013; Rashidi & Samimi, 2012; Rostow, 1962). More specifically, road infrastructure investments constitute important political, economic, and social processes that increase the riches and power of a country, enlarge markets, and lower trade barriers. This leads to increases in productivity outputs and to improvements in mobility and standard of living for the masses (Kustepeli et al., 2012; Njoh, 2012).

Road transportation infrastructure investment has long been considered a subset or component of the capita representing the basic foundation that underpins all production functions. Historically, shipping volumes of raw materials to the factory and finished goods to the market in a timely manner depend on the availability and quality of the rural transportation infrastructure system, mainly in the form of roads traveled by trucks and automobiles (Adler & Polsky, 2010; Haghshenas & Vaziri, 2012; Prud'homme, 2005; Shafik, 2005; Tukker & Dietzenbacher, 2013). For much of the 20th century, road transportation infrastructure investment was one of the least recognized subfields of economic development, and it was virtually neglected as an analytic component in the early development of economic literature, in

which capital is undifferentiated and commonly represented by factories (Osayomi, 2013; Prud'homme, 2005; Shafik, 2005; Tukker & Dietzenbacher, 2013).

Transportation infrastructure was not considered with the same focus as other forms of capital in the early economic models (Shafik, 2005). In particular, the state's dependency on infrastructure has been a complicated issue. Productivity effects are likely to vary substantially according to the type of infrastructure (private versus public) and can differ as the level of infrastructure evolves over time (Na, Han, & Yoon, 2013). Numerous contemporary research works have added to empirical knowledge concerning transportation infrastructure as a facilitator and important contributor to a nation's economic development (Aschauer, 1989; Bofinger, 2011; Gwilliam, 2013).

Shafik (2005) explained the reason road transportation infrastructure is so underrepresented in the early economic literature. Traditional economic models treat capital as undifferentiated; that is, roads and other production components were lumped together as capital, so the specificities of infrastructure were not captured. Na et al. (2013) asserted that one of the main econometric challenges has been the identification of the productivity effects of road transportation infrastructure. Road transportation infrastructure underlies the more visible forms of capital, facilitating the delivery of inputs to places of production and the delivery of finished goods to marketplaces. Road transportation infrastructure also supports various social services, providing access to schools, hospitals, and places of employment (Pradhan & Bagchi, 2013; Prud'homme, 2005).

Given the capital-intensive nature of road transportation infrastructure and the increasing scarcity of resources for capital-intensive projects, it is important to understand the effects of road transportation infrastructure investments on the economic activity of a developing country (Gramlich, 1994; Masarova & Iyanova, 2013; Usman, 2014). There is burgeoning literature directed at the relationship between road networks investment and economic development in developed countries such as the United States and United Kingdom (Evans & Karras, 1994; Masarova & Iyanova, 2013; Munnell, 1992; Nobrega & Stich, 2012). In contrast, very limited numbers of studies have addressed the possible relationship between investment in road transportation infrastructure and economic development in developing countries including the Federal Republic of Nigeria, which I proposed to study.

The possibility of measuring the effects of road infrastructure planning and investments by using predefined economic development objectives that can be measured over time is an interesting subset of the transportation infrastructure paradigm that has not received much attention in the literature. Developing countries would do well to analyze their progress in view of 21st century observations rather than simply copying models and achievement of developed countries from the previous century. Additionally, each developing country should tailor its development models to suit it specifically. I analyzed the effect of road infrastructure investments on economic development in one developing country, Nigeria, to improve planning for that country's further development.

Chapter 1 provides background information on previous studies related to road transportation infrastructure investments. Chapter 1 also includes the problem statement, the

purpose of the study, the research questions, the conceptual framework, the nature of the study, definitions, assumptions, the scope and limitation, and the significance of this study for sustainable economic development in Nigeria as an example of a developing country whose experience may be of use beyond its borders.

Background of the Study

Scholars and researchers agree that transportation infrastructure, including roads for automobiles and trucks, facilitate economic development and drives economic activities in developed countries. These transportation infrastructures were part of the economic development planning that occurred during the industrial revolution in the 19th and early 20th centuries, a model that continues to this day in which transportation planning and investments are linked to the expected economic development objectives of a region (Rashidi & Samimi, 2012; Rostow, 1962; Smith, 1880). It is not surprising that a significant amount of literature supports a relationship between transportation infrastructure investments and a country's political, social, and economic development (Bagchi & Pradhan, 2013; Lakshmanan, 2011).

Most developing countries share a history of colonial government and are particularly at a disadvantage in their preparedness for economic development with regard to transportation infrastructure systems, partly because the existing road transportation systems they must build on to get the best results for the investments are often out of step with modern economic development patterns. Rather than starting from the position of strength that would include a transportation infrastructure similar to that of colonial government nations, these former colonial countries including Nigeria have inherited minimally developed roads that only

connect a few major cities and are designed mainly to facilitate the movement of commodities from regions of the colonies to points of shipment to the colonial nations (Njoh, 2012). Rural populations, commonly considered in developed countries as an important part or even a backbone of the economy, are left in the countrysides of developing countries virtually disconnected from any meaningful economic participation (Njoh, 2012; Thomas, 2013; Usman, 2014).

Even the most capable, forward-looking leader may find it fiscally challenging and politically overwhelming to move the country forward into a more robust economic condition quickly, given the starting point of the country's transportation infrastructures. Road transportation infrastructure investment produces real and measurable economic impact that comes directly and indirectly from the ability of businesses to get access to production inputs and marketplaces essential to the country's economic vitality and development. Although individual strata experiencing benefits may vary, transportation infrastructure significantly influences individual mobility and can be linked to economic stratification of the population, all of which can benefit a nation's productivity. A country's transportation infrastructure influences economic development in two ways: as an independent factor of production and through its impact on total productivity progress and therefore on economic development (Beyzatlar & Kustepeli, 2011; Kim et al., 2014; Kustepeli et al., 2012)

In theory, an increase in investments directed toward road transportation infrastructure should not only increase the output and development of the economy as a whole, but should also affect the price competitiveness of domestic or exported goods and services, promote new

business creations, affect the employment level, reduce costs, and improve quality of life (Kim et al., 2014). This argument has been corroborated empirically by Calderon and Serven (2008), who reported that an increase as minimal as one standard deviation in the index of transportation infrastructure stocks would increase per capita income growth by 2.9 percentage points. A similar increase in the infrastructure quality index would increase growth by 0.68 percentage points (Aschauer, 1989; Boopen, 2006). To better comprehend the contributions of transportation infrastructure to a country's economic development, one could imagine the United States without the interstate highway system.

The dynamic effects of such a loss would have a negative impact across all economic spectrums, both business and personal. To serve their country well, Nigeria's policymakers must fully understand the effects of investments in road transportation infrastructure on economic development, where to direct the investment, how much to invest as a percent of gross domestic product (GDP), and what such investment can mean to the wealth and power of the country. For instance, while many developing countries only invested about 2% of GDP on transportation infrastructure annually, China reportedly committed to invest 7% of GDP on transportation infrastructure systems (Commission on Growth and Development [CGD], 2007). This study provided new insight that may enable Nigeria's policymakers and business leaders to better understand effects of transportation infrastructure investment on economic development.

Many researchers agree that relationships between transportation infrastructure investment and economic growth must take into account a multidimensional framework that considers GDP, population size, degree of urbanization, traffic density, level of economic

development, and road infrastructure. Growth theories have been used to examine regional economic theories as they relate to transportation investment and its effect on population change and economic development. Three theories have played significant roles: neoclassical growth theory, growth pole theory, and location growth theories. To understand the large volume of research data on transportation infrastructure and its contributions to economic and social change in developing countries, I segmented the research by categorizing the data into four manageable categories.

Infrastructure Investment in Relation to Poverty Alleviation

Infrastructure development has long been championed as the cure for poverty, and existing literature suggests the existence of a positive relationship between economic growth and infrastructure investment. Other research on poverty alleviation has focused on empowerment, or increasing the number of poor people who participate in decision-making processes through access to infrastructure including transportation. In Latin America, Estache, Foster, and Wodon (2002) explored the relationship between infrastructure reforms and poverty alleviation. After reviewing data on both macro- and microeconomic connections between infrastructure reform and poverty alleviation, Estache et al. (2002) concluded that privatized infrastructure development tended to alleviate poverty if the poor could afford to participate in the benefits (access to jobs, etc.). Fan and Chan-Kang (2005) and Stivastava and Shaw (2013) analyzed the effects of different forms of public investments on growth and rural poverty in various Chinese provinces and concluded that road infrastructure had the largest impact on

poverty as compared to rural education, telecommunications, irrigation, agricultural research and development, power generation, and targeted poverty alleviation.

Infrastructure Investment in Relation to Economic Growth

One of the pioneer studies that addressed the relationship between transportation infrastructure and economic development was conducted by Aschauer (1989) who concluded that there was a positive impact on private sector productivity when public capital was invested in transportation infrastructure. Aschauer followed selected highways to analyze the per capita income impact, and again concluded that there is a relationship between the two. In the 1990s, Mofidi and Stone (1990) looked at the impact of transportation infrastructure on economic development through a productivity lens and found a positive relationship between highway spending and manufacturing investments and employment. Jones (1990) looked at employment, income, and investment as key variables for assessing the economic impact of transportation infrastructure. Cook and Munnell (1990) also found positive relationships between highways infrastructure and the gross state product (GSP). Others including Moonmaw et al. (1995) found positive relationships between transportation infrastructure and per capita income. Akhmetzhanov and Lustoy (2013) demonstrated links between transportation infrastructure and regional development with respect to population movements.

Infrastructure Investment in Relation to Regional Development

The United States, the European Union, and many countries around the world place much emphasis on the role of infrastructure investment as a catalyst for regional territorial cohesion, promotion of economic development, and the reduction of economic disparities.

Regional road infrastructure has played a significant role in how goods are transported across vast distances and in how passengers are carried from one location to another. Road infrastructure affects how well materials and products at all stages of production arrive on time to the next stage of production or to the consumers, who in turn must have the jobs so they can afford to make the purchase. This model pulls employment, savings, wages, investment, and consumption into a synergistic whole. In the European Union model, factors that play significant roles in determining transportation investment priorities include but are not limited to appropriateness of transportation policy, availability of funding sources, cost-effectiveness of projects, and the administrative capacity to manage and absorb funds. These investment priorities then shape the performance metrics for evaluating the constructed road(s). The key metrics are accessibility, territorial cohesion, economic competitiveness, and environmental sustainability. The impacts are assessed using the Spatial and Socio-Economic impacts (SASI) model that is common in 130 regions of Europe (Burinskienė & Griškevičiūtė-Gečienė, 2012). This is the framework that has dominated regional economic development polices and theories since the 1940s when Rosenstein-Rodan, Nurkse, Rostow, and other researchers began to extrapolate the relationship between infrastructure, including transportation infrastructure, and economic growth (Crescenzi & Rodriguez-Pose, 2012; Xueliang, 2013).

Infrastructure Investment in Relation to Developing Countries

Yu et al. (2012) examined the relationship between economic growth in China, at both the national and regional levels, and transportation infrastructure investment, using a Granger causality framework and a panel co-integration on time series data from 1978 to 2008. Yu et al.

concluded that although at the national level the data showed a unidirectional Granger causality from transportation infrastructure to economic growth, at the regional level the data showed bidirectional causality for the more affluent region and a unidirectional causality for the low-income western and central regions. Yu et al. concluded that improving transportation infrastructure is not enough to stimulate economic growth in the underdeveloped areas of China. Iyanova and Masarova (2013) studied economic development and road infrastructure investments in the Slovak Republic Regions, and found that affluent regions tended to see more positive effects of transportation infrastructure investment on economic growth than less affluent regions. Iyanova and Masarova contended that economic development depends on socioeconomic, political, and natural geographic factors as well as historical background and demography. Thomas (2013) weighed the economic development benefits of transportation investment in South Africa's high speed rail project dubbed the "Gautrain" and warned that although it eased traffic congestion and created jobs, it also deepened mobility-related exclusion and gave priority to the wealthy in the distribution of public funds.

Problem Statement

Road transportation infrastructure including highways and rural roads is vital for movement of goods and services critical to a country's economic vitality, and has been recently categorized by many scholars as the most important engine for economic development (Akhmetzhanoy & Lustoy, 2013; Aschauer, 1989; Njoh, 2012; Peterson & Jesup, 2007). Developed countries such as the United States and Great Britain built the framework of their existing transportation infrastructures over decades of planning and systematic investment that

reflect economic development envisioned far into the future. This transportation infrastructure foresight in developing transportation infrastructure has led to increasingly high levels of innovations at low levels of expenditures toward construction, maintenance, and management of road networks.

The investments of developed countries in road infrastructure have increased the wealth and power of many of these nations. The movement to develop road networks in the United States that started between 1890 and 1930, and continued with the development of the interstate highway, led to an exponential increase in road networks and spurred periods of unprecedented economic development that catapulted the country to new levels of wealth and power. A developing country such as Nigeria can learn an important lesson from the planned investment that the United States made in its road networks and interstate highways by linking its transportation infrastructure planning and implementation to economic development activities that lead to sustainable economic development.

The United Nations Development Programme (2009) described Nigeria's road networks as the worst and among the deadliest in the world. The United Nations Development Programme and the World Bank (WB) data show that Nigeria has a very poor transportation infrastructure system and has one of the lowest records of economic development. The direct impact of poor road networks on Nigeria's economic development has not been established. The problem addressed in this qualitative case study was the impact of the lack of investment in transportation infrastructure in the form of road networks on Nigeria's economic development.

Numerous studies have been conducted by researchers attempting to measure the economic benefits of road network investments in many countries including Nigeria. These studies were limited in scope and in the availability of relevant data, and did not touch on the direct economic impact of roads infrastructure in Nigeria (Adede & Olafiaji at el.; Adefila & Bulus, 2014; Tunde & Adeniye, 2012, 2014; Usman, 2014). More importantly, some economic historians have argued that certain preconditions, including substantial advancements in human capital, must be present for a developing country such as Nigeria to effectively generate or recoup sustainable economic benefits from investments in road infrastructure (Banister & Berechman, 2001; Rostow, 1962; Siemiatycki, 2013). Based on evidence from the United States and other developed nations, certain necessary underlying preconditions must be present in developing countries including Nigeria before any meaningful long-term trajectories of economic development from road transportation infrastructure investment can be manifested (Rostow, 1962, 1974). Key necessary preconditions identified in the literature to allow positive economic development elasticity relative to road infrastructure investments in developing countries are shown in Figure 1.

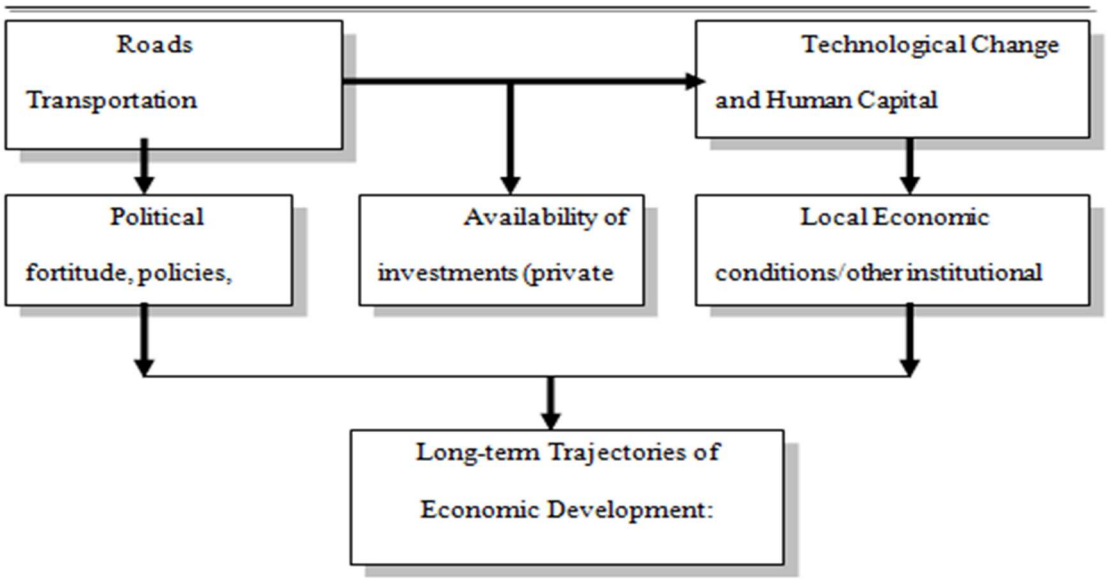

Figure 1. Key necessary pre-conditions to economic development convergence. Derived from Banister and Berechman, 2001.

Preconditions include technological change and availability of human capital, including positive economic externalities in terms of quality labor force and buoyant local economic condition, availability of investments from private and public sources, environmental sustainability, social inclusion, literacy and other initiatives dependent on concerted actions of policymakers, political fortitude, and communities that foster economic transformation**.** Rostow (1962) argued that during the preconditions phase, developing countries such as Nigeria need to build up infrastructure for education, transportation, power, and administration, and that most often the developing countries such as Nigeria have the material resources but lack capital, technology, and knowledge to effect a transition to modernization. Banister and Berechman (2001) asserted that for a country to fully benefit from road transportation infrastructure investments, there must be a concerted effort to revamp the entire economy of the country, not

only the road infrastructure. As noted by Deviney and Crowley (2002), "economic development is not only the formation of an industrial structure but the total socio-cultural transformation of a society" (p. 23). It is this complex chain of mutually reinforcing events that leads to the creation of the necessary market structures including road infrastructure for sustainable economic development (Deviney & Crowley, 2002; Gautam & Queiroz, 1992).

The focus of this qualitative case study aligned with the construct concerning developed countries' road infrastructure investment in pursuit of optimal economic development paradigms for societal transformation. The study entailed reviewing normative data and peer-reviewed literature linking relevant indicators such as GDP, road infrastructure investment from both public and private sources, and other relevant indicators of divergent development experienced in developing countries as a result of road infrastructure planning investment and implementation. My goal in this study was to investigate the relationship between road transportation infrastructure investments and economic development in Nigeria.

Individual person-to-person interviews were conducted among in-transit or U.S.-based Nigerian business stakeholders, former elected officials, policymakers, and transportation project managers who had lived, studied, or worked in Nigeria, to seek their opinions, perspectives, and experiences as to whether lack of road transportation infrastructure investment appears to be affecting economic development in Nigeria. In addition, public and private road infrastructure investments and other conditions of economic development in developed countries such as China, India, and Brazil were examined to determine how a developing

country such as Nigeria might advance its road infrastructure investments strategy to promote greater economic development.

Purpose of the Study

The purpose of this qualitative case study was to better understand the relationship between the investment in road networks and economic development in Nigeria. This study would also help to underscore the relationship between planned investments in transportation infrastructure, especially road networks and their effects on economic development, generation of economic activities, environmental quality, improvement of quality of life and individual mobility, social quality, reduction of poverty, and redistribution of population. This research was intended to offer a better understanding of the impact of roads investment on economic development and provide useful and current information for Nigeria's policymakers and leaders who are involved in road infrastructure investment decisions.

A qualitative case study allows for the examination of existing private and public road transportation investment in developing countries. I conducted one-on-one face-to-face interviews with in-transit or U.S.-based Nigerian business stakeholders, former elected officials, policymakers, and transportation project managers who had lived, studied, or worked in Nigeria, to gain their perceptions of relationships between road transportation infrastructure investments and subsequent economic benefits for developing Nigeria. A general understanding is that all states or regions in Nigeria are not at the same development stage at the same time. Different states and regions in Nigeria have started this process of economic modernization and development of transportation infrastructure at different times and may need to spend different

times at different stages, but all states and regions will ultimately undergo similar transformation processes (Crowley & DeViney, 2002; Dietzenbacher & Tukker, 2013; Rostow, 1974; Siemiatycki, 2013).

This study was intended to fill some of the research gaps about the relationship between road infrastructure investments and economic development in Nigeria and to provide a platform for developing best practices for Nigeria's policymakers and funders of road infrastructure. This study may also provide useful information that can help Nigeria to capitalize on the experiences of developed nations such as China, India, and Brazil to advance economic development-modernization through road infrastructure investments.

Research Questions

The problem identified in this qualitative case study was the impact of the lack of investment in transportation infrastructure in the form of road networks on Nigeria's economic development. The purpose of this qualitative case study was to investigate the relationship between road transportation infrastructure investments and economic development in Nigeria. This study proposed to answer the following research questions (RQs).

RQ1: What is the impact of road transportation infrastructure investments on economic development in Nigeria?

RQ2: What are the necessary planning, implementing, and monitoring criteria needed for pre- and post-construction activities?

RQ3: How does investment in transportation, specifically road networks, affect social change?

Answers to these questions are intended to provide insights for project managers and policymakers on the influence of road transportation investment on economic development in Nigeria. A panel of three experts was established to provide content validity. The experts reviewed and approved the interview questions listed in Appendix C. The panel members consist of Ph.D. level experts who had knowledge and understanding of road transportation infrastructure, project management, and economic development. Three panel members consist of road transportation experts and a geographer, and the other two panel members included a project manager and an expert in economic development.

Conceptual Framework

The literature review revealed that in Nigeria, as in most developing countries, decisions concerning road transportation infrastructure investments are usually made to meet the utilitarian need to move people to urban areas, where the jobs and schools are often located, without any other formal plan to connect or measure the economic development benefits of those investments. In most developing countries, including Nigeria, road transportation infrastructure investments come from federal or state budgets, as opposed to the selling of bonds that carry built-in requirements for performance measurement. Any road transportation infrastructure model must account for not just the construction of roads, but also the benefits to society in general, as illustrated by Figure 2.

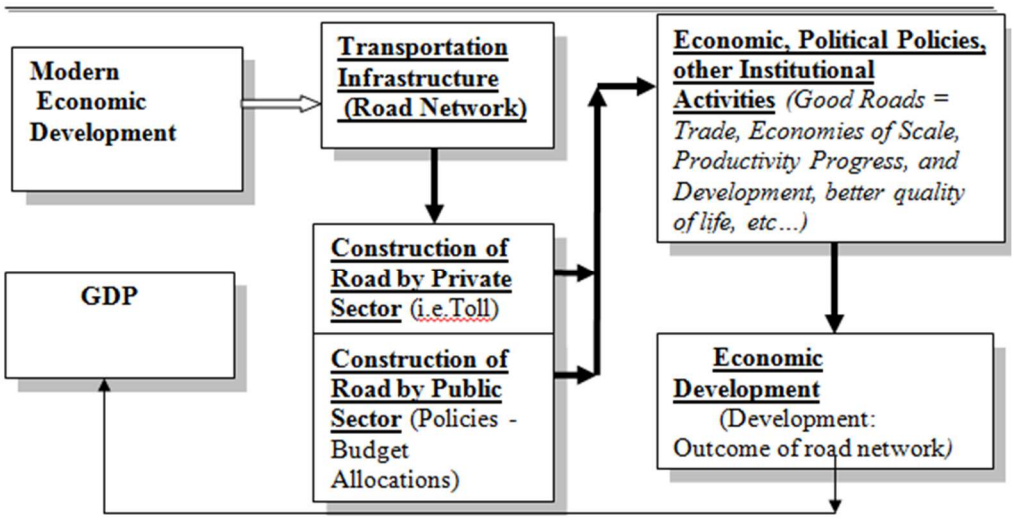

Figure 2. Conceptual road transportation infrastructure development lifecycle.

I created Figure 2 to show a conceptual understanding of the process of road transportation infrastructure development lifecycle in Nigeria. Data concerning relationships between road transportation infrastructure investments and the benefits associated with such investments are difficult to come by in developing countries. One reason, as Ogun (2010) suggested, could be the corruption of government officials. Another reason, as Khasnabis, Dhingra, and Safi (2010) posited, is that private funds are needed in developing countries to match the need for high capacity road infrastructure.

Current literature on road infrastructure and its relationships to economic development benefits can be summed up by four core elements that are intertwined within the pre- and post construction process. A purpose-driven set of road infrastructure management policies and strategies sets the stage for the fiscal or budget allocations that affect the type of road that is constructed and the expected measureable impacts the road will have on the socioeconomic well-being of a community, city, state, region, or nation.

Nature of the Study

A qualitative case study was employed to examine the impact of road transportation infrastructure investments on economic development in Nigeria. The qualitative method is appropriate because it allows the researcher to examine alternate modes of data after the initial investigation, allowing the research problem to drive the process as opposed to the initial research design protocol driving the entire process (Denscombe, 2014). As Patton (2015) attested, qualitative methods favor drawing meanings from participants' feedback the researcher's observations, and interviews conducted in the real world rather than in the laboratory.

A qualitative study involves a deductive process in which research methods are carefully planned. As Riege (2003) attested, qualitative methods favor drawing meanings from participants' feedback and are best suited for the exploration of program processes or activities when data are collected in the field as compared to in the laboratory. A single case study is appropriate for studying whether road transportation infrastructure planning, investments, and construction are related to sustainable economic development because, as Noor (2008) indicated, a case study supports planning, practice improvements, and demonstration of applicable theory. Further, Mason (2010) suggested that with defined questions and a general need for increased knowledge in a particular discipline, the case study approach works best.

In this study, I employed a non experimental, relational qualitative approach using one-on-one interviews with in-transit or U.S.-based Nigerian business stakeholders, former elected officials, policymakers, and transportation project managers who had lived, studied, or worked

in Nigeria to find out their opinions and perceptions about whether road transportation infrastructure affects economic development in Nigeria. Prior research was extended by investigating the relationship between road transportation infrastructure investments and subsequent economic development. Due to poor or nonexistent empirical data from developing countries such as Nigeria, one-on-one interviews were conducted to gain insight into the impact of road transportation investments on Nigeria's economic development. Bowen (2008) posited that the qualitative research process allows for the use of formal and informal interviews, along with observations where feasible. Findings in this study came from purposeful samples that would normally be suitable to answer the research question. Furthermore, the use of such a qualitative approach gave me the opportunity to provide a full answer to the research questions. More details about the proposed research design are provided in Chapter 3.

Definitions

Transportation infrastructure: The underlying structures that support economic activities by moving goods and people, including the delivery of inputs to places of production, goods and services to customers, and customers to marketplaces (Trimbath, 2011).

Road networks: Road networks in this study refer to all rural roads, highways, and feeder roads that connect cities, villages, and national capital.

Economic development: Concerted actions by the community and policymakers to improve the standard of living of citizens and the economic health of a country.

Developing country: A country with a gross national income (GNI) of US$11.905 per capita per year and or less (World Bank, 2013).

Infrastructure investment: Efforts committed (monetary and non-monetary) for the construction of new road networks and improvement of existing road networks.

Infrastructure: Public investment in social services such as road networks and physical assets.

In-transit: Nigerians who are visiting the United States for business, pleasure, personal, diplomatic, or other purposes.

Assumptions

To understand the context of a study, a researcher must take a holistic position (Patton, 2015). Although transportation infrastructure precepts have been used in many contexts, including economic development, this study focused on roads infrastructure and economic development. I assumed that road networks in Nigeria were underdeveloped compared to those in developed countries and in some other developing countries in Asia and Europe. I also assumed that the benefit of road transportation infrastructure may be spread across rural and urban sectors in Nigeria. The level of benefit may differ from state to state depending on each state's readiness to invest in road networks. I assumed the participants would provide honest responses to the interview questions without assistance from each other. I relied on the participants' perceptions, opinions, and knowledge of road transportation infrastructure in Nigeria, and their responses to the interview questions were vital to the study. I further assumed that results from one-on-one face-to-face interviews would be reliable.

Scope and Delimitations

This qualitative case study was designed to explore the relationship between roads infrastructure planning, investment, and implementation and predefined goals for economic development. In a poorly understood phenomenon such as the effect of roads infrastructure on a country's economic development, researchers may use exploratory studies to identify key variables and generate hypotheses for future research (Scapens, 2004).The scope of this study was the impact of road transportation infrastructure investment on Nigeria's economic development.

Although some scholars and researchers have criticized the modernization theory of roads as simplistic and approached it with a great deal of pessimism, the prevailing consensus among scholars and researchers is a positive view of transportation infrastructure as important to economic development (Dietzenbacher & Tukker, 2013; Na et al., 2013; Usman, 2014). Transportation infrastructure is the central focus in Smith's (as cited in Prud'homme, 2005) vision of economic development: "No roads, no transport, no trade, no specialization, no economies of scale, no productivity progress and no development" (p. 147). Similar support for transportation infrastructure as important to economic development can be traced back to the Good Roads Movement in the United States between 1890 and 1930. Reformers campaigned for the construction and improvement of U.S. roads (Fuller, 1955). The subsequent construction of the interstate highway system and rural road networks in the United States fueled economic development across the country (Aschauer, 1989; Fuller, 1964; Paxson, 1946).

A transportation infrastructure system such as a road network is frequently cited in the academic literature as key to promoting economic development and stability in both developed and developing countries. This presumption has been globally nurtured since it was first noted by Smith in 1776 and by Aschauer in 1989, as well as in the World Bank 1994 policy debate. Substandard and deteriorating transportation infrastructure remains an obstacle to economic development in Nigeria. Transportation infrastructure alone is not enough to attain the desired economic conditions for any country, but it is among the most important transitional mechanisms in modern economic development paradigms (Banister & Berechman, 2001; Khasnabis et al, 2010; Lakshmanan, 2011). Although discussions about capital and economic growth models such as the endogenous growth theory did not until recently include transportation infrastructure as a major factor in production, road transportation infrastructure is nevertheless an important economic development facilitator (Akgungor, Gulcan, & Kustepeli et al., 2012; Bagchi & Pradhan, 2013). In the 1990s, researchers introduced transportation infrastructure as an important factor of production functions (Bagchi & Pradhan, 2013; Na et al., 2013; Prud'homme, 2005). The introduction quickly led to a more explicit modern economic development model in which aggregate output is shown as a function of labor, capital, and transportation infrastructure (Prud'homme, 2005). With the introduction of transportation infrastructure into the economic development model, transportation infrastructure is explicitly recognized as an important part of policymakers' efforts to increase economic development, particularly in developing countries such as Nigeria.

This qualitative case study focused on the relationships between transportation infrastructure investment and economic development in Nigeria. The Federal Republic of Nigeria (FRN) is on the western coast of Africa; it shares borders with the Cameroon republic to the east, the republic of Benin to the south, and the Niger republic to the north. The most populous country on the African continent with a population of over 170 million, Nigeria accounts for over one-half of West Africa's population (United States Department of State, 2012). According to the United States Department of State (USDOS) in its 2012 report, Nigeria is equivalent in geographic area to Arizona, California, and Nevada combined. Nigeria was a British colony and became a sovereign nation on October 1, 1960.

As is the case with many developing nations, Nigeria's road network is its dominant means of transportation, with over 40 % of its population continuing to reside in rural areas. About 70.3% of the rural population and 34.8% of the urban population are engaged in farm commodities production (Nigeria Bureau of Statistics [NBS], 2006). Agriculture contributes about 42% to Nigeria's gross domestic product (Njoku, 2010). Prior to 1970, Nigeria depended on abundant agricultural products for export; after the discovery of crude oil in 1970, Nigeria's export economy shifted in both volume and value from agricultural products to oil, which become the major source of revenue for the country. In April 2014, Nigeria became the largest economy in Africa. Nigeria has overtaken South Africa as Africa's largest economy after a rebasing calculation almost doubled its gross domestic product to more than $500bn. Data from the Nigeria Bureau Office of Statistics (NBS, 2014) showed Nigeria has been growing as an investment destination owing to the size of its consumer market and growing capital markets.

Despite its impressive recent growth in population and GDP, Nigeria still trails South Africa in the basic infrastructure, such as power and roads, needed to lift its people out of poverty (Foster & Pushak, 2011).

Limitations

It was beyond the scope of this study to address all areas that may affect the outcome of this study. There were limits to the number of necessary documents available directly from developing countries such as Nigeria to carry out rigorous inquiry regarding the impact of road transportation infrastructure on economic development. The limitations and challenges faced in this study included the willingness of the participants to give honest insights regarding their opinions, perspectives, and knowledge as to whether road network investment affects economic development in Nigeria. To circumvent this limitation, I took appropriate measures to explain to the participants their rights and also provided a written assurance of their confidentiality.

Significance of the Study

This study was significant for developing countries including Nigeria. The effects of road networks include easy mobility, location of industries, residential settlement, and the commerce that follows agricultural sales, such as food stands and bus service, as well as the location of education facilities such as secondary schools and colleges. Road infrastructure investments represent important political, economic, and social processes that eventually increase the riches and power of a country, enlarge markets, and lower trade barriers, thereby increasing productivity outputs and improving mobility and standards of living for population masses (Beyzatlar & Kustepeli, 2011; Iyanova & Masarova, 2013; Khasnabis et al., 2010).

The study may show the impact of good roads networks on transportation cost, driving time, and other factors contributing to a nation's economic development. A qualitative case study was used to examine the relationship between investment in road networks and economic development in Nigeria, which will be helpful to policymakers considering the wise investment of resources in Nigeria and other similar developing nations. This study added to the literature an understanding of the influence that road transportation infrastructure has on an economy, especially a developing economy such as Nigeria's. Additionally, substantial literature shows that a good roads network is critical component in a fight against poverty in a developing country such as Nigeria (Kustepeli et al., 2012; Njoh, 2012).

The access to a good road network will facilitate trade by providing transportation of agricultural products for rural farmers and allowing a farmer's crops to reach marketplaces. Also, access to a good roads network will reduce traveling time, resulting in lower transportation costs, better living conditions, a reduction in the number of car accidents, and a reduction in the transportation costs of agricultural products (Akhmetzhanoy & Lustoy, 2013; Dietzenbacher & Tukker, 2013; Osayomi, 2013). This case study supported the work of policymakers and scholars by supplying deep, detailed data for use in future studies that may be broader in scope.

Significance to Practice

This qualitative case study was significant to the field of management to better understand the impact of road transportation infrastructure investment on economic development. This study contributed to the field of management by providing new insights into

the management dimension of economic development planning and policy decisions regarding road transportation infrastructure investment in Nigeria.

Significance to Social Change

This study provided a basis for assessing the value of road transportation investment for Nigeria. A good roads network is a critical component of poverty reduction in a developing country such as Nigeria. Access to good roads can facilitate trade by providing transportation of agricultural products for rural farmers, providing employment to the masses, allowing farmer's crops to reach marketplaces, and reducing traveling time resulting in lower transportation costs, better living conditions, a reduction in the number of car accidents, and a reduction in transportation costs of agricultural products. This study contributed to social change by demonstrating that construction of road networks will serve public interest by increasing the standard of living, reducing traveling time, and decreasing the amount spent on transportation.

Summary and Transition

In Chapter 1, I highlighted the importance of transportation infrastructure investment for economic development in Nigeria. Prior research efforts pertaining to the effects of road transportation infrastructure investment on the economic development of Nigeria yielded little theoretical advancement. A conceptual framework was presented that was used to guide the study design and the research questions. The assumptions, scope, and limitations of the study were also noted. Key terms were defined. Chapter 2 presents a review of literature pertinent to road transportation infrastructure investments, including transportation theory, infrastructure theory, and classical and contemporary economic development theories.

Chapter 2: Literature Review

The development of transportation infrastructure and its connection with economic development has long been established in both the public and private sectors, especially in developed countries. Transportation infrastructure was the focus in Smith's vision of economic development. " No roads meant no transportation, no trade, no specialization, no economies of scale, no productivity progress and no development" (Smith, as cited in Prud'homme, 2005, p. 147). For much of the developed world, studies have been conducted and public input has been sought before transportation infrastructures were budgeted and built. Traditionally, companies (local, national , and international) established their presence and facilities around transportation sources to benefit from access to raw materials, distribution channels, and customer base (Njoh, 2012).This led to investment in transportation infrastructures such as railroads, airports, and seaports connecting to economic clusters and enhancing economic development (Porter, 2000). Economic development policies of many developing countries, Nigeria included, show gaps in the understanding of the relationship between transportation infrastructure investment and economic development, and how economic development will occur at various stages of development paradigms (Hossein-Rashidi & Samini, 2012; Khasnabis et al., 2010; Nobrega & Stich, 2012; Usman, 2014).

For many developing countries, transportation infrastructure planning, investment, and implementation are seen as different from economic development planning (African Development Bank [AfDB], 2015). This is partially due to the existing colonial era road infrastructure framework that was planned without the long view of sustainable economic

development (Njoh, 2012). Roads infrastructures serve as the backbones for most transportation infrastructures in these developing countries, without the benefits of feasibility studies, economic studies, and environmental impact reports that typically accompany transportation infrastructure planning, investment, and implementation in the Western world. The purpose of this study was to better understand the relationship between transportation infrastructure, specifically road networks development, and economic development in Nigeria. The knowledge gained from this study may provide guidance to developing countries including Nigeria to focus on road transportation infrastructure investment more efficiently and in a way that may better support economic development. This study presented a differentiated view of road transportation infrastructure investment as an important subset of the economic capital, and more particularly as an important means for advancing the economy of a developing country.

In Chapter 2, I state the literature search strategy, describe the conceptual framework that anchored the study, and present a literature review pertinent to road transportation infrastructure and economic development. Scholars studying the relationship between investment in transportation infrastructure and economic development have not addressed the specific relations but have rather focused on how much is needed to construct projects and the expected return on investment (Lakshmanan, 2011; Pradhan & Bagchi, 2013; Prud'homme, 2005; Shafik, 2005). Further, roads infrastructure in developing countries such as Nigeria has traditionally been built to facilitate movement of people; the creation of economic development activities beyond the movement of goods has been a secondary consideration (Njoh, 2008). Although this was adequate in the colonial era, the 21st century requires developing countries to

be more strategic in connecting roads infrastructure investment planning and construction to the planning, execution, and monitoring of economic development activities. This is why it has become necessary to understand the various stages of the development paradigms (Khasnabis et al., 2010; Nobrega & Stich, 2012; Rashidi & Samini, 2012; Usman, 2014). Road infrastructures are not necessarily linked to economic development because they serve other purposes than providing direct economic benefits (Prud'homme, 2005). This makes it difficult to connect road infrastructure investment to economic development. Current literature on transportation infrastructural investments and economic development has included undifferentiated lenses rather than focusing on the specific aspect of capital (Bagchi & Pradhan, 2013; Lakshmanan, 2011; Prud'homme, 2005; Shafik, 2005). These studies rely on data from economic clusters such as train stations, motor parks, airports, and seaports to show the connection between transportation infrastructure investment and economic development.

Literature Search Strategy

In conducting the literature review, the following databases were assessed: SAGE, ProQuest central, ABI/INFORM complete, Business Source Complete/Premier and Emerald Management Journals. I used the following search terms: roads infrastructure and economic development, transportation infrastructure, developing countries infrastructure development and economic development.

Conceptual Framework

This study was conducted to increase knowledge about the relationship between road transportation infrastructure investments and the economic development of Nigeria. The

theoretical framework was derived from Solow's economic growth theory, Rostow's economic theory, modernization theory, and Transportation Infrastructure Theory (Frischmann, 2005; Rostow, 1962; Slow, 1956) with reference to the United States. Highway infrastructure in the United States embodies an amalgamation of over 200 years of public funds invested through various forms of user taxes (Khasnabis et al., 2010). To justify these large amounts of public funds spent on highway projects, factors such as improved safety, reduced congestion, and improved mobility have been cited in conjunction with economic, urban, regional, and national economic benefits. Although these infrastructures were primarily financed by long-term bonds, very small portions of the U.S. highways were funded by private investments (Khasnabis et al., 2010). Although the U.S. highway system is used here as a reference, the purpose of this study was to explore the role infrastructure investment plays in the economic, social, and sustainable growth in developing countries, particularly in Nigeria. Many researchers agree that there are economic benefits inherent in transportation investments (Bagchi & Pradhan, 2013; Duchin & He, 2009). However, the methods used to establish and measure these benefits have created challenges.

Bagchi and Pradhan (2013) investigated the effect of transportation infrastructure investment on economic growth in India using the vector error correction model (VECM), as shown in Figure 3, to analyze data for both road and rail from 1970-2010.

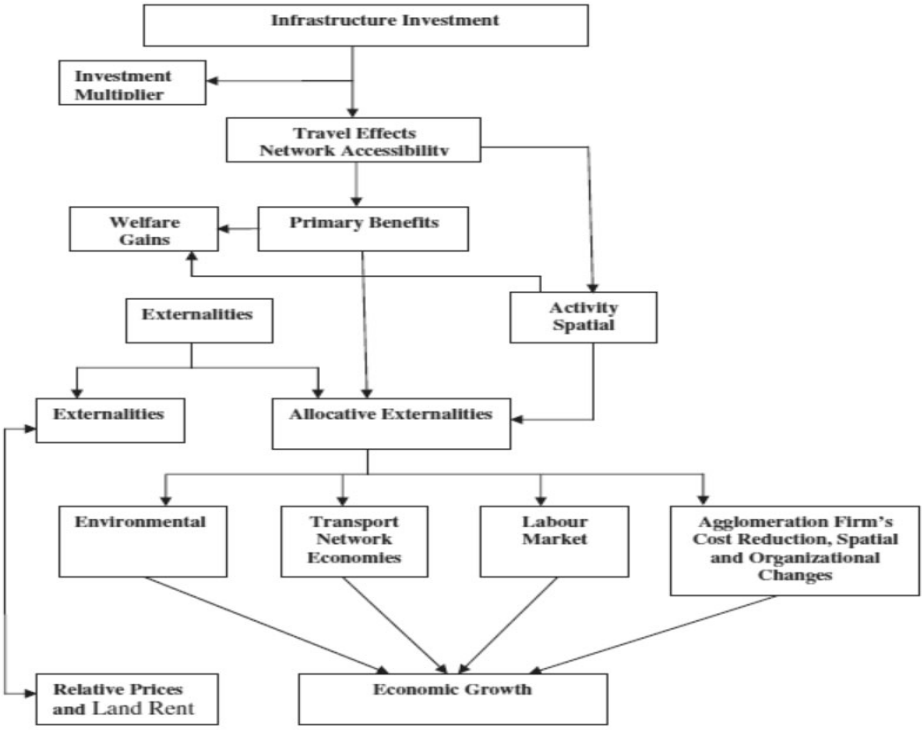

Figure 3. Evaluation of economic growth benefits from the transportation infrastructure.

Source: Bagchi & Pradhan, 2013, p.140

Bagchi and Pradhan found that road transportation infrastructure investment had a bidirectional causality between gross domestic capital formation and economic growth, and road transportation and capital formation. Bagchi and Pradhan also found that rail infrastructure had a unidirectional causality between economic growth and rail transportation, and gross capital formation and rail transportation.

Bagchi and Pradhan suggested that for the Indian economy to experience substantial growth, gross capital formation and the expansion of transportation infrastructure (roads and rail) must go hand in hand. Bagchi and Pradhan applied Banister and Berechman's conceptual framework,

presented in Figure 3, to evaluate the economic development benefits from the transportation infrastructure as a framework mitigating what Bagchi and Pradhan described as “self-evident” causality.

This conceptual framework is complex and addresses the multidimensional aspect of the relationships between transport, development, location and other factors that play key roles in understanding the economic growth that may be fueled by transportation investments. Lakshmanan (2011) offered a different conceptual framework, shown in Figure 4, arguing that any transportation investment lowers costs and increases accessibility “due to the fact that transport improvements modify the marginal costs of transport producers, the households’ mobility and demand for goods and services”. Such changes ripple through the market mechanisms endogenizing employment, output and income in the short run (Lakshmanan, 2011).

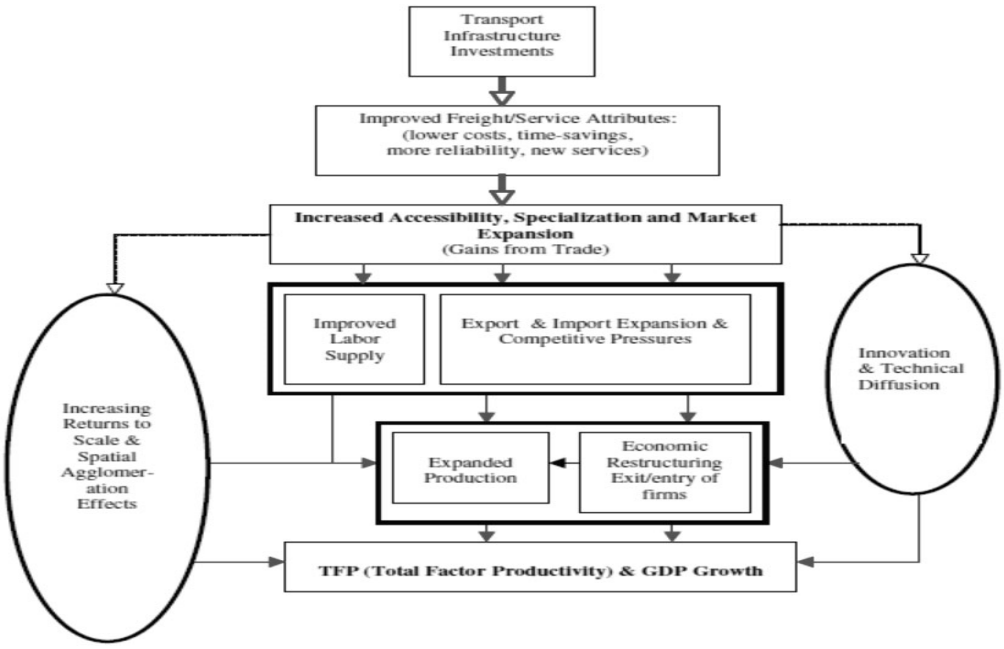

Figure 4. Transport infrastructure and economy-wide benefits. Source: Lakshmanan, 2011, p. 9.

From the research on transportation investment and economic development literature, I deduced four basic conceptual stages, shown in Figure 5, for achieving pre- and post-construction success. A well thought out road infrastructure management policy and strategy sets the stage for the fiscal or budget allocations, which affect the type of road that is constructed and the expected measureable impacts the road will have on the socioeconomic well-being of a community, city, state, region, or nation.

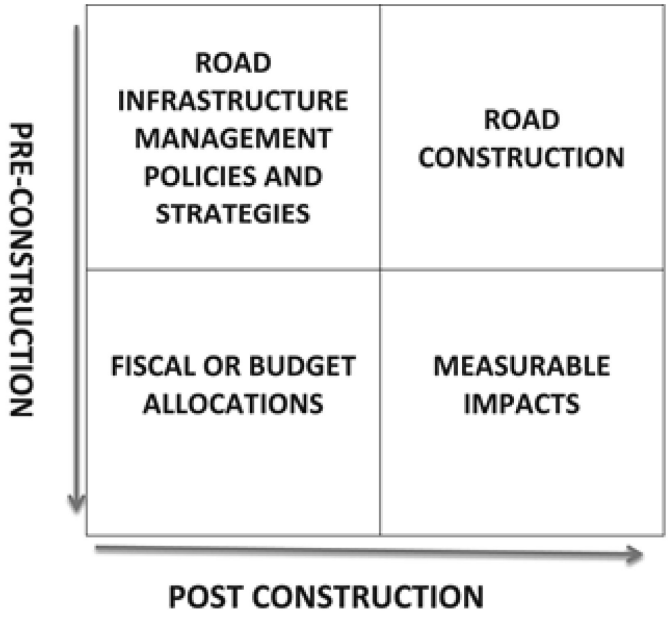

Figure 5. Integrating transport investment and pre- and post-construction.

Working from this concept, I explored whether road infrastructure projects in Nigeria had these four elements. The literature review reveals that in Nigeria, as in most developing countries, road infrastructure investment decisions have usually been made to meet the utilitarian need to move people to urban areas, where the jobs and schools are often located, without any other formal plan to link or measure their economic development benefits. Data relevant to the relationship between road transportation infrastructure investment and the benefits associated with such investments are far more difficult to come by in developing countries including Nigeria. One reason, as Ogun (2010) suggested, could be corruption of government officials. In most developing countries including Nigeria, road infrastructure investments come from federal or state budgets, as opposed to selling bonds that carry built-in requirements for stringent and streamlined performance measurement. Another reason, as

Khasnabis et al. (2010) posited, is that private funds are increasingly needed in developing countries to match the need for high capacity road systems.

The United Nations Millennium Development Goals 2015 attempted to map the course of development to alleviate poverty in developing countries, and one of the key strategies was investing in road transportation infrastructure. This followed as a result of a generally understood phenomenon that a significant number of the world's poor live in rural areas where roads infrastructure is usually poor or nonexistent (Ogun, 2010). As the literature review revealed, numerous studies have been conducted in reference to the impact of roads infrastructure investments on socioeconomic growth to alleviate poverty.

Policies and strategies for investment in road transportation infrastructure must also consider safety in addition to poverty alleviation. The World Health Organization (2009) estimated that over 1.2 million people are killed annually on roads, with an additional 20-50 million suffering nonfatal injuries. Among the top 10 causes of death in the world is road accidents, and this could rise to Number 6 by 2020 (World Health Organization, 2009). Traffic accidents tend to be clustered in low and middle income countries, where about 97% of road accidents occur (Osayomi, 2013). Road accidents top some infectious diseases in mortality rates in developing countries, and in Nigeria they are of great concern. The World Health Organization (WHO) recently ranked Nigeria second in the incidence of road traffic accidents in the world, due in large part to unsafe roads. Between 2006 and 2008, there were 16,478 reported cases of traffic fatalities and 79,409 road traffic accidents (Osayomi, 2013, pp. 88-89).

For Nigeria, little or no empirical data exist to evaluate the relationship between road transportation infrastructure investment and poverty alleviation. There is a gap in the literature as to whether Nigerian policymakers use the integrated process prevalent in the European Union (EU) countries for assessing road transportation infrastructure investment for socioeconomic impacts. This gap is further complicated by prevalent corruption that diverts public funds earmarked for roads infrastructure to personal use, leaving little or no means for tracking the economic benefits of Nigeria's road investments in either short or long terms. This creates opportunities for researchers to begin to fill-in the gap with studies, findings, and recommendations that will compel Nigerian policymakers to address this data gap. In this study, I have attempted to find out whether policymakers in Nigeria do follow the four elements in pre- and post-construction, in other words whether their road transportation infrastructure investment policies and strategies lead to funding mechanisms that in turn lead to the actual construction of roads, at which point we should find a meaningful performance matrix showing the socioeconomic benefits of the investment. Without these systems in place, it will be difficult for developing countries such as Nigeria to meet the United Nations Millennium goals and mandates for poverty alleviation. This is one more reason why this study is important. With these systems in place, it will be easy for researchers to answer basic questions, including whether road transportation infrastructure investment reduces poverty, what the poverty trends are, how increased urban road infrastructure development affects the urban poor, and how investment in road transportation infrastructure compares to other poverty alleviation vehicles such as social welfare programs or investment in other forms of transportation such as rail and

air. The consequences for not having these data include the potential for urbanization leading to high levels of inequality, poverty, and other societal challenges that could in turn lead to insecurity and conflict within the society (Ogun, 2010).

Literature Review Related to Key Variables and Concepts

For many industrialized economies, transportation infrastructure has been a critical part of economic development. These countries have built their transportation infrastructure over a period covering more than a century, and because these transportation arteries served well-defined economic purposes, new systems can be integrated into the old with efficiency and produce immediate cost savings. In developing countries, on the other hand, the old transportation networks upon which new ones are built still serve the obsolete economic purposes of a long gone colonial era (Bagchi & Pradhan; 2013; Lakshmanan, 2011; Rashidi & Samimi, 2012).

A large volume of work supports the relationship between transportation infrastructure investments and a society's political, social, and economic development (Akhmetzhanoy & Lustoy, 2013; Bagchi & Pradhan; 2013; Kustepeli et al., 2012). More specifically, road transportation infrastructure investments represent important political, economic, and social processes that eventually increase the riches and power of a country, enlarging markets and lowering trade barriers and thus increasing productivity outputs while also improving the mobility and standard of living for the masses (Adler & Polsky, 2010; Bagchi & Pradhan, 2013; Njoh, 2012; Prud'homme, 2005).

The economic theory of infrastructure and commons management was popularized by economist Frischmann (2005). Frischmann's theory of infrastructure and commons management provides a theoretical foundation for analyzing the contribution of a country's road network to economic growth and development and the resulting social implications in developing economies. Frischmann argued that allowing the public open access to infrastructure, such as a network of roads, would create an economic return for the society and lead to social change. Frischmann's economic theory of infrastructure has focused on the demand side of an economy and investigates how transportation infrastructure such as a network of roads can create value for the general public. The central premise behind this theory is value creation. Frischmann proposes that open access to a network of roads for the public, can create significant positive results for the society. Since analysis of transportation infrastructure investment and its relationship to economic growth is multidimensional, many researchers have posited that such an analysis must encompass many components including GDP, population size, degree of urbanization, traffic density, and level of economic development. Thus, applying Frischmann's economic theory of infrastructure and commons management to this study, I expected that allowing the public open access to network of roads would significantly impact economic development by improving the standard of living for the masses and would result in social change.

Growth Theories

Growth theories have been used to evaluate regional economic theories concerning transportation investment and its effects on population change and economic growth. Three

theories have played significant roles: neoclassical growth theory, growth pole theory, and location growth theory. Solow's (1956) neoclassical model has guided this study. The core premise of Solow's model is that it relates aggregate production function, or input, to productivity, or output. Solow describes the marginal utility to be gained from productivity, capital investment, and labor and argues that technological progress in developed nations will peak at a certain time and then eventually decline. Solow argued that the average cost of production will rise in a developed nation; he viewed transportation infrastructure planning, investment, and implementation as distinct from the planning economic development process, while the opposite occurred in the developing nation due to continued increase in marginal utility of labor and capital investments. Solow's theory supports the notion of investment in road transportation infrastructure. Thus, in applying Solow's theory to this study, I expected to find that investment in road transportation infrastructure (road networks) would have an economic impact on the growth of the developing nation such as Nigeria.

Growth pole theory is driven by the concept that growth or economic development is usually not uniform across a region but is often concentrated at a specific pole. The pole represents a concentration of economic activity in one area; from which growth is propagated or diffused to other areas or regions. Growth pole theories were very popular in the 1960s and early 1970s, and many countries, including developing countries, embraced them as guides for their national growth strategies to mitigate regional disparities in incomes, employment, and education accessibility. Growth pole theories were used to facilitate decentralization and encourage rapid economic growth or industrialization. Growth pole theories are also meaningful

for assessing or forecasting population change, as they can suggest best use of limited regional resources to be invested, allocated, or distributed for maximum effect on economic development.

Location growth theories endeavor to explain the distribution of economic activity as it relates to the functional allocation of activities to locations, the locations of individual activities, the division of spatial markets among producers, and the distributions of different types of production across portions of territory. The goal is to exclude from the analysis any geographical features that may be influencing the concentration of territorial activities, leaving the location choices to be explained by the economic factors that define location processes, such as the agglomerations of economies that cause economic activities to concentrate, and the transportation costs that distribute activities in space. Balancing these two phenomena explains, even within a uniform space hypothesis, the existence of agglomerations of economic activities.

A Holistic Review of Infrastructure Investment

To understand the large volume of data on transportation infrastructure and its contributions to economic and social change in developing countries, I segmented the research by categorizing the data into four manageable categories:

- Infrastructure investment in relation to poverty alleviation,
- Infrastructure investment in relation to economic growth,
- Infrastructure investment in relation to regional development, and
- Infrastructure investment in relation to developing countries.

Infrastructure Investment in Relation to Poverty Alleviation

Infrastructure development has long been championed as the cure for poverty, and existing literature suggests the existence of a positive relationship between economic growth and infrastructure investment. Infrastructure as a concept is very broadly defined in literature and for the purposes of this research is loosely defined as public investment in social services and physical assets. Public investments in social services and physical assets are seen as key determinants of long-term sustainable growth and provide a platform for poor people to benefit from the growth process (Ogun, 2010). There are three schools of thought on infrastructure and poverty alleviation. The first school contends that there is no relationship between investment in infrastructure and reduction in poverty, and these theorists use three arguments to support their view: that the connection between infrastructure investment and poverty alleviation is presumed and not substantiated by research; that the actual benefit from infrastructure in a given case is lower than anticipated; and that because developing countries tend to have corrupt government officials, attribution of poverty reduction to infrastructure is generally suspect (Ogun, 2010). The second school contends that any social investment in infrastructure is likely to positively impact education and health and is more geared toward poverty alleviation than toward physical infrastructure. The third school contends that investments in both physical and social infrastructures reduce poverty (Ogun, 2010).

Other research on poverty alleviation has focused on empowerment (increasing the number of poor people who participate in the decision making process) through access to infrastructure such as transportation. Estache et al. explored the relationship between

infrastructure reforms and poverty alleviation in Latin America. After reviewing data on both the macro- and micro-economic relationships between infrastructure reform and poverty alleviation, Estache et al. concluded that privatized infrastructure development tended to alleviate poverty if the poor could afford to participate in the benefits, for example through access to jobs. Fan et al. (2002) analyzed the effects of different forms of public investments on growth and rural poverty in various Chinese provinces and concluded that road infrastructure had the largest impact on poverty as compared to rural education, telecommunications, irrigation, agricultural research and development, power generation, and targeted poverty alleviation. They found that 3.2 poor people were lifted from poverty for every 10,000 yuan invested by the government in rural roads. Comparing the impact of infrastructure investment in electricity generation in 52 countries and paved roads in 41 countries, Bennathan & Canning (2000) found that in low-income countries, the return on investment is likely higher; that in middle-income countries, the investment return was higher for paved roads because of the relatively low costs of road construction; and that both electricity generation and paved roads increased returns significantly when combined with human capital.

Akinbobola and Saibu (2004) explored the relationship between unemployment, poverty, and income inequality in Nigeria using a Vector Autoregressive (VAR) framework. To analyze data from 1986 to 2000, the researchers used quarterly data on real per capita income; unemployment rate, a human development index, and government capital expenditure. They found that improvements in human development and reduction in poverty can be achieved when the unemployment rate is reduced. They also found that improvement to the human

development index can be realized when there is growth in public expenditures. Akinbobola and Saidu (2004) concluded that the living conditions of Nigerians can be improved by infrastructure-driven policies that reduce unemployment.

Fan and Chan-Kang (2004) extended the correlation between infrastructure and poverty reduction by focusing on the impact of roads in China. They concluded that low-quality roads (generally rural) have four times the benefit-cost ratio for GDP of high-quality roads. They argued, further, that insofar as poverty reduction is a concern, low-quality roads do more to pull the poor above the poverty line than high-quality roads. Ramessur, Rojid, and Seetanah (2009) cited several studies supporting the ideal that infrastructure investments—specifically roads—lead to positive economic and social change for the poor.

Citing Calderon and Serven (2010)'s study in the Philippines that looked at data from 73 rural provinces, Ramessur, Rojid, and Seetanah (2009) concluded that the strongest indicator of poverty reduction in this case was the existence of road infrastructure. Citing another study from Indonesia where public expenditures in 25 provinces were assessed from 1976 to 1996, Ramessur et al. posited that road infrastructure had by far the most impact in poverty reduction compared with other investments in irrigation, health, agriculture, science and technology, education, and forestry. Ramessur et al. concluded that "road capital may be considered one of the assets of the poor" (p. 20), because it improves the functioning of product and labor markets. Citing the Jacoby study of Nepal conducted in 1999, Ramessur et al. found that extensive rural road networks provided many benefits to the poor but also that any increase was not as laudable a benefit as those that landowners received from the same infrastructure. Citing

Kwon's study of 2000 that used Indonesia data, Ramessur et al. reported that provincial roads directly improve the employment and income of poor people and that for every 1% increase in road investment, there was a corresponding 0.35 drop in poverty incidence over a five year period.

Some scholars have focused on the provision of access to services, resources, and productive employment (promotion of opportunity) and enhancement of security by reducing the vulnerability factors (Ramessur, Rojid, & Seetanah, 2009). Theoretical underpinnings of transportation investments and improvements to standards of living for the poor involve many facets or links. Ramessur, Rojid, and Seetanah (2009) posited that there are five major groups of poor people affected by lack of transportation infrastructure:

- The "income poor" make fewer trips as they tend to travel on foot;
- The "accessibility poor" live in the periphery of urban cities but lack access to city facilities (such as hospitals and schools) and job opportunities because the facilities are often located in the city;
- The "time poor" use slow and very time-consuming modes to and from work, leaving them with little personal time;
- The "safety poor" are generally women, children and the elderly, who, as pedestrians are vulnerable to both personal violence and road accidents; and
- The "energy poor" travel long distances by walking, inducing boredom and tiredness and reducing their productivity.

Using the above definitions for poor people, Ramessur, Rojid, and Seetanah (2009) demonstrated clear links between poverty alleviation and road infrastructure development. They argued that higher education enables the urban poor to become mobile, switch jobs, or capitalize on opportunities as they become available. They posited that road infrastructure opens up opportunities in the labor market, spearheads a decline in unemployment, and stimulates job opportunities for low-income people. Ramessur et al. argued that each 1% increase in government revenue reduces urban poverty by 23% (p. 27), concluding that a government revenue increase has direct or indirect effects on the poor by serving as an income redistribution mechanism. They found a correlation between export-oriented countries and their ability to tackle poverty, as distinguished from those whose GDP were not export-driven, because the former have more income to spend on welfare programs, and the prices paid or received from exports tended to directly benefit the poor through sustainable employment. Ramessur et al. confirmed that "long run economic growth is the key to the alleviation of absolute poverty since it creates the resources to raise incomes" (p. 27).

Infrastructure Investment in Relation to Economic Development

Transportation infrastructure investment has long been considered by many as a subset or component of the capital, the foundation that underpins all production functions. Historically, volumes of raw materials shipped to the factory as well as of finished goods shipped to the market in a timely manner depend on the availability and quality of rural transportation infrastructure (Adler & Polsky, 2010; Kustepeli et al., 2012; Na, et al., 2013; Osayomi, 2013). However, for much of the 20th century, transportation infrastructure investment was one of the

least recognized subfields of economic development, and it was virtually neglected as an analytic component in the early development of economic literature, in which capital is undifferentiated and commonly represented by factories (Bagchi & Pradhan, 2013; Osayomi, 2013; Prud'homme, 2005; Shafik, 2005). Shafik (2005) explained: "Why infrastructure is so underrepresented in the early economic literature, is the fact that in our economic models we treat capital as undifferentiated (as roads and other production components lumped into a common concept of capital), so the specificities of infrastructure are not captured" (p. 189). Additionally, Na; et al. (2013), asserted that "one of the main econometric challenges, however, has been the identification of the productivity effects of infrastructure. In particular, the state dependency of the effect of infrastructure has been a complicated issue. That is productivity effects are likely to vary substantially according to the type of infrastructure and can differ as the level of infrastructure evolves over time" (p. 265).

Numerous contemporary studies have contributed to current knowledge concerning transportation infrastructure as a facilitator of a nation's economic development (Aschauer, 1989; Boopen, 2006; Calderon & Serven, 2003, 2008). Transportation infrastructure underlies the more visible forms of capital, facilitating the delivery of inputs to places of production; and the delivery of finished goods to marketplaces. Transportation infrastructure supports various social services, providing access to schools, hospitals, and places of employment (Bagchi & Pradhan, 2013; Lakshmanan, 2011; Shafik, 2005). Given the capital-intensive nature of transportation infrastructure systems and the increasing scarcity of resources for capital-intensive projects, it is important to understand the effects of transportation infrastructure

investments on the economic activity of a developing country (Kustepeli et al., 2012; Masarova & Iyanova, 2013; Nobrega & Stich, 2012).

One of the pioneer studies that investigated the links between transportation infrastructure and economic development was conducted by Aschauer (1989). Aschauer concluded that there was a positive impact on private sector productivity when public capital was invested in transportation infrastructure. Aschauer followed with a seminal study of selected highways to analyze the per capita income impact and again concluded that there was a relationship between the two (1990). Mofidi and Stone (1990) looked at the impact of transportation infrastructure on economic development from the productivity standpoint and found a positive relationship between highway spending and subsequent manufacturing investments and employment. Jones (1990) looked at employment, income, and investment as key variables for assessing the economic impact of transportation infrastructure. Munnell and Cook (1990) also found positive relationships between highway infrastructure and the Gross State Product (GSP). Moonmaw, et al. (1995) also found a positive relationship between transportation infrastructure and per capita income.

Akhmetzhanov and Lustoy (2013) demonstrated that there are clear links between transportation infrastructure and regional development when examining population movements: "In the 1950s new cities sprang up not far from London along the main railroad lines and now daily trips to work from these cities to the capital are normal. Startup of the HS1 project in Great Britain also brought into the London labor market cities that were formerly considered too far from the capital for daily trips to work (p. 46)." Kustepeli et al. looked at transportation

infrastructure and the movement of goods and also found a positive impact: “Services provided by infrastructure are fundamental to economic activity. Increased accessibility to transport improvements facilitates mobility of goods and services increase” (p. 2619**)**. Boopen (2006) argued that in developing countries, investment in transportation infrastructure has a greater positive impact on productivity than any other investment.

Although roads are prominent across the landscapes of developing countries, their impacts on economic, environmental, and social conditions are not well documented. Intuitively, the effects of road infrastructure are far reaching and play key role in economic activities that come alive because of their existence, but finding data to support such claims is difficult at best. Developing a comprehensive framework for considering the impact of roads would provide a platform for policymakers, funders, and academics to develop assessment tools to accurately measure these impacts. Dietzenbacher and Tukker (2013) captured this sentiment well: “While the importance of transportation infrastructure for economic development is widely acknowledged and well documented in the literature (World Bank, 1994; Transportation Research Board, 2003; Luo, 2004; Demurger et al., 2002), the approaches to analysis are varied (Rietveld, 1989).”

Angermeier; et al developed a two-dimensional analyzing the impacts of roads on aquatic biota. The first dimension recognized three phases of road development each with its own ranges of temporary and spatial scales: (a) road construction, (b) road presence and (c) urbanization. The second dimension recognized five classes of environmental impacts associated with road development: (a) habitat structure, (b) water chemistry, (c) flow regime,

(d) energy source and (e) biotic interactions (Angermeier, et al, 2004). As Angermeier, et al. (2004), acknowledged, "current assessments of environmental impacts of roads are inadequate to ensure informed decision making" (p. 20). If the assessments of environmental impacts—the more visible and well-studied aspects of construction—are inadequate and unavailable, the assessments of the economic development linkages will be even more so.

Infrastructure Investment in Relation to Regional Development

The United States, the European Union (EU) and many countries around the world place huge emphasis on the role of infrastructure investment as a catalyst for regional territorial cohesion, promotion of economic development and the reduction of economic disparities. Regional road infrastructure has played a significant role in how goods are transported across vast distances and in how passengers are carried from one location to another. Road infrastructure affects the timely arrival materials and products at all stages of production and distribution, whether to factories or as finished products to markets, where consumers must in turn have jobs in order to afford to make purchases. This reality ties indicators such as employment, savings, wages, investment and consumption into a synergistic whole.

The European Union model for transportation investment is anchored by the role the decision making processes play from pre- to post-construction. Burinskienė & Griškevičiūtė-Gečienė (2012) summarized this process as follows: Usually, the process of decision making plays a great role at the initial stages of transportation development strategic planning.

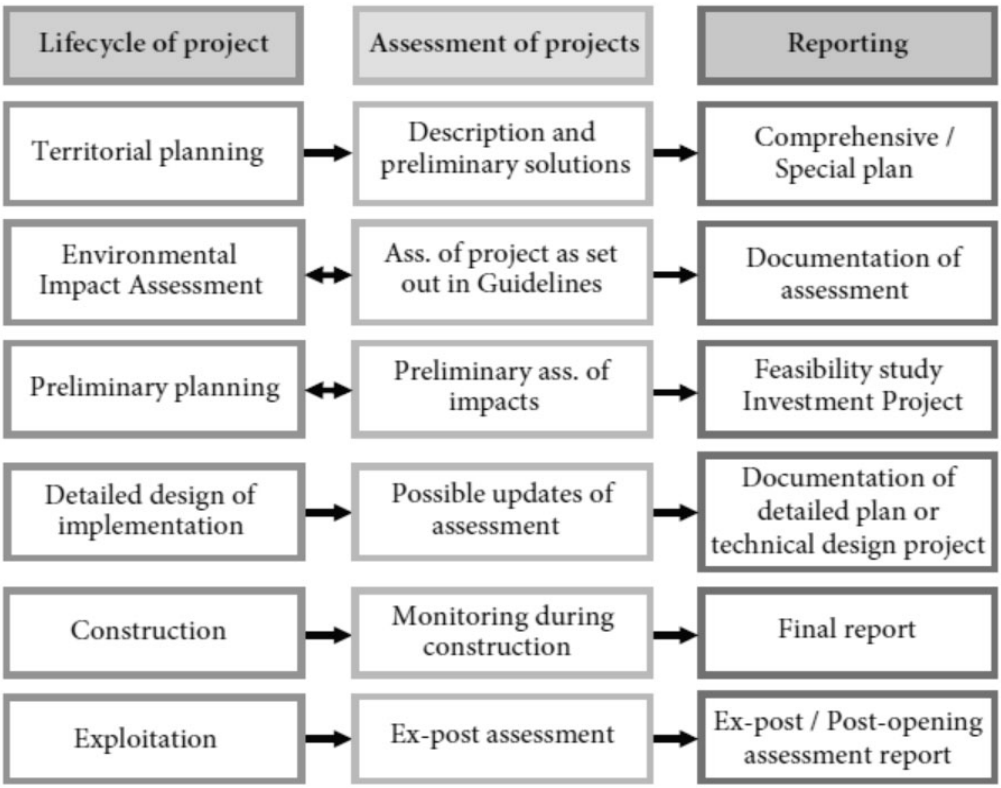

Figure 6. A general approach to the justification process of development projects on transport infrastructure in the EU countries (systemized results of the EU practice). From Burinskienė & Griškevičiūtė-Gečienė, 2012, p. 658. Used by permission.

The decisions are made on a different level depending on institutional approaches. Despite this structure, a selection of separate projects is quite problematic. The solutions usually have to be represented in 2–4 different alternative ways. The selection of the optimal alternative is performed evaluating projects using qualitative and quantitative criteria. The final decision is made after performing a detailed assessment.

Elaboration of such assessment depends on a project type and its size. The environmental impact assessment is usually included in the whole process of justification (Burinskienė & Griškevičiūtė-Gečienė, 2012, p. 657). Burinskienė & Griškevičiūtė-Gečienė, (2012) also provided a comprehensive diagram showing the interrelated relationships between the lifecycle of a project, assessment of a project, and reporting, depicted in Figure 6.

In the European Union model there are key factors that play significant roles in the transport investment prioritization and they include but are not limited to: appropriateness of transport policy, availability of sources of funding, cost-effectiveness of projects, and administrative capacity to adequately manage and absorb funds. These investment priorities then shape the impacts and create the basis for creating performance metrics for the constructed road(s). The key metrics are accessibility, territorial cohesion, economic competitiveness, and environmental sustainability. The impacts are assessed utilizing the SASI model that is common in 130 regions of Europe (Burinskienė & Griškevičiūtė-Gečienė, 2012, p. 660).

Thomopoulos et al. (2009) created a more complex conceptual model that explored GDP, accessibility, population, employment, socioeconomic indicators and the labor force and examined how Greece tied its own practice to the EU's national regional policy and recommendations. In this model, Greece created its own national regional Strategic Guidelines built around the European Union model for identifying its transportation investment priorities. The Spatial and Socio-Economic Impacts (SASI) model is used to assess spatial impacts of transportation infrastructure of European significance with social-economic factors. The model Figure 7 not only allows for the modeling of the impacts of transport on regional development

by modeling population and production, but also allows for forecasting time into shorter periods in order to assess impacts in the short-run:

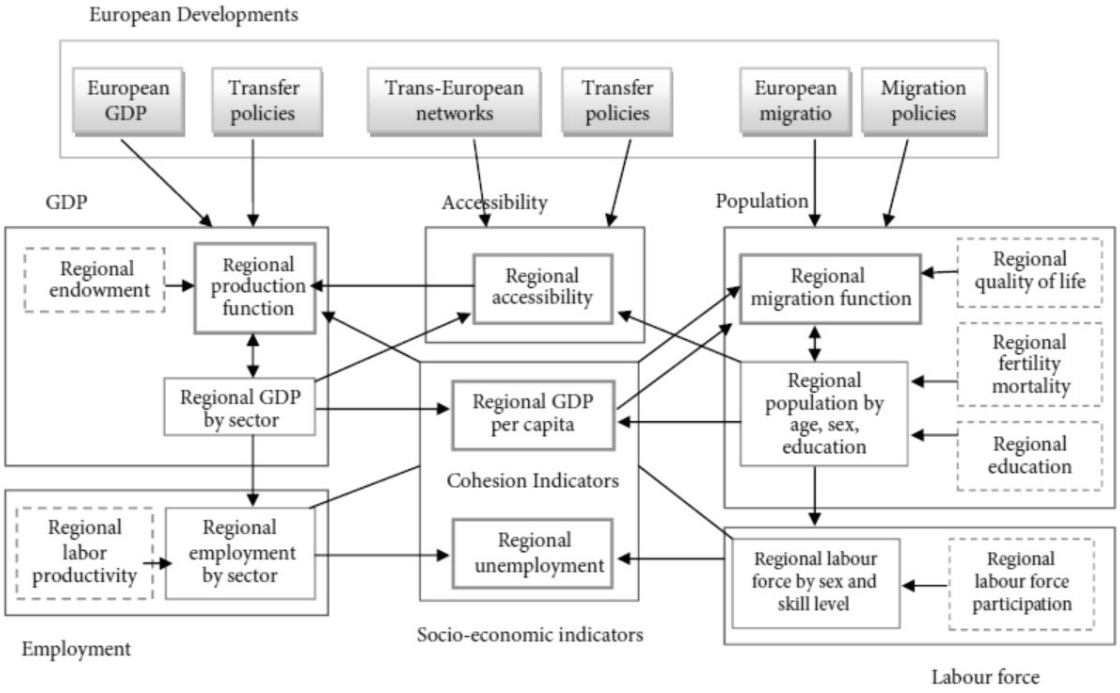

Figure 7. The SASI Model. From Burinskienė & Griškevičiūtė-Gečienė, 2012, p. 661. Used by Permission.

This is the framework that has dominated regional economic development polices and theories since the 1940s, when Paul Rosenstein-Ronda, Ragnar Nurkse, W.W. Rostow and other researchers began to extrapolate on the relationship between infrastructure, and investment, including transportation infrastructure and economic growth (Crescenzi & Rodriguez-Pose, 2012; Xueliang, 2013). While methods for determining the impact of road infrastructure on economic development of regions continue to evolve, new challenges to existing models persist. One such challenge is the demand of land use policies that may conflict with transport planning

policies. As many researchers have noted, land use policies are aimed at reducing demand for unnecessary travel and reducing the necessary traffic—the domain of transport planning policies (Beria et al. 2010, Eliasson & Lundberg, 2012). As Burinskienė and Griškevičiūtė-Gečienė (2012) explained:

Transport policy is more clear and effective than regulation of land use when the main aim of policy is a sustainable transport system. Yet, the means of land use is valid at all stages of transport planning and are often efficient for a long-term perspective. Therefore, an integrated and effective interaction between transport planning and land use is often validated through the procedures of territorial planning.

When Crescenzi and Rodriguez-Pose (2012) explored this framework with EU regional growth data from 1990 and 2004, they discovered that infrastructure investment was a poor predictor of economic growth and argued that instead that the EU regional growth was a multidimensional framework. This framework included "adequate 'social filter', good innovation capacity, both in the region and in neighboring areas and a region's capacity to attract migrants" (p. 487). Xueliang (2013) agreed that the theories from the Western nations' experience suggesting that investment in transportation promotes regional economic growth have been proven wrong in many developing countries. Xueliang (2013) argued that within multidimensional factors contributing to regional economic growth, "labor plus capital stock from other parts of the public sector make the greatest contribution to regional economic growth in China" (p. 24-25).

Yu et al. (2012) examined the relationship between economic growth in China—at both the national and regional levels—and transportation infrastructure investment using the causality in a Granger causality framework and a panel co-integration on a time series data from 1978-2008. Their empirical findings suggested that at the national level, the data showed a unidirectional Granger causality from transportation infrastructure to economic growth, but that on a regional level, the data showed bidirectional causality for the more affluent region and a unidirectional causality for the low-income western and central regions. The findings of Yu et al. (2012) suggest that improving transportation infrastructure is not enough to stimulate economic growth in the underdeveloped areas of China. Iyanova & Masarova (2013) in studying economic development and road infrastructure investments in the Slovak Republic Regions also found that affluent regions tended to see more linkage between the two than other not so affluent regions. Iyanova & Masarova (2013) contended that economic development depends on other factors including socioeconomic, political, natural-geographic, historical, and demographic. Thomas (2013) weighed the economic development benefits of transportation investment in South Africa's High Speed Rail project dubbed the "Gautrain" and warned that although it eased traffic congestion and created jobs, it also deepened the mobility-related exclusion and gives priority to the wealthy in the distribution of public funds.

Infrastructure Investment in Relation to Developing Countries

There is a burgeoning literature directed at the relationship between road networks investment and economic development in developed countries such as the United States and United Kingdom (i.e. Aschauer, 1990; Eisner, 1991; Iyanova & Masarova (2013); Munnell,

1992; Nobrega & Stich, 2012; Usman, 2014). In contrast, very limited numbers of studies have explored the possible relationship between investments in transportation infrastructure and economic development in developing countries such as the Federal Republic of Nigeria. Many of the researchers who have studied the relationships between investment in transportation infrastructure systems and economic development have peered through undifferentiated lenses rather than focusing on the specificities aspect of capital (Bagchi & Pradhan, 2013; Lakshmanan, 2011; Prud'homme, 2005; Shafik, 2005). Additionally, the economic development policies of many developing countries, Nigeria included, suggest there are gaps in the understanding of the relationship between transportation infrastructure investment and economic development; more importantly, it is imperative to understand the various stages of the development paradigm (Khasnabis et al, 2010; Nobrega & Stich, 2010;Rashidi & Samini, 2012;; Usman, 2014).

The assertion that transportation infrastructure investment serves as an important catalyst or even as the backbone of a country's economic development, particularly in developing countries, has long been debated among economists and researchers (Dash & Sahoo, 2012; Echui & Keho, 2011; Olsson, 2010). The uncertainty can be attributed in part to data collection constraints. Information technology constraints have prevented effective collection of empirical data necessary to carry out a more rigorous inquiry into the links between transportation infrastructure investment and economic development in developing countries. As a result, studies conducted in developing countries on this subject have been at best limited or inconclusive. This lack of certainty has also been noted in the development investment policies

of many developing countries (Njoh, 2008; Siemiatycki, 2013). There is a dearth of empirical work investigating the relationship between transportation infrastructure investments and economic development from developing countries. The limited studies conducted have only been able to show a lack of imagination in the policy making in many of these developing countries with respect to the connection between transportation infrastructure investments and Gross Domestic Products (GDP) (Njoh, 2008, 2012; Siemiatycki, 2013). The transportation infrastructure management and policies of many developing countries lack a clear focus. This lack of focus or certainty has been noted in the development investment management and policies of many developing countries (Njoh, 2008, 2012; Siemiatycki, 2013). Clearly, there is knowledge gap and the developed countries (such as the United States) have experiences and the empirical data depository that would help move developing countries (such as Nigeria) to better realize benefits of transportation infrastructure investments that have long been realized by developed countries (Johnson and White, 2010; Peterson & Jesup, 2007; Rashidi & Samimi, 2012; Siemiatycki, 2013).

This study explores whether—in developing countries; such as Nigeria—there is a relationship between the planning, investments, and build-out of road transportation infrastructure with long-term economic development strategies. One contribution I will make to scholarship on the relationship between transportation and economic development is to identify and link key factors needed for a developing country, such as Nigeria, to gain new knowledge and understanding of the effect of transportation infrastructure on their past development efforts and future plans. The volume of both raw materials and finished goods to be shipped depends

on the availability and quality of good road networks (Lakshmanan, 2011; Na, et al, 2013; Usman, 2014). Transportation infrastructure contributes enormously to economic activities of nations (Na, et al, 2013; Usman, 2014). It enables a country to compete in global markets through reduced product prices, elimination of internal trade barriers, speed and efficiency in getting raw materials to production sites and in getting finished products to market and expanded market possibilities. Infrastructure is also tied directly and indirectly to a multitude of other related activities including reducing poverty, stimulating the economy, and improving standards of living (Bagchi & Pradhan, 2013; Dietzenbacher &Tukker, 2013). While some scholars and researchers have downplayed the importance of modernizing road networks with reference to doubts about production elasticity, the prevailing consensus is that transportation infrastructure is important to economic development (Bagchi & Pradhan, 2013; Lakshamanan, 2011; Na, et al, 2013). Transportation infrastructure is the central focus in Adam Smith's (1880) vision of economic development: "No roads, no transport, no trade, no specialization, and no economics of scale, no productivity progress and no development" (quoted in Prud'homme, 2005, p.147). This construct inspired the Good Roads Movement in the United States between the 1890s and the 1930s. Reformers campaigned for the construction and improvement of U.S roads (Fuller, 1955). The subsequent construction of the U.S. interstate highway system and connections to rural roads in the United States fueled economic growth across the country (Aschauer, 1989; Fuller, 1964; Paxson, 1946). Developing countries often model their plans on the achievements of developed countries but in the 21st century, these countries will do better if

they measure their progress by aligning their transportation infrastructure plans to their economic development strategies and goals.

Summary and Conclusions

In Chapter 2, I reviewed the literature on road transportation infrastructure and economic development. To understand the large volume of research data on transportation infrastructure and its contributions to economic and social change in developing countries, I grouped them into four manageable categories: infrastructure investment in relation to poverty alleviation, infrastructure investment in relation to economic growth, infrastructure investment in relation to regional development, and infrastructure investment in relation to developing countries. The literature review revealed that in Nigeria, as in most developing countries, road infrastructure investment decisions are usually made to meet the utilitarian need to move people to urban areas, where the jobs and schools are often located, without any formal plan to measure resulting economic development benefits. However, data pertaining to relationships between road transportation investment and the benefits associated with such investments are difficult to come by in developing countries.

The literature review on transportation investment led me to conclude that four basic conceptual stages were necessary for achieving pre- and post-construction success: a stakeholder-driven (a) road infrastructure management policy and strategy that is used to formulate (b) fiscal or budget allocations linked to the type of (c) road that is constructed and the expected (d) measurable impacts the road will have on the socioeconomic well-being of a community, city, state, or region, or of the entire nation.

Chapter 3 will provide more transitional materials to connect the gaps in the literature to the methods described.

Chapter 3: Research Method

The purpose of this qualitative case study was to better understand the relationship between road transportation infrastructure investment and economic development in Nigeria. Bogdan and Biklen (2011) and Patton (2015) asserted that characteristics of qualitative research include conducting research in its natural setting, describing its subject matter, describing a particular phenomenon from examining it in-depth, addressing the process and how data are collected and analyzed, and using inductive reasoning to describe the topic as accurately as possible. In this chapter, I describe the methodology, design, and other techniques used in this study.

Research Design and Rationale

The study of whether roads infrastructure planning, investments, and build-out are related to sustainable economic development was well-suited to the qualitative case study approach (Biklen & Bogdan, 2011). The opportunity for roads infrastructure investment in Nigeria is great and is estimated to be in the three hundred billion dollar range in Nigerian currency, equivalent to two hundred billion in U.S. dollars, at an exchange rate of 150 Nigerian naira to one U.S. dollar (Reuters, 2013). The return on investment is also great considering the wide gap between supply and demand. The increase in economic activities and population growth is driven by the need for the upgrading of Nigeria's economic backbone: its transportation infrastructure and development. In November 2010, the President of the African Development Bank Group, Dr. Donald Kaberuka, met with the President of Nigeria and members of his cabinet and senior policymakers. In the course of this meeting, the Nigerian

officials made clear that the government's foremost priority was to meet the demands for critical infrastructure facilities.

The Government of Nigeria requested that the African Development Bank (AfDB) prepare a report on the state of infrastructure in the country. The Bank accepted this request, cognizant of the fact that policy actions and investment in infrastructure have important roles to play in Nigeria's economic transformation. Infrastructure development is a key contributor to a better business environment. It is a precondition for private sector development and a key enabler of regional integration. Investments in transportation infrastructure are critical to advancing agriculture productivity, which is a pillar of the Nigerian economy, and to human development, including the delivery of health and education services to the poor. The activities involved in infrastructure sector upgrades can themselves be a stimulus for growth and productive employment. Studies have shown that increasing the infrastructure investments in core sectors by 1% can increase GDP growth by up to one percentage point. In recognition of these facts, the development of Africa's infrastructure is a key component of the strategic direction being pursued by the Bank (AfDB, 2011).

According to Bluhm, Harman, Lee, and Mitchell (2010), the decision to conduct a study is always driven by the research questions. This study proposed to answer the following research questions:

RQ1: What is the impact of road transportation infrastructure investments on economic development in Nigeria?

RQ2: What are the necessary planning, implementing, and monitoring criteria needed for pre- and post-construction activities?

RQ3: How does investment in transportation, specifically road networks, affect social change?

I conducted a descriptive study using qualitative methods to describe the relationship between road transportation infrastructure investment and economic development in Nigeria. Merriam (2014) defined case study as an in-depth description and analysis of a bounded system. A qualitative case study was the best fit for the study, because it provided the right tool to explore the context of the study from a holistic perspective that was bounded by time, individuals, activities, and events, and because it allowed for gathering information from multiple sources (Biklen & Bogdan, 2011; Patton, 2015). Tellis (1997) argued that a case study is the best option when the questions drive the research questions in answering the "*what*" and the "*how"* of the study. Additionally, Yin (2013**)** suggested that case studies should include "*who*" and "*what*" to be studied, employ interviews for data collection, develop themes and patterns, analyze data, and offer explanations for the findings. Furthermore, a case study is best for a given context when multiple sources of data can be utilized to produce a comprehensive finding (Donnelly & Trochim, 2001; Jacelon & O'Dell, 2005). All of these factors made a case study the best option for exploring whether roads infrastructure planning, investments, and build-out are related to the planning of economic development strategies in Nigeria.

Role of the Researcher

My role was an observer, participant, and observer-participant. The goal was to explore the relationships between roads infrastructure planning, investments, and build-out and the corresponding economic development planning and activities. I conducted one-on-one face-to-face interviews with participants to gather the data. In addition, I culled peer-reviewed research information pertinent to road transportation infrastructure and economic development. The information collected for the case study made my role as researcher very important (Yin, 2013). In conducting this study, I set up an expert panel of three to five professionals with in-depth knowledge of road transportation infrastructure and economic development to review the research questions to ensure relevancy, quality, validity, and reliability.

The researcher should be cognizant of researcher biases and how they can influence the direction and outcome of a study (Yin, 2013). I am from Nigeria and spent many years in Nigeria before migrating to the United States for further studies. Noor (2008) argued that case studies based on gathering data through interviews are subjective; the researcher should be aware of his or her prior sentiments and opinions concerning the research problem. I ensured that my personal opinions and prior experiences about road infrastructure in Nigeria were not subjectively integrated into the study direction or outcome. Instead, I allowed the findings to be driven by the data. I conducted the interviews by contacting participants face to face and giving them the option to withdraw from the study at any point in the process.

Prior to commencing the interview, each participant was given a consent form to sign. Participants were informed of their rights and assured of the confidentiality of information

gathered from the interviews, and were told how the results would be stored for 5 years and made available to the Walden University community. Collected data were masked to prevent the identification of participants and stored in a password-protected file, and all physical data were securely locked in a filing cabinet in my office.

Methodology

Population Sampling

The appropriate units of analysis are derived from the research questions and are used to determine the scope of data collection (Yin, 2013). Purposeful sampling was used to select Nigerian stakeholders who influenced the planning, funding, construction, and monitoring of roads infrastructure development in Nigeria or who were affected by road infrastructure in Nigeria. Donnelly and Trochim (2007) argued that purposeful sampling is appropriate when sampling for proportionality is not critical. Purposeful sampling was adequate for this study because there were sizeable numbers of Nigerians who were familiar with the knowledge and nuances of roads infrastructure in Nigeria and who were either living in the United States or visiting the United States in some capacity.

Through purposeful sampling, I identified in-transit or U.S.-based Nigerian stakeholders who had influence over road transportation infrastructure development or who were directly or indirectly impacted economically. In-transit Nigerian government officials are those who are visiting the United States, and they can be current or past office holders or appointed officials. Interviewees were categorized into four groups: in-transit or U.S.-based current or former Nigerian elected or appointed government officials who had influence in roads transportation

infrastructure development, in-transit or U.S.-based current or former senior management or policymakers who had influence in road transportation infrastructure, in-transit or U.S.-based Nigerian business stakeholders whose business success in Nigeria were directly or indirectly affected by the existence of sustainable road infrastructure, and U.S.-based Nigerian stakeholders who had lived, studied, visited, or worked in Nigeria within the last 5 years and had experienced the Nigerian road infrastructure personally. The interview participants were divided into groups to gain a broader representation of individuals involved in the study.

The U.S. Census Bureau (2010) identified Nigerians, both expatriate and those who are naturalized United States, as part of the diversified U. S. demographic. The census data also showed that Nigerian business owners based in the United States do extensive commercial business in Nigeria. Anecdotal evidence points to a wide distribution of Nigerians across the United States, with large populations clustered in Metropolitan areas like New York; Washington, DC; Atlanta, Georgia; Houston, Texas; Los Angeles; and Dallas, Texas. The Federal Government of Nigeria also has several diplomatic posts in the United States, including an embassy in Washington, DC, and consulates in New York and Atlanta (U.S. Department of State, 2012). These areas provided sufficient numbers of Nigerians for this study's population.

Instrumentation

I designed an original interview guide with open-ended questions (Appendix C).I used in-depth person-to-person interviewing and observation as instruments for data collection. The interviews consisted of semi-structured open-ended questions. The interview questionnaire was approved by three expert panel members who had knowledge, experience, and understanding of

road transportation infrastructure investment and economic development. Interviews were conducted to gain detailed insights into participants' perspectives, opinions, and understanding of the subject being investigated (Turner, 2010).

To establish construct validity and reliability, Yin (2013) suggested the use of multiple sources referred to as triangulation of evidence. Yin asserted that a case study must not only be specific, it must also describe an event, process, or person. In many situations, case studies are used to contribute to the body of knowledge of the phenomenon being studied. Yin proposed four tests needed for the evaluation of a qualitative study: construct validity, external validity, internal validity, and reliability (Yin, 2013). As Yin posited, internal validity is necessary when a causal relationship needs to be established. Because this study did not include a causal condition or a hypothesis, the internal validity approach was not used. Instead, I focused on construct validity, external validity, and reliability to describe a phenomenon without preexisting bias affecting the data collection.

To satisfy the rigors of construct validity, Yin (2013) recommended specific concepts that relate to the original objectives of the study and that can be operationalized to match the concepts. In this study, Nigerian government officials who were in-transit in the United States or were based here, and who had influence in the planning, funding, construction, and monitoring of roads infrastructure and economic development, constituted the construct. Other Nigerian stakeholders who were directly or indirectly affected by roads infrastructure in Nigeria also constituted the construct. For reliability, Yin (2013) suggested that the researcher develop a protocol that includes field procedure, a research overview, and a guide for the final report. I

developed a case study protocol to guide me in preparing for the interviews, in gathering the data, and in compiling and interpreting the data. The steps for exploring whether roads infrastructure development, funding, and monitoring in Nigeria are related to economic development can be replicated by other researchers using the case study protocol.

A primary threat to validity was social concerns, such as assuring the participants that their privacy would be maintained at all times. This was achieved by informing participants that the research would be conducted under the auspices of a major global university, that their identities would be concealed, and that any coding that could possibly reveal their identities by deductive analysis would also be mitigated. This approach was supported by Yin (2013), who posited that using triangulation to create lines of investigation increases the validity of the study when data sources come together. Credibility of the interview data was achieved by comparing it to the study objectives and checking for consistency (Wildemuth & Zhang, 2009). Each transcript had the participant's code, such as Participant 1, Participant 2, and so forth; no personal identifier was affixed, and the data will be stored in encrypted format for 5 years on my computer and then deleted.

Observation was conducted during the interviews, and I kept detailed notes of my prejudices, personal feelings, and impressions of the participants' knowledge and passion for the subject of the study as they responded to the questions. The interpretation of data collected via interviews was shared with each participant through member checking to clarify unclear responses. When it comes to instrumentation for a qualitative case study approach, Yin (2013)

proposed three principles: construct a case-study database, develop a chain of evidence, and use multiple sources of information.

Procedure for Selecting Expert Panel Members

This research was based on data collected from participants' responses to interview questionnaires. Before conducting the interviews, I recruited an expert panel of three individuals with in-depth knowledge and experience of Nigeria's road infrastructure investment and economic development. These experts reviewed and validated the interview questions and assisted in evaluating how well the questions would be understood, whether they would be relevant to the study, and what changes, if any, were needed.

Procedures for Recruiting and Interviewing Participants

I selected my research participants based on a sequential referral technique, selecting content-matter experts on the subject of road infrastructure planning, investment, construction, and economic development within the context of a particular developing country (Nigeria). As Weiss (1994) suggested, people who are content-matter experts in the area of study or were witnesses to the event are often the best people to provide information, because they are the most informed on the subject. Nigeria has road infrastructure governing bodies with decision-making processes for developing road networks at the national, state, regional, and local levels. This government structure yielded a pool of potential participants who could inform the study based on their experiences, their knowledge of policies and procedures, and their established economic development planning strategies, using road infrastructure as the cornerstone of the study. Four different types of participants were identified, with 20 (20) total participants:

- In-transit or U.S.-based current or former Nigerian elected or appointed government officials who have influenced road transportation infrastructure development in any of the following capacities: planning, policy formulation, budgeting, construction, or performance monitoring and reporting;
- In-transit or U.S.-based current or former senior managers or policymakers who have influenced road transportation infrastructure development in any of the following capacities: planning, policy formulation, budgeting, construction, or performance monitoring and reporting;
- In-transit or U.S.-based Nigerian business stakeholders whose business success in Nigeria is directly or indirectly affected by roads infrastructure; and
- U.S.-based Nigerian stakeholders who have lived, studied, visited, or worked in Nigeria within the last five years and have experienced the Nigerian road infrastructure personally.

Table 1 shows participants and the number of interviews to be conducted per group.

Table 1

Number of Interviews and Participant Type

Key Informants	**No. of Interviews**
In-transit or U.S.-based current or former Nigerian elected or appointed government officials	5
In-transit or U.S.-based current or former senior management or policymaker	5
In-transit or U.S.-based Nigerian business stakeholders	5
U.S.-based Nigerian stakeholders who have lived, studied or worked in Nigeria	5
Total Interviews	20

Procedures for Data Collection

Choosing 20 participants who understand road infrastructure planning, investments, and construction and the formulation, implementation, and monitoring of economic development strategies generated information-rich data (Patton, 2015), which was the central goal of the study. The specific procedures for how participants were identified, contacted, and recruited included the following criteria:

- In-transit or U.S.-based current or former Nigerian elected or appointed government officials who had influenced road transportation infrastructure development in any of the following capacities: planning, policy formulation, budgeting, construction, or performance monitoring and reporting;

- In-transit or U.S.-based current or former senior managers or policymakers who had influenced road transportation infrastructure development in any of the following capacities: planning, policy formulation, budgeting, construction, or performance monitoring and reporting;
- In-transit or U.S.-based Nigerian business stakeholders whose business success in Nigeria was directly or indirectly affected by roads infrastructure; and
- U.S.-based Nigerian stakeholders who had lived, studied, visited, or worked in Nigeria within the last five years and had experienced the Nigerian roads infrastructure personally.

In quantitative research, the percentage of the total number of available participants is used to predetermine the sample size. Qualitative research, by contrast, offers many acceptable ways in which a sample size is derived, such as the suggestion of Bertaux (1981) that 15 participants are a sufficient sample (adapted from Guess et al., 2006). There are researchers who have argued that when a study reaches a point of diminishing returns, when gathering additional data will make no difference, this saturation point determines the number of samples (Ritchie at el., 2013). Since the nature of qualitative research is to produce an understanding of the meaning of events, hypothetical generations that require high sample numbers are not necessary (Crouch & McKenzie, 2006**)**. Once a saturation point is reached, collection of additional data does not shed any more light because it is redundant (Glaser & Strauss, 2012).

The main purpose of conducting interviews is to find out what is in and on the subjects' minds and to gather their stories (Patton, 2015). I conducted person-to-person interviews to

elicit information from selected Nigerians in four groups: in-transit or U.S.-based current or former Nigerian elected or appointed government officials who had influenced road transportation infrastructure development; in-transit or U.S.-based current or former senior managers or policymakers who had influenced road transportation infrastructure; in-transit or U.S.-based Nigerian business stakeholders whose business success in Nigeria was directly or indirectly affected by the existence of sustainable roads infrastructure; and U.S.-based Nigerian stakeholders who had lived, studied, visited, or worked in Nigeria within the last five years and had experienced the Nigerian road infrastructure personally.

Interviewing is appropriate when a researcher cannot observe behavior, feeling, or how people interpret the world around them (Merriam, 2014). Prior to conducting the interviews and data collection, I obtained written approval from Walden University's Institutional Review Board (IRB) for the topic. Having received the board's approval, I took steps to validate the research questions as stated in the interview protocol. The first step was to confirm the participants' contact information and their willingness to participate in the study. Seidman (2013) and Bogdan and Biklen (2011) discussed techniques the researcher can use when interviewing participants. According to Seidman, (2013), the researcher should listen carefully for every word participants are saying. Listening carefully gives the researcher the opportunity to ask follow-up questions for clarification. Asking follow-up questions demonstrates that the researcher is actively listening. Singleton and Straits (2010) asserted the need for the researcher to maintain communication with a participant during an interview to gain full understanding of the study's purpose.

Once one of the potential participants agreed to be interviewed, I provided him or her with a consent form (Appendix A) to read and sign. The participant was asked to keep a copy, and I obtained a copy before the interview was conducted. To ensure that all participants were asked the same questions, I created an interview protocol (Appendix C). With the permission of the participant, I used an audio recorder to capture his or her responses. All interviews were coded by pre-assigned participant number, such as Participant 1, Participant 2, and so forth, and they were conversational in order to allow participants to freely share their insights and thoughts. A semi-structured in-depth open-ended interview questionnaire was used to collect data. The intent of using the interview questionnaire protocol is to ensure that all participants are asked the same questions. Each interview lasted 45 to50 minutes, and a transcript was provided to each participant after the completion of the interview if requested. If the participant declined to be audio recorded, his or her wishes were honored, and that interview was not included in the study. No participant declined to be audio recorded. The interviews were conducted in the participants' offices or in a hotel for in-transit officials. I took detailed notes during interviews to ensure capture of participants' responses. Table 2 shows the data sources and instruments used to collect data.

Table 2

Type and Source of Information to Be Collected

Information/Information Source	**Interviews**	**Observations**
In-transit or U.S.-based current or former Nigerian elected or appointed government officials	Yes	Yes
In-transit or U.S.-based current or former Nigerian senior management or policymakers	Yes	Yes
In-transit or U.S.-based Nigerian business stakeholders	Yes	Yes
U.S.-based Nigerian stakeholders who have lived, studied or worked in Nigeria	Yes	Yes

Data Analysis

Data analysis is the process of making sense out of the data (Merriam, 2014). This involves consolidating, reducing, and interpreting information from the interviews and observations. Content and inductive techniques are two common data analysis techniques in qualitative study. Content analysis involves content of interviews, participants' responses, observations, and field notes taken during interviews. Inductive analysis involves grouping participants' responses into categories and themes. Seidman (2013) suggested not starting data analysis until all interviews are completed, which enables the researcher to study all transcripts before analysis. In contrast, Merriam (2014) recommended simultaneous analysis with data collection, because without ongoing analysis, the data can be unfocused and repetitious and will result in overwhelming quantities of data to be processed.

I chose to employ the constant comparative method of data analysis proposed by Glaser and Strauss (2012). I identified segments of information from the interviews and observations that were similar and responsive to the study research questions. I read the interview transcripts, notes, and relevant documents collected and noted in the margins of the transcripts any comments and words that showed similarities. I organized repeated words and ideas into categories and themes. Corbin and Strauss (2014) referred to this stage as *axial or analytical coding.*

Qualitative research involves analyzing materials and data that are unstructured. I used NVivo software to manage, shape, and make sense of unstructured interview information. NVivo was used for analysis of the interview transcripts and observation notes, as well as to classify and analyze the responses of the participants into thematic data areas. It was also used to evaluate the themes, perceptions, and opinions of the participants that might influence the impact of road transportation infrastructure investment on economic development in Nigeria.

Issues of Trustworthiness

Credibility

Triangulation is defined as comparing different methods and different kinds of data in order to corroborate findings (Bloomberg & Volpe, 2012). Silverman (2013) argued that credibility is the relative confidence that findings are accurate and are based on the data collected. In this study, credibility was established through triangulation, extended contact, and saturation. Using triangulation enabled me to reduce the impact of biases (because each method used to gather data has the potential to cancel out the weaknesses of the other), while giving me

the flexibility to gain an understanding of the different aspects of the study. Triangulation was achieved by using different sources of data field notes, participants' responses, and observations to gain a broader perspective of the subject. By interviewing 20 people who come from different backgrounds with different perspectives on road infrastructure planning, investing, construction, and economic development, this study reached saturation, which helped establish credibility.

Transferability

Road infrastructure planning, investment, and construction, and the planning, execution, and monitoring of economic development linked to it, are universal. Most developing countries, Nigeria included, have ministries of public works or transportation or other government agencies responsible for roads and for economic development. The results of an information-rich study utilizing public records and other documents and interviewing government officials can be transferred to other developing countries with similar characteristics.

Dependability

Studies carried out in the social world do not always turn out the same when replication attempts are made because, as Marshall and Rossman (2014) noted, human societies are constantly changing, and so replicability is not guaranteed. So instead of replicability, social science aims for dependability of research. Dependability involves ensuring that the strategies used for the findings can be repeated in a similar setting and context and yield similar results. I kept an audit trail of conditions of the research that may alter its dependability so that other researchers performing similar studies will know what to expect. I have included a compilation record showing how I gathered the evidence and collated, synthesized, and analyzed the data.

Confirmability

Confirmability means using data to confirm findings rather than relying on the researcher's intuition, in order to establish research objectivity (Marshall & Rossman, 2014). Confirmability for this research was achieved by following a systematic procedure for data collection, analysis, and reporting in order to mitigate researcher bias and enhance replicability of the findings. The following procedure represents Yin's (2013) recommendation:

1. For the unit of analysis, I used purposeful sampling for participant selection from in-transit or U.S.-based Nigerian government officials and both Nigerian business owners and Nigerian citizens who reside in the United States.
2. Before participants were interviewed, they were given a consent form to sign. The consent form included a statement of the research problem and the purpose of the study.
3. Each participant was scheduled for an interview session lasting 45 to 50 minutes.
4. I conducted interviews to gather data from all participants, namely: in-transit or U.S.-based current or former Nigerian elected or appointed government officials who had influenced road transportation infrastructure development; in-transit or U.S.-based current or former senior managers or policymakers who had influenced road transportation infrastructure; in-transit or U.S.-based Nigerian business stakeholders whose business success in Nigeria was directly or indirectly affected by the existence of sustainable road infrastructure; and U.S.-based Nigerian

stakeholders who had lived, studied, visited, or worked in Nigeria within the last five years and had experienced the Nigerian road infrastructure personally.

5. I maintained a chain of evidence and stored the data.
6. I used the constant comparative and content analysis techniques to interpret the data.
7. I tabulated evidence for each research theme.
8. I achieved saturation.
9. I conducted data triangulation by using data from the interviews and the results from literature review on road infrastructure planning, funding, construction, and monitoring in relation to economic development.
10. I developed themes and patterns.
11. I reviewed the patterns, proposed an explanation of the findings, and then related the analysis to the relevant literature on the subject.

Ethical Procedures

Every procedure in this study was ethical, and as part of this commitment, I obtained permission from Walden University's institutional review board for all activities. I gained access to the population by calling individuals preselected from organizational charts in public records and in Nigeria's embassy or consulate office. Ethical concerns such as the utilization of informed consent forms and electronic archival system were mitigated by not allowing data linked to minors to be used and by ensuring that all participants' concerns were addressed immediately. Further, if a participant wished to discontinue the engagement, his or her wishes

would be promptly honored and the interview halted. Provisions addressing the ethical standards that I followed are addressed in the consent form.

Informed Consent

I used an informed consent form (Appendix A) to educate participants about their rights, the purpose of the study, and the voluntary nature of their participation. Prior to commencing any interview, I presented an informed Consent form to each participant informing him or her of the audience and purpose of the study, the implications of participating in the research, the voluntary nature of the study, and the freedom of each participant to withdraw from the study at any point if he or she is no longer comfortable with the process. Participants were assured that their responses would be coded and that no information identifying them personally would be known except by the researcher. Once a participant agreed to participate, he or she was informed about the risks involved in the research and procedures and was given the opportunity to withdraw or remain in the study. Risk of harm could be physical, psychological, or both (Donnelly & Trochim, 2008). I ensured that participants were not exposed to any risk during the interview process. The participants were assured that the study was voluntary and that they could decide to end it at any time. The informed consent form gave the participants the assurance that they could withdraw from the study with no adverse impact and that their participation would not result in any risk or danger to them.

Maintaining Participants' Confidentiality

Donnelly and Trochim (2008) posited that anonymity and confidentiality are two key ways to protect participants' privacy. The principle of anonymity requires that the participants'

anonymity is maintained throughout the course of the research, while the principle of confidentiality ensures that no person not directly involved in the research is allowed access to participant identification data. Confidentiality was achieved by assigning alphanumeric code to participants (Participant 1, Participant 2, and so forth) as opposed to identifying them by their names, in all data collection instruments including the consent forms. All records pertaining to this study will be stored in a filing cabinet encrypted format and locked in the researcher's office for 5 years after completion of the study.

Summary

The goal of this qualitative case study was to establish whether road transportation infrastructure planning, investment, and construction are related to the planning, execution, and monitoring of economic development activities in a developing country, Nigeria. The scope of this study was restricted to Nigeria. The findings may assist policymakers, funders, and all those involved in road transportation infrastructure and economic development in understanding the relationship between road transportation infrastructure investment and economic development activities. The qualitative case study approach was chosen to drive the study and to increase the knowledge base of road infrastructure and economic development activities. In Chapter 4, I analyze the data analysis and report my findings.

Chapter 4: Results

Chapter 4 presents the data collected in this study. The purpose of this study was to better understand the relationship between investment in road networks and economic development in Nigeria. This study also underscored the relationship between planned investments in transportation infrastructure, especially road networks, and their effects on economic development, generation of economic activities, environmental quality, improvements in quality of life and individual mobility, social quality, reduction of poverty, and redistribution of population. The following research questions guided the study:

RQ1: What is the impact of road transportation infrastructure investments on economic development in Nigeria?

RQ2: What are the necessary planning, implementing, and monitoring criteria needed for pre- and post construction activities?

RQ3: How does investment in transportation, specifically road networks, affect social change?

Expert Panel

Before gathering data, I engaged three expert panel members who had in-depth knowledge and experience in road transportation infrastructure investment and economic development. These experts reviewed and validated the interview questions and assisted in the evaluation of the clarity of the questions and their relevance to the overall purpose of the study. The interview questionnaires were amended to reflect the experts' validation.

Study Setting

The data collection process began after approval by Walden University's Institutional Review Board (Appendix G). Each participant was contacted by email (Appendix B) with a follow-up call to establish his or her interest in participating in the study. The transportation and roads infrastructure in Nigeria, as in other developing countries, is challenging to navigate, and this experience cuts across all sectors of society—rich and poor, leaders and non leaders, everyday citizens, and stakeholders. Anyone who has plied these roads has experienced their ups and downs and can provide meaningful insights into solving some of the challenges. In particular, those who have traveled to the United States and have experienced its roads infrastructure have a deeper insight and understanding of the gaps between what is the current roads status in Nigeria and what it could become.

Demographics

A total of 20 subjects were chosen, including former and current Nigerian government officials, as well as Nigerian businessmen and women who were in-transit or resided in the United States, and those who live permanently in the United States and who had traveled to Nigeria on business. Participants were divided into four groups: in-transit or U.S.-based current or former Nigerian elected or appointed government officials who had influence in road transportation infrastructure development, in-transit or U.S.-based current or former senior management or policymakers who had influence in road transportation infrastructure, in-transit or U.S.-based Nigerian business stakeholders whose business success in Nigeria was directly or indirectly affected by the existence of sustainable road infrastructure, and U.S.-based Nigerian

stakeholders who had lived, studied, visited, or worked in Nigeria within the last 5 years and had experienced the Nigerian road infrastructure personally.

Data Collection

A total of 20 interviews were conducted for the study. Interviews were conducted over a period of 8 weeks, from October 2 through November 30, 2015. The one-on-one face-to-face interviews were conducted in the participants' offices or in a hotel in the case of in-transit officials. Each interview lasted approximately 45 to 50 minutes. Before the interview process began, each participant was informed of the nature and form of the research. Each participant was given a consent form (Appendix A) to read and sign. I asked each participant if he or she understood the consent form and if there were any questions. Once signed, a copy was given to the participant while I kept one copy. Each participant was further informed of his or her rights to continue or withdraw from the process at any time, the purpose of the study, the procedures, and the risks involved. The interview began once the participant's consent was received. I sought permission of all participants to digitally record the interviews as stated in the consent form. All of the interviews were recorded with an audio voice recorder. To ensure that all participants were asked the same questions, an interview protocol was used (Appendix C). The interview questions were intended to explore participants' experiences with road and transportation infrastructure in Nigeria. Participants were given as much time as needed to respond to the questions. Detailed field notes were taken during the interviews.

To reduce subjectivity, I triangulated the data. Triangulation was achieved by using different sources of data field notes, participants' responses, and observations to gain broader

perspectives of the subject. I shared transcribed data with participants to ensure that I had captured their responses accurately, and I gave them the opportunity to change any inaccurate information. All participants' data were masked, assigned a predetermined code, and stored in password-protected files. Data will be locked in a filing cabinet in my office for 5 years. Table 3 presents the participants, the total number of interviews conducted for each participant, and the alphanumeric code assigned to avoid identifying the participants' names.

Table 3

Participants, Total Number of Interviews, and Assigned Code

Participants	**Number of Interviews**	**Assigned Code**
In-transit or U.S.-based current or former Nigerian elected or appointed government officials	5	GP1.1, GP1.2, GP1.3, GP1.4, and GP1.5
In-transit or U.S.-based current or former senior management or policymaker	5	GP2.1, GP2.2, GP2.3, GP2.4, and GP2.5
In-transit or U.S.-based Nigerian business stakeholders	5	GP3.1, GP3.2, GP3.3, GP3.4, and GP3.5
U.S.-based Nigerian stakeholders who have lived, studied or worked in Nigeria	5	GP4.1, GP4.2, GP4.3, GP41.4, and GP4.5
Total Interviews	20	

Data Analysis

I used qualitative data analysis software NVivo 10 to analyze the interview transcripts. For each interview, I listened to the audio recording of the interview data and transcribed it into

a document using Microsoft Word. The transcribed data were saved on my computer hard drive and imported into QSR software NVivo 10 for analysis. Participants' responses were grouped into categories and themes so that I could identify parts of the interviews that addressed the purpose of the study. This approach conformed to Merriam's (2014) data analysis process that includes consolidating, reducing, and interpreting information from interviews and observations and also allowed me to employ content and inductive techniques, two common data analysis techniques in qualitative study.

Using the constant comparative method as modified by Boeije (2012), I organized the data as follows: (a) categorizing, (b) coding, (c) delineating categories, and (d) identifying similarities. Textual analysis of the data collected revealed several significant similar statements by the participants. Almost all participants agreed that development of roads and transportation infrastructure in Nigeria was below par and needed serious planning and governance structure. All participants agreed that corruption was the biggest hindrance to having a good roads network in Nigeria. Some participants argued that the existing roads network, the enhancement of these roads, and the ongoing planning strategies for new roads construction were a carry-over from the colonial era; their use and continued relevance as a tool to spur economic development and social change was at best questionable. When participants framed their responses according to their experiences with the U.S. roads and transportation infrastructure, they concluded that Nigeria had a long way to go in both the construction of new roads and the maintenance of existing roads and transportation infrastructures. They also argued for the intentionality of

linking roads and transportation planning, construction, and maintenance to economic development goals. Table 4 presents common responses that emerged from the interviews.

Table 4

Participants' Common Responses from the Interviews

Research Question number	Interview Question	Common Response from Interview
RQ1	What is the impact of road transportation infrastructure investments on economic development in Nigeria?	i. Without good roads and transportation infrastructure, there can be no economic development ii. If the leaders can prioritize road network construction there would be economic development and if the roads are upgraded, and if they have checks and balance in place it will improve economic development. iii. When you have good roads, people will be motivated to participate in economic development activities such as searching for employment. But when the roads networks are not good people are not motivated to invest
RQ2	What are the necessary planning, implementing, and monitoring criteria needed for pre- and post-construction activities?	i. Once projects are awarded, no follow-up measures are implemented to ensure that the work is done according to specifications, the completed work is inspected to ensure compliance and an ongoing maintenance schedule is developed ii. Most of the streets and roads are in terrible bad condition, with pot holes considered to be potential death trap. There appears to be no national standard for size and weight restriction or signage or specification stretching the importance of adequate drainage—[all components of good planning, implementation and monitoring]. iii. They don't maintain the road they just construct but don't maintain them. The road network is not strong enough to sustain heavy vehicles for one and there is no plan for road maintenance.
RQ3	How does investment in transportation, specifically road networks, affect social change?	i. Economic activities tend to follow roads and transportation infrastructure investments ii. Roads extend people's social options and connectedness iii. Long distance commuters' productivity and quality of life are negatively affected by the delays inherent in road networks that are mainly single-lane going in one direction

Themes in this study were identified by looking for similarities in participants' responses to interview questions. Combining the structural and textual statements allowed me to identify overarching themes related to the research questions. Table 5 presents three major themes from the participants' responses linking road and infrastructure development to economic and socio-cultural development and the reasons why Nigeria is not as developed as it should be today.

Table 5

Common Themes and Evidence in Participants' Responses

Common themes	**Participants' responses**
Corruption	i. Yes, corruption is a big part of it and greed is the next, the politicians are too greedy to allow the economic system to flow freely. They have everything needed to do their work, there are information well documented for them to carry out their work but they choose to sabotage everything because of what they need to put in their pocket. ii. The economy, the commerce is not moving and everything is at halt because of bad road networks. The lack of fund is preventing Nigeria from constructing new roads. The lack of funds does not mean that Nigeria does not have money, Nigeria is generating money but they still lack of funds because the money is misappropriated, mismanage, so at the end of the day they can construct road even though the money is there.
Planning and Execution	i. We have good road networks in the North part of the country than in the southern part. The reason in the Northern part is dry while the southern parts is wet and have different kinds of soil. Even the road networks are constructed to standard or specification because the people monitoring don't check if right materials and qualities are used after they have taken their kick back. ii. There is need actually to have proper planning to link these roads between where raw material and where these products are produced to the factory and these are the activities that will boost the economy.
Governance	i. Once road networks is constructed in an area people start moving there, built houses, hotels, schools, gas station and other thing for accessibility. People always follow where you have good road networks and the cost of land near the road network start going up and the land owners will have more money to spend for the economy. ii. We have to have the weight of vehicle that is allowed to go through our roads, In United States for example there is weight station in their road networks system but in Nigeria we don't have weigh station and you know Dangote transportation is a well-known transportation company in Nigeria, when Dangote's big overloaded truck go through roads that are not design to take such weight. The road network goes bad sooner than expected. No weigh station in our road network.

In the area of corruption and embezzlement, greed figured prominently in participants' responses. In the areas of planning and execution, all participants interviewed identified poor design, lack of adherence to specifications, and lack of ongoing maintenance. In the area of governance, participants repeatedly cited performance monitoring, the inability of government to determine whether roads were built to specifications, and lack of assurance that funds were used appropriately. For example, Participant GP3.1 said the following:

> The way I feel about it and as far as I am concerned, Nigeria doesn't have anything like road networks and transportation infrastructure, planning, or investment and construction. Because the picture tells everything; and it is a very bad situation in Nigeria. They don't have road and they cannot make road out of road meaning they cannot even maintain the few roads they have in the country not even constructing a new road network. That is what I feel about it—Nigeria does not have roads.

Although Participant GP3.1 was expressing the lack of road maintenance, the participant was not implying that roads do not exist in Nigeria. This differentiation enabled me to make sense of the participant's sentiments and not necessarily the word choices. When a participant used his or her U.S. roads and transportation infrastructure worldview to assess the current Nigerian situation, he or she sometimes made generalized statements that I had to normalize to make them consistent with what other participants had said. For example, Participant GP3.1 stated the following:

With reference to execution and monitoring, you have to have something before you can monitor it. If you don't have something what is there to monitor. There is no planning, there is no investment; there is nothing there, there is no road construction what are you going to monitor? Nigeria doesn't have road network. One thing that Nigeria lack is not just the road network or transportation infrastructure, they lack maintenance of road and transportation infrastructure. As for planning and monitoring; I don't see anything to monitor and if you don't have anything going on what are you going to monitor? Nigeria doesn't maintain the few roads they have; the roads have pot holes.

Although Participant GP3.3 agreed with what Participant GP3.1 said above, that perspective was stated differently:

The road construction here in the United States is broader, wider and you can see the right of way all the way from where you are starting from and you have traffic lights. We don't have that luxury dual lane carriage in Nigeria. Exception are few of the cities like in Abuja and Lagos you could see some good road networks but there is still a lot of congestion and we don't have enough roads in Nigeria.

In another example, Participant GP1.1 stated the following:

The roads are very few which we call in the United State as interstate, roads connecting states to another states in western world you have several option of movement but in Nigeria we have just a major roads which we call trunk A road

> which connect one state to another state and when the road is blocked either by accident, movement is paralyzed and it becomes a problem because people have to spend lot of hours waiting for the accident to be cleared. So my understanding is that road network in Nigeria is very poor until we are in the position to have an alternative design option for wider and dual lanes road for connections from community to community.

While Participant GP1.1 was comparing his U.S.-based experience with the Nigerian experience, the participant suggested that alternative design options for wider dual lane roads should be part of all future roads and transportation infrastructure design. This is consistent with what other participants concluded. Another example of normalizing the data appears where Participant GP 2.2, in a bid to link badly maintained roads to traffic accidents and the time it takes to move from one location to another, generalized the whole country's experience as follows:

> What is happening in Nigeria right now is that you could go seven miles in four hours because of the bad road network. You could travel seventeen miles in five hours because of the bad roads due to pot holes in the roads; you are going to see break down vehicles disturbing the traffic movement and creating go slow and it is very unbelievable so there is nothing, they lack road maintenance. The bad road causes people to not move easily from one location to the other.

To add another example, Participant GP4.1 said the following:

> When I was in Lagos in June this year 2015 and I was traveling from Ilupeju to Lagos main land, the distance of seventeen miles between Ilupeju and Lagos mainland took me four hours to get to Lagos main land. So I do agree the traffic is there but what causes the traffic? It is bad road, pot holes on the road, broken down vehicles and that is a big problem.

Evidence of Trustworthiness

Credibility

I established credibility for this study through triangulation, extended contact, and saturation (Silverman, 2013). Triangulation enabled me to reduce the impact of biases, because each data collection source, such as field notes, participants' responses, and observations, allowed me to gain a holistic view of the subject, and each canceled out the weaknesses of the others. The findings were consistent with the contents of documents reviewed and with the beliefs, perspectives, and understandings of the participants about the subject matter. This gave me the flexibility to increase my understanding of the whole aspects of the study. Interviewing 20 people from a variety of backgrounds who had experience with or knowledge about Nigeria's roads and transportation infrastructure and how to improve them brought the study to saturation. In the process, credibility was established.

Transferability

Road infrastructure planning, investment, and construction, and the planning, execution, and monitoring of economic development linked to that process, are universal. Most developing countries, Nigeria included, have ministries of public works or transportation or other related

government agencies responsible for the roads and transportation needed for economic development. Transferability value was achieved because I provided detailed characteristics which are independent of my personal conclusions and gave other external assessors using similar methodology to come to the same or similar conclusions.

Dependability

Dependability ensures that the strategies used for the findings can be repeated in a similar setting and context, thus yielding similar results. When conditions of the study changed, I documented the changes in an audit trail and discussed how they could affect other similar studies and in the process established dependability.

Confirmability

Confirmability for this research was achieved because I followed a systematic procedure for data collection, analysis, and reporting, and I recorded the document procedures used in order to mitigate my own bias and enhance the replicability of the findings (Trochim, 2001).

My consistency strategies included using multiple sources of data; keeping field notes and memos; keenly observing participants' expressed opinions and demeanor; providing rich, thick description; working with discrepant data; and reducing researcher bias. I used multiple sources to confirm findings for interpreting the data gathered from participants. I shared the preliminary findings with some of the participants to ensure that I had captured their perspectives correctly, and I gave them the opportunity to change any inaccurate information. I have also provided detailed descriptions of the study so that other researchers could successfully

replicate it. I submitted the findings to a professional in the transportation field for peer-review. These additional steps were taken in order to strengthen the quality standard of the study.

Study Results

In this section, I discuss my findings and the participants' responses to interview questions relating to the impact of road network and transportation infrastructure investment in Nigeria's economic development.

Research Question 1

What is the impact of road transportation infrastructure investments on economic development in Nigeria? Aschauer (1990), Bagchi and Pradhan (2013), and Lakshmanan (2011) all agreed that there is a positive relationship between road and transportation infrastructure investment and economic development. They argued that transportation infrastructure spurs new social services; provides access to employment, hospitals, schools, social gathering spots; and increases the per capita income of society at large. The data collected for this research revealed three major thematic categories and nine sub-categories of themes that support the linkage of road networks and transportation infrastructure investments to economic development and social change. Table 6 presents subthemes emerged from the interviews.

Table 6
Subthemes or Categories

- Creating of jobs
- Connection of city to city and community to community
- Movement of goods and services
- Stimulation of individual creativity
- Stimulation of community creativity
- Facilitation of infrastructure development (schools, hospitals, trading clusters, etc.)
- Transformation of socio-cultural norms--the status quo
- Creation of social change & dynamics
- Stimulation of investment activities

Table 6 revealed nine subthemes or sub-categories in which participants linked road and transportation infrastructure investment to economic development and social change in Nigeria. These significant responses from participants appear to support Frischmann's (2005) economic theory of infrastructure and the commons management argument that a road network within a country facilitates economic growth and development with social implications for developing economies. Table 7 presents the number of times participants mentioned these sub-categories' linkage to investment in transportation infrastructure investment and road networks to economic development and social change.

Overall, participants linked investment in road networks and transportation infrastructure to economic development and social change 149 times, and in 52% or 68 times such investments were linked to the following sub-categories:

• Connection of city to city and community to community (20 times)

• Movement of goods and services (20 times)

• Creation of social change and dynamics (20 times)

• Transformation of socio-cultural norms – the status quo (18 times)

Stimulation of individual creativity was linked to economic and social change 14 times, and stimulation of community creativity 15 times; the two categories together garnered 19% of participants' linkages, while transformation of socio-cultural norms received 12% or 18 linkages.

Table 7

Participants' Linkage of Road Infrastructure to Economic and Social Change

Sub Themes	Linkage Made																				Total
ID Code	#1	#2	#3	#4	#5	#6	#7	#8	#9	#10	#11	#12	#13	#14	#15	#16	#17	#18	#19	#20	
Sub-Cat. Code	GP2.1	GP1.1	GP1.2	GP4.1	GP3.1	GP4.2	GP1.3	GP2.2	GP2.3	GP1.4	GP2.4	GP2.5	GP3.2	GP1.5	GP4.3	GP4.4	GP3.3	GP3.4	GP3.5	GP4.5	
Creation of jobs	1	1	1	1	1	1	1		1			1			1	1		1	1	1	14
Connection of city to city and community to community	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	20
Movement of goods and services	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	20
Stimulation of individual creativity	1		1	1	1		1	1	1		1		1	1	1	1	1	1	1	0	15
Stimulation of community creativity	1		1	1	1		1	1	1		1		1	1	1	1	1	1	1	0	15
Stimulation of investment activities		1	1		1		1		1				1	1	1	1	1	1	0	0	11
Facilitation of infrastructure development (schools, hospitals, trading clusters, etc.)	1	1	1	1	1	1	1	1	1		1		1	1	1	1		1	0	1	16
Transformation of socio-cultural norms	1	1	1	1	1	1	1	1	1	1	1		1	1	1	1	1	1	0	1	18
Creation of social change & dynamics	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	20
																					149

Group 1 participants, representing in-transit or U.S.-based current or former Nigerian elected or appointed government officials, gave their highest rankings to the connecting of city to city and community to community, movement of goods and services, transformation of socio-cultural norms, and creation of social change and dynamics. Table 8 presents Group 1

participants' linkage of road infrastructure investment to economic development and social change in Nigeria.

Table 8

Group 1: Participant's Linkage of Road Infrastructure to Economic and Social Change

Sub Themes	Linkage Made							
ID Code	#2	#3	#7	#10	#14	Total	TR	% TR
Sub-Cat. Code	GP1.1	GP1.2	GP1.3	GP1.4	GP1.5			
Connection of city to city and community to community	1	1	1	1	1	5		
Movement of goods and services	1	1	1	1	1	5		
Transformation of socio-cultural norms	1	1	1	1	1	5		
Creation of social change & dynamics	1	1	1	1	1	5		
							20	54%
Stimulation of investment activities	1	1	1	0	1	4		
Facilitation of infrastructure development (schools, hospitals, trading clusters, etc.)	1	1	1	0	1	4		
							8	22%
Creation of jobs	1	1	1	0	0	3		
Stimulation of individual creativity	0	1	1	0	1	3		
Stimulation of community creativity	0	1	1	0	1	3		
							9	24%
							37	

TR= Total Response

%TR= Percentage of Total Response

Group 2 participants, representing in-transit or U.S.-based current or former Nigerian senior managers or policymakers, linked road and transportation infrastructure investments more to stimulation of individual creativity, stimulation of community creativity, facilitation of infrastructure development (schools, hospitals, training cluster, etc.), and transformation of socio-cultural norms, making the linkage collectively 16 times or 46% of responses.

Table 9 presents Group 2 participants' linkage of road infrastructure investment to economic development and social change in Nigeria.

Table 9

Group 2: Participants' Linkage of Road Infrastructure to Economic and Social Change

Sub Themes	Linkage Made							
ID Code	#1	#8	#9	#11	#12	Total	TR	%TR
Sub-Cat. Code	GP2.1	GP2.2	GP2.3	GP2.4	GP2.5			
Connection of city to city and community to community	1	1	1	1	1	5		
Movement of goods and services	1	1	1	1	1	5		
Creation of social change & dynamics	1	1	1	1	1	5		
							15	43%
Stimulation of individual creativity	1	1	1	1	0	4		
Stimulation of community creativity	1	1	1	1	0	4		
Facilitation of infrastructure development (schools, hospi	1	1	1	1	0	4		
Transformation of socio-cultural norms	1	1	1	1	0	4		
							16	46%
Creation of jobs	1	0	1	0	1	3		
							3	9%
Stimulation of investment activities	0	0	1	0	0	1		
							1	3%
							35	

TR= Total Response

%TR= Percentage of Total Response

Group 3 participants, representing in-transit or U.S.-based Nigerian business stakeholders, linked creation of jobs and facilitation the lowest number of times; they linked the rest of the sub-categories evenly except for connection of city to city and community to community and movement of goods and services, which ranked highest. Table 10 presents

Group 3 participants' linkage of road infrastructure investment to economic development and social change.

Table 10

Group 3: Participants' Linkage of Road Infrastructure to Economic and Social Change

Sub Themes	Linkage Made							
ID Code	#5	#13	#17	#18	#19	Total	TR	%TR
Sub-Cat. Code	GP3.1	GP3.2	GP3.3	GP3.4	GP3.5			
Connection of city to city and community to community	1	1	1	1	1	5		
Movement of goods and services	1	1	1	1	1	5		
Stimulation of individual creativity	1	1	0	1	1	4		
Stimulation of community creativity	1	1	0	1	1	4		
Stimulation of investment activities	1	1	0	1	1	4		
Transformation of socio-cultural norms	1	1	1	1	0	4		
Creation of social change & dynamics	1	1	1	1	0	4		
							30	79%
Facilitation of infrastructure development (schools, hospitals, trading clusters, etc.)	1	1	1	1	0	4		
							4	11%
Creation of jobs	1	0	1	1	1	4		
							4	11%
							38	

TR= Total Response

%TR= Percentage of Total Response

Group 4, representing U.S.-based Nigerian stakeholders who have lived, studied or worked in Nigeria, linked stimulation of investment activities the least often (see Table 11).

Table 11

Group 4: Participant's Linkage of Road Infrastructure to Economic and Social Change

Sub Themes	Linkage Made							
ID Code	#4	#6	#15	#16		Total	TR	%TR
Sub-Cat. Code	GP4.1	GP4.2	GP4.3	GP4.4	GP4.5			
Creation of jobs	1	1	1	1	1	5		
Connection of city to city and community to community	1	1	1	1	1	5		
Movement of goods and services	1	1	1	1	1	5		
Facilitation of infrastructure development (schools, hospitals, trading clusters, etc.)	1	1	1	0	0	3		
Transformation of socio-cultural norms	1	1	1	0	0	3		
Creation of social change & dynamics	1	1	1	1	0	4		
							25	71%
Stimulation of individual creativity	1	0	1	1	1	4		
Stimulation of community creativity	1	0	1	1	1	4		
							8	23%
Stimulation of investment activities	0	0	1	0	1	2		
							2	6%
							35	

TR= Total Response

%TR= Percentage of Total Response

I was not surprised that Group 4 participants would link creation of jobs, connection of city to city and community to community, and creation of social change and dynamics, as these may represent the reasons they either migrated to the U.S. or have chosen to remain here. The above data confirm that there is a relationship between the planning, investments, and build-out of road transportation infrastructure and long-term economic development strategies. These data contribute new performance metrics for evaluation. The data also confirm that transportation infrastructure investment serves as an important catalyst or even as the backbone of a country's economic development, particularly in developing countries (Echui & Keho, 2011; Olsson, 2010). The data further confirm that infrastructure investments are tied directly and indirectly to

a multitude of other related activities including reducing poverty, stimulating the economy, and improving standards of living (Bagchi & Pradhan, 2013).

Research Question 2

What are the necessary planning, implementing, and monitoring criteria needed for pre- and post-construction activities? In this section, I discuss participants' comments about the planning, implementation, and monitoring of roads during pre- and post-construction phases. The literature review on transportation investment led me to conclude that four basic conceptual stages were necessary for achieving pre- and post-construction success: a stakeholder-driven (a) road infrastructure management policy and strategy that is used to formulate (b) fiscal or budget allocations linked to the type of (c) road that is constructed and the expected (d) measurable impacts the road will have on the socioeconomic well-being of a community, city, state, or region, or of the entire nation.

The participants from all four groups agreed that in Nigeria, road infrastructure planning, implementation, and monitoring during pre- and post-construction were almost nonexistent. There is no known effective body that monitors the construction of road and transportation infrastructure or plans for the ongoing maintenance of the existing road network. "Known" within this context implies that citizens as stakeholders do not have a known or respected entity designated to conduct performance measurement of infrastructure projects. Although some of the participants had experience in how government in Nigeria operates as it relates to infrastructure, the ordinary citizen does not have an entity to which to report complaints about the condition of a state, city, or rural road. To understand the context from

which these three themes were framed, I asked about the current state of Nigerian roads. Contributing to this deficiency were three overarching themes that the participants mentioned 143 times. Corruption in the awarding of infrastructure projects is a key contributor as to why the four conceptual stages fail within the Nigerian context. Participants mentioned corruption 50 out of the 143 times, or 35%. Participants mentioned lack of planning and maintenance culture 48 times or 34%.

All participants generally agreed that once projects are awarded, no follow-up measures are implemented to ensure that the work is done according to specifications, the completed work is inspected to ensure compliance, and a maintenance schedule is developed. Participants mentioned lack of planning and maintenance culture 48 times or 34%. Bad governance at all levels explains in part why Nigerian roads and transportation infrastructures are either nonexistent or in poor condition. Participants mentioned bad governance 45 times or 31%. Table12 presents the major thematic categories identified by participants: corruption, planning, and governance.

Table 12

Key Themes Identified by Participants

Key Themes		*Number of Times Mentioned*		
ID Code	Sub-Cat. Code	Corruption	Planning	Governance
#1	GP2.1	3	1	1
#2	GP1.1	1	1	3
#3	GP1.2	1	1	2
#4	GP4.1	1	1	2
#5	GP3.1	1	4	1
#6	GP4.2	1	3	3
#7	GP1.3	3	1	1
#8	GP2.2	2	1	1
#9	GP2.3	1	1	1
#10	GP1.4	1	1	1
#11	GP2.4	10	1	3
#12	GP2.5	1	3	2
#13	GP3.2	2	3	1
#14	GP1.5	6	3	2
#15	GP4.3	5	4	7
#16	GP4.4	2	5	2
#17	GP3.3	0	3	2
#18	GP3.4	2	4	6
#19	GP3.5	4	5	1
#20	GP4.5	3	2	3
Sub Total		50	48	45
Total	143			
% of Total		*35%*	*34%*	*31%*

Within the four groups, the data show some demarcations. Group 1 participants mentioned corruption 10 times or 34% of the group's total of 29 responses. Table 13 presents the number of times each group 1 participant mentioned the key themes.

Table 13

Group 1: Key Themes Identified by Participants

Key Themes		*Number of Times Mentioned*		
ID Code	Sub-Cat. Code	Corruption	Planning	Governance
#2	GP1.1	1	1	3
#3	GP1.2	1	1	2
#7	GP1.3	1	4	1
#10	GP1.4	1	1	1
#14	GP1.5	6	3	2
Sub Total		10	10	9
Total	29			
% Total		*34%*	*34%*	*31%*

Group 1 participants mentioned planning 10 times or 34% of the group's total, and governance 9 times or 31% of the group's total.

Participant GP1.4 said the following:

> I have seen a lot of planning for road construction that is supposed to be done during the dry season instead the construction is done in the raining season. What happens is that when the asphalt is poured on the road it is washed away by the rain waters. What does that do to the system? The people go back again to the government and ask for the contract to be funded again. This increases the cost of constructing the road and even the re-evaluation is not done you could see the bulk of the money is gone. You could see that most of our planning is to do false execution and up keep through maintenance is not possible. They don't take it into consideration of the maintenance and even if they do, they do a shady job

> and they give the job to a person they know cannot do a better job because the awarding of the contract has some business interest in the company constructing the road.

Participant GP1.3 added the following:

> Talking about planning we still have a lot to do and talking about execution this thing, who is going to execute them? Who is going to make sure that the roads are constructed and rules are applied? When the person constructing the roads is the person giving out the construction contract. Most of the road construction get started but never completed at all…For instance, the person that supposed to execute the plan is the politician but the politicians always give road construction contract to themselves. In that case who will execute or monitor it, therefore road construction are not planned majority of time.

Group 2 participants mentioned corruption 17 times or 53% of the group's total 32, planning 7 times or 22%, and governance 8 times or 25%. Table 14 presents the numbers of times Group 2 mentioned key themes.

Table 14

Group 2: Key Themes Identified by Participants

Key Themes		*Number of Times Mentioned*		
ID Code	Sub-Cat. Code	Corruption	Planning	Governance
#1	GP2.1	3	1	1
#8	GP2.2	2	1	1
#9	GP2.3	1	1	1
#11	GP2.4	10	1	3
#12	GP2.5	1	3	2
Sub Total		17	7	8
Total	32			
% Total		*53%*	*22%*	*25%*

Participant GP2.4 stated the following:

> Yes, corruption is a big part of why roads are not constructed the way it should and greed is the next, the politicians are too greedy not to allow the economic system to flow freely. They have everything needed to do their work, there are information well documented for them to carry out their work but they choose to sabotage everything because of what they need to put in their pocket.

Participant GP2.3 described it this way:

> Colonial government the way the roads were constructed they are designed to carry bulky materials from the interior of the country and bring to the coast line to the sea port so their first priority was to construct the railway lines running from Lagos all the way to Ibadan and all the way to the North and then one from Port Harcourt running through the eastern part of Nigeria all the way to the North to bring cash crops, like cotton, pea nuts so you find transportation

> infrastructure started in Nigeria with the construction of the railway lines before roads, generally one will expect roads should be the first investment of the colonial government before rail road but that is not they did. They first constructed rail lines into the interior part of the country to carry bulky materials like cotton, peanut that is groundnuts, and then cocoa, oil palm and palm kernel and these are bulky materials that need to be transported. The only way they can transport these bulky material is through rail lines.

Participant GP2.4 said the following:

> My opinion why there is no planning is because there is a breakdown in the logical structure of governance in the country. Breakdown in a sense, because there is no synergy between the government; the public, the private entity, there is no synergy connecting them. The government in Nigeria when there is a project does not have a mechanism of follow up a project in Nigeria. They don't follow up on anything and that creates disconnect. Every project given in Nigeria whether at the state level; federal government level and local level does not have a follow up as to say what happen to this project. Nobody talks about a project once the project is released whether it is done or not and what is the outcome and that show you that there is disconnect and show there is no synergy between government and that linkages is very important with the government, private entities, private industries and even with the academia.

Group 3 participants mentioned corruption 12 times or 29%, planning 18 times or 43%, and governance 12 times or 29% of the group's 42 total. Table 15 presents the number of times each Group 3 participant mentioned key themes.

Table 15

Group 3: Key Themes Identified by Participants

Key Themes		*Number of Times Mentioned*		
ID Code	Sub-Cat. Code	Corruption	Planning	Governance
#5	GP3.1	1	4	1
#13	GP3.2	2	3	1
#17	GP3.3	3	2	3
#18	GP3.4	2	4	6
#19	GP3.5	4	5	1
Sub Total		12	18	12
Total	42			
% Total		*29%*	*43%*	*29%*

Group 4 participants mentioned corruption 11 times or 27%, and planning 15 times or 15% of the group's total. Table 16 presents number of times Group 4 mentioned the key themes.

Table 16

Group 4: Group 4: Key Themes Identified by Participants

Key Themes		*Number of Times Mentioned*		
ID Code	Sub-Cat. Code	Corruption	Planning	Governance
#4	GP4.1	1	1	2
#6	GP4.2	1	3	3
#15	GP4.3	2	4	6
#16	GP4.4	4	5	1
#20	GP4.5	3	2	3
Sub Total		11	15	15
Total	41			
% Total		*27%*	*37%*	*37%*

Participant GP4.3 stated the following:

Frankly speaking our roads are very poor roads. We have very poor roads especially the small roads are very poor in the sense that the contractors wants to make money and as a businessman before road contract is given to the contractor, the people giving him the contract either from the government or people in charge of awarding the contract always ask for a kickback in the form of bribery. So once they demand the kickback he is mandated to comply because if he did not comply and before he complete the contract and as a businessman he tries to make profit and to be able to make profit he will now start to cut corners so he can make profit. He will not have enough money left to construct a very good road and that is why our road is of substandard. You build a road that is supposed to last 10 years before you start maintenance but within 2 to 3 years,

the road is already bad. That is one of the major problem we have in road construction.

Research Question 3

How does investment in transportation, specifically road networks, affect social change? This section is used to discuss participants' comments on how investment in transportation infrastructure affects social change. My literature review showed a large volume of work in support of the relationship between transportation infrastructure investments and a society's political, social, and economic development (Akhmetzhanoy & Lustoy, 2013; Bagchi & Pradhan, 2013; Kustepeliet al., 2012). Road transportation infrastructure investments represented important political, economic, and social processes that eventually increase the riches and power of a country, enlarging markets and lowering trade barriers, and thus increase productivity outputs while also improving the mobility and standard of living for the masses (Adler & Polsky, 2010; Bagchi & Pradhan, 2013; Njoh, 2012). The data collected from participants supported the significant role of road and transportation infrastructure investments in moving society forward. The demographic data analysis in support for how transportation infrastructure affects social change has already been discussed within the context of the first research question above**.**

Participant GP1.2 stated the following:

Building of road in the village will encourage people to move to the village to seek employment and as a result to inter marriages, thereby affect social change. The person moving to the village to seek employment brings with them a new

> culture. A lot of economic activities will start taking place, For example, school, hotels will be built to cater for the population moving to the village and all sort of economic activities will start to take place in the village. Hospital and supper market will be built in the village and all this will create employment. So definitely, the construction of road network will bring economic development in a given area. Road network is a critical part of economic activities.

Participant GP3.5 mentioned the concept of rural road construction development for the purpose of enhancing intercity mobility. Participant GP3.5 said, "There are several ethnic groups within Nigeria, and with the road connections we should be able to understand ourselves and without road network connection you may not know who live in the west, interior north or south." A statement such as this reflected evidence to support the subthemes.

Participant GP2.3 added the following:

> You find out that we begin now use the term sustainable economy that which the industries coming to a particular place should enrich the community it is coming to and it is also going to cause some challenges to the community. You will find out for example, if you just established/settled a trailer park, prostitutes will start to migrate to offer their services and before you know it, will create a lot of social problem and will bring both negative and positive social change, for example you find out HIV will be common in that area and if you look the spread of AID in Africa is due to road networks and if you look at those trailer

park established along the highway you will find out that HIV are prevalent in that area because of good road network.

Summary

The purpose of this qualitative case study was to investigate the relationship between road transportation infrastructure investments and economic development in Nigeria. A total of 20 participants were interviewed, including former and current in-transit Nigerian government officials; Nigerian businessmen and women who are in-transit or reside in the U.S. and those who live permanently in the U.S. and who have traveled to Nigeria on business were targeted as participants in this study. I interviewed the participants individually, transcribed and triangulated the interview data, and performed member checking and bracketing to eliminate researcher bias. I imported the transcribed interview data into QSR NVivo 10 software to discern common patterns, identify thematic categories, and address my three fundamental research questions. In conducting content analysis of the interview data, three thematic categories emerged: corruption, governance, and planning and execution.

In Chapter 5, I interpret the meanings to the findings; explore ways to extend the knowledge gained from this study; and recommend future research in this area, both academic and practical. In order to fill the existing gaps in both literature and application, I also suggest possible areas needing in-depth academic analysis.

Chapter 5: Discussion, Conclusions, and Recommendations

In Chapter 5, I interpret the research findings; explore ways to extend the knowledge gained from this study, and make recommendations for future researchers in academia and in practice. To fill the existing gaps in literature and application, I also suggest possible areas needing in-depth academic analysis. There is a general consensus among researchers that road transportation infrastructure investments represent important political, economic, and social processes and that such investments can play a role in increasing the riches and power of a country, enlarging its markets and lowering its trade barriers, thereby increasing its productivity outputs while also improving the mobility and standard of living for the masses (Adler & Polsky, 2010; Bagchi & Pradhan, 2013; Njoh, 2012; Prud'homme, 2005). There is consensus among some historians that certain preconditions are needed for a developing country such as Nigeria to effectively generate or recoup sustainable economic benefits from investments in road infrastructure (Banister & Berechman, 2001; Rostow, 1962; Siemiatycki, 2013). According to precedents from developed countries like the United States, these preconditions must be present in developing countries including Nigeria before any meaningful long-term trajectories of economic development from road transportation infrastructure investment can be manifested (Banister & Berechman, 2001; Rostow, 1962, 1974). The preconditions include technological change and availability of human capital, including positive economic externalities in terms of quality labor force and buoyant local economic condition, availability of investments from private and public sources, environmental sustainability, social inclusion, literacy and other initiatives dependent on concerted actions of policymakers, political fortitude, and communities

that foster economic transformation. This study's data provided insights into the impact of road transportation infrastructure investments on economic development in Nigeria from four groups.

From a historical perspective, Frischmann's (2005) economic theory of infrastructure and commons management provided a theoretical foundation for analyzing the contribution of a country's road network in facilitating economic growth and development and the resulting social implications in developing economies. Over the last decades, newer theories have been introduced by researchers seeking new and relevant ways to tie road infrastructure development to other positive social rubrics, including GDP, population size, and degree of urbanization, traffic density, and level of economic development. Researchers have examined regional economic theories in relation to transportation investment and its effect on population change and economic growth. Growth theories have been propelled by neoclassical growth theory, growth pole theory, and location growth theories. Solow's (1956) neoclassical model was used to guide this study in helping me analyze the impact of road transportation infrastructure investment on Nigeria's economic development. The core premise of Solow's (1956) neoclassical model related aggregate production function (input) to productivity (production output). In applying Solow's neoclassical theory to this study, I expected that investment in road transportation infrastructure (road networks) would have economic impact in the growth of a developing nation, specifically Nigeria. Growth pole theory researchers have argued that the concept of growth or economic development is usually not uniform across a region but is often concentrated at a specific pole serving as the hub for economic activities. Growth pole theories

were used to facilitate decentralization and encourage rapid economic growth or industrialization. Growth pole theories are relevant for assessing or forecasting population change because they can be used to suggest best use of limited regional resources to be invested, allocated, or distributed for maximum economic development effect. Location growth theory researchers posited that, in any analysis, any geographical features that may be influencing the concentration of territorial activities must be excluded, leaving the location choices to be explained by the economic factors that define location processes.

The general consensus of the participants in this study was that there are political preconditions that hinder Nigeria from effectively generating or recouping sustainable economic benefits from its investments in road infrastructure. It is in the concerted actions of policymakers and politicians that the Nigerian experience in road infrastructure hits a roadblock. In particular, participants identified key themes affecting the development of a sustainable roads network in Nigeria, and suggested that if these themes were addressed, Nigeria would reap the benefits of road infrastructure and all the related benefits that would come with it. Participants identified these benefits and linked them to nine subthemes that they associated with road infrastructure and economic and social change. Table 17 shows the three key themes and nine subthemes:

Table 17

Combined Key Themes and Subthemes

Key Themes Identified as affecting the successful implementation of Roads Infrastructure in Nigeria	**Subthemes Linked to Road Infrastructure and Economic and Social Change in Nigeria**
Corruption	Creation of jobs
Planning	Connection of city to city and community to community
Governance	Movement of goods and services
	Stimulation of individual creativity
	Stimulation of community creativity
	Stimulation of investment activities
	Facilitation of infrastructure development (schools, hospitals, trading clusters, etc.)
	Transformation of sociocultural norms
	Creation of social change & dynamics

Research Question 1 Discussion and Conclusions

Research Question 1: "what is the impact of road transportation infrastructure investments on economic development in Nigeria?" All four groups of participants linked road infrastructure development to both economic and social change through nine subthemes: creation of jobs, connection of city to city and community to community, movement of goods and services, stimulation of individual creativity, stimulation of community creativity, stimulation of investment activities, facilitation of infrastructure development (schools, hospitals, trading clusters, etc.), transformation of sociocultural norms, and creation of social change and dynamics. Table 18 shows Group 1's linkage of road and transportation infrastructure investment to economic development and social change.

Table 18

Group 1: Participants' Linkage of Road Infrastructure to Economic and Social Change

Sub Themes	Linkage Made							
ID Code	#2	#3	#7	#10	#14	Total	TR	%TR
Sub-Cat. Code	GP1.1	GP1.2	GP1.3	GP1.4	GP1.5			
Connection of city to city and community to community	1	1	1	1	1	5		
Movement of goods and services	1	1	1	1	1	5		
Transformation of socio-cultural norms	1	1	1	1	1	5		
Creation of social change & dynamics	1	1	1	1	1	5		
							20	54%
Stimulation of investment activities	1	1	1	0	1	4		
Facilitation of infrastructure development (schools, hospitals, trading clusters, etc.)	1	1	1	0	1	4		
							8	22%
Creation of jobs	1	1	1	0	0	3		
Stimulation of individual creativity	0	1	1	0	1	3		
Stimulation of community creativity	0	1	1	0	1	3		
							9	24%
							37	

TR= Total Response

%TR= Percentage of Total Response

All Group 1 participants, who represented in-transit or U.S.-based current or former Nigerian elected or appointed government officials, linked "connection of city to city and community to community, movement of goods and services, transformation of sociocultural norms, and creation of social change and dynamics" to roads infrastructure and economic and social change in 54% of the 37 total linkages. These are the four key subthemes that could be directly affected by both proactive executive-level policies and decisions and legislatively enacted laws and statutes. Of the total linkages made, this group linked "creation of jobs, stimulation of individual creativity, and stimulation of community creativity" the least (24%).

Table 19 shows Group 2's linkage of road network and transportation infrastructure investment to economic development and social change.

Table 19

Group 2: Participant's' Linkage of Road Infrastructure to Economic and Social Change

Sub Themes	Linkage Made							
ID Code	#1	#8	#9	#11	#12	Total	TR	%TR
Sub-Cat. Code	GP2.1	GP2.2	GP2.3	GP2.4	GP2.5			
Connection of city to city and community to community	1	1	1	1	1	5		
Movement of goods and services	1	1	1	1	1	5		
Creation of social change & dynamics	1	1	1	1	1	5		
							15	43%
Stimulation of individual creativity	1	1	1	1	0	4		
Stimulation of community creativity	1	1	1	1	0	4		
Facilitation of infrastructure development (schools, hospitals, trading clusters, etc.)	1	1	1	1	0	4		
Transformation of socio-cultural norms	1	1	1	1	0	4		
							16	46%
Creation of jobs	1	0	1	0	1	3		
							3	8%
Stimulation of investment activities	0	0	1	0	0	1		
							1	3%
							35	

TR= Total Response

%TR= Percentage of Total Response

All Group 2 participants, who represented in-transit or U.S.-based current or former senior management or policymakers, linked "connection of city to city and community to community, movement of goods and services, and creation of social change and dynamics" to roads infrastructure and economic and social change in 43% of the 35 total linkages made. This group also linked "stimulation of individual creativity, stimulation of community creativity, facilitation of infrastructure development (schools, hospitals, trading clusters, etc.), and transformation of sociocultural norms" to roads infrastructure and economic and social change

in 46% of the total linkages. These are the subthemes most likely to be directly affected by managerial prerogatives and priorities in reducing or eliminating the corruption, bad planning, and haphazard governance that the participants singled out as the key obstacles to road and transportation infrastructure in Nigeria. Table 20 shows Group 3's linkage of road network and transportation infrastructure investment to economic development and social change.

Table 20

Group 3: Participant's' Linkage of Road Infrastructure to Economic and Social Change

Sub Themes	Linkage Made							
ID Code	#5	#13	#17	#18	#19	Total	TR	%TR
Sub-Cat. Code	GP3.1	GP3.2	GP3.3	GP3.4	GP3.5			
Connection of city to city and community to community	1	1	1	1	1	5		
Movement of goods and services	1	1	1	1	1	5		
							10	26%
Stimulation of individual creativity	1	1	0	1	1	4		
Stimulation of community creativity	1	1	0	1	1	4		
Stimulation of investment activities	1	1	0	1	1	4		
Transformation of socio-cultural norms	1	1	1	1	0	4		
Creation of social change & dynamics	1	1	1	1	0	4		
Facilitation of infrastructure development (schools, hospitals, trading clusters, etc.)	1	1	1	1	0	4		
Creation of jobs	1	0	1	1	1	4		
							28	74%
							38	

TR= Total Response

%TR= Percentage of Total Response

All Group 3 participants, who represented in-transit or U.S.-based Nigerian business stakeholders, linked "connection of city to city and community to community and movement of goods and services" to roads infrastructure and economic and social change in 26% of the total

38 linkages while linking the other seven subthemes in 74% of the total linkages. These business stakeholders saw the connection of city and city and movement of goods and services as instrumental to business success. Any road and transportation infrastructure that meets these two subthemes has the potential to see the other seven subthemes addressed or met. Table 21 shows Group 4 participants' linkage of road network and transportation infrastructure investment to economic development and social change.

Table 21

Group 4: Participant's' Linkage of Road Infrastructure to Economic and Social Change

Sub Themes	Linkage Made							
ID Code	#4	#6	#15	#16	#20	Total	TR	%TR
Sub-Cat. Code	GP4.1	GP4.2	GP4.3	GP4.4	GP4.5			
Creation of jobs	1	1	1	1	1	5		
Connection of city to city and community to community	1	1	1	1	1	5		
Movement of goods and services	1	1	1	1	1	5		
							15	43%
Creation of social change & dynamics	1	1	1	1	0	4		
Stimulation of individual creativity	1	0	1	1	1	4		
Stimulation of community creativity	1	0	1	1	1	4		
							12	34%
Facilitation of infrastructure development (schools, hospitals, trading clusters, etc.)	1	1	1	0	0	3		
Transformation of socio-cultural norms	1	1	1	0	0	3		
							6	17%
Stimulation of investment activities	0	0	1	0	1	2		
							2	6%
							35	

TR= Total Response

%TR= Percentage of Total Response

All Group 4 participants, who represented U.S.-based Nigerian stakeholders who had lived, studied, or worked in Nigeria, linked "creation of jobs, connection of city to city and community to community, and movement of goods and services" to road infrastructure and economic and social change in 43% of the total 35 linkages made. These three subthemes had individual ramifications. When road and transportation infrastructures are in place, these

participants agreed that they would lead to job creation, connection of city to city, and movement of goods and services.

Research Question 2 Discussion and Conclusions

Research Question 2: "what are the necessary planning, implementing, and monitoring criteria needed for pre- and post construction activities?" From the research on transportation investment and economic development literature, I proposed four basic conceptual stages for achieving pre- and post construction success. A well thought out road infrastructure management policy and strategy, which sets the stage for the fiscal or budget allocations, which affects the type of road that is constructed; which in turn affects the expected measureable impacts the road will have on the socioeconomic well-being of an area as small as a community, city, state, region, or nation.

Using this concept as a benchmark, I explored whether road infrastructure projects in Nigeria had these four elements. As the literature review revealed, in most developing countries road infrastructure investment decisions have usually been made to meet the utilitarian need to move people to urban areas, where the jobs and schools are often located, without any other formal plan to link or measure the economic development benefits of that investment. In developing countries such as Nigeria, it is difficult to establish the linkage between road and transportation infrastructure spending with the associated benefits because of the corruption of government officials (Ogun, 2010). All four participant groups in my study mentioned corruption, lack of planning, and lack of good governance almost evenly as key hindrances to reaping social benefits from Nigeria's road and transportation infrastructure spending. Table 22

shows the impact of corruption, lack of planning, and lack of good governance concerning road network and transportation investment on economic development and social change in Nigeria.

Table 22

Key Themes Identified by Participants

Key Themes		*Number of Times Mentioned*		
ID Code	b-Cat. Co	Corruption	Planning	Governance
#1	GP2.1	3	1	1
#2	GP1.1	1	1	3
#3	GP1.2	1	1	2
#4	GP4.1	1	1	2
#5	GP3.1	1	4	1
#6	GP4.2	1	3	3
#7	GP1.3	3	1	1
#8	GP2.2	2	1	1
#9	GP2.3	1	1	1
#10	GP1.4	1	1	1
#11	GP2.4	10	1	3
#12	GP2.5	1	3	2
#13	GP3.2	2	3	1
#14	GP1.5	6	3	2
#15	GP4.3	5	4	7
#16	GP4.4	2	5	2
#17	GP3.3	0	3	2
#18	GP3.4	2	4	6
#19	GP3.5	4	5	1
#20	GP4.5	3	2	3
Sub Total		50	48	45
Total	143			
% Total		*35%*	*34%*	*31%*

The general consensus of the participants is that none of these four basic conceptual stages are functioning right now in Nigeria. At the heart of this dysfunction are three key

themes mentioned 149 times: (1) widespread corruption (mentioned 50 times or 35%), (2) lack of coordinated planning (mentioned 48 times or 34%), and (3) lack of good governance mentioned 45 times or 31%.

Research Question 3 Discussion and Conclusions

Research question 3: "How does investment in transportation, specifically road networks, affect social change?"

Existing literature suggests that a good road network is an essential part of poverty reduction in developing countries such as Nigeria. Access to good roads facilitates trade by providing transportation of agricultural products for rural farmers, providing employment to the masses, enabling farmers to carry their crops to markets, and reducing travel times. Accessible roads reduce transportation costs, increase transportation options (for both roads and equipment), and reduce the numbers of car accidents and associated transportation expenses. All of these benefits affect social change by increasing standard of living, reducing travel times, and reducing the amount spent on transportation. All of the participants mentioned "connection of city to city and community to community, creation of social change and dynamics, and transformation of socio-cultural norms" as key themes linking road and transportation infrastructure investments. Figure 8 shows participants' linkage of investment in transportation infrastructure and road networks to social change.

Participant's Linkage of Road Infrastructure to Economic and Social Change

Sub Themes	Linkage Made																					Total	TR	%TR
ID Code	#2	#3	#7	#10	#14	#1	#8	#9	#11	#12	#5	#13	#17	#18	#19	#4	#6	#15	#16	#20				
Sub-Cat. Code	GP1.1	GP1.2	GP1.3	GP1.4	GP1.5	GP2.1	GP2.2	GP2.3	GP2.4	GP2.5	GP3.1	GP3.2	GP3.3	GP3.4	GP3.5	GP4.1	GP4.2	GP4.3	GP4.4	GP4.5				
Connection of city to city and community to community	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	20			
Movement of goods and services	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	20			
Creation of social change & dynamics	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	20			
																						60	60	40%
Transformation of socio-cultural norms	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	0	18			
																						18	18	12%
Facilitation of infrastructure development (schools, hospitals, trading clusters, etc.)	1	1	1	0	1	1	1	1	1	0	1	1	0	1	1	1	1	1	1	0	16			
																						16	16	11%
Stimulation of individual creativity	0	1	1	0	1	1	1	1	1	0	1	1	1	1	0	1	0	1	1	0	14			
																						29	29	19%
Stimulation of community creativity	0	1	1	0	1	1	1	1	1	0	1	1	1	1	0	1	0	1	1	1	15			
																						29	29	19%
Creation of jobs	1	1	1	0	0	1		1	0	1	1	0	0	1	0	1	1	1	1	1	13			
																						13	13	9%
Stimulation of investment activities	1	1	1	0	1	0	0	1	0	0	1	1	1	1	1	0	0	1	1	1	13			
																						13	13	3%
																					149			

Figure 8. Participants' linkage of investment in transportation to social change.

Interpretation of Findings

Infrastructure as a concept is very broadly defined in the literature I have reviewed, and for the purposes of this research I am loosely defining it as public investment in social services and physical assets. To understand the large volume of research data on transportation infrastructure and its contributions to economic and social change in developing countries, and

to interpret the findings from the data collected and analyzed, I used four manageable categories:

- infrastructure investment in relation to poverty alleviation;
- infrastructure investment in relation to economic growth;
- infrastructure investment in relation to regional development; and
- infrastructure investment in relation to developing countries.

For the purposes of analysis and interpretation, I postulated that each of the four categories affecting the infrastructure investment mentioned above has three subthemes that are directly affected while the rest are indirectly affected. This assumption in light of the three research questions offered a window through which to interpret data from the nine subthemes identified by the study participants. Table 23 shows how I have grouped the three subthemes into measureable indicators for understanding the findings.

Table 23
Assumed Impacts of Subthemes on the Four Categories of Infrastructure Investment

Categories of Impact on Infrastructure Investments	**Assumed Direct and Indirect Impacts on the Nine Subthemes**
Infrastructure investment in relation to poverty alleviation	Direct Impact: • Creation of jobs • Stimulation of individual creativity • Facilitation of infrastructure development (schools, hospitals, trading clusters, etc.) Indirect Impact: • Stimulation of community creativity • Stimulation of investment activities • Transformation of socio-cultural norms • Creation of social change & dynamics • Connection of city to city and community to community • Movement of goods and services
Infrastructure investment in relation to economic growth	Direct Impact: • Movement of goods and services • Creation of jobs • Facilitation of infrastructure development (schools, hospitals, trading clusters, etc.) Indirect Impact: • Stimulation of investment activities • Connection of city to city and community to community • Stimulation of individual creativity • Stimulation of community creativity • Transformation of socio-cultural norms • Creation of social change & dynamics
Infrastructure investment in relation to regional development	Direct Impact: • Connection of city to city and community to community • Movement of goods and services • Facilitation of infrastructure development (schools, hospitals, trading clusters, etc.) Indirect Impact: • Creation of jobs • Stimulation of individual creativity • Stimulation of community creativity • Stimulation of investment activities • Transformation of socio-cultural norms • Creation of social change & dynamics
Infrastructure investment in relation to developing countries	Direct Impact: • Stimulation of investment activities • Facilitation of infrastructure development (schools, hospitals, trading clusters, etc.) • Movement of goods and services Indirect Impact: • Creation of jobs • Connection of city to city and community to community • Stimulation of individual creativity • Stimulation of community creativity • Transformation of socio-cultural norms • Creation of social change & dynamics

Infrastructure Investment in Relation to Poverty Alleviation

Ramessur, Rojid, and Seetanah (2009) cited several studies supporting the ideal that infrastructure investments, specifically roads, lead to positive economic and social change for the poor. Canning and Bennathan (2000) found that (a) in low-income countries, the return on investment is likely higher; (b) in middle-income countries, the investment return was higher for paved roads because of the relatively low costs of road construction; and (c) both electricity generation and paved roads increased significant returns when combined with human capital.

Some researchers have agreed that public investments in social services and physical assets are key determinants of long-term sustainable growth and provide a platform for poor people to benefit from the growth process (Ogun, 2010). But there are three schools of thought on infrastructure and poverty alleviation: (a) that there is no relationship between investment in infrastructure and reduction in poverty, (b) that any social investment in infrastructure is likely to positively impact education and health and is more geared toward poverty alleviation than toward physical infrastructure, and (c) that investments in both physical and social infrastructures reduce poverty (Ogun, 2010). Other researchers have contended that too many poverty alleviation efforts have focused on empowerment (usually by increasing the number of poor people who participate in the decision making process) through access to infrastructures such as transportation. In Latin America, Estache et al. explored the relationship between infrastructure reforms and poverty alleviation and concluded that privatized infrastructure development tended to alleviate poverty if the poor could afford to participate in the benefits, such as access to jobs.

In China, Fan et al. (2002) analyzed the different forms of public investments on growth and rural poverty in various Chinese provinces and concluded that road infrastructure had the largest impact on poverty as compared to rural education, telecommunications, irrigation, agricultural research and development, power generation, and targeted poverty alleviation. Fan and Chan-Kang (2004) argued that low-quality roads—generally rural—have four times as much benefit-cost ratio for GDP as those of high-quality roads and concluded that low-quality roads do more to pull the poor above the poverty line than high-quality roads.

In Nigeria, Akinbobola and Saibu (2004) explored the relationship between unemployment, poverty, and income inequality and concluded that the living conditions of Nigerians can be improved by infrastructure-driven policies that reduce unemployment. From a study done in the Philippines, Ramessur, Rojid, and Seetanah (2009) concluded that the strongest indicator of poverty reduction in this case was the existence of road infrastructure. Citing another study from Indonesia where public expenditures in 25 provinces were assessed from 1976 to 1996, Ramessur et al. posited that road infrastructure had by far the biggest impact in poverty reduction compared with other investments in irrigation, health, agriculture, science and technology, education, and forestry. Ramessur et al. introduced five major groups of poor people affected by lack of transportation infrastructure: the income poor, the accessibility poor, the time poor, the safety poor, and the energy poor. Ramessur et al. demonstrated a clear linkage between poverty alleviation and road infrastructure development.

In my study, I assumed that three subthemes that have direct impacts on poverty alleviation are infrastructure developments that create jobs, stimulate individual creativity, and

facilitate other infrastructure development (schools, hospitals, trading clusters, etc.). Table 24 shows the assumed direct and indirect subthemes that affect poverty alleviation.

Table 24
Assumed Impacts of Subthemes on the Four Categories of Infrastructure Investment

Impacts of Infrastructure Investments	**Assumed Direct and Indirect Impacts on Subthemes**
(a) Infrastructure investment in relation to poverty alleviation	<u>Directly Impacts</u> • Creation of jobs • Stimulation of individual creativity • Facilitation of infrastructure development (schools, hospitals, trading clusters, etc.) <u>Indirectly Impacts</u> • Stimulation of community creativity • Stimulation of investment activities • Transformation of socio-cultural norms • Creation of social change & dynamics • Connection of city to city and community to community • Movement of goods and services

Infrastructure Investment in Relation to Economic Development

Historically, economic development theories have considered production of transportation infrastructure frequently as a subset of capital but rarely as its own category. In the colonial era, reliance on rural transportation infrastructure was high because that was the mechanism for transporting raw materials to the factories and finished goods shipped to the market in a timely manner (Adler & Polsky, 2010; Bagchi & Pradhan, 2013; Kustepeli et al, 2012; Na, et al, 2013; Osayomi, 2013; Shafik, 2005).

Transportation infrastructure has recently been credited for supporting various social services and providing access to schools, hospitals, and places of employment (Bagchi &

Pradhan, 2013; Lakshmanan, 2011; Shafik, 2005). A large body of contemporary research has explored transportation infrastructure systems as facilitators of and important contributors to the economic development of nations (Aschauer, 1989; Boopen, 2006; Calderon & Serven, 2003, 2008). Some researchers have argued that transportation infrastructure underlies the more visible forms of capital, facilitating the delivery of inputs to places of production; and the delivery of finished goods to marketplaces (Trimbath, 2011). Table 25 shows the assumed direct and indirect subthemes that affect transportation infrastructure investment in relation to economic development.

Table 25

Assumed Impacts of Subthemes on the Four Categories of Infrastructure Investment

Categories of Impact on Infrastructure Investments	**Assumed Direct and Indirect Impacts on the Nine Subthemes**
Infrastructure investment in relation to economic growth	Direct Impact: • Movement of goods and services • Creation of jobs • Facilitation of infrastructure development (schools, hospitals, trading clusters, etc.) Indirect Impact: • Stimulation of investment activities • Connection of city to city and community to community • Stimulation of individual creativity • Stimulation of community creativity • Transformation of socio-cultural norms • Creation of social change & dynamics

Infrastructure Investment in Relation to Regional Development

In the developed world, there is no question about the role of infrastructure investment as a catalyst for regional territorial cohesion, economic development, and the reduction of economic disparities. An overwhelming quantity of research suggests this is the case. Regional road infrastructure has played a significant role in how goods are transported across vast distances and in how passengers are carried from one location to another. This conception unites indicators such as employment, savings, wages, investment, and consumption into a synergistic whole. The United States grew as a nation through interconnected highway networks built during the Great Depression in the 1930s. These interstate road networks enabled and enhanced interstate commerce and development, benefiting regional development across the entire national landscape. In the European Union model, there are four factors that play

significant roles in the transport investment prioritization: (a) appropriateness of transport policy, (b) availability of sources of funding, (c) cost-effectiveness of projects, and (d) administrative capacity to adequately manage and absorb funds. These key factors led to the development of key metrics that include accessibility, territorial cohesion, economic competitiveness, and environmental sustainability (Burinskienė & Griškevičiūtė-Gečienė, 2012).

In China, Yu et al. (2012) used the Granger causality framework and a panel co-integration on time-series data from 1978 to 2008 to examine the relationship between economic growth in China, at both the national and regional levels, and transportation infrastructure investment. Their findings suggested that unidirectional Granger causality was likely to be evidenced at the national level and in the low-income western and central regions, while the more affluent regions showed bidirectional causality. Yu et al. posited that underdeveloped areas of China needed more than just improvements in the transportation infrastructure. Masarova and Iyanova (2013) agreed that economic development depends on other factors, including socioeconomic, political, natural-geographic, historical, and demographic factors. Their agreement was based on studying economic development and road infrastructure investments in the Slovak Republic Regions (Masarova & Iyanova, 2013).

Based on South Africa's experience with high-speed rail, Thomas (2013) argued that transportation investments can have the unintended consequence of deepening mobility-related exclusion by prioritizing the wealthy in the distribution of public funds. Regional transportation planning and development of road infrastructure in Nigeria continues to follow the British

colonial framework, which was anchored in Adam Smith's (1776) *Wealth of Nations* book that postulated the "vent-for-surplus" condition. The vent-for-surplus condition exists when a country or region produces more goods than it has consumers for, creating the need to transport the goods to other countries for the venting of surplus production capacity. The British were notorious for taking raw materials from developing countries and transporting them to British factories, where they were converted to British manufactured goods and sold back to the colonies. During the colonial era, Nigeria produced more agricultural goods than its citizens could consume, and the roads infrastructure traced paths along which these goods were produced and transported to Britain. These historic roads continue to frame how roads are planned for and built in Nigeria (AfDB, 2011). In 1960, when Nigeria became an independent country, it had 6,500 km of national road network; by 2010; the number had jumped to 197,000 km, of which about 18% was paved (AfDB, 2011). While the federal primary road network represents 9% of the total, state-managed secondary roads represent about 24%; the remaining 67% are village access and tertiary roads (AfDB, 2011). Table 26 shows the assumed direct and indirect subthemes that affect transportation infrastructure investments in relation to regional development.

Table 26

Assumed Impacts of Subthemes on the Four Categories of Infrastructure Investment

Categories of Impact of Infrastructure Investments	**Assumed Direct and Indirect Impacts on the Nine Subthemes**
Infrastructure investment in relation to regional development	Direct Impact: • Connection of city to city and community to community • Movement of goods and services • Facilitation of infrastructure development (schools, hospitals, trading clusters, etc.) Indirect Impact: • Creation of jobs • Stimulation of individual creativity • Stimulation of community creativity • Stimulation of investment activities • Transformation of socio-cultural norms • Creation of social change & dynamics

Infrastructure Investment in Relation to Developing Countries

Compared to the literature concerning developed countries such as the United States and United Kingdom on the possible relationship between investments in transportation infrastructure and economic development, the literature for developing countries such as Nigeria is sparse (i.e. Masarova & Iyanova, 2013; Munnell, 1992; Nobrega & Stich, 2012; Usman, 2014). Nigeria and other developing countries are at different levels of development, and so is the availability of data for evaluating whether economic development policies are related to transportation infrastructure investment at any level (Khasnabis et al, 2010; Nobrega & Stich, 2010; Rashidi & Samini, 2012; Usman, 2014).

There is an unresolved debate among economists and researchers as to whether transportation infrastructure investment in developing countries serves as an important catalyst

or as the backbone of a country's economic development (Echui & Keho, 2011; Olsson, 2010; Peterson & Jesup, 2007; Dash & Pravakar, 2009). This lack of certainty can be attributed to limited data collection efforts by these developing countries. This study explores whether in there is a relationship between the planning, investments, and build-out of road transportation infrastructure with long-term economic development strategies in one developing country, Nigeria. Table 27 shows the assumed direct and indirect subthemes that affect transportation infrastructure investment in relation to developing countries.

Table 27

Assumed Impacts of Subthemes on the Four Categories of Infrastructure Investment

Categories of Impact of Infrastructure Investments	**Assumed Direct and Indirect Impacts on the Nine Subthemes**
Infrastructure investment in relation to developing countries	Direct Impact**:** • Stimulation of investment activities • Facilitation of infrastructure development (schools, hospitals, trading clusters, etc.) • Movement of goods and services Indirect Impact**:** • Creation of jobs • Connection of city to city and community to community • Stimulation of individual creativity • Stimulation of community creativity • Transformation of socio-cultural norms • Creation of social change & dynamics

Limitations of the Study

This case study focused on a single developing country's infrastructural development, which limits the findings from generalization to other developing countries (Denscombe, 2014).

Recommendations

This single-case qualitative exploratory study has both practical and academic implications. The recommendations below are supported by the conclusions drawn from the research data.

Practical Applications

My research revealed that there was no cohesive local, state, regional, or national road infrastructure and economic development strategy in the country under study, Nigeria. While the government representatives may have had a sense that such strategies existed, the fact that the citizens did not see or were not involved in the development of roads and transportation infrastructure development is troubling. In the 21st century, Nigeria needs to develop a comprehensive road and transportation infrastructure development strategy that involves citizens as stakeholders in both the development of the strategy itself and in the monitoring of its usefulness for enhancing sustainable economic development. The uncoordinated and corrupt current practices of planning and funding roads and transportation infrastructures could be resolve through legislation. This could include establishing oversight agencies whose funding is based on citizen input and continued participation from prioritization through regular maintenance. Without good anti-corruption legislation at all three levels—local, state, and national—and without adequate checks and balances between the executive and judicial arms of government, the corrupt practices that hinder the successful implementation of roads and transportation infrastructure development in a rich country such as Nigeria will continue to undermine the country's economic and sociopolitical growth potential.

The model and implementation of contract awards need to be revamped and independent oversight bodies or agencies tasked with review and suspension-of-award powers. These powers must be backed by the judiciary to ensure that corrupt practices are dealt with through the courts. In time, as politically-motivated awards are brought before the courts by citizens using well-thought-out legislative statutes as authorities, the modus operandi of today may begin to subside. The current status, in which citizens who are primary stakeholders have no choice or monitoring authority concerning which roads get constructed or fixed, must cease and new models must be enacted if Nigeria hopes to develop its considerable economic potential. Currently, Nigeria is number 22 among the world's largest economies, but as the largest in Africa, it has the potential to achieve the ranking of one of the 10 largest economies in the world based on the share size of its current and projected population growth.

Future Research Applications

Research literature on the possible relationship between investments in transportation infrastructure and economic development in developing countries such as the Federal Republic of Nigeria is limited compared to that concerning developed countries such as the United States and United Kingdom (i.e.Aschauer, 1990; Eisner, 1991; Iyanova & Masarova , 2013; Munnell, 1992; Nobrega & Stich, 2012; Usman, 2014).

Nigeria and other developing countries are at different levels of development and so is the availability of data for evaluating whether economic development policies are related to transportation infrastructure investment at any level (Khasnabis et al, 2010; Nobrega & Stich, 2010; Rashidi & Samini, 2012; Usman, 2014).

It would be helpful to have additional qualitative research on the impact of good legislative laws and statutes and a strong judiciary that provide easy access for citizens to litigate bad and corrupt contract awards in relation to roads and transportation infrastructure funding, implementation, and monitoring. Since corruption in the awards, construction, monitoring, and maintenance of roads and transportation were the key discoveries in this exploratory single case study, a more comprehensive study that examines the shared governance process where citizens as stakeholders have a voice and power to bring before the courts would be desirable.

Another future study could utilize the nine subthemes from my findings as performance rubrics to measure the effectiveness and efficiency of roads and transportation infrastructure in a developing country:

- Creation of jobs
- Connection of city to city and community to community
- Movement of goods and services
- Stimulation of individual creativity
- Stimulation of community creativity
- Stimulation of investment activities
- Facilitation of infrastructure development (schools, hospitals, trading clusters, etc.)
- Transformation of socio-cultural norms
- Creation of social change and dynamics

Implication for social change

Since independence in 1960, Nigeria has not been able to overcome the road networks and transportation infrastructure deficiencies that deter its economic development. Some of the root causes can be attributed to corruption in awarding roads contract, lack of roads construction monitoring, and poor governance. Access to good road networks and transportation infrastructure will not only enhance economic development of developing nations-Nigeria included, but will facilitate efficient delivery of goods and agriculture produce to market. It will reduce traveling time and transportation costs; and minimize accidents and human deaths on Nigerian roads.

The implications for social change in my study can include providing scholars with a better understanding of the influence of good road infrastructure investment on economic development, especially in a struggling economy such as Nigeria's. This study can potentially contribute to positive social change by suggesting improvements in the road communication networks, which can subsequently lead to improved standards of living, decreases in travel time, and cost of transportation.

Conclusion

The general consensus among the participants in this study revealed that corruption in awarding roads contracts, lack of monitoring of contracts awarded, and governance of roads construction were the main hindrances to improvement of road networks and transportation infrastructure in Nigeria. This study support previous research showing investment in road networks and transportation infrastructure improves the economic development of nations.

When road networks and transportation infrastructure investments are made in a developing country such as Nigeria, the benefits garnered from the investment usually extend beyond economic development to social transformation.

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Appendix A: Research Interview Consent Form

You are invited to take part in a research study of the impact of transportation infrastructure on Nigeria's economic development. You were invited for the study because of your Knowledge; experience of Nigeria's road networks, and you were current or former Nigerian elected or appointed government officials or former senior management or policymakers or in-transit (Nigerians who are visiting the U.S. for business, pleasure, personal, diplomatic or other purposes) or U.S.-based Nigerian business stakeholder whose business in Nigeria are directly or indirectly affected by the existence of sustainable roads infrastructure. This form is part of a process called "informed consent" to allow you to understand this study before deciding whether to take part. This study is being conducted by a researcher named William A Agbigbe, Sir, who is a doctoral student at Walden University. Mr. Agbigbe is a citizen of Nigeria. This research solely reflects his role as a Walden student. The research is completely separate from his perceptions of Nigeria's road networks.

Background Information: The purpose of this study is to examine the impact of road transportation investment on Nigeria's economic development. The researcher will seek to provide insight into how investing in road networks might benefit Nigeria populations. Additionally, the researcher seeks to add to the management literature on economic impact of road networks investment.

Procedures: If you agree to be in this study, you will be asked to:

- Participate in one-on-one face-to-face interview with the researcher

Additionally;

- The researcher will audio tape your responses and takes notes during the interview
- The researcher anticipates each interview will last approximately 45 to 50 minutes
- The researcher will provide you the opportunity to review your responses and any preliminary analysis to ensure the content is an accurate and complete representation of your participation

Here are some sample questions:

- Describe your understanding of roads and transportation infrastructure planning, investments and construction in Nigeria
- Describe your understanding of roads transportation infrastructure investment and the planning, execution and monitoring of economic development activities in Nigeria
- Describe your understanding of roads and transportation infrastructure and its relationship to economic development.

Voluntary Nature of the Study: Your participation in this study is voluntary. This means that everyone will respect your decision of whether or not you want to be in the study. No one at your agency will treat you differently if you decide not to be in the study. If you decide to join the study now, you can still change your mind during or after the study. You may stop at any time.

Risks and Benefits of Being in the Study: Being in this type of study involves some risk of the minor discomforts that can be encountered in daily life, such as stress or becoming

upset. Being in this study would not pose risk to your safety or wellbeing. Any risk of injury or harm during the study interview is virtually nonexistent and the duration of the interview session will be limited to thirty 45-50 minutes. The interview will be audio recorded to maintain the accuracy of all information collected. The study will assist policy makers, funders, program managers and other related officials who are responsible for roads infrastructure and economic development the awareness and knowledge about key linkages that could reduce poverty, create economic development and contribute to a more just society. The case study will serve as a model for public agencies seeking to link roads infrastructure development to economic development activities.

Compensation: Participation in this study is voluntary; there will be no form of payment for participation, but an executive summary of the findings will be offered to the participants as nonmonetary form of compensation.

Confidentiality:

Any information you provide will be kept confidential. The researcher will not use your personal information for any purposes outside of this research project. Also, the researcher will not include your name or anything else that could identify you in the study reports. The privacy of all participants will be protected with all sensitive data coded in place of source identification. All study protocol, collected data and consent forms will be stored in a locked container for 5 years from completion of the study.

Contacts and Questions:

You may ask any questions you have now. Or if you have questions later, you may contact the Walden University representative who can discuss this dissertation with you. Walden University's Institutional Review Board approval number for this study is 09-09-15-0146784 and it expires on September 8, 2016

The researcher will provide all participants a copy of the consent form.

Statement of Consent:

I have read the above information and I feel I understand the study well enough to make a decision about my involvement. By signing below, I am agreeing to the terms described above.

Printed Name of Participant ……..

Date of consent …….

Participant's Written Signature ……

Researcher's Written Signature ….……

Appendix B: Sample Email Letter to Participate in the Study

From: William A Agbigbe, Doctoral Student,

Walden University

Subject: Research Project

Dear Sir or Madam,

You are invited to take part in a research study entitled *The Impact of Transportation Infrastructure on Nigeria's Economic Development.* The purpose of the study is to investigate the relationship between road transportation infrastructure investments and economic development in Nigeria. The data gathered from the interview may provide insight into how roads infrastructure and economic development activities are purposefully tied together by those responsible for planning, executing and monitoring them. The proposed study holds the potential to serve as a model for public officials involved in roads infrastructure development and economic development activities in Nigeria. The study is being conducted by a researcher named William Agbigbe, who is a doctoral student at Walden University. You will be asked to participate in a one-on-one face-to-face interview with the researcher to gain your opinion; knowledge and perception regarding road network investment in Nigeria. The interview will take approximately 45 to 50 minutes. Your responses to interview questions will be audio recorded, and notes will be taken during the interview. Your identity and all your responses to

interview questionnaire and notes taken by me will be kept strictly confidential. I would be grateful if my request is granted.

Best regards,

William A Agbigbe

Appendix C: Interview Protocol

The Impact of Transportation Infrastructure on Nigeria's Economic Development

Time of Interview:

Date:

Place:

Interviewer:

Position of Interviewee:

Brief description of Study:

Questions

1. Describe your understanding of roads and transportation infrastructure planning, investments and construction
2. Describe your understanding of roads and transportation infrastructure and the planning, execution and monitoring of economic development activities
3. Describe your understanding of roads and transportation infrastructure and its relationship to economic development
4. How does road infrastructure investments relate to economic development in Nigeria?
5. How should road infrastructure investments relate to economic development in Nigeria?
6. What are the planning linkages between the need for road construction and the need for economic development?
7. How does investment in transportation infrastructures, specifically in road network affect social change?

Appendix D: Expert Panel

A panel consisting of three to five experts will be assembled. The experts will review the interview questions (see Appendix C) to determine their suitability for the research questions. The panel members will consist of Ph.D. level university professors who have knowledge and understanding of road transportation infrastructure, project management and economic development. The researcher send initial letter as listed in Appendix E, requesting participation on an expert panel to review the interview questions. The second letter see Appendix F will follow after acceptance of request to participate as an expert panel. The interview questions will be change to reflect expert's feedback for content validity.

Appendix E: Sample Letter of Invitation to Participate on Expert Panel

Date……..

From: William A. Agbigbe, Doctoral Student,

Walden University

Subject: Request to Serve on Expert Panel to Validate Research Questions

Dear Sir or Madam,

I am a doctoral student at Walden University, conducting a qualitative case study on the impact of transportation infrastructure on Nigeria's economic development. The purpose of the study is to better understand the relationship between the investment in road networks and economic development in Nigeria. You are invited to participate on an expert panel to validate the interview questions. You are being selected due to your qualification, experience, and knowledge of road networks and economic development. I will be grateful if my request is granted.

Best regards,

William A. Agbigbe

Appendix F: Sample Letter of Interview Questions Validation

Date……

From: William A. Agbigbe,Sr. Doctoral Student,

Walden University

Subject: Interview Questions Validation

Dear Sir or Madam,

Thank you for accepting my request to participate in the process of validating my interview questions. Your identity and all your responses to my questions will be kept strictly confidential. The purpose of this qualitative case study is to better understand the relationship between the investment in road networks and economic development in Nigeria.

The research questions for the study are as follows:

1. What is the impact of road transportation infrastructure investments on economic development in Nigeria?
2. What criteria are necessary for planning, implementing, and monitoring pre- and post-construction activities?
3. How does investment in transportation infrastructure in the form of road networks affect social change in Nigeria?

4. The interview questions for the study are as follows:
5. Describe your understanding of roads and transportation infrastructure planning, investment, and construction.
6. Describe your understanding of roads and transportation infrastructure and the planning, execution and monitoring of economic development activities.
7. Describe your understanding of roads and transportation infrastructure and its relationship to economic development.
8. How does road infrastructure investment relate to economic development in Nigeria?
9. How should road infrastructure investments relate to economic development in Nigeria?
10. What are the planning linkages between the need for road construction and the need for economic development?

How does investment in transportation infrastructure, specifically road networks, affect social change?

Best regards,

William A. Agbigbe, Sr.

Appendix G: IRB Approval Letter

IRB Materials Approved - William Agbigbe, Sr.

IRB <IRB@waldenu.ed 9/9/15

u>

to me, Robert

Dear Mr. Agbigbe,

This email is to notify you that the Institutional Review Board (IRB) has approved your application for the study entitled, "The Impact of Transportation Infrastructure on Nigeria's Economic Development."

Your approval # is 09-09-15-0146784. You will need to reference this number in your dissertation and in any future funding or publication submissions. Also attached to this e-mail is the IRB approved consent form. Please note, if this is already in an on-line format, you will need to update that consent document to include the IRB approval number and expiration date.

Your IRB approval expires on September 8, 2016. One month before this expiration date, you will be sent a Continuing Review Form, which must be submitted if you wish to collect data beyond the approval expiration date.

Your IRB approval is contingent upon your adherence to the exact procedures described in the final version of the IRB application document that has been submitted as of this date. This includes maintaining your current status with the university. Your IRB approval is only valid while you are an actively enrolled student at Walden University. If you need to take a leave of absence or are otherwise unable to remain actively enrolled, your IRB approval is suspended. Absolutely NO participant recruitment or data collection may occur while a student is not actively enrolled.

If you need to make any changes to your research staff or procedures, you must obtain IRB approval by submitting the IRB Request for Change in Procedures Form. You will receive confirmation with a status update of the request within 1 week of submitting the change request form and are not permitted to implement changes prior to receiving approval. Please note that Walden University does not accept responsibility or liability for research activities conducted without the IRB's approval, and the University will not accept or grant credit for student work that fails to comply with the policies and procedures related to ethical standards in research.

When you submitted your IRB application, you made a commitment to communicate both discrete adverse events and general problems to the IRB within 1 week of their occurrence/realization. Failure to do so may result in invalidation of data, loss of academic credit, and/or loss of legal protections otherwise available to the researcher.

Both the Adverse Event Reporting form and Request for Change in Procedures form can be obtained at the IRB section of the Walden website.

Researchers are expected to keep detailed records of their research activities (i.e., participant log sheets, completed consent forms, etc.) for the same period of time they retain the original data. If, in the future, you require copies of the originally submitted IRB materials, you may request them from Institutional Review Board.

Both students and faculty are invited to provide feedback on this IRB experience at the link.

Information about the Walden University Institutional Review Board, including instructions for application, may be found at this link.

Appendix H: Permission to Use

Subject: **ATS.: Ref; Permission to use Figures in dissertation**

From: **Aušrinė Griškevičiūtė Gečienė** <ausrine.griskeviciute@vgtu.lt>

Date: Mon, Apr 4, 2016 at 12:03 AM

To: William Agbigbe <william.agbigbe@waldenu.edu>

Good morning,

You may use.

Good luck,

Kindly regards,

dr. Aušrinė Griškevičiūtė-Gečienė

Lecturer

Department of Urban Engineering

Vilnius Gediminas Technical University

Saulėtekio al. 11, LT-10223 Vilnius, Lithuania

Nuo: William Agbigbe <william.agbigbe@waldenu.edu>

Išsiųsta: 2016 m. kovo 15 d. 08:34

Iki: Aušrinė Griškevičiūtė Gečienė; Marija Burinskienė

Tema: Ref; Permission to use Figures in dissertation

Dear Sir/Madam,

I am a Doctoral Candidate at the Walden University in United States of America. I am writing to ask for your permission to use in my dissertation figures 1 and 2 (see attached) on pages 658 and 661 of your article titled "Towards creating the assessment methodology for urban road transport development projects" published in the Journal of Technological and Economic Development of Economy, volume 18, number 4, pages 651 through 671. I would be very grateful if my request is granted.

Best regards,

William Agbigbe,Sr