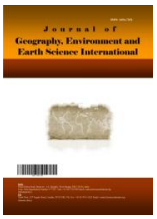

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Urban Transport Infrastructure and Population Dynamics in Sub-Saharan Africa: Evidence from Bamenda City, Cameroon

Chianebeng Japhet Kuma[1*], Gideon Samba[2] and Jude Ndzifon Kimengsi[2]

[1]Department of Geography and Planning, The University of Bamenda, Cameroon.
[2]Department of Geography, The University of Bamenda, HTTC, Bambili-Bamenda P.O.Box 39, Bambili, Bamenda, Cameroon.

Authors' contributions

This work was carried out in collaboration among all authors. Author CJK designed the study, performed the statistical analysis, wrote the protocol and wrote the first draft of the manuscript. Authors GS and JNK managed the analyses of the study and the literature searches. All authors read and approved the final manuscript.

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ABSTRACT

Transportation infrastructure has become one of the key development factors in urban centers of sub-Saharan Africa. However, a nuanced understanding of the links between the state of urban transport structures and the mutations in urban populations exist. We contribute to clarify this nuance, by using a case study of Bamenda – a primate city *par excellence*. Bamenda provides an interesting case study because of its centrality and it rapidly growing population. Using a semi-structured interview guide, we randomly surveyed 400 household heads within the urban hub of Bamenda. This data was complemented with key informant and expert interviews to target stakeholders. Multiple Linear Regression analysis (at 0.05 levels of significance) led us to the following conclusions: location choice was influenced by a combination of transport structures, commercialization, land affordability, labour and educational factors, and where transportation factors are prioritized over other factors in location selection and spatial population concentration in

**Corresponding author: E-mail: chianebeng@yahoo.com;*

Bamenda. The study findings contribute to edify urban development planning, with regards to unbundling the links between transport infrastructure and the dynamics of urban population. Further empirical evidence is required to ground this assertion.

Keywords: Transport infrastructure; development; population dynamics; Bamenda.

1. INTRODUCTION

Transportation generally is a prerequisite for spatial interaction and the most important urban support system that is reshaping urban centres of the world today [1]. The availability and viability of transport infrastructure in western cities and some rare cities in the African continent such as Abuja, Johannesburg and Cairo, have made transportation to be efficient. This has contributed to urban growth in terms of its effect on population, physical structure and socio-economic development of urban areas. Transport infrastructure is therefore a crucial vector for urban insertion because it provides access to economic activity; healthy family, and helps in spinning social networks [2].

Given the rate at which urban centres all over the world are emerging [3], there is no doubt that urban transport planning and infrastructural development defines the beauty and the people of a city and goes a long way in interpreting the types of political structures of a place. A chaotic (unplanned and poorly planned), dirty and unorganised urban transportation systems is, to a large extent, symptomatic of poor governance. Gerd et al. [4] opined that urban transport policies and investments are only implemented on the basis of urban transport planning and management, therefore their evaluation is usually linked to performance in terms of transport operations.

Transportation and its impact on socio-economic development cannot be overemphasized. Developed countries have invested significantly to develop their transport sector. The United States Bureau of Transportation Statistics (2004) registered close to 135.9 billion dollars on federal highways construction (an estimate of 1.3% GDP) by the US government in 2002, while its households devoted 20 per cent of their expenditures to road transport [5,6]. [7] argued that the development and implementation of transport infrastructure projects is an essential instrument for the wellbeing of the American citizens, as well as an anchor for the economy and population growth. This is an indication that transport infrastructure is essential for socio-economic development and the growth of a city.

Studies addressing the impact of transport infrastructure on population concentration suggests that the results are inconclusive; governments in some developing countries place emphasis only on industrialisation as the panacea for economic and population concentration [8]. Jones and Woods [9] argued that apart from industrialization, there exist varied factors, classified in different ways that affect the location choice of people in a city. In essence, the author clarified that industrialization should not be considered as the only motivating factor that attracts population concentration. Albaladejo [10] claimed that social capital was an important motivating factor for the development of clusters in a given city. Martyniuk-Peczek et al. [11] shared similar lines of thought when they indicated that accessibility, availability of space and improved transport systems are cardinal for people to choose their favourable location in cities.

Baum-Snow [12] in his study on American cities documented that access radial highways caused economically important decentralization in the United State metropolitan cities. Similar study conducted on Chinese cities by Baum-Snow et al. [13] found an estimated 4-5% decline in Chinese central city population for each radial highway over 20 years, comparable to Baum-Snow's estimate of 6% for the United State. This suggests that road infrastructure has a major impact on urban form in different contexts. Complementing Baum-Snow's work, Duranton et al. [14] elucidated that the construction of kilometres of inter-state highways in a city have economically important impacts on the growth rate of population and employment opportunities. The author further revealed that inter-state system has a modest effect on inter-regional trade flows and composition in the late 20th Century in the United State of America. Puga and Nunn [15] who probed their study on the effects of topography on economic development suggested an important role for transportation costs, and hence, indirectly, for transportation infrastructure. A unifying observation of these

studies is that the authors addressed the possibility that transport infrastructure development play significant role in the development and growth of a city. Further, studies have explored the trends and triggers of urban population growth in several parts of sub-Saharan Africa [2,1,15,16]. However, an issue which seem to have eluded urban geographical literature centres on the links between transport infrastructural development and population growth. Put succinctly, the extent to which transport development shapes the pattern of population growth remains relatively less understood. We contribute to narrow this research gap, taking the case of Cameroon's primate city - Bamenda.

In several cities of Cameroon, urban transport infrastructures such as roads, bus stations (transport agencies, council motor-parks) and the peripheral airport at Bafut have contributed immensely to the urban growth of the city [14]. Bamenda city is one of the fastest growing urban centres in Cameroon after Douala and Yaoundé following it creation as the regional headquarters of the North-West Region by the Cameroon government since 1961. Though many studies have been done on transportation, relatively few studies have been conducted on the effect of urban transport infrastructure on population dynamics, particularly in Bamenda city with similar entry of development and growth effects. We therefore seek to fill in this gap by analysing the relationship between transport infrastructure development and spatial population concentration in Bamenda and also to establish the link between transport infrastructure development and location choices of citizens in Bamenda City.

2. MATERIALS AND METHODS

2.1 Study Area

Bamenda is the regional headquarters of the North West Region (Fig. 1). The city is situated in the southeast of the region between Latitudes 5° 56' and 5° 58' North of the Equator and longitudes 10° 09' and 10°11' East of the Greenwich Meridian. Bamenda has a total surface area of 3125 Km^2 [17] and is linked by road to all the divisions of the Region.

The city covers three Sub-divisional councils: Bamenda I, II and III councils which jointly gives the town the status of a City Council. Bamenda City is also connected to the national administrative and commercial capitals of Yaoundé and Douala. It is further connected to Nigeria by road through Mamfe in Manyu

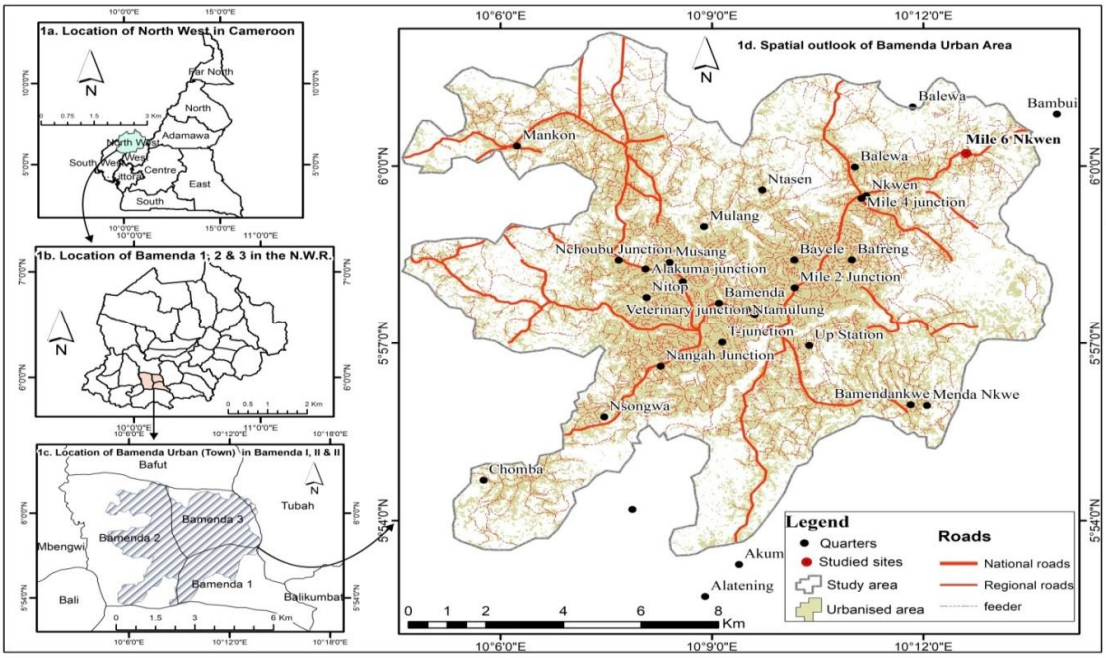

Fig. 1. Location of Bamenda City in the North West Region
Source: Adapted from the Geo-database of Cameroon 2020

Division of the South West Region, and the porous boundaries of Menchum and Donga - Mantung Divisions. The city became well known during the colonial days of the Germans and British who scrambled for territories in Cameroon from around the 19th century. Surviving as a traditional monoculture village during the colonial days, today Bamenda has become a complex heterogeneous city offering many services to its urban dwellers as well as to its hinterlands. This has made Bamenda a major cross route and socio-economic nerve wire along the Trans-African High way corridor. Bamenda comprises three municipalities – Bamenda I, Bamenda II and Bamenda III. Within each municipality, a 5% sample was drawn (Table 1) for the study.

2.2 Data Collection

This study combines both secondary and primary set of data which enabled the researchers to collect information on transport infrastructure and population growth parameters in Bamenda city. Four neighbourhoods were selected for the study with a total population of 8052 household heads (Table 1). The primary data was collected through random sampling of 400 households (N= 400) at the selected neighbourhoods. This mostly involved the household's heads, traders, and inter-urban passengers situated at an estimated radius of 3km around the neighbourhoods where majority of transport structures are situated. This phase of the fieldwork was completed after the administration of 400 questionnaires. The data was further complemented by in-depth qualitative investigation to know the state of infrastructural development in the city. This was done through semi-structured interviews with transport authorities (Proprietors of Transport Agencies, Bamenda City Council Delegate and the Regional Delegate of Transport). Field observations were concluded at the study sites to appreciate the transport infrastructural activities (Bus stops, motor-parks, markets and road network) and how these activities have influence population growth and locational choice. The study adopted a stratified random sampling to select the different neighbourhoods within the three sub-divisions that make up Bamenda City. For the sake of reliability, a pre-test of 10 questionnaires were deploy in the field. After a week, the rest of the questionnaires were directly administered to the rest of the sample households. The data types were grouped into quantitative (interval and ratio); categorized into continuous and discrete data, and qualitative (nominal and ordinal). Data collected from the field was summarized using descriptive and inferential statistics as presented in the results in the form of tables, charts frequencies, percentages, graphs, diagrams, maps and photograph for clarity. The hypotheses were tested with Multiple Linear Regression (Table 2), at 0.05 levels of precision and all calculated P-values were given at .001 indicating a 95% confident level of the results collected.

3. RESULTS AND DISCUSSION

3.1 Transport Infrastructure Development and Spatial Population Concentration in Bamenda city

The result of the field work and analysis as presented on Table 3 indicates growth in the volume of transport infrastructure such as road network, travel agencies, automobile, motorcycles, commercial structures (hotels) which have influenced population growth. The secondary data is limited in 2016 because as from 2017, the Anglophone crisis intensified and disrupted most administrative functions, thus there exist no clear data as from 2017 in any of

Table 1. Target neighbourhoods and distribution of population/transport infrastructure

Council area	Selected neighbourhoods or quarters	No. of TS (MPs, TA)	HHs target	Sample size	Sampling %
Bamenda I	Menda-Nkwe	1	160	8	5%
Bamenda II	Small Mankon (City Chemist-Food market)	6	1312	65	5%
	Ntamulung (Sonac street)	5	3119	155	5%
Bamenda III	Nkwen (Mile 2, Mile 4)	4	3461	173	5%
Total		16	8052	400	5%

Note: TS = Transport structures (MPs =Motor Parks, TA = Transport Agencies), HHs = Household heads
Source: Authors' fieldwork compilation, 2020

Table 2. In-depth description of variables used to run the multiple linear regressions

Y	X	Description	Mean square	Std. dev.	R-square	P-values
Growth in population	X_1	Growth in road infrastructural facilities	18.588	6.02141	.995	.000**
	X_2	Growth in transport agencies	50.000	19.1702	.922	.010**
	X_3	Growth in automobiles	8.4118	3.27984	.991	.000**
	X_4	Growth in motor cycles	19.294	5.28872	.985	.000**
	X_5	Growth in commercial structures	19.279	5.09281	.982	.000**

*Note: Y = Dependent variable, X = Independent variables. The coefficient of determination (R-Square) of .995, .922, .991, .985 and .982 indicate that, for the sample .99 percent of the variation in population is explained by the variation in the transport infrastructure. The p-values are significant at .001** levels. This therefore means that population growth is significant at P≤0.01 and P≥0.05*

Source: Author's computation from the result of analysis, 2020

the government agency concerning transportation in Bamenda city. An in-depth look at Table 3 suggests that as from 2000 to 2016, all transport facilities in Bamenda city witnessed an increase though not at the same level. In 2000 right up to 2004, the number of tarred roads in Bamenda was limited to 12; by 2016 the total number of roads had increased to 31. This was the same with transportation agencies within the city that witnessed an increase though with stagnation period in some years. Between 2001 to 2008, the number of transport agencies remained at 12, this was because of the instability of motor parks and travel agencies within the central city as the Bamenda Urban Council by then tried to dismantle the structures to re-direct their location at the entrances of the city as a measure for sustainable land use management.

By 2013, one more agency was added bringing the total number to 13 transport agencies, the number increased by one each year from 2011 to 2016 bringing the total number of transport agencies to 17. The table further indicate an increase in the numbers of automobiles in Bamenda from 2000 to 2016 respectively. By the year 2000, Bamenda had 1254 matriculated vehicles and by 2016, the number had reached 45296.

Table 3. Growth in the volume of transportation infrastructure and population growth from 2000-2016 in Bamenda

Years	Cumulative increase in road infra	Cumulative increase in travel agencies	Growth in automobile (Buses/cars)	Growth in motorcycle	Cumulative increase in commercial structures(hotels)	Population growth
2000	12	9	1254	248	25	213153
2001	12	10	2832	329	25	226867
2002	12	12	4282	454	26	237487
2003	12	12	6116	593	26	249489
2004	12	12	8139	736	29	262353
2005	15	12	10210	877	32	271873
2006	15	12	12360	1001	45	291853
2007	15	12	16140	1606	49	314274
2008	19	12	17922	2511	58	335706
2009	21	13	23451	3381	58	352226
2010	21	13	28523	4647	59	362964
2011	21	13	29874	6096	63	374386
2012	22	14	33711	7033	64	385271
2013	24	15	37027	7594	68	391452
2014	25	16	38760	8315	72	419034
2015	27	17	41722	8950	74	434724
2016	31	17	45296	9236	77	468004
Total	31	17	45296	9236	77	468004

Source: Adapted from Bamenda City Council Population Statistics and Transport Departments, Regional Ministry of Transport, Bamenda, 2020

The total number of motorcycles were limited to 248 by the year 2000, and by 2016, it had reached 9236 motorcycles. It was the same for commercial structures like hotels, by 2000, Bamenda counted 25 hotels of varied sizes. As of 2016, the total number of hotels in the city stood at 77. The researcher noticed that as the number of transport infrastructure, population growth also increases.

3.1.1 State of transport infrastructural development in Bamenda City

One of the most visible outcomes of transport infrastructure development in a city is an increase in accessibility which facilitates people's ability to reach their desired destinations. Based on fieldwork enquiry of 400 sample respondents within Bamenda city, the opinion of 24 (4.01%) sample respondents indicated that transport infrastructure in the city is well developed, 249 (41.64%) expressed that poor transport infrastructure construction dominate the city's environs, while 202 (33.78%) sample respondents expressed that transport infrastructure construction is on-going. The reaction of the rest of the sample respondents 139 (23.25%) was that there exist no form of infrastructure development in Bamenda City. Drawing conclusion from Table 4, it is evident that Bamenda City has recorded poor transport infrastructure development. This is an indication that transportation infrastructures are not the only motivating factor for population growth in the city. Other indicators will therefore be necessary in future to establish factors on population growth. There is high population pressure on the existing road infrastructure as traffic congestion tops the order of the day. Also there is poor organization and installation of transport agencies within the inner city of Bamenda as they provoke traffic during departure and entry periods.

Table 5 gives the current situation of the state of urban road network in Bamenda city. From the description, it is realized that 67.1 km of current roads in Bamenda are poorly constructed, just 13.3 km of well tarred roads exist, 475.9 km constitute earth roads and 5.8 km is under projection to be tarred.

Given the current state of urban infrastructures and the unprecedented population growth in Bamenda, stakeholders (Bamenda City Council Delegate (BCCG), Delegation of Urban Development Planning (DUDP) and the Delegation of Transport), have much to do in developing a Master Plan (MP) for Bamenda City, with dare need for urban land reforms in the city. From informant interviews, the research

Table 4. Respondents' views on transport infrastructural development in Bamenda

Options/Responses	Frequency of responses	Percentage
Transport infrastructure is well constructed	24	4.01
Poor transport infrastructure construction	249	41.64
Transport infrastructure construction is on-going	202	33.78
No form of transport infrastructure construction	139	23.25
Total	400	100

Source: Author's field survey, 2020

Table 5. Current state of urban roads in Bamenda city

S/N	State	Description	Lengths in Km
01	Well-constructed and tarred roads	Hospital Roundabout to Naakah Bridge, Commercial Avenue, Governor's Junction to Amour Mezam	13.3 km
02	Poorly constructed tarred roads	Hospital roundabout to limits with Bafut, Hospital roundabout to Mbengwi, Finance Junction to Bambui City Chemist Roundabout to End of Tar, Veterinary, Junction to Mile 2 Akum, Inner ring road, Ndamukong-Foncha Street	67.1 km
04	Constructed earth roads	Almost all access roads in the city which are not tarred	475.9 km
05	On-going roads to be tarred	Ntambag access roads, K-town road, Access to the BCC premises, BMM-Mendakwe	5.8 km

Source: Data collected from Bamenda City Council Planning Department, 2020

team was made to understand that a concept of urban community organization and hierarchy of road networks is underway, reallocation of land rights in order to establish a more equitable distribution of land to accommodate the incoming population has been designed already. This reallocation of land will act as a powerful strategy for the promotion of both economic development and environmental quality. Fig. 2 presents the proposed concept of urban community organization and hierarchy of road networks in Bamenda City.

According to an Expert Interviewee from Bamenda City Council:

"The concept of the proposed road network for Bamenda is based on minimizing traffic through the inner area in general and the city center in particular. People should only come to the city center because they need a service or have something to do there. Those entering Bamenda should be provided with options to reach their destinations without losing time and cost. It is also necessary to provide a wide range of choices to different destinations within the city. In this way, we will be able to manage the urban influx of population in Bamenda".

The propose concept contains arterial roads which bring traffic from outside into Bamenda city, freeways which connect arterial roads and enable exogenous traffic to by-pass Bamenda city to the other neighbouring sub-divisions. Sub freeways have been designed to carry traffic from arterial roads and freeways to major parts of the city notably the Central Business District (CBD. Primary roads which take traffic from sub-freeways to specific communities or activity areas, secondary distributors is also designed to take traffic and distribute within communities or economic activity pocket areas within the city. We also notice tertiary roads which distribute traffic within neighbourhoods.

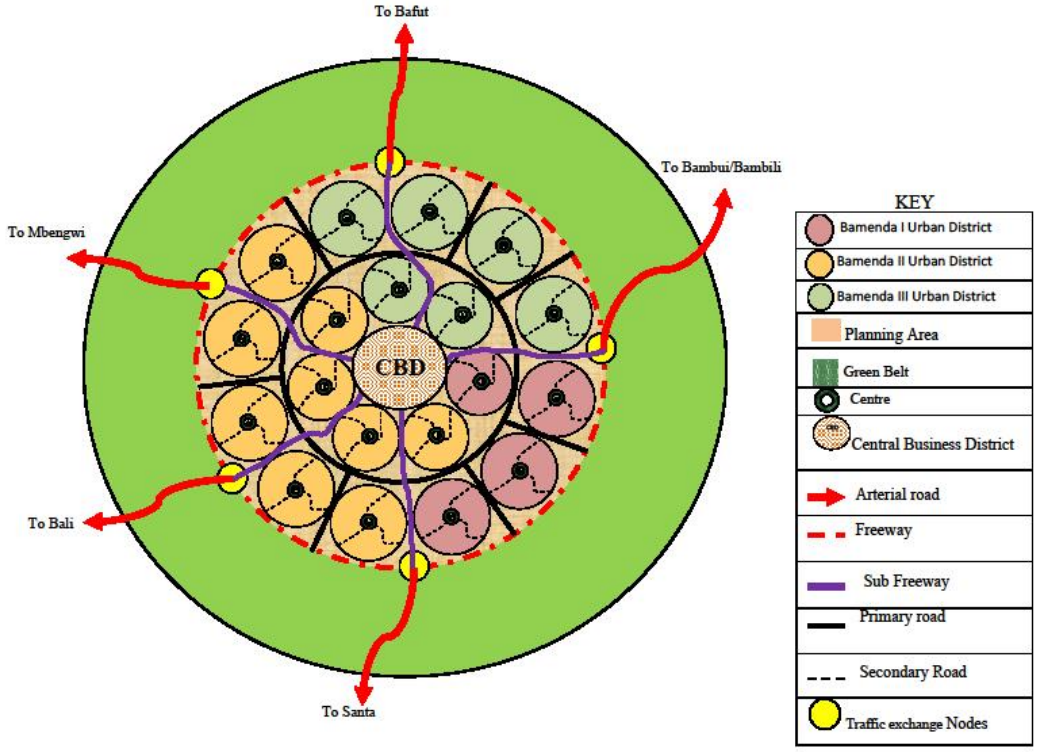

Fig. 2. Propose concept of urban community organization and hierarchy of road networks in Bamenda City

Source: Adapted from Bamenda City Council Proposed Master Plan (MP), 2020

The result from the pairwise correlation coefficient is shown on Table 6. The correlation coefficient for each pair of variables appears at the intersection of one variable's row and the other's column. Each variable in the group correlates perfectly with itself, as it is evident by the coefficients of +1.00 at the intersection of a particular variables' row and column. The growth in road infrastructure correlates very strongly with the growth in population (R = .995), having a P-value of .001. The growth in transport agencies correlates very high with population growth (R = 922), with a *p* = .001; the growth in population correlates with the growth in automobile (buses) with an R- value of .991 and a *p- value* of .001.

The growth in the numbers of motorcycle correlates with the growth in population having a co-efficient of .958 with a P-value of .001. Lastly, the analysis of the research data revealed that the growth in the numbers of commercial structures (hotels) in Bamenda correlates with the growth in the population of the city. The coefficient was .982 with a p- value of .001. This indicates that population expansion of Bamenda has been triggered by increase in transport infrastructure variables.

In reality, if transportation infrastructure increases or improves, all other variables will increase. This reduces the propensity of road accident; facilitate in-migration thereby causing demand in movement leading to correspondent increase in the number of people. In the same vein, the growth in population would lead to increase in the numbers of transport agencies, automobiles and commercial structures would increase in the same direction. This is indicating a very strong positive multiple relationship between the predictors (Growth in road infrastructure, transport agencies, automobiles, motorcycle, and commercial structure) and the dependent variable (population growth).

3.2 Transport Infrastructure and Location Choice in Bamenda

It is stated in the body of literature that transport infrastructure is one of the cardinal instruments for population growth, economic growth, commercial trade and employment. The putting in place of transport structures such as roads, parks, bus station, agencies are fundamental for urban development of Bamenda city and so their presence greatly affect location choice. In a full space of 3km^2 are found the essential economic activities of the city and all the transport agencies and motor-parks which assures inter-urban and peri urban mobility.

3.2.1 Factors affecting location choice

Based on respondent's view point (Table 7), the study reveals that location choice of Bamenda residents is influenced by transport and communication facilities (93.5%), these included

Table 6. Correlations of the dependent and independent variables (Partial correlation)

Correlations coefficients of dependent and independent variables							
		Y	**X_1**	**X_2**	**X_3**	**X_4**	**X_5**
Pearson Correlation	Y	1.000	.995	.922	.991	.958	.982
	X1	.995	1.000	.931	.992	.960	.978
	X2	.922	.931	1.000	.925	.915	.856
	X3	.991	.992	.925	1.000	.983	.971
	X4	.958	.960	.915	.983	1.000	.931
	X5	.982	.978	.856	.971	.931	1.000
Sig. (1-tailed)		.	.000	.000	.000	.000	.000
			.	.000	.000	.000	.000
				.	.000	.000	.000
					.	.000	.000
						.	.000

Y = the dependent variable (Growth in population
X1 = Independent variable (Growth in road transport infrastructure)
X2 = Independent variable (Growth in transport agencies),
X3 = Independent variable (Growth in Automobile (Buses))
X4 = Independent variable (Growth motorcycle) and
X5 = Independent variable (Growth in Commercial Structures)

Source: Author's computation from the result of analysis, 2020

road networks, transport agencies, motor-parks and telecommunication networks. The finding also considers commercialization (79.7%), labour (23.3%), land affordability (42.3%) and education (74%).

3.2.2 Reasons for residing close to transportation infrastructure in Bamenda

As shown on Table 8, the findings revealed that people chose to reside closer to transport infrastructure because of accessibility (87%), they also indicated that minimising cost of transportation was another reason (79%) while the last reason advanced for was to maximise demand (31.5%).

Fig. 3 shows road network configuration and transport activities within the central city of Bamenda.

3.2.3 Areas of population concentration in Bamenda city

It is noted from the fieldwork finding as presented on table 9 that majority of the urban citizens of Bamenda are concentrated around transport infrastructure locations (63.3%), suburbs and residential areas (13%), while market venues, commercial avenues and educational institutions concentrate 23.7% of the urban masses.

The veterinary junction (Fig. 4) is located at the city centre and is the first major junction that links up this centre and the rest of the city. It links the Ayaba Street (N6) and the Sonac Street to the Ngeng junction. Majority of Bamenda population is concentrated within the axis. It has a radius of about 25 m and a T-shape on a relatively flat surface. Its functioning is characterized by frequent traffic jams and go slows due to the absence of demarcated lanes for the different road users and the numerous commercial activities carried out around.

One of the major travelling agencies that link the city of Bamenda to the rest of the region and country happens to be located opposite a major sub divisional hospital in the most populated part of the city. The Amour Mezam axis is about 550m long from the Mile 2 junction to the Ntambessi junction on the N11 road. The traffic flow along this axis is the slowest in the city and it sometimes takes hours to cover this stretch of road because of the numerous commercial activities carried out around. There are however by passes and road cuts that can alleviate the congestion problem but they are undeveloped.

Table 7. Transport infrastructure and location choice in Bamenda

Options	Frequency of responses	Percentage
Availability of transport and communication facilities	374	93.5%
Commercialization	319	79.7%
Labour	93	23.3%
Land affordability	169	42.3%
Education	296	74%

Source: Author's field survey, 2020

Table 8. Reason for residing close to transportation infrastructure

Options	Frequency of responses	%
Accessibility	348	87%
Minimising cost of transportation	316	79%
Maximising demand	126	31.5%
Total	514	128.5%

Source: Author's field survey, 2020

Table 9. Areas of population concentration in Bamenda

Areas of population concentration	Frequency	Percentage
Around transport infrastructure sites (motor parks/transport agencies, road junctions, high ways	253	63.3%
Suburbs, residential areas	52	13%
Market venues, commercial avenues, and education	95	23.7%
Total	400	100%

Source: Author's field survey, 2020

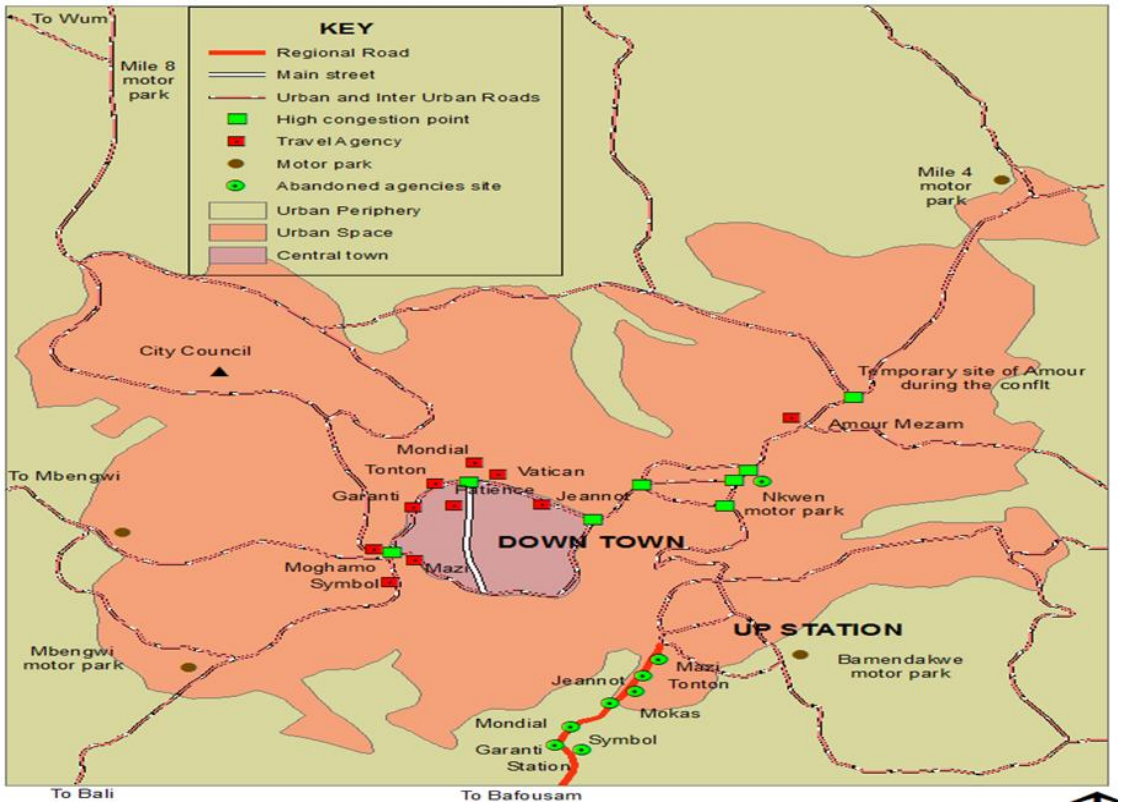

Fig. 3. Transport map of Bamenda city showing location of travel agencies
Source: Transport data and data collected from the field, 2020

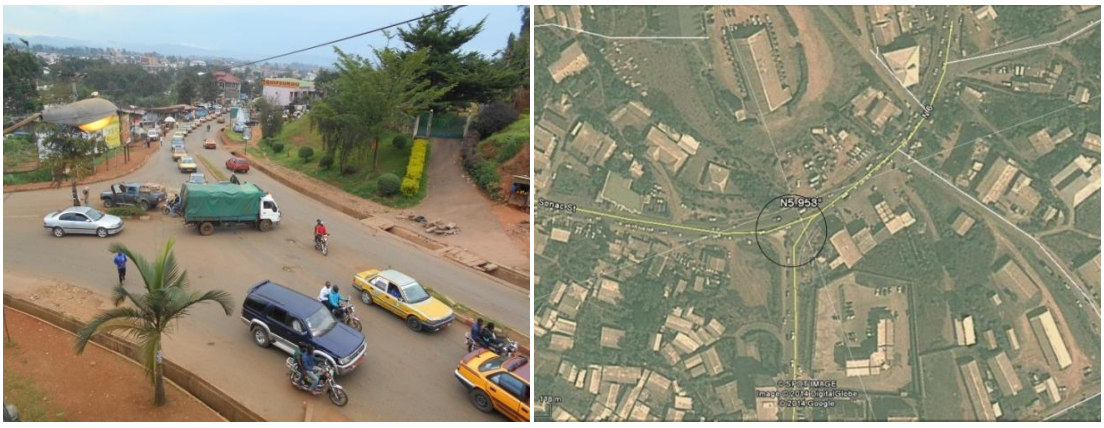

Fig. 4. Partial view of veterinary Junction (Field photo and aerial photograph, 2020)

3.3 Discussion of Findings

Transport infrastructure developments in Bamenda city are found to play important role on household's choice of residence. A good number of transport structures such as roads, transport agencies, motor-parks have subsequently increased in number within the last few decades and exert significant impacts on the growth of Bamenda population especially high concentration witnessed along the transportation terminals. In this paper it is found that, apart from transport structures which have strong ramification on population concentration and residence choice of location, there exist relative other factors of great importance such as land

Fig. 5. Partial view of Amour Mezam Axis (Field photo and aerial photograph, 2020)

affordability, commercial motive and the search for better education. Among the factors considered to influence location choice of residence and agglomeration, it is discovered that accessibility, minimizing cost of transportation and maximizing demand were the main reason why most of the residence chose to reside near transportation structures. Prevailing literatures on location choice, consistently with this finding, demonstrate that the development of transport structures [12], accessibility [11], and availability of labour [9] are significant factors in location choice of residence in Bamenda. Duranton et al., [14] also highlighted that that the construction of inter-state highways in a city have a very strong to play on the growth rate of population and employment opportunities. Comparing this to Bamenda City, the Trans-African highway and other national roads connected to the region have made Bamenda a major cross road and an economic nerve within the Trans-African highway corridor.

4. CONCLUSION AND RECOMMENDA-TION

This research paper provides some reflections on the links between urban transportation structures, population concentration and location choice of city dwellers in Bamenda city, Cameroon. It is important to note that transportation has become a necessity and an essential requirement to urban lifestyle especially in hinterland conglomerations like that of Bamenda. The results from the study have found that transport infrastructure development actually exert some significant impact on population growth of Bamenda city as great number of the inhabitants are found to concentrate around transport installation sites like the motor-parks and transport agencies. Though, other factors have proven to attract people thereby narrowing the fact that transport infrastructure cannot be the only factor for population concentration and location choice in the city. Moreover, the presence of educational institutions as a source of innovation and connectivity by roads (under construction) and commercial activities raises the potential of Bamenda for such population concentration and location choice as well. Although road network in Bamenda present a perilous condition couple with the on-going socio-political instability, much still need to be done as far as transport infrastructure construction is concern especially now that Bamenda has a State University.

On that note, like in any other Sub-Saharan city having the same resemblance characteristics of Bamenda city, state government can put in place efficient public transport system so as to accommodate the ever increasing urban populace. Although empirical analyses have demonstrated significant information on the spatio-temporal relationship between transport infrastructure development and population growth, it provides limited explanation theoretical background of the role of transportation on population concentration and location choice. Therefore, further research is encouraged to use spatial statistical analysis and dynamic modeling to study between urban transport and population growth.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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