

AN ASSESSMENT OF STREETSCAPE INFRASTRUCTURE IN ILORIN METROPOLIS, NIGERIA.

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Abstract

Rapid rate of urbanization, non-compliance with planning standards and increasing pressure on vehicular transport has precipitated series of problems that have threatened functionality of streetscape infrastructure in Nigeria. Streetscape infrastructure include street lights, street trees & landscape strips, sidewalks, bus shelters, sign posts, drainages and speed limiters amongst others. This study assesses their availability, functionality, condition and desirability in Ilorin metropolis, Nigeria. Data were collected using structured questionnaire and Twenty-six streets were sampled across the three local government areas. 310 respondents were sampled while data analysis was done using SPSS version 16 software package. Frequency tables and percentages were used to present the statistics generated. Results revealed that 54% of the entire streetscape infrastructure is considered inadequate. However, most respondents are satisfied with the level of availability of some streetscape infrastructures i.e. street lights, drainages, speed bump sand speed limit signs. 52% of the respondents confirmed that infrastructure such as sidewalks, sit outs; trees & landscape strips, bus shelters and waste cans are not functional. Study concludes that deficiency and poor condition of the streetscape infrastructure predispose pedestrians to dangers of road accidents while creating transport, economic, health and urban management problems. Recommendation is made for adequate provision and efficient management of streetscape infrastructure to achieve satisfactory, functional, safe, aesthetically pleasing vehicular and pedestrian routes. These are basic necessities for sustainability and efficiency of cities in the 21st century.

Keywords: *Infrastructure, Landscape, Pedestrian, Streetscape, Sustainability, Vehicular.*

1.0 Introduction

Streets in cities can symbolically be likened to blood vessels in humans which allow life to flow in the veins (Abdulraheem M.O. 2018). Rikhi, Kanika and Rudrapriya (2016), described streetscape elements as those functional and aesthetic items in pedestrian spaces that provide amenity and utility to pedestrians and other street users and sustainability in the streetscape is one of the most important strategies for sustainable urban life. Though, traditional planning limited street function to the movement of people, cars and freights, the inception of modern planning has revealed streets to hold more potentials than serving just transportation and accessibility purposes alone. Streets and streetscape actually play a vital role in the improvement of health and well-being of citizens and sustainability of urban centers. In fact, streets exist as the most abundant and ubiquitous urban open spaces (Rikhi et. al., 2016). They are a place where significant part of life of a city happens.

Regretfully, the streets of Ilorin Metropolis have increasingly become unfriendly to anyone other than drivers and motorcyclists, when compared to how they were in the early 70s. Their quality of being pedestrian friendly is suddenly lost. Streets in Ilorin no longer serve as the friendly urban open space where pedestrians can enjoy safety, comfort, accessibility and

efficient mobility. This work seeks to evaluate the condition of streetscape infrastructural facilities in Ilorin Metropolis with a view to advocating for well-designed streetscape that will encourage connection, understanding and communal feelings for those who frequently use the space.

2.0 Literature review

Wang, Wang & Hong (2014) opined that roads/streets play a vital role in shaping the landscape of the city and the function of roads is no longer limited to transportation, but also includes safety, convenience, comfort and aesthetics among others. Montgomery, J. (1998) said “Streets are undoubtedly the most important elements in a city’s public realm; the network of spaces and corners where the public is free to go, to meet, to gather or simply to watch one another. Thus successful urban places are based predominately on streets and the connected street life and this might not be actualized without considering the condition of the streetscape. Glaser (2012) maintained that streets were the frontage of cities and that it was from the streets that people first experienced and felt cities.

Streetscape as a term has been of relatively little usage among Nigerian scholars, planners, civil engineers and other allied professionals. The term has been used to describe the aspect of urbanism that considers the totality of the physical street environment, including semi-private spaces such as residential front yards and commercial terraces, street trees, flower boxes and planters which enhance these spaces (Montgomery, J. 1998).

According to Charlwood (2004), Streetscape is a term used to describe the natural and built fabric of the street, design quality of the street, its visual effect, particularly how the paved area is laid out and treated. It includes buildings, the street surface, the fixtures and fittings that facilitate its use from bus shelters and signage to planters.

From the context of these definitions, streetscape isn’t new in the Nigerian context it’s only the term that has not been frequently used. The constituent of streetscape align perfectly with street furniture / infrastructure which we are very much used to.

Nevertheless the origin of the term is not the main focus in this review but its functions, objectives and what it stands to achieve in terms of environmental sustainability. Streets are integral part of our environment, thus factors and components that ensure it continuous functionality and subsistence also become important.

The elements of a sustainable streetscape include all that is expected to be on a street to serve beyond the purpose of pedestrian and vehicular mobility, such as Sidewalks, Planters, Street furnishings, Benches, Street Trees and Landscape Strips, Rain Gardens, Lighting, Trash Receptacles, Signages, Bus Shelters, Medians, Curbs, Bicycle Facilities, Crossings, Public Art and Cafe Spaces. Streetscape has also been described as the visual identity of a neighbourhood which plays an important role in facilitating interaction and cohesion between residents and creating a livable community.

With the spate of urbanization, series of problems have cropped up affecting the peaceful nature and beautiful arrangement of the streets in our urban centers. This includes encroachment of the road and its rights of way for display of wares, on-street trading, carrying out informal activities e.g. vulcanizers stand, refuse dumping, building of shops or citing of illegal roadside structures. This hampers pedestrian movement on the sidewalks, distorts the aesthetic view of the street and reduces its functionality Shonibare (1996). Shonibare (1996) concluded that the encroachment of open spaces and road sides by markets and service industries is one of the major environmental management problems plaguing many Nigerian urban centers. In a similar study, Alabi (2009) also reported that most of the open spaces and roads in the city had been encroach upon by the people for commercial activities or other uses. In addition, Olorunfemi,

Oladele and Koffi (2016) emphasized that one aspects of streetscape that cannot be undermined is the arrangement of buildings on the street, but which has been altered due to the desire of property owners to maximize the use of their land in many urban center, non observation of building codes and setbacks which is not only disrupting the aesthetics of the street but also endangering the lives of the residents and other road users. The authors conclude this to be the result of negligence on the part of the planning authorities.

Pedestrian friendly streets have been advocated by urban designers and transport planners, an approach that will reduce carbon emission, improve security of the neighbourhood and health of residents. Streets as a subset of urban public space, is an element that is able to promote continuity, cohesion and order in the territory. This is in addition to its natural ability to create and maintain strong local centrality, environmental quality, economic competitiveness and sense of citizenship. The use of streetscape for community cohesion, pedestrian friendly / street walkability, heat Island eradication, community policing and traffic calming among its other advantages have not been fully harnessed in Ilorin, Kwara state.

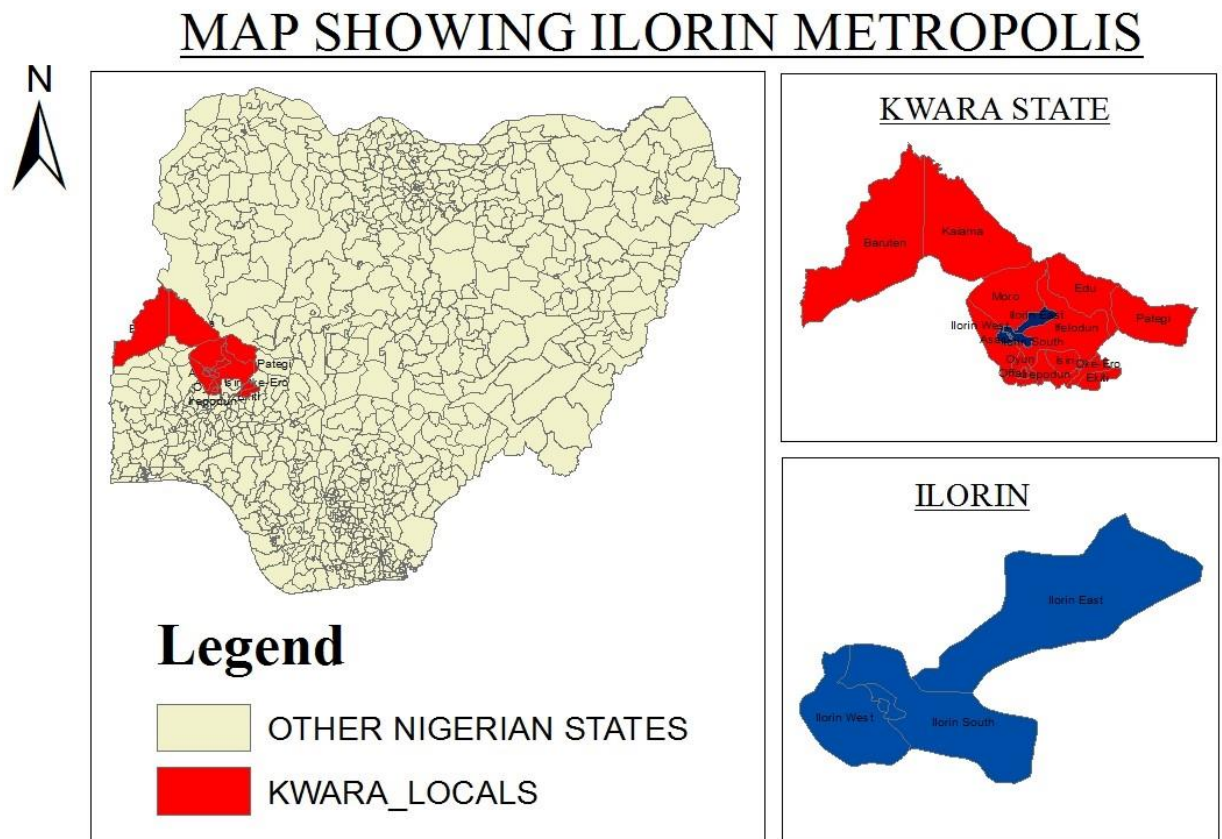
This study will assess streetscape infrastructure in Ilorin metropolis, Kwara state and the specific objectives are to:

1. appraise the availability of streetscape facilities in the study area;
2. assess the existing condition and functionality of streetscape infrastructures in Ilorin metropolis; and
3. appraise the level of desirability for these facilities by the residents.

The findings of this study will thus be of immense benefits in the aspect of insightful provision to policy makers in the study area through the revelation of the conditions of streetscape and its components and the proactive measures to be taken to ensure sustainability of the available streetscape infrastructures. Furthermore, it will contribute to knowledge, by offering useful data to students and researchers of transportation studies, urban management and other related concerns.

3.0 Materials and Methods

This study was conducted in Ilorin city, Kwara State Nigeria, considered to be one of the fastest growing cities in Nigeria since 1967 when it became a state capital (Oyegun 1992). It occupies an area of 765km² with elevation ranging from 250 to 400 meters above sea level and located geographically between latitude 8°30'N and 8°50'N and longitude 4°20'E and 4°35'E. Ilorin metropolis comprises Ilorin west, Ilorin East and Ilorin South Local Government Areas. It shares common boundaries with Moro, Asa and Ifelodun Local Government Areas of Kwara State. The city is strategically located at the geographical and cultural confluence between the North and South of Nigeria.



Survey method was primarily used in this study. Secondary sources of data included population figures from the National Population Commission, maps, published journals, the internet and other relevant literatures on the subject.

Research instruments that aided the process of data gathering for this study are three: questionnaire, photograph materials and interviews. Structured questionnaire forms were designed to elicit relevant facts from the respondents on the availability, condition, functionality and desirability of streetscape and street infrastructures in various neighbourhoods in the study area. Interviews were scheduled with some stakeholders e.g. staff of the Town Planning and Development Authority, Ministry of Works, Ilorin etc. Photographs of the existing physical situation of some street infrastructures in Ilorin metropolis were obtained to support the findings of the study.

Cluster Sampling was used to sub-divide the study area into clusters with the aid of the established Kwara state political ward division, from which sub-clusters were randomly selected. To ensure all clusters enjoy equal representation, proportional allocation was then used to ascertain the total numbers of respondents to be sampled in each sub-cluster. Systematic Random Sampling was adopted in administering questionnaire on respondents within the sub-clusters. This was achieved by administering 10 questionnaires on every street in each sub-cluster or 5 questionnaires after every ten houses in every sub-cluster.

In determining the sample frame, the population of Ilorin was projected using the 2006 population figure of 777,667 (NPC, 2006). The population projection formula:

$$P_t = P_n (1 + r/100)^n$$

was adopted. The projected population figure for the year 2018 was 1,145,482.

The sample size was calculated by using Taro Yamane (Yamane, 1973) formula with 95% confidence level. The calculation formula of Taro Yamane is presented as follows:

$$n = \frac{N}{1+N(e)^2}$$

where: n = sample size; N = number of people in the population; e = allowable error (%) which gives a sample size of 400

Structured questionnaire was prepared, which had two (2) major sections. A total of 400 questionnaires were administered, using systematic random sampling technique. Data analysis was done using SPSS version 16 software package. Frequency tables and percentages were used to present the results and descriptive statistics generated.



Plate 1: A bus shelter converted for other uses Tanke road, Ilorin.

Source: Author's Field Work, (2018).



Plate 2: Street lights along Tanke Oke-Odo.
Source: Author's Field Work, (2018).



Plate 3: Sidewalk in good condition along Ahmadu Bello way, Ilorin.

Source: Author's Field Work, (2018).



Plate 4: Sidewalks/ drainage overridden by Shops, F-Division, Ilorin.

Source: Author's Field Work, (2018).



Plate 5: Streetlights along Challenge road Ilorin
Source: Author's Field Work, (2018)



Plate 6: Street lights along Taiwo road
Source: Author's Field Work, (2018).

Table 1: Availability, Functionality and Desirability of streetscape Infrastructure

STREETSCAPE FACILITIES	Available	Not Available	Highly Functional	Functional	Not functional	Highly desirable	Desirable	Not desirable	Indifferent
Sidewalks	46.4	53.6	51.8	25.9	22.3	73.5	15.9	7.3	3.3
Sit-outs	32.8	67.2	24.3	27.1	48.6	43.6	35.0	6.4	15.0
Road Median	48.9	51.1	35.5	33.9	30.6	51.6	29.5	9.8	9.1
Trees/Landscape Strips	29.7	70.3	25.5	15.3	59.2	40.3	18.7	27.3	13.7
Streetlights	90.6	9.4	53.6	27.1	19.3	81.5	7.7	6.2	4.6
Bus shelters	38.5	61.5	17.9	30.8	51.3	42.8	27.5	11.6	18.1
Parking Spaces	33.0	67.0	17.6	41.7	40.7	58.1	29.1	6.8	6.0
Drainages	89.0	11.0	34.3	36.6	29.1	67.2	23.0	9.8	NIL
Speed Bumps	50.0	50.0	23.3	39.1	37.6	53.2	22.7	14.2	9.9
Waste Can	35.6	64.4	18.3	38.5	43.2	62.0	21.4	9.0	7.6
Sign Posts	65.6	34.4	18.9	40.9	40.2	52.4	27.0	5.6	15.0

Source: Authors' field work (2018)

Table 2: Condition of Streetscape Infrastructure

STREETSCAPE FACILITIES	<i>Very good</i>	<i>Good</i>	<i>Fair</i>	<i>Bad</i>
Sidewalks	53.0	23.0	10.3	13.7
Sit-outs	14.2	19.2	18.3	48.3
Road Median	40.3	20.9	22.5	16.3
Trees/ Landscape Strip	31.3	10.1	11.1	47.5
Streetlights	56.6	19.3	10.2	13.9
Bus shelters	16.5	26.0	28.3	29.2
Parking Spaces	30.3	22.2	22.2	25.3
Drainages	45.8	13.1	20.8	20.3
Speed Bumps	30.6	27.4	17.7	24.3
Waste Can	28.0	15.0	25.2	31.8
Sign Posts	28.9	31.4	11.3	28.4

Source: Authors' field work (2018)

4.0 Results

The male gender formed the highest percentage (54%) of respondents while the female gender accounted for the remaining percent (46%). In terms of occupation, it was revealed that 45% are students, 27.5% are traders, 16.5% are civil servants, 9.0% are artisans' and only a minute percentage (2%) are unemployed.

Assessment of monthly income of respondents in the study area, revealed that 36.2% earn less than N20, 000 monthly, 28.5% earn between N21,000-N41,000, while 22.5% earn between N41,000-N60,000. Only 12.8% earn above N100, 000 in a month.

Data on duration of stay of respondents in the area showed that 11.8% of the respondents have stayed in the area for less than 1 year, 39% have stayed in the town for up to 5years. Those that have stayed between 6-10 years accounted for 25.6% while 8.7% have actually stayed in the town for up to 10years. 8.7% of the respondents have stayed in the area for 21 years and lastly 6.2% stayed in the study area between 11-15years.

Car ownership was another variable assessed in the study area, 74.5% of the respondents do not own a car, only 24.5% of the people sampled have cars. Since highest percentage of the people living in the area have no personal cars, provision of adequate streetscape infrastructure facilities would be of immense benefit to the area, considering the fact that facilities such as sidewalks, trees, bus shelters, streetlights, speed bumps, road medians to mention a few, are of great benefits in safeguarding lives and health of pedestrians generally and specifically those who use public transport.

About 46% of respondents attested to the availability of side-walks, while 54% claimed that sidewalks are not available. In addition 74% consider sidewalks as highly desirable though about 7% find them not a desirable streetscape facility (see Table 1). Field observation also show that the roads in the study

area are not pedestrians friendly e.g. roads in Sango, Agbo-Oba, Pakata, Oloje, Tanke, Sabo-Line, Opo-Malu, Oke-Ose among others.

Further analysis revealed that 49% of respondents believe that the available sit-outs are not functional at all though they are highly desired (44%) when compared to 6% that say they are not facilities that are desired. Furthermore, about 48% of respondents reported that the available sit outs are in a bad state while only 18 % belief the condition is fair (See Table 2).

Forty percent (40%) of respondents believe the available road medians are in very good condition while 16% said they are in a bad state. Furthermore 51% attest to the fact that road medians are not available while 40% confirm they are available in their own areas (See Table 2). Moreover 52% find road medians as a very highly desirable streetscape facility. Only 10% consider them undesirable.

As high as 70% of respondents attest to the fact that trees/landscape strips are not available at all in the metropolis, though 27% do not consider this facility as desirable, 40% consider it highly desirable (See Table 1). When considering the condition of tree/ landscape strips that are even available in Ilorin metropolis, 48% of respondents indicated that they are in very bad state (See Table 2). When analyzing the availability and condition of streetlights in Ilorin, the largest percentage (91%) of respondents confirmed the availability of streetlights (See Table 1). 57% belief the streetlights are in good working condition, when compared to 10% that belief the condition is just fair (See Table 2). 82% find streetlights as highly desirable streetscape facility but about 5% do not really bother whether they are available or not. 81% of the respondents consider the streetlights as highly functional. Only 19% reported that they are not functional, though available (See Table 1).

Bus shelters are not commonly found in the metropolis as confirmed by 62% of respondents. 51% also said they are not functional at all as most of the available bus shelters are not used for purposes meant for but for display of wares by hawkers of vegetables, dried fish, fruits etc. Parking spaces are highly desired but generally not available as confirmed by 67% of respondents (See Table 1). It was also discovered that where available, only 18% of respondents find them highly functional while the remaining percentage of respondent find them either fairly functional or not functional at all. The condition of speed bumps is believed to be very good according to 31% of the respondents, though, to 24% of the sampled respondents, the condition of speed bumps is bad. 27% said they're in good condition while about 18% believe the condition is just fair. 53% of the respondents find speed bumps highly desirable, though about 14% said they do not desire to have speed bumps in their areas. The number of people that desire to have waste bins in their neighbourhood is large (62%) but an equally large percentage (64%) confirmed that they are not available at all (See Table 1).

Indeed 89% of the sampled respondents confirm availability of drainages while 49% belief the drainages are in very good condition though only 34% confirm that they are very functional while another 29% said they're not functional at all despite the fact that a large percentage (67% and 23%) finds the presence of drainages in Ilorin highly desirable or desirable respectively. Furthermore, the study revealed that some streetscape facilities are available and highly functional e.g. streetlight (80.7%), drainages (70.9%) and road median (69.4%)

5.0 Discussion

The survey considered eleven (11) streetscape infrastructural facilities in Ilorin Metropolis. They include Sidewalks, Sit-outs, Road-Medians, Street-Trees/Landscape-Strips, Streetlights, Bus-shelters, Parking Spaces, Drainages, Speed-Bumps, Waste Cans and Sign Posts. They were all assessed on the basis of availability, functionality and desirability.

Assessment of the availability of streetscape infrastructure in Ilorin metropolis revealed that the largest percentage (90.6%) of respondents confirmed streetlights to be the most available and generally well

spread amongst all the streetscape infrastructures. This is followed closely in terms of availability by drainages (89%), then sign posts (65.6%). The least available streetscape infrastructure is trees / landscape strips, which scored about thirty percent (29.7%). This is closely followed by parking spaces (33%) and sit-outs (32.8%) which equally scored low in terms of availability though they ranked low only after trees / landscape strips.

Evaluating the functionality of the streetscape infrastructure, streetlights still scored the highest percentage (54%) and considered highly functional. In fact renaissance survey carried out by the researcher at night time in the study area also confirmed this (see Plate 2 & 6). The street lights were on in most of the areas visited at night during the study period. Most of the respondents confirmed that this was a result of the “OPERATION LIGHT-UP KWARA” project of the Governor Abdulfatai Ahmed administration. They reiterated that the project had considerably reduced incidence of criminal activities at night generally in the state. Sidewalks scored 52% while road median ranked third (35.5%) on the highly functional scale. Meaning that road median and sidewalks were available and highly functional in the area under study. Trees and bus shelters are infrastructures that are considered as not functional at all scoring 59% and 51% respectively. This may be attributed to the fact that they also ranked low on the availability scale.

Measurement of the desirability of the streetscape infrastructure was among the objectives of this study. They were ranked as highly desirable, desirable, not desired and indifferent. Streetlights had the highest score (81.5%) on the scale of highly desirable. Sidewalks, drainages, and waste cans scored highly after streetlights with 74%, 67% and 62% respectively

The landscape features not desired by the populace are speed bumps (14.2%), and bus shelters (11.6%). In fact it was observed that most speed bumps are evident in areas where sidewalks are lacking. This also could translate to high rate of motorcycle/car accidents in such areas since pedestrians have to share the road with moving vehicles and motorcycles. Furthermore most of the bus shelters have been converted to uses other than what they were meant for (See plate 1).

Indeed many respondents said they are indifferent to the availability of trees (13.7%), sign posts (15%) and bus shelters (18%). This point to the fact that a lot of enlightenment and awareness campaigns is required for the citizenry, by government and other stakeholders on the importance of these landscape infrastructure for safe, healthy, efficient and sustainable cities.

Sustainable environment is dependent on streetscapes as it is one of the ways to achieve sustainable cities. The streetscape facilities in Ilorin are highly desirable though some are not in a good condition which invariably influences their functionality.

6.0 Conclusion

Urban environment is so dependent on adequacy, functionality and condition of streetscape infrastructure because it is one of the ways to achieve sustainable metropolitan cities. However, the provision and management of streetscape infrastructures must be enhanced so as to achieve a well-coordinated, aesthetically pleasing and sustainable street and road networks in Kwara State.

The study reveals a general dearth of streetscape infrastructures in the metropolis. Only street lights, drainages and speed bumps are available to some extent in the state even though some of the areas sampled still do not have them. Infrastructures such as sidewalks, sit outs, trees and landscape strips, bus shelters, waste cans are generally absent. Absence of sidewalks exposes pedestrians to dangers on the road and contributes to transportation problems in the study area. Furthermore, trees and landscape strips that ought to moderate atmospheric temperature in the urban areas are almost lacking in the study area, the resultant effect is the heat island we are presently experiencing. In fact the midday temperature in the study area fluctuated between 38°C - 40°C in the months of February to April 2019 (NTA weather Forecast Report).

The study revealed that streetlights are highly functional in the study area. This is a result of the just concluded 'Light Up Kwara' project by the state government. In addition, infrastructures such as road median, drainages, speed bumps and sign posts are found to be available and reasonably functional. Surprisingly the function of the recently launched 'Soludero' bus shelter has been totally changed by the residents as some of this shelter are now used for display of wares by hawkers of pepper, vegetables, fish etc. (See Plate 1) while beggars and the mentally imbalanced sit and sleep in some of the bus shelters too.

The condition of streetscape infrastructures, sidewalks, road median, street lights, parking space, drainages, is confirmed by respondent to be good, however some of these facilities are affected by the weather/climate conditions and human activities. For instance, the drainages are filled with sands and debris during raining season and subsequently get blocked. Human actions such as the disposal of waste into the drainages due to the unavailability of the waste cans result in littering of the streets with refuse. Most residents also build shops on top of the drainages or very close to it (See Plate 4) thereby obstructing free flow of storm water and movement of debris in the drainages.

In addition, lack of parking spaces lead motorists to park indiscriminately on the streets which always lead to traffic clog especially during the peak hours. The study reveals the level of desirability of all the streetscape facilities in the study area is very high as they are what make the environment a safe and convenient abode. In conclusion, maintenance and proper management techniques are the life wire of infrastructures, the state of our streetscape and its components is deplorable today due to poor environmental management which has led to problems such as blockage of drainages, dilapidation of street furniture, pollution, road deterioration, accidents among others.

The following recommendations are thus made:

1. Government should improve on the provision of streetscape infrastructure while ensuring that quality materials are used in their construction. Only durable materials with distinct texture that enhance the life span of infrastructures and their functions should be allowed.
2. To safeguard the life and health of pedestrians, government must ensure roads are separated with bollards and walkways wide enough to allow free movement of all while private companies should be contracted to ensure cleanliness, regular and sustained maintenance of streets, pedestrian ways and streetscape infrastructure.
3. Planting of suitable street trees and shrubs along the street/road networks should be promoted to reduce the issue of heat island in the urban centre.

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