

Article citation info: Odufuwa, B. O. – Salisu, U. O., – Fasina, S. O., Determinants of household vehicle acquisition and use in a south-western city of Nigeria. *Transport & Logistics: the International Journal*, 2017; Volume 17, Issue 42, April 2017, ISSN 2406-1069

## DETERMINANTS OF HOUSEHOLD VEHICLE ACQUISITION AND USE IN A SOUTH-WESTERN CITY OF NIGERIA

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### **Abstract:**

Transportation is a significance source of greenhouse gases (GHG). Nevertheless, its impacts on environment and human health has increasingly attracted attentions in both developed and developing countries. However, studies on transportation and climate change have neglected determinants of household vehicle acquisition and use. In this study, these factors were examined with the view to encourage the use of public transport in Lagos, Nigeria. Stratified and purposive sampling technique were used to administer 784 questionnaire to households in 15 residential districts (high, medium and low density). Also, within the residential districts, informal interviews were conducted in selected mechanical workshops. Forty-nine variables from data collected were analysed using correlation and multiple regression. Nine variables (income ICM, household-size HSZ, cost of vehicle CSTVC, cost of trips CTRP, cost of maintenance CSMAT, distance to destination DTDS, cost of fuelling CTFLG, years of driving experience YRDRV and frequency of trips FRTRP) were statistically significant ( $P < 0.05$ ). 63.5% of variation in the determinants of acquisition and use of household private vehicles is accounted for by 16 explanatory variables. Household income contributed the highest (12.1%), followed by Household size (7.1%). Cost of registration of Vehicle (CREGV) has the lowest contribution of 0.2% to the coefficient of explanation. ICM, HSZ, DPTS, AGV, TMTV, CTRP, DTDS, YRDRV and FRTRP have positive coefficients while CSTVC, CREGV, CSMAT, RESDN, CTSPRT, and CTFLG have negative coefficients. Thus, the propensity to acquire and use private vehicles by different household's increases with increase in income, distance travel, household-size, cost of trip, and frequency of trips.

### **Keywords:**

*Household Vehicles, Utility Maximization, Travel Behaviour, Public Road Transport, Climate Change, Greenhouse Gas Emission.*

## **INTRODUCTION**

Transport sector is widely recognized as highest generator of greenhouse gas emissions (GHG) [15, 25]. It contributes about one-fifth of global greenhouse gas emissions causing climate change [26]. It is imperative to note that industrialized countries accounts for close to 30% of global GHG emissions. Indeed, United States takes the leads amongst all other countries of the World in terms of transport-related GHG emissions [26]. Surveys in developing countries, like China, India and Nigeria established that the astonishing rate of motorisation is responsible for increasing GHG emissions. Though, urbanization and economic development are linked to changes in consumption patterns, which in turn determine household mobility or transportation needs [15]. Despite observed impacts of transport sector on human health and environment, it has often being acknowledged that immobility is one of the factors hindering economic progress of individuals and nations as a whole [24]. This fact have been emphasised by renowned transport expert that “immobility perpetuate poverty” [22]. This implies that, transportation has resultant effects on almost every human being in the course of daily activities. Thus, it is rare to conceive a situation over space where transportation does not play tangible role in the life of any individual or society at large. Similar to this view, is the assertion of [2, 4, 24], that “the issue of transport is a derived effect of the fulfilling of all sorts of needs, varying from economic needs to social needs”. This further justified the fact that, transportation is a “derived demand” and therefore, there is no escape from it.

Despite major shift to the use of public transport in most developed countries, many households in developing countries rely on personal vehicles for different trips, particularly in urban areas [8, 10, 15, and 24]. It should be noted that, car travel is related to climate change, dependence on fossil fuels, and traffic congestion. [4] reported that reducing trips made by car might help combat oil dependence, global warming, and environmental pollution. [21] reports that the emergent of paratransit transport service in most Nigerian cities, especially commercial motorcycles- popularly known as “okada” can be attributed to prevailing economic situation. [8, 12, 20] reiterate that increasing levels of private car ownership in is a sign of affluence, but there are also many negative consequences including increased traffic congestion, road accidents and environmental costs.

It is pertinent to note that in most developing countries, including Nigeria, issues relating to household automobile dependency and public transport services is important policy issues. Though, in recent time governments are interested in reducing emission of greenhouse gas; based on its impact on human and environmental health. Sequel to this, the Kyoto Protocol among other agreements encourages studies that can help to ameliorate greenhouse gas emissions [3, 9, 27]. Efforts at encouraging reduced greenhouse gas emissions, particularly from transport sector are advocated in many countries [3, 10, 11, 15]. To achieve this, study that analyse factors influencing household acquisition, dependency and use of private automobiles will be a pointer to right directions or steps to be taken towards reducing greenhouse gas emission from transport sector. This was based on the fact pronounced dependency on and use of private automobiles has raised concerns, as witnessed in increasing motorization, congestion, accidents and greenhouse gas emission. This study will therefore serve as basis for formulating sustainable transport agenda.

The policy question being addressed by this study is “What are the interventions necessary to ameliorate increasing household automobile acquisition, dependency and use in Nigeria? This paper therefore, investigate factors influencing household’s automobile dependency and use, and identify factors that will facilitate improve use of public transport. Findings from this paper will provide information on policy measures that will enhance use of public transportation and foster effective neighbourhood planning.

## **1 UTILITY MAXIMIZATION THEORY AND TRAVEL BEHAVIOUR: A CONCEPTUAL CONSIDERATION**

Spatial interaction is an inevitable human activity; this stem on the fact that movement in any society is an avenue of developing individual and nation as a whole [11, 15, 24]. Meanwhile, concerns over acquisition and use of private vehicles, particularly the impact of carbon-monoxide emissions on human and environmental health have stimulated different areas of research [9, 20]. Though, provision of road network and parking facilities have being notable strategies adopted by most government in developing countries to ameliorate rising demand for transport [17, 21]. However, [21] noted that these measures are temporary; and can rarely solve transport externalities (pollution, congestion, accidents etc). Therefore, understanding households travel behaviour, specifically acquisition and use of private automobiles is of interest to this paper. Within this context, the utility maximization theory of the micro-economics was adopted to showcase household responses as well as understanding the interrelations of different factors that can be used to explain acquisition and use of private automobiles in the society.

Utility maximization or rational choice theory (RCT) has its root in microeconomic, and proposed that consumers seek to maximise utility by calculating costs and benefits of available alternatives [1, 18]. [1] noted that in RCT, individuals are assumed to have comprehensive knowledge of alternatives and their attributes, and are capable of ranking them according to their satisfactions and dissatisfaction. Relating utility theory to travel behaviour and automobile acquisition, it could be deduced that households make choices based on satisfaction derived from the means or mode of travel. [14] emphasised that utility theory is based on the premise of rational choice. Rational choice asserts that a decision-maker is able to rank possible alternatives in order of personal preference and will choose that alternative that ranked highest, subject to relevant constraints placed on the choice decision. For instance, decision to travel by public transport is a factor of different attributes or variables. However, utility is define as the satisfaction derived by a consumer through the use of goods and services. Rational choice can be translated into utility terms: a traveller chooses alternative which maximizes his or her utility, subject to relevant constraints. Meanwhile, the utility function can either be actual amounts of goods and services which comprise; choice alternatives, characteristics or attributes of goods and services in varying proportions [14].

Applications of utility theory to travel behaviour have been reported in the context of mode choice [18], spatial interactions, which encompass trip generation and distribution, car ownership [14]. Decision to acquire private vehicles is assumed to involve allocation of value or expenditure on different groups of needs e.g food items, housing, and leisure. This process is assumed to be necessary based on budget constraint and need to derive maximum satisfaction from chosen option. Meanwhile, it should be noted that changes in prices of certain commodities may have resultant effect on other household needs. Thus decision is not perfect, but involves taken of risks. According to [14] commodity groups relevant to modelling travel decisions can be written thus:

$$u = u(x, c, t) \tag{1}$$

Where:  $u$  is household utility,  $x$  is the amount or quantity of travel,  $c$  is consumption of non-travel goods and services and  $t$  is leisure time [14].

Sequel to this, household automobile acquisition is a function of different variables; among which are income, distance travel, travel time, purpose of trip, attributes of public transport etc. This can be represented thus:

$$VC = (i, d, t, p, a, \dots, n) \tag{2}$$

Utility function involves tagging consumer preferences; and this cannot be measured in absolute quantities, because the unit of measurement depends on the utility function chosen. The only important fact is determining whether the utility of one bundle outweighs

another, decision maker selects alternative with the highest utility [19]. To specify the utility function, different variables can be included, this include: alternative specific constants, vehicle attributes and socioeconomic characteristics among others [19]. [1] emphasised that utility is a linear function that includes attributes of modes of transport and travellers. This includes travel time, cost, and frequency, as well as decision-maker factors (e.g. income, auto ownership, age, and land use). It was noted that travel decision-making factors are based on population density, employment status and mixed land use. According to [1] the utility function form is:

$$U_{ij} \equiv V_{ij} + \epsilon_{ij} \quad (3)$$

Where  $U_{ij}$  is the utility of individual  $j$  for alternative  $i$ ,  $V_{ij}$  is the deterministic part of the utility of the alternative  $i$  for individual  $j$  and  $\epsilon_{ij}$  is the random component of the utility of the alternative  $i$  for individual  $j$ . Indeed, effective public transport system in cities can enormously discourage the use of private automobiles and simultaneously reduce emission of carbon-monoxide [21]. However, the utility theory suggest the integration or consideration of different attributes or factors for the overall decision on the need for acquisition and use of private automobile and available alternatives.

## 2 METHODOLOGY

Reviewed literature and reconnaissance survey shows that Lagos metropolis consists of high, medium and low density residential neighbourhoods. The study is a cross-sectional survey, stratified and purposive sampling technique was used to administer 483 questionnaire to households in high, medium and low residential districts in Lagos, a South Western state of Nigeria. Purposive sampling technique was used to choose the target respondents, i.e. households that own and use private automobile. The questionnaire was divided into three parts. Part one probed into the socio-economic background of respondent, such as age, educational, income, household size and marital status. The second part consists of variables on travel characteristics (purpose of trip, time of travel, cost of trip, distance, number of vehicles, driving status, frequency of trips etc). The final part was based on attributes of vehicles, neighbourhood characteristics and government policy. In the study, 49 variables were investigated, definitions of explanatory variables used were stated in Table 1, and justifications for selected variables were provided. Correlation and Multiple regression was used to analyse data collected. Reliability of research instrument was conducted using test-retest method and this gave a reliability coefficient of  $(r) = 0.82$ .

In this study, the dependent variable is acquisition and use of private. According to [4, 12, 15, 20, 24] explanatory variables for travel behaviour can be categorized as: (i) socio-economic and demographic characteristics, (ii) spatial development patterns, (iii) policies (iv) national cultures and (v) individual preferences. Based on this, acquisition and use of private automobile was identified as dependent variable; while 49 explanatory/predictor variables explained household's acquisition and use of private automobiles. For this study, explanatory variables were categorised into five: (i) Socio-economic (ii) Neighbourhood characteristics (iii) Attributes of vehicle (iv) Government policies (v) Household travel pattern. The effects of each factor on acquisition and use of private automobile was obtained through the percentage contributions ( $R^2$ ) of each variable. To justify adoption of appropriate data collection (triangulation of data), informal interview were conducted in selected mechanical workshops to elicit information related to acquisition, use and maintenance of private vehicles.

Income (ICM) is a notable variable of interest, based on the fact that increasing incomes make owning and maintaining private automobile feasible. Income and household automobile acquisition and use can be good predictors for household travel behaviour. For

instance, household's income determines the choice of household vehicle to be acquired (cost of vehicle (CSTVC) is related to income). This hypothesis is worth investigating because it is a determinant of household's expenditures. For empirical analysis, RESDN, DPTS and DTDS variables are design related, which necessarily influence mobility. [2, 7, 15, 24] noted that urban form and landuse influence time cost and convenience of different modes of transport. Meanwhile, low density and spread-out developments make walking and cycling unattractive due to long distances between trip origins and destinations [6, 10, 15, 20, 23]. Also, higher densities with a mix of land-uses provide for shorter trip distances and offer more opportunities for walking and cycling [8, 10, 16]. Effective land-use planning (compact settlements) in some developed countries like the Netherlands, Germany encourages short trips and increase use of public transport, cycling and walking [5, 24].

CREGV, CTSPT, AGV, CSMAT, CTFLG and CTRP are cost related variables that influence decision to own and use private automobile. For instance, inclusion of CTFLG and CSMAT in this study is justified as follows; most households allocate cost to different needs (food, housing, education etc), it is assumed that the cost of fuelling and maintaining household vehicles may resultantly affect other important household needs. HSZ, CRCPT and TMTV are also inevitable variables in this study. The household size is related to carrying capacity (space factor) of vehicles and purpose of trip. Culture and attitudes are often mentioned as explanatory variables for differences in travel behavior. Cultural differences might also be related to different lifestyles [10, 15, 13].

**Table 1** Definition of Explanatory or Independent Variables

S/N	Household Socio-economic Variables	Variables Label	S/N	Government Policies	Variables Label
1.	Age	AG	29.	Safety	SFTY
2.	Income	ICM	30.	Import duty	IPDTY
3.	Household size	HSZ	31.	Cost of Vehicle	CSTVC
4.	Ownership of dwelling/Apartment	OWD	32.	Cost of registration of Vehicle	CREGV
5.	Gender	GND	33.	Security	SCRTY
6.	Employment Status	EPS	34.	Cost of Insurance	CTINSR
7.	Education	EDU	35.	Type of Insurance	TPINSR
8.	Marital Status	MTS		<b>Household Travel Characteristics</b>	
	<b>Neighbourhood and Residential Characteristics</b>		36.	Trip Purpose	TRPS
9.	Residential Density/ Form	RESDN	37.	Culture/Attitudes Towards Cars	CLTCR
10.	Distance to public Transport bus stop	DPTS	38.	Time of Travel	TMTV
11.	Type of Dwelling	TDW	39.	Cost of Trip	CTRP
12.	Nature of the Environment	NTEVT	40.	Cost of Maintenance/ Repair	CSMAT
13.	Spaciousness of Dwelling	SDLG	41.	Distance to Destination	DTDS
14.	Condition/Characteristics of Road	CHRD	42.	Frequency of Trips	FRTRP
15.	Parking	PKG	43.	Attitude towards Public Transport	ATPBT
16.	Availability of Public Transport	AVPT	44.	Driving Experience	DVEPS
	<b>Vehicles Attributes</b>		45.	Drivers Licence	DRVLC
17.	Availability of Spare Parts	AVSPT	46.	Access/Use of Mobile Phones	ACMPH
18.	Fuel efficiency/consumption	FEFCY	47.	Previous experience with vehicle	PEVVHL
19.	Car Weight	CRW	48.	Cost of fuelling	CTFLG
20.	Make of Vehicles	MKV	49.	Years of driving experience	YRDRV
21.	Model of Vehicles	MDV			
22.	Type of Engine (Cross/Straight)	TYEG			
23.	Space Factor (Carrying Capacity)	CRCPT			
24.	Age of Vehicle (Year of Make)	AGV			
25.	Cost of Spare Parts	CTSPRT			
26.	Brand of Vehicle (New/Used)	BDVHC			
27.	Design of vehicle (aesthetic)	DSNVC			
28.	Technical Personnel (know how)	TECPN			

\*Dependent Variable= Acquisition and use of private vehicles.

(Source: Author's fieldwork, 2016)

Explanatory variables identified above might have different influence on acquisition and use of private automobiles. The influence of these factors was investigated through bi-variate analysis. Regression analysis was estimated to determine the joint contribution of selected explanatory factors. Most variables had to be transformed for the analysis. Variables selected for this analysis was based on reviewed literature. The multiple regression analysis sheds light on the impact of different factors on use of private automobiles. The method adopted for this study builds on existing literature, and identifies socio-economic and demographic factors, spatial development patterns, government policies, mechanical and electrical attributes of vehicles, culture and attitudes as groups of explanatory variables for acquisition and use of private automobile. The study follows the assumption that individuals choose to acquire private vehicle and use mode of transport that maximizes utility or satisfaction and minimizes disutility or dissatisfaction of travel. In other words, an individual would choose private automobile/vehicle if satisfaction or utility derived is larger than the satisfaction or utility of a walk, bike, or public transport trip.

### **3 FINDINGS AND DISCUSSIONS**

In this study, 16 main explanatory /predictor variables were found to explain household acquisition and use of private automobiles (dependent variable). These factors cut across socio-economic, residential, vehicles, government policies and household travel characteristics. Table 2 presents the matrix of intercorrelation among variables used for the analysis. The matrix indicates that the regression results are unaffected by multicollinearity as just only one pair-wise correlation is in excess of 0.83 among the explanatory variables (between ICM and FRTRP). Also the regression coefficients give a better indication of absence of multicollinearity. Findings presented in the matrix table reveal the true independence of the explanatory variables used in the multiple regression analysis, in that the pair-wise correlation coefficients are indeed low.

The effects of each of the variables on acquisition and use of private automobiles were obtained from inspection of each of their percentage contributions ( $R^2$ ) (See Table 3). Selected and justified explanatory variables determining household acquisition and use of private automobiles was analysed by regression of variables against ownership of private vehicles. Nine of the variables are statistically significant ( $P < 0.05$ ). These are income, household size, cost of vehicle, cost of trips, cost of maintenance, distance to destination, cost of fuelling and frequency of trips. The results of multiple regression presented in Table 3 are fairly satisfactory in that 63.5% (Adjusted  $R^2$ ) of the variation in the determinants of acquisition and use household private vehicles is accounted for by listed explanatory variables. Estimated parameters reveal that household income (ICM) is an important factor determining acquisition and use of private vehicles haven contributed the highest (12.1%), followed by HSZ (7.1%). CREGV has the lowest contribution of 0.2% to the coefficient of explanation.

**Table 2** Correlations matrix of determinants of household automobile acquisition and use variables

	Y	ICM X1	HSZ X2	RESDN X3	DPTS X4	CRCPT X5	AGV X6	CTSPRT X7	CSTVC X8	CREGV X9	TMTV X10	CTRP X11	FRTRP X12	CSMAT X13	DTDS X14	CTFLG X15	YRDRV X16
<b>Y</b>	1.00																
ICM	0.720	1.00															
HSZ	0.615	0.674	1.00														
RESDN	0.405	0.596	0.511	1.00													
DPTS	0.612	0.481	0.372	0.643	1.00												
CRCPT	0.524	0.536	0.463	0.524	0.416	1.00											
AGV	0.345	0.376	0.206	0.507	0.318	0.321	1.00										
CTSPRT	0.521	0.265	0.384	0.215	0.412	0.596	0.584	1.00									
CSTVC	0.542	0.670	0.523	0.643	0.507	0.317	0.432	0.437	1.00								
CREGV	0.517	0.563	0.531	0.381	0.510	0.443	0.537	0.520	0.416	1.00							
TMTV	0.635	0.450	0.305	0.418	0.426	0.314	0.342	0.216	0.538	0.562	1.00						
CTRP	0.434	0.501	0.517	0.445	0.369	0.613	0.416	0.378	0.514	0.674	0.653	1.00					
FRTRP	0.571	0.631	0.473	0.461	0.487	0.521	0.538	0.481	0.452	0.371	0.571	0.217	1.00				
CSMAT	0.610	0.612	0.246	0.421	0.332	0.415	0.524	0.521	0.426	0.543	0.232	0.429	0.316	1.00			
DTDS	0.512	0.576	0.469	0.316	0.526	0.527	0.513	0.461	0.523	0.501	0.531	0.256	0.336	0.448	1.00		
CTFLG	0.415	0.217	0.364	0.250	0.448	0.650	0.456	0.506	0.558	0.493	0.318	0.431	0.310	0.521	0.475	1.00	
YRDRV	0.581	0.524	0.481	0.384	0.625	0.620	0.427	0.532	0.547	0.471	0.462	0.341	0.427	0.549	0.558	0.492	1.00



It should be noted that ICM, HSZ, DPTS, AGV, TMTV, CTRP, DTDS, YRDRV and FRTRP have positive coefficients while RESDN, CTSPRT, CSTVC, CREGV, CSMAT and CTFLG have negative coefficients. This indicates that propensity to acquire and use private vehicles by different household's increases with increase in income, distance travel, household size, cost of trip, frequency of trips and years of driving experience. This result appears interesting as low income affects daily movement (spatial interactions), invariably high income level will resultantly influence use of private vehicles.

Based on this finding, it is pertinent to note that households are likely to acquire and use private vehicles when a positive (increase) change in income, frequency of trips, travel distance and household size. The regression table however reveals that all the nine variables are statistically related to acquisition and use of private vehicles, and they are statistically significant at 0.001. This finding is in variance with previous studies, particularly those conducted in developed countries; where acquisition and use of private vehicles goes beyond income level, but attributes of public transport services and neighbourhood design and characteristics are notable factors [4, 10, 17, 19, 24]. Based on the above analysis it could be deduced that socio-economic characteristics of households cannot be the only determining factors for acquisition and use of private automobiles. In other words, other factors (environmental, vehicle characteristics, and government policies) also predisposed acquisition and use of private vehicles in the study area. Thus, provision of effective public transport service and enhanced neighbourhood design and planning is partly a requisite for limiting increasing acquisition and use of private vehicles for different daily movement or spatial interactions.

**Table 3 Results of Regression Analysis**

Variable Code	R	R <sup>2</sup>	Unstandardize coefficient (beta)	Standardize coefficient (beta)	Co-efficient of Determination	't'	Sig.
Constant	-	-	4.783	-	-	3.672	0.000
ICM	0.348	0.121	0.351	0.316	12.1	8.193	0.003
HSZ	0.266	0.071	0.620	0.451	2.4	4.961	0.001
RESDN	0.214	0.046	0.750	0.575	5.3	2.715	0.002
DPTS	0.110	0.012	1.112	0.312	1.2	2.410	0.004
CRCPT	0.155	0.024	0.180	0.571	7.1	5.383	0.007
AGV	0.152	0.023	-0.231	-0.241	2.3	1.751	0.011
CTSPRT	0.145	0.021	0.341	0.651	2.1	-2.534	0.035
CSTVC	0.318	0.101	0.115	0.362	10.1	5.895	0.002
CREGV	0.045	0.002	0.170	0.710	0.2	2.631	0.001
TMTV	0.130	0.017	1.713	0.615	1.7	1.075	0.003
CTRP	0.114	0.013	1.130	0.421	1.3	3.412	0.004
FRTRP	0.205	0.042	0.812	0.537	4.2	4.385	0.005
CSMAT	0.207	0.043	0.150	0.236	4.3	3.651	0.001
DTDS	0.230	0.053	3.142	0.512	5.3	6.531	0.001
CTFLG	0.179	0.032	1.812	0.612	3.2	1.295	0.004
YRDRV	0.118	0.014	0.216	0.721	1.4	0.751	0.005
					<b>63.5%</b>		

Source: Fieldwork, 2016

To corroborate findings from empirical analysis, respondents (mechanical personnel) interviewed explained that:

*“Some customers abandoned their vehicles in the workshop because they cannot afford the cost of spare-parts or engines to repair them”*

It was made known through interview and observations that most vehicles in mechanical workshops were abandoned due to inability of most customers to afford the cost of engines

and electrical problems (See fig. 1 and 2). Mechanical personnel claimed that consultations before acquisition of vehicles is an important factor. In other words, respondents (Mechanical personnel) emphasised that:

*“Very few customers/owners do inform or discuss with us before buying their vehicles. Some of them have made-up their mind the make and model of vehicles they want”*



**Fig.1** Abandoned Vehicle due to Spare Parts issues  
Source: Author's Field Survey, 2016.

#### 4 CONCLUSIONS

Despite major shift to the use of public transport in most developed countries, many households in developing countries rely on private vehicles for different trips, particularly in urban areas. Meanwhile, high level of motorization or car travel is related to climate change, particularly emission of greenhouse gases, congestion and increase accidents rate. Towards encouraging the use of public transport in most developing cities, this study examined different determinants and use of private household vehicles and neglects of public transportation in Nigerian fast growing city- Lagos. The utility maximization theory was used as the theoretical framework for the study. It was noted that, individuals are assumed to have comprehensive knowledge of alternatives and their attributes, and are capable of ranking them according to their satisfactions and dissatisfaction. In other words, households make choices based on satisfaction derived from the means or mode of travel. In this study, sixteen explanatory/predictor variables were found to explain household acquisition and use of private automobiles (dependent variable). These factors cut across socio-economic, residential, vehicles, government policies and household travel characteristics. Nine of the variables are statistically significant ( $P < 0.05$ ). These are income, household size, cost of vehicle, cost of trips, cost of maintenance, distance to destination, cost of fuelling and frequency of trips. Estimated parameters using the multiple regression analysis reveal that household income (ICM) is an important factor determining acquisition and use of private vehicles haven contributed the highest (12.1%). It can be deduced from findings of this study that households are likely to and not to acquire and use private vehicles when there is change in income, frequency of trips, travel distance and household size. For instance, positive increase in income may propel households to acquire and use public transport. Meanwhile, findings from this study is in variance with previous studies, particularly those conducted in developed countries; where acquisition and use of private vehicles goes beyond income level, but attributes of public transport services and neighbourhood design and characteristics. Based on this fact, there is need to examine public transport and neighbourhood attributes as determinants to the use of public transport in developing countries like Nigeria. This implies

that socio-economic characteristics of households cannot be the only determining factors for acquisition and use of private automobiles. Similarly, the wish to acquire and use of private automobiles is connected or related to attributes of vehicles. There is need for further study on attributes of vehicles as determinants for acquisition and use of private vehicles. Considering high emission of greenhouse gas/ carbon monoxide, particularly from transportation, increasing congestion and accidents in the city, intervention to reduce dependency and use of private vehicles is urgently required. This study therefore suggests the need for urgent and deliberate policy intervention that will propel the shift from dependency on and use of household private vehicles to other sustainable modes of travel, particularly public transport and hence reducing greenhouse gas emissions and other transport externalities. This study calls for policy interventions that will encourage use of public transport for different trips or spatial interactions. Sequel to this, two complimentary approaches were recommended to ameliorate discharge of carbon monoxide from transport: supply and management of public transport service and encouraging adoption of best practices of neighbourhood planning and designs that will discourage dependency on private vehicles.

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