



Analysis of Modal Choice of Residents in Lagos State

Tolulope Ayodeji Olatoye¹ and Akeem Adewale Oyelana²

¹*Faculty of Science and Agriculture, University of Fort Hare, Alice, South Africa*

E-mail: 201615087@ufh.ac.za

²*Faculty of Management and Commerce, University of Fort Hare, Alice, South Africa*

E-mail: 201100592@ufh.ac.za

KEYWORDS Lagos State. Modal Choice. Residents. Transport Modes

ABSTRACT The aim of the study was to examine work trip modal choice of residents in selected local government areas of Lagos State. The study used quantitative research design to obtain information from the respondents. Multi-stage random sampling techniques were used to select the respondents. The data was collected through self-administered questionnaires. It was analysed using descriptive statistics of frequency and percentage. The findings of the study revealed that 80 percent of those who owned a motorised vehicle owned only one while those that owned 2-3 motorised vehicles were 19 percent. Those that owned 3- 4 motorised vehicles in the study area were 1 percent only. It was also revealed that the state suffers from constant challenges of urban transportation, and these include high cost of transportation, overcrowded buses, bad inter-community roads, as well as delay in commuting from one place to another due to traffic congestion. The study concludes that unless the limitations are resolved, the residents in Lagos State will continue to experience those challenges. The study recommends that transport policy makers and planners in Lagos should develop and promote water transport in the state, so as to ease traffic congestion.

INTRODUCTION

According to Guerrero-Ibanez et al. (2015), the means by which people, goods and services achieve mobility is referred to as transport modes, and they fall into one of three basic types, depending on what surface they travel over: land (road, rail, and pipelines), water (shipping), and air (Bocarejo and Oviedo 2012). These various modes of transport pose a challenge to people commuting, because it hinders the enjoyment of efficient transportation. This is because people are faced with a difficult decision on which mode of transport would be most effective to achieve their commuting.

The modal choice of commuters is a complex phenomenon in urban transport. It is a fundamental determining factor in the modern transportation industry. According to Ackaah (2016), it is believed that conventional traffic procedures are generally based on the supposition that travelers reduce their travel distance or travel time, and usually use a single measure of travel impedance, such as travel distance, cost, generalized travel or travel time, and other factors.

De Witte et al. (2013) posited that commuter's modal choice and availability is greatly influenced by the interaction between transportation and land use. This was supported by

Tyrinopoulos and Antoniou (2013) empirical study on the relationship between the frequency of trips and land-use-activity indices. De Witte et al. (2013) observed that the relationship between spatial accessibility and trip frequency hovered between 0.35 and 0.50 for trip purposes that are not working, with no significant relationship between work trip frequencies and accessibility. The purposes for trips are for educational, commercial, social, or recreational purposes. Except for recreational trips, travel is not essential, but rather provides the required support for the accomplishment of some purposes, as well as a mechanism in reducing the spatial challenges of separation, by enhancing the communication between diverse land use activities (Suzuki et al. 2013).

The process of selecting "person's trips" by transport modes is referred to as Modal choice. This process considers the aspects that are vital to people or organizations in the process of decision-making regarding the mode to use. The researches have revealed that the intra-urban needs of the majority of people living in an urban environment cannot be met by a single means of travel, particularly when an urban environment has a topography that is dominated by water and land such as Lagos State (Opoko and Oluwatayo 2014). There is the need to have

a modal split, to share the total number of person's trip through different means of travel, and if accomplished, it will definitely reduce traffic congestion on a particular route. This was corroborated by Fagnant and Kockelman (2015) in their study of traffic delay in Ibadan, which is capable of reducing the traffic volume on the roads.

Generally, the transport system in Nigeria is characterized by a biased modal development, which favors road transport. According to Effiom and Ubi (2016), the road is accountable for over 90percent of both passenger and freight transport. This is therefore established according to Effiom and Ubi (2016) in the World Bank 2002 report, which indicated that on a daily basis across the three bridges between the Lagos Island and mainland in 2001, a total of 1.59 million two-way passenger traffic across the three bridges, and more than 75 percent commuted by public transport. This denotes a yearly overall growth in passenger demand by about 3.4 percent over the last decade (Agu et al. 2017).

Aim of this Study

This study examines work trip modal choice of residents in selected local government areas of Lagos State, with a view to analyse factors that determine their modal choice.

Objectives of the Study

- To determine the factors which influence work trip modal choice in the selected local government areas of Lagos State

Research Problem

Lagos as a megacity and former capital of Nigeria is inhabited with millions of people resident in the state. Consequently, the state suffers from constant challenges of urban transportation, and these include the high cost of transportation, bad inter-community roads, as well as a delay in commuting from one place to another due to traffic congestion. Other challenges include widespread road congestion, overcrowded buses and long delays for commuters with attendant cost in terms of wasted time, rapid wear and tear of automobiles and

excessive consumption of fuel (Beuran et al. 2015). Already, Lagos State has a high demand for the efficient transportation system. However, this has been complicated by poor coordination, synergy, and control at different levels of several government transport agencies and parastatals (Basorun and Rotowa 2012), thereby contributing to the hardship people experience in their daily commuting.

Addressing the transportation and traffic challenges of a complex megacity like Lagos, has been a major priority of successive governments of the state over the years. Given the complex nature of the transport sector in the state, the need to exploit alternative means cannot be over-emphasized (Akpoghomeh 2012). Efforts have been made by the government to alleviate the traffic concerns of people living in metropolitan Lagos as well as other Lagos suburbs. This was done in ensuring efficient mobility around the state.

The problems of traffic congestion in Lagos have however defied many strategies employed by different administrators in the state, compelling commuters to seek different modes that would satisfy their traveling demand. Nevertheless, with the introduction of the Bus Rapid Transit as a transport mode, which was designed as an alternative to single-occupancy commuting, and to the unstructured and unregulated private commercial operators that ply the city, passenger choice appears to be unlimited. Aimed with the strategy to ease traffic and offer modal choice to commuters in Lagos, as well as the importance of improving air quality, save energy, and reduction in peak period congestion, the Bus Rapid Transit has enabled passengers the choice of choosing an efficient mode of commuting around Lagos suburbs and the metropolis.

Many empirical analyses on mode choice in Lagos and probably in Nigeria at large have been based on selected mode. This includes a study on commuters' preferences/choice for public transport (Adeyinka 2013; Ojo 2019), studies on water transport ferry service route network and infrastructures (Atobi 2013).

However, this study focuses on the use of both private and public transportation for work based commuting in eight (8) contiguous local government areas of Lagos State, namely Surulere, Mushin, Somolu, Ikorodu, Kosofe, Ikeja,

Lagos Island, and Lagos Mainland. This will give an insight into the understanding of mode choice of residents in Lagos.

Literature Review

Factors Influencing Mode Choice

A passenger's mode choice is influenced by many different attributes (Richter and Keuchel 2012). In many cases, commuters are confronted with the decision to choose which mode the best suit their commuting option. In demanding an efficient, effective and low-cost transport system that would get passengers to their point of destination, different factors interplay.

In modeling the choice of modal transport with the integration of hierarchical information, Richter and Keuchel (2012) found that a passenger's mode choice is influenced by many different attributes. The researcher used the Integrated Hierarchical Information Integration (HII-I) approach to overcome the problem of biased result, by summarizing like attributes into constructs. The aim of their study was to apply HII-I to the model choice of modal transport, and to test if the separate sub-experiments can be concatenated into an overarching model. Analysis of choice data was carried out using multinomial logit (MNL) models, this was done separately for the bi-modal and the tri-modal experiments. Their empirical finding suggested that taste parameters and scale parameters were found to be equal in the bi-modal experiments process, supporting equality across sub-experiments. Regarding the selection of attributes, Keuchel and Richter (2011) also discovered that the total travel time, as well as the price, can be derived from the economic theory of consumer behaviour.

Paulssen et al. (2014) examined the value of time as a revealed preference in modal choice. Their empirical study aimed to estimate the real total cost of traveling in Brazil, both by air and by coaches, considering the value of the time as a relevant factor for the passenger's decision when traveling by coach or by plane. In their methodology, they applied a model developed by Fezzi et al. (2014), which stated that the higher the travel time, the higher the passenger's preference for staying longer in some place. This considered the relation between the difference

of the average fares and travel time for both means of transportation. The results showed the trade-off income for which the passenger changes from the slowest to the fastest mode of maximizing the utility. They observed that cost was most important in mode choice between traveling by coach and traveling by plane, as the cost of traveling by coach is lower than traveling by plane.

Basorun and Rotowa (2012) investigated the public transport operations in Lagos Island, and aim to investigate the performance level. The study adopted simple descriptive statistics, as well as a pair wise - association between the level of patronage by commuters and level of service of the private sector in the public transport system through the use of the Pearson's Correlation test. Also, a well-structured questionnaire was designed to investigate 20 to 25 variables on the operators and commuters in the area respectively. A sample size of 160 public transport operators as well as 480 commuters was randomly selected for this research, and the analysis of the collected data were subjected to two levels, namely the univariate analysis, which refers to the behavior and attribute of each variable. Secondly, the bivariate analysis which is a function of the correlation between the pairs of variables. A hypothesis was also established for the study, to determine if any significant correlation exists between the private-driven public transport services and the level of patronage. The result indicate that the correlation analysis of the 'r' value was highly positive (0.95) with a significant correlation between the level of privately- driven public services and the commuters' level of patronage in the study area.

Nkegbe et al. (2012) analyzed the transport modal choice of the non-resident university students in Ghana. The multi-stage sampling technique was employed in the study to draw 384 students for Developmental Studies in the University Campus. They analyzed data using the multinomial logit regression, and their findings revealed that the bus was the most patronized means of transport by the students, followed by the motorcycle. However, the bicycle was the least used mode of transport, while students who stayed close to campus preferred walking. They also found that the choice of students' mode of transport is greatly influenced by travel time, a

distance of stay, education, mother's income as well as the received remittance level.

In examining the user's accessibility level to Bus Rapid Transit bus stops in regards to the waiting time, as well as the distance and travel time at the Bus Rapid Transit bus stop, Olawole (2012) for his sample population did a random selection of 200 Bus Rapid Transit users in Agboyi-Ketu area of Kosofe Local Government of Lagos state. His study was channeled by two hypotheses. Firstly, that there is an inverse correlation between distance to BRT bus stops and patronage of BRT services are inversely correlated, and secondly, that the distance is inter-correlated with the travel time by influencing the frequency levels regarding the patronage of BRT services.

In their study, Agunloye and Ilechukwu (2011) examined the correlation between the socioeconomic characteristics and travel patterns of the rail patrons in Lagos state. In a bid to unpack this research, both primary and secondary data sources were used. The sources of primary data were questionnaire administration on the travel and socio-economic characteristics of train passengers. A sample size of 210 questionnaires was administered representing 20 percent of the total population. Using stepwise multiple regression analysis, inferential (Pearson's moment correlation coefficient), descriptive (frequency tables) as well as data analytical tools, the relationship between socio-economic and trip characteristics was investigated through correlation analysis, also, in a bid to confirm the existence of relationship or otherwise, multiple linear regression analysis was adopted.

Owolabi (2009) examined the application of behavioral models on paratransit modal choice in Akure. With the aid of a traffic survey using manual counting, he collected data in the morning, afternoon and in the peak period of the night, to characterize the volume of traffic on the major roads within Akure metropolis, and in a view of determining the predominant modes of transport and their proportion in the traffic stream. He analyzed using a combination of multiple regression methods of the least squares and binary logit probability models. The behavioral travel demand model was also used in analyzing the effects of transport attributes on modal choice. The analysis of the composition of traffic re-

vealed that most predominant mode of transport in the metropolis are the passenger cars, which constitute 70.75 percent of traffic; followed by motorcycles constituting 22.6 percent and buses, trucks and bicycles constituting 4.03 percent, 2.24 percent, and 0.29 percent, respectively. Analyses of the models indicate high constant values in the models for taxi and motorcycle modes, thus showing that they have inherent advantages over other modes.

Adetunji and Aloba (2013) examined work trip patterns and the structure of urban environment in Ilesha, Nigeria. From the foregoing, 1,365 questionnaires were administered through eleven traffic analysis zones, using descriptive (principal component analysis) as well as the cartographic phenomenon analysis in Arc view 3.2 environments. In the course of this study, the origins, destinations and spatial configuration of the work trips pattern of urban residents in Ilesha were clearly elucidated. Their findings reveal that the Owa's palace zone recorded the highest volume of work trips in the city with about 21.2 percent of the total work trips in the study area. Similarly, high proportions of workers from other zones were received from Bolorunduro, Imo, Ayeso, and Okesa areas, with each constituting 10.6 percent, 10.3 percent, 12.6 percent, and 10.7 percent, respectively. It was observed that these four zones are thus the most popular and significant work-trip destinations in the study area.

The similarities that exist between this study and the literature reviewed are the work trips, origin, the destination of work trips and the proportion of mode share by various modes. Also, this study, like other kinds of literature focuses on the factors that influence mode choice with the aim of bringing out the salient factor, which people consider before choosing a mode. Again, analysis techniques which were employed in analyzing data in various literature were also used to analyze the data for this study, which included the multiple regression and the χ^2 (Chi-square) technique.

In spite of the similarities this study have with the reviewed literature, some differences and dissimilarities still exist, which make this study unique. This study did not make a study on the land use parameters, which is among the factors that influence mode choice and distance traveled. This implies that accessibility, land use,

and urban design were not considered as a factor as in the study, unlike the works of Keuchel and Richter (2011) and Richter and Keuchel (2012) as well as preferences of commuters' lifestyle (Urry 2016).

Nevertheless, in analyzing commuters' choice, most of the literature reviewed studied mode choice in two transport mode forms (Bovy and Stern 2012; Tavasszy et al. 2012; Saeed 2013; Salonen and Toivonen 2013). In relation to the studies conducted within Nigeria, the major difference of this study and the literature reviewed is the spatial extent in which this study was examined with eight (8) contiguous local government areas as the subject of the study. The literature no doubt has demonstrated that various mode choice parameters are important considerations for commuters in choosing the mode, which would best suit their commuting option.

RESEARCH METHODOLOGY

Study Area

Lagos State is located in south-western Nigeria, on the coast of the Atlantic Ocean in the Gulf of Guinea, at the western side of the Niger delta river. It lies approximately on longitude 2° 42' E and 3° 22' E and latitude 6° 22' N and 6° 52' N and is bounded on the west by the Republic of Benin, sharing boundaries with Ogun State eastwards and northwards. Lagos is the smallest State in Nigeria, occupying a total area of 3,577 sq km, and 22 percent or 787sq km of the state consists of creeks and lagoons. Lagos has a huge metropolitan landmass originating from the islands and separated by creeks, such as the Victoria Island and Lagos Island, which fringe the southwestern shoreline of Lagos Lagoon, and protected from the Atlantic Ocean by long sand spits, such as Bar Beach that stretch up to 100 km east and west of the shoreline. There are 20 local government (administrative) areas in Lagos with 37 Local government development areas, bringing the administrative areas of the State to 57.

Economy

Lagos is the most populous metropolis in Nigeria with a population of 7,937,932 in the 2006

population census (Elias and Omojola 2015). Lagos is currently estimated to be the second fastest growing city in Africa (7th fastest in the world), and currently the third most populous city in Africa after Cairo and Kinshasa. Lagos was once the administrative capital of Nigeria and is currently the country's financial and economic capital. As the most prosperous city in Nigeria, much of the national economic activities and wealth are concentrated in Lagos. There is a preponderance of financial and commercial activities going on the island, which is the central business district of the state. Also, most of the country's financial institutions and multinational corporations and commercial banks' have their headquarters in Lagos. Nigeria's leading port in Lagos is one of Africa's busiest and largest ports, which is under the auspices of Nigerian Ports Authority and is split into three main sections, namely Apapa Port (site of the container terminal), Lagos port and Tin Can Ports respectively.

The data garnered for this research were mainly from primary and secondary sources. The multiple choice questionnaire survey method was adopted for the collection of primary data. This was used to elicit information from respondents. The multiple choice questionnaire was drafted in such a way to cover the objectives of the study. The questionnaire was organized into two parts namely, A and B. Part A elicited information on the socio-economic and demographic characteristics of the respondents. These included questions on their age, marital status, gender, occupational type, educational level, monthly income, house type, and employment type. Part B was designed to elicit information on travel characteristics of respondents, which included vehicle ownership, mode choice, mode availability, waiting time and mode take-off time, important factors considered by respondents when making work trip as well as making a return trip. Information was obtained on the respondents' work trip characteristics, such as mode choice, origin, destination, travel time, transport cost and mode ownership type for seven (7) days of the week.

Secondary Data

Data from the National Population Census of 1991 and 2006 for eight local government ar-

eas of Lagos State were obtained from the National Bureau of Statistics and from the website of Georg Stubitsch. These were used to project 2013 population figures for the areas to determine the sampling size of respondents in the study. The 2013 population projection was based on the Arithmetic Numerical model using the formula,

$$K_a = \frac{P_2 - P_1}{t_2 - t_1} \text{ and}$$

the general equation line $P = P_1 + K_a (t - t_1)$

where P refers to a population

t refers to the time

K_a refers to arithmetic growth constant

Sampling

The multi-stage random sampling technique was adopted for this research in order to guarantee adequate representation. The first stage was the identification of all local government areas that the bus rapid transit (BRT) corridor traveled through in Lagos. The BRT corridor was used to determine the local government areas selected for this study because of its length, which is around 44km from Ikorodu to C.M.S., with the corridors ability to connect and link a large area of Lagos, especially the metropolitan area, thereby creating a contiguous area for the study. In the next stage, the total population in each local government areas projected to the year 2013. A sample size of respondents was determined at the last stage, based on the projected figure for each local government area, which is at 0.018 percent for the year 2013. The selected respondents were chosen from differ-

ent strata of the society namely bankers, teachers, market women, students, civil servants, traders, taxi drivers, factory workers, and engineers.

Table 1 shows the sample size from the selected local government areas namely: Kosofe, Ikeja, Lagos Island, Ikorodu, Lagos Mainland, Surulere Mushin, and Somolu local government areas.

The target population of this study comprised of commuters who live within the local government areas that represented the study area. The targeted population of the study includes those who also use a mode or a combination of modes to make their work trip. However, a respondent who is above 20 years and has a regular work, commuting from one place to another was considered eligible to participate in the survey. Based on the proportion of the population in each local government area, as Table 1 illustrated, a total of 750 questionnaire copies was administered in the study.

Hypotheses

H_0 = No significant relationship exists between factors and modal choice.

H_1 = A significant relationship exists between factors and modal choice.

Analysis of Data

The Statistical Package for Social Sciences (SPSS), 17.0 version software was used to process and analyze the data for this study. Frequency distributions and cross-tabulations were employed to present the findings of the study. In addition, data were illustrated with the aid of

Table 1: Population figures in each Local Government Area

LGA	1991 census figures ¹	2006 census figure ²	2013 projected figure	Sample size at 0.018%
Ikeja	203, 383	317, 614	370, 922	70
Ikorodu	88, 700	527, 917	732, 884	132
Kosofe	412, 407	682, 772	808, 942	146
Lagos Island	165, 996	212, 700	234, 495	43
Lagos Mainland	273, 079	326, 700	351, 723	65
Mushin	539, 783	631, 857	674, 825	123
Somolu	358, 787	403, 569	424, 467	76
Surulere	462, 261	502, 865	521, 814	95
Total	2, 504, 396	3, 605, 994	4, 120, 073	750

Source: 1. National Bureau of Statistics

a statistical diagram, using simple and component bar charts.

The statistical techniques employed for this research are the multiple regression analysis and the chi-square test. The chi-square was used to test the first hypothesis, because of its ability to tests for the existence of a relationship (or otherwise) between two variables. The multiple regression analysis was used to test the second and the third hypotheses, because of its usefulness to predict values of variables, based on the value of two or more other variables. Therefore, the technique was chosen to ascertain the joint and individual contribution of the independent variables, in order to provide an explanation to the variation in the dependent variables.

The hypothesis which states that the factors that influence work trip modal choice, cost, time, safety, comfort, driver's skill, and congestion considerations were tested using the multiple regression analysis. The dependent variable was a factor in mode choice whose empirical measure was defined in terms of cost, time, drivers' skill, safety, comfort, and congestion. The independent variables that provided explanations were mode take off time and waiting time to get mode, with time measured in terms of minutes and hours.

Gender was measured in male and female; age was measured in years; marital status was measured in single, married, separated, divorced and widowed, while the level of education was measured by no education, primary, secondary, tertiary. Occupation type was measured in medical personnel, banker, lawyer, clergy, artisan, teacher, trader, clerical staff, registered professional and others. Employment type was measured in a civil servant, private employee and self-employed, while house type was measured in one room, room and parlour, a room self-contained, 2 or 3 bedroom flat and duplex.

RESULTS AND DISCUSSION

Factors Influencing Work Trip

Nchuchuwe and Adejuwon (2012) identified the basic problem of transportation in Nigerian rural areas as a decrease in the supply of infrastructure with three broad major aspects, as lack of motorable road connections, low rate of car

ownership and absence of well-structured public transport. The situation is not all that different today, especially in some urban centers of developing countries. Many cities where business and economic activities thrive, car ownership for easy movement around the city is usually the desire of many urban worker commuters. In this study, a total of 68 percent of respondents said they do not own a form of motorized vehicle, while 32 percent owned a form of motorized vehicle (Cervero 2013).

However, 80 percent of those who owned a motorised vehicle owned only one, while those that owned 2-3 motorised vehicles were 19 percent (Cervero 2013). Those that owned 3-4 motorised vehicles in the study area were only 1 percent. In all the eight local government of the study areas for the year 2010 and 2011, the findings also indicated the vehicle registrations by ownership type from the licensing offices. Obviously, private owned vehicle registration was high in all licensing offices in each local government area, with centers in Ikeja, Ikorodu, Lagos Island and Surulere recording 71.3 percent, 91.3 percent, 77.2 percent and 73.1 percent in 2010 and 73.7 percent, 80.3 percent, 74.3 percent and 72.5 percent in 2011 (Femi 2013). Commercially owned vehicle registration was next as it recorded similar registration over each local government area in the study area for the two years in review (Aderamo 2010; Sangowanwa et al. 2010; Femi 2013). Likewise centers in Ikeja, Ikorodu, Lagos Island and Surulere recorded 15.4 percent, 7.2 percent, 12.8 percent and 14.8 percent in 2010 and 17.7 percent, 16.4 percent, 16.7 percent and 18.8 percent in 2011.

However, government and corporation owned vehicle registration was low for the two years in review. For the government owned vehicles, licensing offices in Ikeja, Ikorodu, Lagos Island and Surulere local government areas recorded 1.0 percent, 0.1 percent, 0.4 percent and 0.1 percent in 2010 and 0.4 percent, 0 percent, 0.2 percent and 0.1 percent in 2011 respectively. While these local government areas also recorded 12.4 percent, 1.4 percent, 9.6 percent and 11.9 percent in 2010 and 8.2 percent, 3.3 percent, 8.8 percent and 8.6 percent in 2011 respectively for corporation owned vehicles.

Among the respondents surveyed, Table 2 revealed that 39 percent chose their mode as a

Table 2: Reasons mode was used by respondents for the journey to work

LGA	Reason mode was used										Total
	Fast		Cheap		Short waiting time		Better managed		Efficient		
	Freq	%	Freq	%	Freq	%	Freq	%	Freq	%	
Kosofe	67	46	30	21	21	14	12	8	16	11	146
Ikorodu	70	53	18	14	4	3	7	5	33	25	132
Surulere	25	26	21	22	16	17	8	8	25	26	95
Somolu	31	41	16	21	8	11	9	12	12	16	76
Mushin	42	34	33	27	25	20	7	6	16	13	123
Lagos Island	17	40	8	19	9	21	5	12	4	9	43
Lagos Mainland	17	26	13	20	8	12	5	8	22	34	65
Ikeja	23	33	17	24	9	13	10	14	11	16	70
Total	292	39	156	21	100	13	63	8	139	19	750

means of transport to work because it was faster. This is based on the fact that people working in Lagos encounter various challenges in getting to their place of work. Therefore, in order to meet resumption time, the mode which would move faster would be their choice, if traffic delay was not hectic. 8 percent of the respondents were concerned about the management of the mode, while 21 percent showed monetary concern by choosing mode base on cost. Short waiting time to get a mode was the concern for 13 percent of the respondents, while 19 percent was rather concerned about the efficiency of the transport mode. This is supported in literature by de Dios Ortuzar and Willumsen (2011) in his work on transport modeling.

In examining the factors which were most important to respondents in their commuting to work, Table 3 revealed that time was most important to respondents in choosing a mode to work, and this recorded for 42 percent responses. Interestingly for others, safety was more important than cost, which account for 19 percent of the respondents commuting to work. The cost however, was 18 percent, while commuters' comfort was 14 percent. The driver's skill recorded 4 percent as traffic, while the congestion as a mode choice factor recorded just 3 percent of the responses.

In a return trip, Table 4 revealed that respondents again chose time considered as the most important factor in their mode choice. This re-

Table 3: Most important factor in mode choice for the journey to work

LGA	Most important factors as regards journey to work												Total
	Cost		Time		Driver's Skill		Safety		Comfort		Congestion		
	Freq	%	Freq	%	Freq	%	Freq	%	Freq	%	Freq	%	
Kosofe	25	17	57	39	2	1	31	21	29	20	2	1	146
Ikorodu	17	13	63	48	1	1	30	23	21	16	0		132
Surulere	18	19	32	34	10	11	14	15	12	13	9	9	95
Somolu	7	9	41	54	1	1	17	22	7	9	3	4	76
Mushin	33	27	46	37	8	7	18	15	11	9	7	6	123
Lagos Island	9	21	18	42	2	5	5	12	9	21	0		43
Lagos Mainland	10	15	32	49	1	2	9	14	11	17	2	3	65
Ikeja	18	26	23	33	2	3	19	27	7	10	1	1	70
Total	137	18	312	42	27	4	143	19	107	14	24	3	750

Source: Fieldwork 2013

Table 4: Most important factor in mode choice for return trips

LGA	Factor considered when going back home												Total
	Cost		Time		Driver's Skill		Safety		Comfort		Congestion		
	Freq	%	Freq	%	Freq	%	Freq	%	Freq	%	Freq	%	
Kosofe	23	16	49	34	4	3	38	26	30	21	2	1	146
Ikorodu	23	17	40	30	1	1	40	30	22	17	6	5	132
Surulere	22	23	27	28	5	5	15	16	16	17	10	11	95
Somolu	9	12	24	32	1	1	21	28	14	18	7	9	76
Mushin	21	17	40	33	6	5	32	26	11	9	13	11	123
Lagos Island	8	19	17	40	0		7	16	11	26	0		43
Lagos Mainland	12	18	24	37	4	6	12	18	11	17	2	3	65
Ikeja	8	11	33	47	2	3	17	24	8	11	2	3	70
Total	126	17	254	34	23	3	182	24	123	16	42	6	750

Source: Fieldwork 2013

corded a total of 34 percent compared with 42 percent when making work trips. In returning home from work, the safety consideration becomes more pronounced as 24 percent of the respondents would consider safety as a factor in their mode choice. Nevertheless, 17 percent and 16 percent of the respondents would respectively consider cost and comfort as a factor in their mode choice when going back home. Only 6 percent and 3 percent would consider traffic congestion and the driver's driving skill as an important factor in their mode choice when going back home.

The respondents' who waited for less than 5 minutes to get their choice of mode to work were 47 percent. This is an expression of the improved transportation system in Lagos, as only 5 percent was recorded as waiting time to get trans-

port mode in more than 20 minutes. However, other respondents that waited for about 10 minutes were 20 percent, while those that waited for more than 5 minutes were 19 percent as shown in Table 5.

The personal vehicle was the mode with the lowest take-off time among motorized vehicles with 61 percent in less than 1 minute take off time. This was understandable because of the decision to take off rest on the commuter, and this is consistent with the findings of Hjorthol (2013). In a situation where the decision was outside the control of the commuter, it was observed that Bike and cabs had the lowest take-off time of less than 1 minute with 40 percent and 31 percent respectively. Buses had the least take off time of less than 1 minute with 4 percent of the respondents. Coaster bus had the high-

Table 5: Transport mode takeoff time by LGA

LGA	Mode takeoff time										Total
	< 1 min		2 - 4 mins		5 - 10 mins		10 -15 mins		>15 mins		
	Freq	%	Freq	%	Freq	%	Freq	%	Freq	%	
KKosofe	48	33	53	36	28	19	15	10	2	1	146
Ikorodu	46	35	29	22	37	28	13	10	7	5	132
Surulere	19	20	32	34	19	20	16	17	9	9	95
Somolu	16	21	31	41	20	26	9	12	0		76
Mushin	22	18	32	26	44	36	20	16	5	4	123
Lagos Island	11	26	20	47	5	12	6	14	1	2	43
Lagos Mainland	25	38	16	25	15	23	8	12	1	2	65
Ikeja	27	39	25	36	11	16	5	7	2	3	70
Total	214	29	238	32	179	24	92	12	27	4	750

Source: Fieldwork 2013

est take-off time of more than 15 minutes with 17 percent of the respondents. However, the average take-off time for all modes was between 2 and 4 minutes.

Parameters of Influence on Mode Choice

Cost

The cost of transportation as a factor in work trip mode choice could be of importance to commuting workers in order to minimize their daily and monthly transport expenses (Paez and Whalen 2010; Litman 2015). Cost as a factor only reflected in the choice of respondents in BRT and small bus with 31 percent and 28 percent respectively. However, respondents do not consider cost when choosing water ferry, cabs and bike as a means of transport to work. Theses recorded an insignificant proportion of 1 percent, 0 percent, and 2 percent respectively as depicted in Table 5. In support of this finding, Basso et al. (2011) opined that commuters without an option may not consider the cost of public transportation. The rating for cost as a factor in mode choice showed that 37 percent of the respondents chose cost as very important to them, while 32 percent chose most important and 21 percent chose important. Only 7 percent and 2 percent chose cost as less important and not important factors respectively in their choice of transport to work.

Time

Time as a resource is what most people value as important. This is majorly due to its exhaustive nature of usage. In other words, time is a replenishable resource, so people who place value on it use time with good judgment. However, this was not different in the responses of this study. As depicted in Table 5, time as a factor in mode choice recorded a significant proportion of 44 percent for the small bus, 15 percent for BRT, 12 percent for a personal vehicle and 10 percent for the bike. The rating for time as the most important factor in mode choice by respondents showed that 53 percent chose time as the most important factor to them, while 33 percent of the respondents chose very important, and 11 percent chose important. Only 3

percent and 1 percent chose the time as less important and not important factors respectively in their choice of transport to work. The importance of time in commuting is further buttressed in literature by Li et al. (2010), Islam et al. (2014) and St-Louis et al. (2014), who emphasized that reduced transit time is an important consideration towards ensuring the happiness of commuters in the course of travel.

Driver's Skill

Driver's skill as a factor for commuting workers in Lagos State is most important in relation to commercial vehicles with the largest patronage. As identified in the Table, BRT was 33 percent, the small bus was 26 percent and the big bus was 22 percent of the respondents considered driver's skill before choosing the mode as a mean of transport to work. The rating for driver's skill as a factor in mode choice by respondents showed that 39 percent chose a driver's skill as very important to them, while 29 percent chose important and 20 percent chose most important. Only 8 percent and 4 percent chose driver's skill as less important and not important factors in their choice of transport to work. Hence, it is very imperative to emphasize that driver's skills in determining the choice of transport to work should not be under rated. As a matter of fact, the study conducted by Van-Lierop and El-Ge'sneidy (2016) has shown that the importance of driver's skills is very necessary and should be taking into consideration while making decisions on the choice of transport. Realistically, Van-Lierop and El-Ge'sneidy (2016) also revealed that a good driving skill fosters harmonious relationship between, customer satisfaction, service quality as well as behavioral intentions in public transit.

Safety

Safety in transportation for commuting workers in Lagos translates beyond successful commuting from their places of origin to their places of destination. It is also a measure for the protection of their personal belongings when going to work and coming back home. It is interesting to note that along with cost and time as a factor, safety consideration recorded a response

across the modes, as shown in Table 5. 34 percent of the respondents chose a personal vehicle for safety consideration reason; while 21 percent chose a small bus and 20 percent chose BRT. Only 8 percent chose the staff bus as a safety consideration. The rating for safety as a factor in mode choice by respondents showed that 41 percent chose safety as a most important factor to them, while 34 percent chose very important and 19 percent chose important. Only 4 percent and 2 percent chose safety as less important and not important factors respectively in their choice of transport to work. To back up this study finding, Karou and Hull (2014) revealed that the availability of transport choices, cost, reliability, as well as their travel time greatly hinges on safe public transport. Further, Popuri et al. (2011) and Jain et al. (2014) observed that commuters give highest priority to safety in their travel decisions.

Comfort

The stress of commuting can indeed have an effect on the work efficiency of workers, especially when held in Lagos traffic for an extended time. This implies that some commuters would like to ensure their personal comfort in commuting to work. Therefore, it was not surprising to observe that in Table 5, personal vehicle recorded a significant proportion of 45 percent in comfort consideration, while staff bus and BRT recorded 17 percent each. Cabs and small bus recorded 7 percent each in respondents' comfort consideration. The rating for comfort as a factor in mode choice by respondents showed that 36 percent chose comfort as a very important factor to them, while 28 percent chose important and 24 percent chose most important. Only 8 percent and 4 percent chose comfort as less important and not important factors respectively in their choice of transport to work. This study finding is coherent with Abou-Zeid et al. (2012), who observed in the study that more than one-third of the respondents gave high preference to comfort in the course of commuting. Additionally, Legrain et al. (2015) concluded that comfortable transport modes reduce commuters stress, thereby enhancing a positive correlation between choice of modal transport and commuting stress.

Congestion

In terms of traffic congestion in Lagos, two peak periods are often observed. These are when going to work and when returning from work. These periods coupled with other activities which prompt the movement of people causes a heavy vehicular jam. To avoid traffic congestion, people learned to avoid these peak periods. Therefore, it was observed in Table 6 that 33 percent of the respondents chose a small bus for congestion consideration. This can be because of its ability to maneuver around traffic during congestion periods. 29 percent chose BRT based on congestion consideration. This can also be due to the fact that BRT enjoys right of way on Lagos highways. However, 21 percent of the respondents chose a personal vehicle based on congestion consideration. The rating for congestion as a factor in mode choice by respondents showed that 28 percent chose congestion as a less important factor to them, while 23 percent chose important and 21 percent chose very important. Only 16 percent and 12 percent chose congestion as not important and most important factors respectively in their choice of transport to work. This study finding is consistent with Rowden et al. (2011), Small (2013) and Cervero (2018), who elucidated that congestion is principally a difficulty related with peak periods, as well as spatial proximity of workplaces and residences and accounts as a predominant reason for traffic congestion, as more than two thirds of daily work trips take place solely within suburbs.

Test of Hypothesis

The hypothesis states that the factors, which influence work trip modal choice cost, time, safety, comfort, driver's skill and congestion considerations was tested with a multiple regression to predict the level of influence these factors have in mode choice with mode take off time and waiting time to get mode as the predictors.

H_0 = There is no significant relationship between factors and modal choice.

H_1 = There is a significant relationship between factors and modal choice.

Table 6: Factors considered in mode choice when making work trips

Most important factor	Mode of transport									
	BRT	Water ferry	Bike	Cabs	Small bus	Big bus	Personal vehicle	Staff bus	Coaster bus	Walking
Cost	31%	1%	2%	-	28%	4%	6%	7%	3%	9%
Time	15%	2%	10%	4%	44%	3%	12%	2%	1%	2%
Driver's skill	33%	-	7%	-	26%	22%	4%	4%	4%	-
Safety	20%	1%	4%	3%	21%	1%	34%	8%	2%	1%
Comfort	17%	-	3%	7%	7%	1%	45%	17%	-	1%
Congestion	29%	-	4%	4%	33%	4%	21%	-	-	4%
Total	20%	1%	6%	3%	31%	3%	20%	6%	2%	3%

Source: Fieldwork 2013

The result indicated that the value of R was 0.112, which indicates a very low degree of correlation (Table 7). The value of R^2 and the coefficient of determination indicated 0.013. This implies that the independent variables only explained 1.3 percent of the variability of the dependent variable, which is very small. However, Karlaftis and Vlahogianni (2011) stressed that there is a positive relationship between the variables.

Table 7: Model summary

Model	R	R square	Adjusted R square	Std. Error of the estimate
1	.112 ^a	.013	.010	1.461

a. Predictors: (Constant), Mode Takeoff Time, Waiting Time to get Mode

Table 8: ANOVA^b

Model	Sum of squares	Df	Mean square	F	Sig.
1	Regression	20.343	2	10.171	4.767
	Residual	1593.792	747	2.134	.009 ^a
	Total	1614.135	749		

a. Predictors: (Constant), Mode Takeoff Time, Waiting Time to get Mode

Table 9: Coefficients^a

Model		Unstandardized coefficients		Standardized coefficients		Sig.
		B	Std. error	Beta	t	
1	(Constant)	2.443	.128		19.151	.000
	Waiting time to get mode	.087	.053	.071	1.626	.104
	Mode takeoff time	.073	.058	.056	1.265	.206

a. Dependent Variable: Most Important Factor in Mode Choice

Statistical Significance

The F ratio in the ANOVA Table tests whether the overall regression model is good and fit for the data. This Table indicates that the regression model predicts the outcome variable significantly well. The ANOVA Table shows that the independent variables did not statistically predict the dependent variable, $F(2, 747) = 4.767$, $p > .0005$ (Table 8). Thus, the regression model is not good and not fit for the data. The two independent variable coefficients, which were tested for statistical significance indicated that waiting time to get mode and mode take off time were not significant at 1.04 and 2.06 respectively (Table 9). Therefore, the decision for the hypothesis is that H_0 (which states that there is no significant relationship between factors and modal choice) is accepted and H_1 (which states

that there is a significant relationship between factors and modal choice) is rejected.

CONCLUSION

Several findings have emerged from the study, which may be of great interest to researchers and transport planners. Statistically, these findings revealed that the independent variables did not significantly predict the dependent variable, $F(2, 747) = 4.767, p > .0005$. Therefore, the two independent variable coefficients which were tested for statistical significance indicated that waiting time to get mode and mode take off time were not significant at 1.04 and 2.06 respectively. It was also revealed that only 32 percent of the respondents owned a motorized vehicle, while 68 percent do not own any. Of these 80 percent, 1 percent owned a motorized vehicle, while 19 percent owned between 2- 3 motorized vehicles. Again, it was observed that time consideration with a proportion of 42 percent was what Lagos State residents considered as the most important factor in commuting to their place of work as well as 34 percent of them returning from their place of work. 19 percent of the respondents considered safety, while 18 percent considered the cost of transportation. 14 percent of the respondents considered comfort, while only 4 percent and 3 percent considered the driver's skill and traffic congestion respectively. The least waiting time for residents to get a mode to work was less than 5 minutes with a total of 47 percent. It only takes 5 percent of the respondents more than 20 minutes to get their mode to work. The average take off time for a mode was between 2 and 4 minutes.

It is expected that the findings in this study will ensure further research in the transport mode choice of other trip purposes in Lagos as well as other parts of the country, which will further contribute to the knowledge of modal choice. Also, it is expected that the government and transport policy makers and planners in Lagos would further develop and promote water transport in the state. This would ease traffic congestions and give passengers options away from road transport. However, small buses and BRT were the most efficient transport modes for a work trip in this study; the modes should be harnessed and better coordinated by the authori-

ty, in order to ensure more efficiency in their service delivery.

REFERENCES

- Abou-Zeid M, Witter R, Bierlaire M, Kaufmann V, Ben-Akiva M 2012. Happiness and travel mode switching: findings from a Swiss public transportation experiment. *Transport Policy*, 19(1): 93-104.
- Ackaah W 2016. *Empirical Analysis of Real-time Traffic Information for Navigation and the Variable Speed Limit System*. PhD Thesis, Unpublished. München: Universitätsbibliothek der Universität der Bundeswehr München.
- Aderamo AJ 2010. Transport in Nigeria: The case of Kwara state. *African Economic and Business Review*, 8(1): 19-40.
- Adetunji MA, Aloba O 2013. Urban spatial structure and work trip patterns in South-western Nigeria: The example of Ilesa. *Journal of Geography and Regional Planning*, 6(4): 93-102.
- Adeyinka AM 2013. Assessment of the quality of urban transport services in Nigeria. *Academic Journal of Interdisciplinary Studies*, 2(1): 49.
- Agu AG, Ikenna MH, Ben UD 2017. Determinants of passenger preference for long distance shuttle services in Nigeria. *IJBFRM*, 5: 42-51.
- Agunloye OO, Ilechukwu VU 2011. Travels pattern and socio-economic characteristics of rail transport passengers in Lagos Metropolis, Nigeria. *International Journal of Economic Development Research and Investment*, 2(1): 115-126.
- Akpoghomeh OS 2012. The Terror of Transport and the Transportation of Terror. From <https://www.uniport.edu.ng/files/Inaugural%20Lectures/94th%20Inaugural%20Lecture_2012%20by%20Prof%20Akpoghomeh.pdf> (Retrieved on June, 2019).
- Atobi AO 2013. An evaluation of transport infrastructure in Lagos State, Nigeria. *Journal of Geography and Earth Sciences*, 1(1): 9-18.
- Basorun JO, Rotowa OO 2012. Regional assessment of public transport operations in Nigerian cities: The case of Lagos Island. *International Journal of Developing Societies*, 1(2): 82-87.
- Basso LJ, Guevara CA, Gschwendner A, Fuster M 2011. Congestion pricing, transit subsidies and dedicated bus lanes: Efficient and practical solutions to congestion. *Transport Policy*, 18(5): 676-684.
- Beuran M, Gachassin M, Raballand G 2015. Are there myths on road impact and transport in sub Saharan Africa? *Development Policy Review*, 33(5): 673-700.
- Bocarejo SJP, Oviedo HDR 2012. Transport accessibility and social inequities: A tool for identification of mobility needs and evaluation of transport investments. *Journal of Transport Geography*, 24: 142-154.
- Bovy PH, Stern E 2012. *Route Choice: Wayfinding in Transport Networks*. USA: Springer.
- Cervero R 2013. Linking urban transport and land use in developing countries. *Journal of Transport and Land Use*, 6(1): 7-24.

- Cervero R 2018. *America's Suburban Centers: The Land Use-transportation Link*. USA: Routledge.
- de Dios Ortuzar J, Willumsen LG 2011. *Modelling Transport*. John Wiley & Sons.
- De Witte A, Hollevoet J, Dobruszkes F, Hubert M, Macharis C 2013. Linking modal choice to motility: A comprehensive review. *Transportation Research Part A: Policy and Practice*, 49: 329-341.
- Effiom L, Ubi P 2016. Deficit, decay and deprioritization of transport infrastructure in Nigeria: Policy options for sustainability. *International Journal of Economics and Finance*, 8(3): 55-68.
- Elias P, Omojola A 2015. Case study: The challenges of climate change for Lagos, Nigeria. *Current Opinion in Environmental Sustainability*, 13: 74-78.
- Fagnant DJ, Kockelman K 2015. Preparing a nation for autonomous vehicles: Opportunities, barriers and policy recommendations. *Transportation Research Part A: Policy and Practice*, 77: 167-181.
- Femi A 2013. Road crashes trends and safety management in Nigeria. *Journal of Geography and Regional Planning*, 6(3): 53-62.
- Fezzi C, Bateman IJ, Ferrini S 2014. Using revealed preferences to estimate the value of travel time to recreation sites. *Journal of Environmental Economics and Management*, 67(1): 58-70.
- Guerrero-Ibanez JA, Zeadally S, Contreras-Castillo J 2015. Integration challenges of intelligent transportation systems with connected vehicle, cloud computing, and internet of things technologies. *IEEE Wireless Communications*, 22(6): 122-128.
- Hjorthol R 2013. Attitudes, Ownership and Use of Electric Vehicles—A Review of Literature. From <<https://www.toi.no/getfile.php/1332442/Publikasjoner/T%C3%98I%20rapporter/2013/1261-2013/1261-hele%20rapporten%20nett.pdf>> (Retrieved on 5 June 2017).
- Islam R, Chowdhury MS, Sarker MS, Ahmed S 2014. Measuring customer's satisfaction on bus transportation. *American Journal of Economics and Business Administration*, 6(1): 34-41. doi:10.3844/aje-basp.2014.34.41
- Jain S, Aggarwal P, Kumar P, Singhal S, Sharma P 2014. Identifying public preferences using multi-criteria decision making for assessing the shift of urban commuters from private to public transport: A case study of Delhi. *Transportation Research Part F: Traffic Psychology and Behaviour*, 24: 60-70.
- Karlaftis MG, Vlahogianni EI 2011. Statistical methods versus neural networks in transportation research: Differences, similarities and some insights. *Transportation Research Part C: Emerging Technologies*, 19(3): 387-399.
- Karou S, Hull A 2014. Accessibility modelling: Predicting the impact of planned transport infrastructure on accessibility patterns in Edinburgh, UK. *Journal of Transport Geography*, 35: 1-11.
- Keuchel S, Richter C 2011. Applying integrated hierarchical information integration to mode choice modelling in public transport. *Procedia-Social and Behavioral Sciences*, 20: 875-884.
- Legrain A, Eluru N, El-Geneidy AM 2015. Am stressed, must travel: The relationship between mode choice and commuting stress. *Transportation Research Part F: Traffic Psychology and Behaviour*, 34: 141-151.
- Li Z, Hensher DA, Rose JM 2010. Willingness to pay for travel time reliability in passenger transport: A review and some new empirical evidence. *Transportation Research Part E: Logistics and Transportation Review*, 46(3): 384-403.
- Litman T 2015. *Evaluating Public Transit Benefits and Costs*. Victoria, BC, Canada: Victoria Transport Policy Institute.
- Nchuchuwe FF, Adejuwon KD 2012. The challenges of agriculture and rural development in Africa: The case of Nigeria. *International Journal of Academic Research in Progressive Education and Development*, 1(3): 45-61.
- Nkegbe PK, Kuunibe N, Abdul-Mumin Y 2012. Choice of transport mode by non-resident university students in Ghana. *International Journal of Business and Social Science*, 3(20): 136-142.
- Ojo TK 2019. Quality of public transport service: An integrative review and research agenda. *Transportation Letters*, 11(2): 104-116.
- Olawole MO, Aloba O 2014. Mobility characteristics of the elderly and their associated level of satisfaction with transport services in Osogbo, Southwestern Nigeria. *Transport Policy*, 35: 105-116.
- Opoko PA, Oluwatayo AA 2014. Trends in urbanisation: Implication for planning and low-income housing delivery in Lagos, Nigeria. *Architecture Research*, 4(1A): 15-26.
- Owolabi AO 2009. Paratransit Modal Choice in Akure, Nigeria—Applications of Behavioral Models. *Institute of Transportation Engineers (ITE) Journal*, 79(1): 54-58.
- Páez A, Whalen K 2010. Enjoyment of commute: A comparison of different transportation modes. *Transportation Research Part A: Policy and Practice*, 44(7): 537-549.
- Paulssen M, Temme D, Vij A, Walker, JL 2014. Values, attitudes and travel behavior: A hierarchical latent variable mixed logit model of travel mode choice. *Transportation*, 41(4): 873-888.
- Popuri Y, Prousaloglou K, Ayvalik C, Koppelman F, Lee A 2011. Importance of traveler attitudes in the choice of public transportation to work: Findings from the Regional Transportation Authority Attitudinal Survey. *Transportation*, 38(4): 643-661.
- Richter C, Keuchel S 2012. Modelling mode choice in passenger transport with integrated hierarchical information integration. *Journal of Choice Modelling*, 5(1): 1-21.
- Rowden P, Matthews G, Watson B, Biggs H 2011. The relative impact of work-related stress, life stress and driving environment stress on driving outcomes. *Accident Analysis & Prevention*, 43(4): 1332-1340.
- Saeed N 2013. Cooperation among freight forwarders: Mode choice and intermodal freight transport. *Research in Transportation Economics*, 42(1): 77-86.
- Salonen M, Toivonen T 2013. Modelling travel time in urban networks: Comparable measures for private car and public transport. *Journal of Transport Geography*, 31: 143-153.

- Sangowawa AO, Alagh BT, Ekanem SE, Ebong IP, Fase-ru B, Adekunle, BJ, Uchendu OC 2010. An observational study of seatbelt use among vehicle occupants in Nigeria. *Injury Prevention*, 16(2): 85-89.
- Small K 2013. *Urban Transportation Economics*. UK: Taylor & Francis.
- St-Louis E, Manaugh K, van Lierop D, El-Geneidy A 2014. The happy commuter: A comparison of commuter satisfaction across modes. *Transportation Research Part F: Traffic Psychology and Behaviour*, 26: 160-170.
- Suzuki H, Cervero R, Iuchi K 2013. *Transforming Cities with Transit: Transit and Land-Use Integration for Sustainable Urban Development*. UK: The World Bank.
- Tavasszy LA, Ruijgrok K, Davydenko I 2012. Incorporating logistics in freight transport demand models: State-of-the-art and research opportunities. *Transport Reviews*, 32(2): 203-219.
- Tyrinopoulos Y, Antoniou C 2013. Factors affecting modal choice in urban mobility. *European Transport Research Review*, 5(1): 27.
- Urry J 2016. *Mobilities: New Perspectives on Transport and Society*. USA: Routledge.
- Van-Lierop D, El-Geneidy A 2016. Enjoying loyalty: The relationship between service quality, customer satisfaction, and behavioral intentions in public transit. *Research in Transportation Economics*, 59: 50-59.

Paper received for publication in February, 2019
Paper accepted for publication in March, 2019