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Bus Rapid Transit (BRT) Project: An Alternative to Road Traffic Congestion along Mararaba-Nyanya-Abuja Highway, Nigeria

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ABSTRACT

Bus rapid transit (BRT, BRTS, bus way, transit way) is a bus-base mass transit system that meets certain conditions. A true BRT system generally has specialized design, services and infrastructure to improve system quality and remove the typical causes of delay. Sometimes described as a "surface subway". BRT aims to combine the capacity and speed of a metro with the flexibility, lower cost and simplicity of a bus system. The methodology adopted was a simple stratified random sampling technique used and 300 road commuters were interviewed including motor drivers of all kind, public and private workers and students commuting the road. The research employed cluster sampling method which deliberately includes people of similar characteristics in the location. The results of the analysis revealed that time wastage, increased accidents, lost of working hours, pollution, fatigue, lateness, delays, fuel consumption and blocked traffic due to passage of emergency vehicles were the major problems of road traffic congestion. Furthermore, the results suggest that BRT project can reduce the menace. In conclusion the research has shown that relationships exist between the research variables. From the explanations and figures in the analysis, it is evident that road traffic congestion has an impact on social/economic aspects. The study also recommends that the Federal government and the Nasarawa State government should implement this project and make a priority so as to reduce the suffering of the commuters.

Key words: BRT, lateness, delays, commuters, metro, subway.

INTRODUCTION

Transport or transportation is the movement of people, animals, services and goods from one location to another. Modes of transport include air, rail, road, water, cable, pipeline, and space. Transport infrastructure consists of fixed installations necessary for transport including roads, railways, airways, waterways, canals and pipelines and terminals such as airports, railway stations, bus stations, warehouses, trucking terminals, refueling depots (fueling docks and fuel stations), and seaports. Terminals may be used both for interchange of passengers and cargo and for maintenance. Vehicles traveling on these networks may include automobiles, bicycles, buses, trains, trucks, people, helicopters, and aircraft.

The forms of transport include public transport which includes the provision of formal and informal transport that is provided collectively by state and private sectors. Fare in the said providers is paid by the passengers. Besides buses operating on public services; many private companies, schools, parastatals and

government agencies operate buses to provide transport to and from work for their personnel/employees, trucks dealing with raw materials, services and goods transit. Private transports include privately owned cars, motorcycles, and bicycles.

In the past few decades, developing countries have experienced huge population growth (Mistro and Mfinanga, 2011). The increase in population has led to the increase in demand for urban transport, especially in African cities. However, the transport infrastructure in these cities is not appropriate for the road transport demand. Transport is one of the key sectors of the economy. It plays a critical role in day-to-day economic development activities. It serves as a catalyst in production as it facilitates movement of inputs to production points and evacuates products to storage or market places.

Pacione et al; (2005) argued that ineffective and inefficient transport systems significantly limit economic development, social opportunities and societal interactions. Access to affordable and good quality public transport services is critical for the urban population, as lack thereof leads to economic, social and physical isolation (Department for International Development, 1999). The problem seems to affect low income-communities located in the city outskirts with inadequate access to public transport and other basic urban facilities (Hine; Olvera et al, 2003). Generally, transport is crucial for development because without physical access to resources and markets, health, education and other social services; the quality of life suffers, growth stagnates and poverty reduction cannot be sustained. Motorized transport, with its corresponding negative impacts, contributes for a large part in creating an imbalance between the three aspects of sustainable development: economic growth, social progress and environmental protection (Robin and Wytse, 2011).

Despite the fact that Abuja is a pivot of Nigeria's administrative seat, road traffic congestion is a headache and burning issue to the private and public institutions; and the city dwellers in general. The congestion in the city is associated with increased vehicular queuing and poor accessibility to work and home places especially in the morning and evening hours. The serious road traffic congestions are observable in times between 6:00 – 10:00 am (the time when most workers are going to their work places) and the times between 04:00 – 10:00 pm when most of workers go back to their home places. Basing on these facts, it can be established that most of workers and people in general do report very late at their work stations such as offices, market places, schools and hospitals. This means that, some may report on time although very tired and with stress and some may not. Others do face the problem of few sleeping hours due to early waking and late sleeping, wastage of time on queues, overtime work as well as few hours to rest at home after work. The time loss of road vehicles because of traffic congestion is determined on the basis of roughly estimated queue lengths, time periods of congestion and the mean queue speed (Hansen, 2000). It is evident

that people in the study area spent more time in traffic queues than in other dealings. Generally, transport in the study area is chaotic, inefficient, unreliable and dangerous. It negatively affects the society especially the urban poor through loss of productivity, inhibiting human development and reducing the quality of life. All these complications and problems which most of employees and the people of the general public do encounter under different degrees and circumstances are said to be directly associated with the existing road traffic congestion.

Bus rapid transit (BRT, BRTS, busway, transitway) is a bus-base mass transit system that meets certain conditions. A true BRT system generally has specialized design, services and infrastructure to improve system quality and remove the typical causes of delay. Sometimes described as a "surface subway". BRT aims to combine the capacity and speed of a metro with the flexibility, lower cost and simplicity of a bus system. Currently, TransJakarta considered as the longest BRT route in the world with approximately 210.31 km length connecting the Indonesian Capital city.

To be considered BRT, buses should operate for a significant part of their journey within a fully dedicated right of way (busway)to avoid traffic congestion. In addition, a true BRT system has most of the following elements:

- Alignment in the center of the road (to avoid typical curb-side delays)
- Stations with off-board fare collection (to reduce boarding and alighting delay related to paying the driver)
- Station platforms level with the bus floor and multiple bus doors for entry (to reduce boarding and alighting delay caused by steps and queueing)
- Bus priority at intersections (to avoid intersection signal delay).

METHODOLOGY

Study area

The study area lies between latitude 7°20'N of the equator and longitude 6°045'S and 7°39'S. Road in the study area is to the Federal Capital Territory what Lagos-Ibadan Expressway is to Lagos. Many workers who cannot afford the exorbitant rent in the FCT live in many of Abuja's satellite towns on that axis. Such areas include Kugbo, Karu, Nyanya, Jikwoyi, Kurudu, Kpegi and Orozo. Some others live farther into neighbouring Nassarawa State. They live in Mararaba, Masaka, Nyanya Gwandara, One Man Village, Ado, New Nyanya, Kuchikau, Keffi and even Lafia, the state capital.

Mararaba-Nyanya-Abuja highway
Source: Culled from LRNZH, 2015.

Study population and sampling techniques

The population was composed of employees from formal and informal sectors and students. A simple stratified random sampling technique was used and 300 road commuters were interviewed including motor drivers of all kind, public and private workers and students going to schools in Abuja.

The research employed cluster sampling method which deliberately includes people of similar characteristics in a specific location (Miles and Huberman 1994).
This technique was used in order to obtain a representative sample drawn from a heterogeneous population. The population was grouped into a more homogeneous group so as to provide the best chance for generalization and allow increased precision. Homogeneous groups include people of similar character such as professional background or any other character which makes them distinct from the other.

Data analysis

Descriptive analysis method was adopted. This type of analysis, analyzed the responses through diagrams, tabulations, frequencies and percentages by using Statistical Package for Social Sciences (SPSS). In analyzing the data, answers from different respondents and information obtained from documents were thoroughly checked out and compared to establish their validity. The purpose was to add value to the study findings. Analysis of data was basically based on the research aim.

RESULTS AND DISCUSSIONS

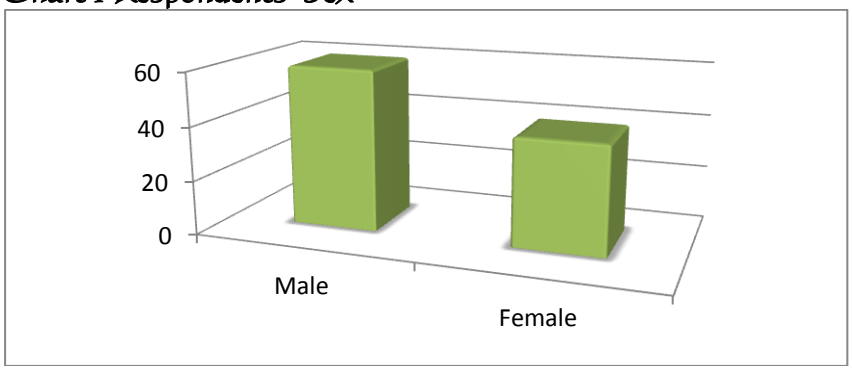
This chapter presents the nature of data collected in the field. The data concerning the social-economic impact of road traffic congestion in Mararaba-Nyanya-Abuja were collected through various methods namely: open and closed-ended interview.

Socio-Economic Characteristics of Respondents

Sex

Generally, the study covered 300 respondents, 180(60%) of the respondents interviewed were males while 120(40%) were females.

Chart 1 Respondents' Sex

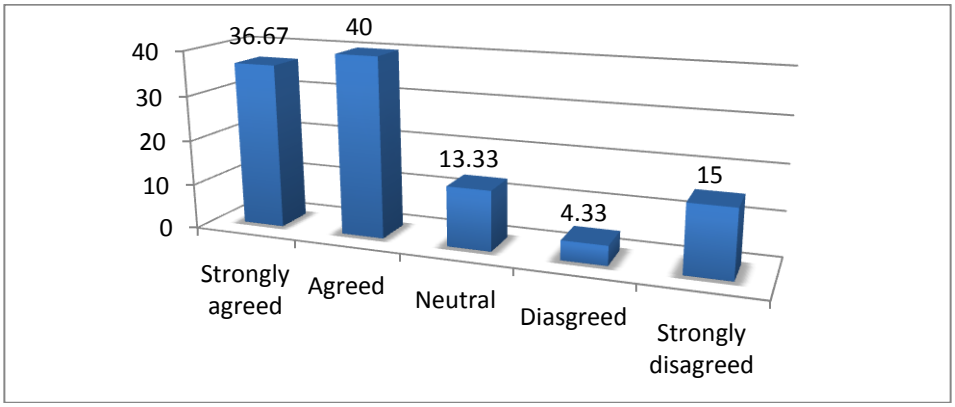


Source: field survey, 2016

Educational Level

Research findings indicated that 40(13.33%) of respondents who participated in the study using interview had primary education, 100(33.33%) had secondary education, 48(16%) had certificate and diploma education, 67(23.33%) had undergraduate degrees and 45(15%) had masters plus; of which 3 had PhD.

Figure 1 Respondents' Level of Education

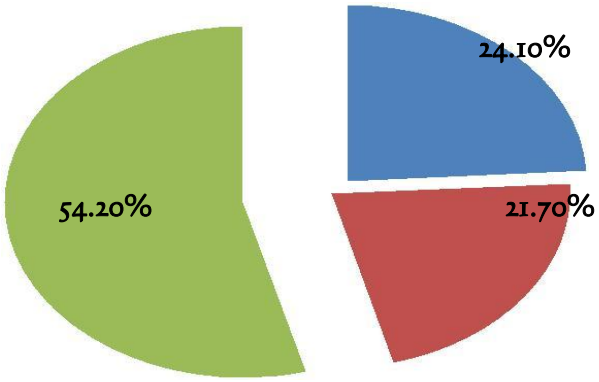


Source: Field survey, 2016

Type of Employment

The research findings indicated that, out of 300 respondents who participated in the study, 24.1% were employed in various public and private organizations, 21.7% were self employed while 54.2% were unemployed.

Figure 2 Respondents' Employment level



Source: Field work, 2016

RESPONDENTS VIEWS ON THE IMPACT OF ROAD TRAFFIC CONGESTION

Delays

The research findings depicted that, delays due to traffic road congestion results in late arrival to any place where a person is going.

About 110 (36.67%) of the whole respondents strongly agreed, 130(43.33%) agreed and 60(20%) were neutral, that is they neither agreed nor disagreed with the proposition above

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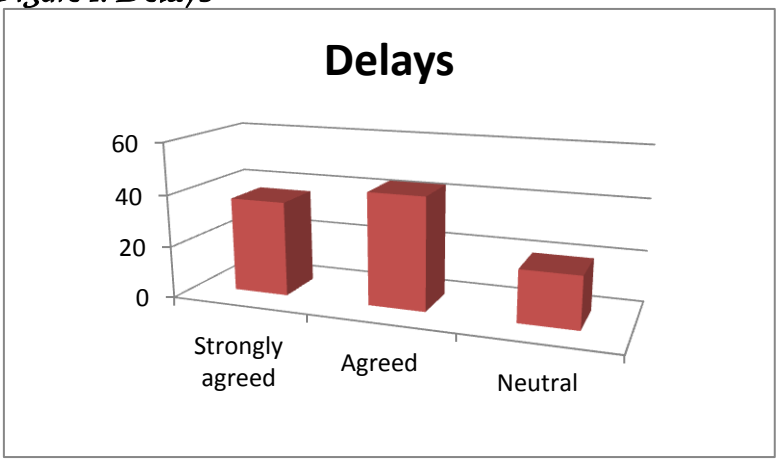
Figure 1: Delays

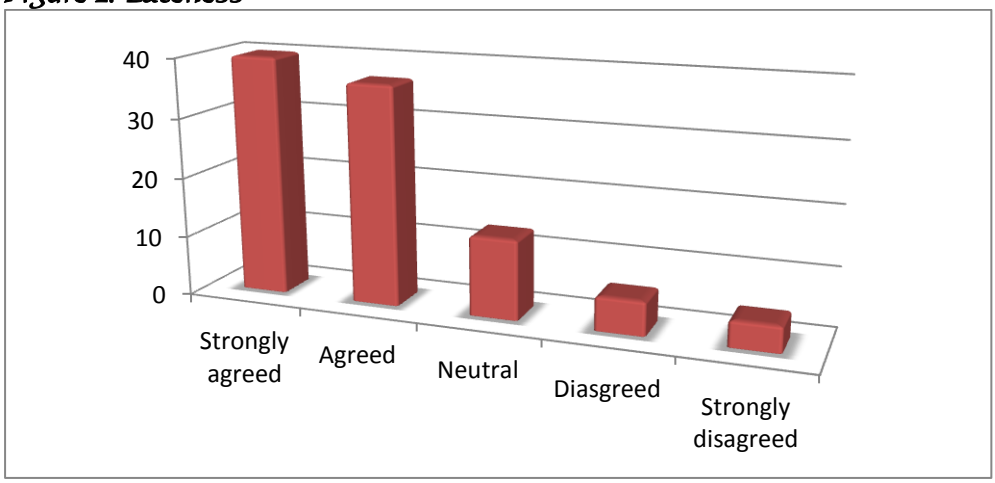


Source: Field survey, 2016

Lateness

Data from the field show that lateness to work reduce hours of performance of an individual and organizations. About 120(40%) of the respondents strongly agreed with the affirmation above, while 110(36.67%) agreed, 40(13.33%) were neutral, 17(5.67%) disagreed and 13(4.33) strongly disagreed.

Figure 2: Lateness

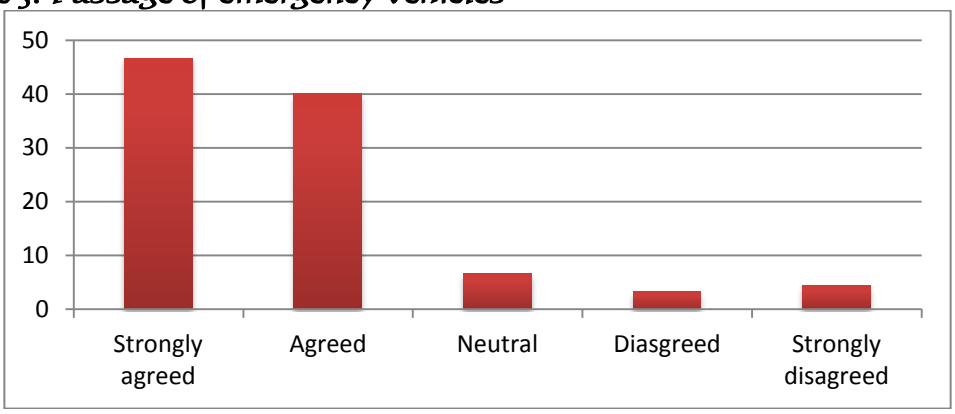


Source: Field survey, 2016

Emergence Vehicles

The research conducted showed that blocked traffic jam due to interference with emergence vehicles and military/security agents travelling to various destinations was highly experienced. This situation impedes travelers to reach their destinations on time. About 140(46.67%) of the respondents strongly agreed, 120(40%) agreed, 20(6.67%) were neutral, 10(3.33%) disagreed and 10(3.33%) strongly disagreed.

Figure 3: Passage of emergency vehicles

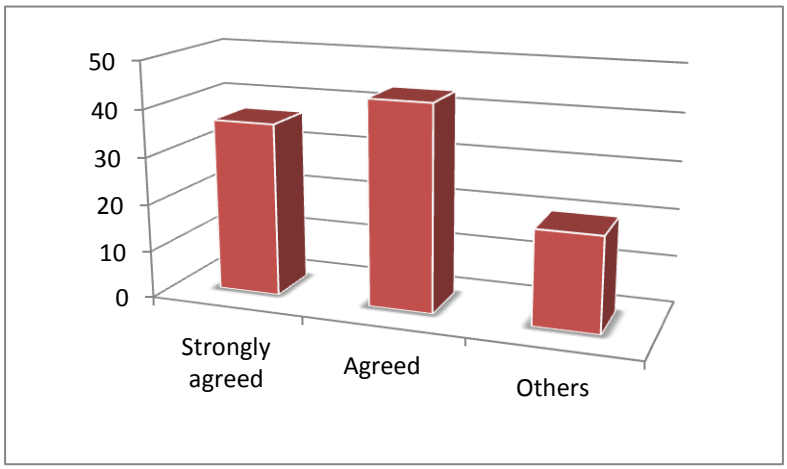


Source: Field survey, 2016

Wastage of time

The research findings demonstrated that many working hours are lost daily on the way during traffic jams. Out of 300 respondents, 110(36.67%) strongly agreed, 130(43.33%) agreed, 60(20%) neither agreed nor disagreed.

Figure 4: Time wastage

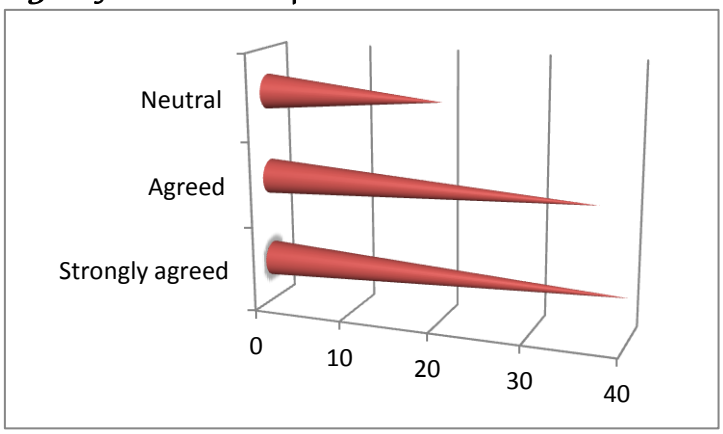


Source: Field survey, 2016

Fuel Consumption

About 120(40%) of all respondents strongly agreed on the high level of fuel consumption by cars during the congestion. 110(36.67%) respondents agreed on the same grounds of fuel consumption, 70(23.33%) were neutral.

Figure 5: Fuel consumption

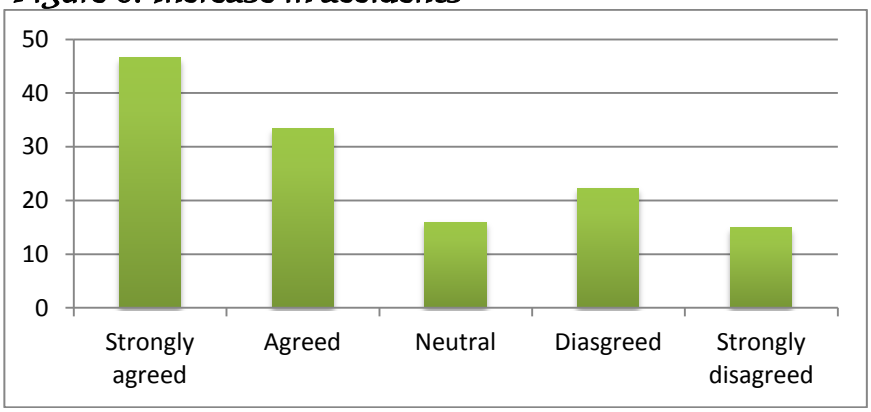


Source: Field survey, 2016

Increase in accidents

Concerning the increase of accidents in the study area due to traffic jam, the research showed that; 40(13.33%) strongly agreed, 100(33.33%) agreed, 48(16%) were neutral, 67(22.33%) disagreed, while 45(15%) strongly disagreed.

Figure 6: Increase in accidents

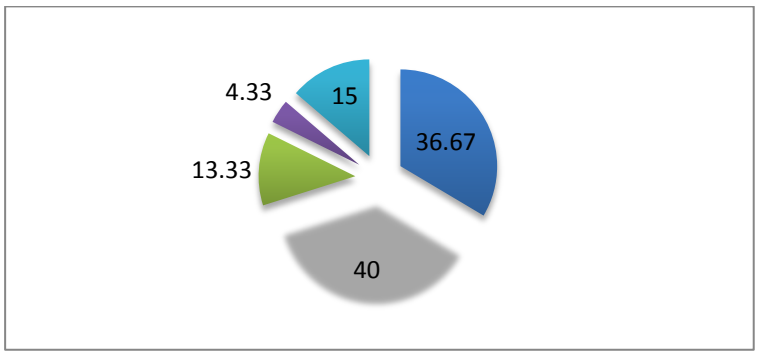


Source: Field survey, 2016

Some of the views shared by the respondents regarding traffic congestion were pollution, fatigue, early wake up, inability to determine travel time and associated risks.

Views on the BRT Project in the study area

It has been suggested that the BRT projects once implemented will alleviate the problem of traffic congestion in the study area. Concerning how the BRT project will lead to efficient social-economic activities, it showed that110(36.67%) of the respondents strongly agreed, and 120(40%) agreed, 40(13.33%) were neutral, 13(5.67%) disagreed, 17(4.44%) strongly disagreed.



Source: Field survey, 2016

CONCLUSION

In conclusion, the research has given a clear picture on the nature of the respondents who participated in the study. Briefly it has shown the relationship that exists between the research variables. From the explanations and figures in the analysis, it is evident that road traffic congestion has an impact on social/economic aspects. Although the respondents had demonstrated a diverse standpoint on the effects of road traffic congestion, much emphasis has been placed on the positive perception that; road traffic congestion has a substantial impact socially, economically and even psychologically to the road commuters.

RECOMMENDATIONS

- ✓ The Federal government and

the Nasarawa state government should implement this project and make it a priority so as to reduce suffering of the commuters.

- ✓ Penalties should be given to offenders who may bump into the BRT lane when the project is implemented.

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