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**PEDESTRIANS' PERCEPTION ON THE ASPECT BETWEEN  
"SAFETY" AND "CONVENIENCE" IN THE USE OF PEDESTRIAN  
BRIDGES IN LAGOS STATE.**

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**Abstract**

*Traffic related deaths as a result of traffic problem is as high as other life threatening ailments such as; cancer, HIV, kidney failure and so on. Pedestrian bridges are facilities constructed for the purpose of allowing pedestrians to cross varieties of road without being exposed to the risks of accidents of any kind. Even with the provision of these pedestrian bridges in Lagos, it is observed that pedestrians still do not comply with its use. This study sought the perception of pedestrian on the paramount aspect between "safety" and "convenience" in assessing their destination, using the major pedestrian bridges along the Ikorodu expressway as a case study. Data for this study was generated from both the primary and secondary sources. The study adopted a survey technique for data generation. Five (5) pedestrian bridges were selected and used for the study (Anthony, Palmgroove, Maryland, Ojota and Ketu). Findings from this study establishes the fact that functionality of pedestrian bridge in terms of usage is low, where 65.1% of the respondents indicated that they use pedestrian bridge occasionally, also, 23.3% of the respondents sees the use of pedestrian bridges as very stressful. The study observed that the commonest reason people do not use pedestrian bridges in Ikorodu expressway is because they feel it is time consuming, stressful, and far, which exacerbate the low level of compliance. Importantly, the study establish whether there is relationship between the use of pedestrian bridge and the achievement of "safety" and "convenience" using Chi-Square ( $X^2$ ) test at 0.05 significance level. The*

*analysis suggests an association/relationship between the use of pedestrian bridge and the achievement of “safety” and “convenience” in the study area. The study concludes that pedestrian bridges are grossly under-utilized in the study area, while recommending compliance in the use of pedestrian bridge through constant public sensitization, introduction of iron barricades between road medians, periodic maintenance/renovation of pedestrian bridges, enforcement measures by relevant Government agencies, design/structural consideration for the aged and physically challenged persons, location of pedestrian bridges in traffic and accident prone areas.*

***Keywords:*** *pedestrian, bridge, compliance, safety, convenience and traffic*

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## **Introduction**

Globally, traffic related accidents involving vulnerable road users who are pedestrians portrays a critical safety threat (Huan, 2013 cited in Ibrahim, et al, 2019). Yearly, approximately 1.35 million people die in road crashes worldwide, on average of 3,380 deaths per day, with twentytwo percent of pedestrians’ death (Nwite, 2019). An estimated figure of 275,000 pedestrians die every year globally as a result of traffic collisions (WHO, 2015). Africa has assumed the regional headquarters for road crashes, due to its poor road infrastructure and poor post-accident Medicare index, securing the highest number of fatalities with an average of 27.5 death rate per 100,000 people. Nigeria is sitting high and tight on the list of most affected countries, due to her poor traffic management and lax enforcement of traffic laws, that have enabled drunk-driving, over speeding, deliberate obstruction, etc. In 2017 alone, there was a record of 66,998 crashes in Nigeria, resulting in 36,215 deaths. Lagos is a high partaker of these crashes and the consequent deaths, scoring 5th behind Niger, Kogi, FCT and Kaduna. It has a record of 3,000 road crashes, 900 injuries and 110 deaths. About 20 of these deaths involved pedestrians (Ohadugha, et al., 2017).

Pedestrian bridge is among the relatively safest facilities to preside the pedestrian traffic on urban road (Idham et al., 2018). Pedestrian bridge as a means of communication is to provide convenience, comfort and safety to its users so that there is no direct encounter between the crossers with the flow of traffic vehicles passing through the road. At the onset of the design of major

transport routes in Nigeria there was no consideration for vulnerable pedestrians who by and large are element of accident on highways (Sisiopiku and Akin, 2003). Many communities across the nation have started seeking ways to increase pedestrian activities and discourage automobile dependency, particularly for short trips in residential settings (Sisiopiku and Akin, 2003). The trend of “new urbanism,” for example, encourages developing pedestrian friendly neighborhoods, which would offer proximity of pedestrians to shared neighborhood amenities (Sisiopiku and Akin, 2003). However, one of the crucial aspect of urban road safety policy in urban areas is pedestrian road safety. Therefore, in designing these facilities, consideration must be given to pedestrians, who are the potential users to provide high level of assured confidence, efficiency, comfort, safety and security.

Pedestrians, as defined by Oxford Advanced Learner’s Dictionary are persons walking in the street and not travelling in a vehicle. Pedestrians are mostly exposed to danger especially during the week days due to the numerous activities that takes place within the week such as people’s livelihood, educational and religious activities). In locations with high population density or population-attracting activity such as school, religious, sporting facilities, etc., facilities for safe road crossing of pedestrians cannot be undermined. History has it that Pedestrians were king of the road, it took a lot of sensitization from auto mobile manufacturers to convince pedestrians to accept this development due to incessant road crashes between vehicles and vulnerable pedestrians with the fatalities estimated at approximately 1.35 million people, between 20-50 million more people suffer non-fatal injuries and permanently disabled as a result of their injuries globally (WHO, 2018). The high population and inadequacy of traffic infrastructure in developing countries have resulted in road traffic crashes and traffic congestions. Pedestrian crossing facilities such as crosswalk signalized and un-signalized, pedestrian bridges overpass underpass at an intersection or midblock which is alien to Nigeria with crossing facilities are patterned to separate pedestrians from the moving vehicles hence improving the safety of the pedestrians. Unfortunately, the pedestrians prepare to cross illegally despite the fact that the facilities are for their safety (Ibrahim et al, 2018).

Presence of facilities in a particular area helps to boost the growth of people in that particular environment. Hence the beauty of any pedestrian bridge serves

as a pull factor to its use and the area. This idea works in conjunction with the appearance, type, location, configuration and convenience of pedestrian bridge. According to Gehl (2011) as cited in Ohadugha, et al. (2017) an important form of transportation in urban areas are pedestrians. Pedestrian's need should be considered as an integral part of the road transport system. In order to see the effectiveness of the pedestrian facilities usage especially pedestrian bridges, it is necessary to assess the feasibility of facilities from pedestrian's point of view as well as the design standard requirement of pedestrian facilities, and to assess the level of its usage. However, the concept of level of services (LOS) is widely used in road traffic planning as well as in planning for pedestrian traffic and events (Kretz, et al., 2011). It is expected that there should be high level of compliance to pedestrian bridge use.

The Lagos State Environmental Sanitation Corps on patrol caught and prosecuted no fewer than ninety five (95) persons for indiscriminate crossing of highways and pedestrian across the state (Punch, 2020). A number of researches such as Ohakwe et al. (2011) as cited in Ohadugha, et al. (2017) have anticipated that the cause of pedestrian accidents are due to over speeding, bad road, drunk driving, faulty vehicles, ignorance of pedestrians to traffic rules and many more. The issue of reducing the numbers of pedestrian accident or if possible, eradicating it has been the major problem for both individuals and government. Pedestrians are usually prone to accidents and they represent 70% of traffic accidents in most developing countries (Jordan Traffic Institute, 2010). However, with the existence of pedestrian bridges in Lagos state, pedestrians as observed still do not adhere to its use.

This study was conducted leaning on the premise of "safety" and/or "convenience" in the provision of facility. It is evident that, the old pedestrian bridges in Lagos state do not meet the functional requirement but most of the recently constructed pedestrian bridges are better in terms of design features, target location and considerations for physically challenged persons. Hence, the purpose of this study is to seek the perception of the pedestrian on the paramount aspect between "safety" and "convenience" in assessing their destinations as well as assessing the level of pedestrian compliance on the use of pedestrian bridges in Lagos State. The specific objectives are to; examine the level of awareness of the usage of pedestrian bridge by pedestrians, examine the reason(s) of usage and non-usage of pedestrian bridge by pedestrians, proffer

possible solutions towards improving the level of utilization and management of pedestrian bridges, with the view to reduce the high rate of traffic accidents in the study area and Lagos state in general.

### **Statement of problem**

The fatalities and permanent disabilities suffered by pedestrians caused by incessant road crashes on the high ways is on the rise, despite the provision of pedestrian bridge by the Government at different location in the metropolis for their safety and to ease traffic congestion some pedestrians are still adamant on crossing the highways illegally. Globally, roughly 1.2 million motorised-related fatalities and fifty million traffic-related injuries occur each year (WHO, 2004). Larger percentage of these injuries and fatalities involve pedestrians, and the majority occur in developing countries. Because of the rapid increase in personal automobile use in developing countries, these numbers are projected to increase by 65 percent by 2020, thus raising traffic fatalities to the sixth leading preventable cause of death worldwide (WHO, 2004).

In spite of pedestrian bridge functioning effectively, there still exists pedestrians who cross the road without using it. An assessment of the effectiveness of bridge use reveals that it has not been utilized effectively. According to Kretz et al. (2011), only half in the number of people in Jakarta uses the bridge; everyone else crosses the street on the road pavement. The assessment of geometric feasibility emphasizes the need to improve the geometrics of sidewalk and the pedestrian bridge. This includes the width, the rise, the slope of the bridge, and the width of the sidewalk in several segment in order to increase the space provided encourage pedestrians to use the bridge. The result of this assessment demonstrates the need for facilities that accommodate pedestrians better, and for more intensive law enforcement measures to help increase the effectiveness of the pedestrian bridge and the reduction of vehicular flow impediments from pedestrian movements.

The World Health Organization (2013) asserts that, more than 270,000 pedestrians in the world lose their lives on road accidents yearly which results to 22% of the total 1.24 million road traffic death. In spite of the magnitude of problems, most efforts of minimizing pedestrian deaths had generally focused only on education and traffic regulation. Aworemi et al. (2010) discussed the major causes of road traffic accident where he stated that human, vehicle,

roadway and environment have significant contribution of about 79.4% on the road traffic accident.

It is always a sight to behold then on the ever-busy Ojota pedestrian bridge how scores of pedestrians queued to use the bridge, especially at peak hours both in the morning and evening. Pedestrian usage of the bridge was compelled by the fact that enforcement by men of the Lagos State Environmental Sanitation and Special Offences Unit (Task Force) was effective. Many people then feared the dreaded operatives of the Sanitation Corps (LAGESC). But, today, the pedestrian bridges virtually lie fallow as considerably few people now make use of the bridges. Many users of the bridges have practically abandoned them and now cross the expressway at will and unhindered,

There are about 20 pedestrian bridges on Ikorodu road alone; most of them newly built. These bridges were necessitated by incessant accidents involving people trying to cross the road. Each time that happened, the government took the blame. In other to stem the tide of these illegal crossing across the highways. According to THE NATION newspaper report of 2<sup>nd</sup> of May, 2015, being aware of the risks involved is not enough to discourage people from cross the expressways without using pedestrian bridges. Some of the reasons for not using pedestrian bridges as identified by the report include: acrophobia, lack of warning signs, health issues, structural defects (high risers – steepness), insecurity especially at night, non-consideration of physically challenged and location. Another identified problem in some major cities of Nigeria including Lagos state is that, after the construction of overpass pedestrian bridges, major barriers were put in-between high ways road dividers to discourage pedestrians from crossing illegally but over time these major barriers have been borrowed through by pedestrians. In the same vein, Tech gadget usage among young and old is on the rise, these gadgets are to enhance communication or for entertainment in the form of smart phones and other smart devices, Unfortunately, these devices are being used by pedestrians on the highways which exacerbate their judgments while crossing illegally in spite of the availability of pedestrian bridge.

### **Statement of hypothesis**

**H<sub>0</sub>:** there is no significant relationship between the use of pedestrian bridge and the achievement of safety and convenience in the study area.

### **Study area**

Ikorodu road is a long stretched expressway connecting the mainland to Ikorodu in Lagos state. It has a length of about 24.5 kilometers starting from Muritala Mohammed way after the flyover from Lagos mainland separating Mushin from Shomolu along its path, after a 4 kilometer drive the expressway interchanges with Apapa Oworoshoki Expressway or Gbagada Expressway, northward is Mobolaji Bank Anthony way immediate the interchange leading towards Computer Village and Muritala Muhammed International Airport, then makes a cloverleaf interchange with Lagos-Ibadan Expressway after this interchange, it becomes a divided arterial road all the way eastwards into Ikorodu.

### **Literature review**

Zegeer et al. (2002) in one of their publications a comprehensive guide on pedestrian facilities and pedestrian safety and mobility. The writers provided information to guide on avenues to identify mobility needs and safety for pedestrians with the roads right of way. The guide covers such topics as the walking environment including sidewalks, curb ramps, crosswalks, roadway lighting and pedestrian over and underpasses, roadway design including bicycle lanes, roadway narrowing, reducing the number of lanes, one-way/two-way streets, right-turn slip lanes and raised medians, intersections with roundabouts, T-intersections and median barriers, and traffic calming designs. Pedestrian safety is of gross priority to Governments around the world with less importance impart to convenience herewith researchers also dwell more, although there are scholastic papers on safety and convenience but none has viewed safety or convenience over the other as a priority of an average pedestrian.

In the twenty first century, death attributed to pedestrians were four thousand seven hundred and thirty nine (4739) and injuries suffered in traffic crashes were seventy eight thousand (78,000) in the United States, representing 11% of all the people died in traffic crashes and 2% of all traffic injuries. Pedestrian fatality rate is of decreasing 27% from the 6482 pedestrians killed in 1990. Most pedestrian fatalities in 2000 occurred in urban areas (71%) and at non-intersection locations (78%). Pedestrian fatalities accounted for 85% of all non-occupant fatalities in 2000. The 690 pedal cyclist fatalities accounted for 12%,

and the remaining 3% were skateboard riders, roller skaters, etc. (NHTSA, 2000).

Pedestrian safety is worse in the United States with higher pedestrian fatalities than most European countries. In their summation, annually the number of pedestrian fatalities per hundred thousand people in United States is around 2.04 FARS, and a lower crash rate based on data in Northern Europe and Central Europe country according to a report by European Transport Safety Council. Countries with lowest pedestrian fatalities are Denmark with a rate of (1.29), Sweden (0.84) and the Netherlands (0.70).

From a study conducted in Kano State it was observed that 60% of the respondents make use of pedestrian bridges and 40% of the respondents do not make use of the pedestrian bridges notwithstanding their level of education. Further enquire to the usage of the pedestrian bridges indicated that personal safety was considered to be the major reason (66%) for choosing the bridges, followed by barricades (25%) and finally due to heavy traffic (9%) while non-usage of the pedestrian bridges indicated that the height of the bridge was the reason with the highest percentage of (38.5%), followed by poor ramp design (26.7%), and beggars on the bridges are major factor discouraging (11.7%) of the pedestrians from using the bridges (Ibrahim et al, 2018).

Although considerable research has been undertaken in the very recent years to address the challenges of pedestrian safety ( Wall G. T. 2006 ; Retting et al., 2002; Tan & Zeeger, 1995; Zeeger et al., 2002; Zeeger, Stewart, Huang, & Lagerwey, 2002; Ivan et al., 2001; Road Information Program, 2001; Schieber & Vegega, 2001; Miller, 1999, 2000; Yagil G. 2000; Krabbel, Appel, & Ikels, 1998; Kronborg & Ekman, 1995; Marc et al, 1995; Pasanen & Salmivaara, 1993; Levelt, 1992).

A study by Sharples and Fletcher (2001), dealt with pedestrian perceptions of different road crossing facilities including bridges. The majority of respondents felt that: (a) convenience (easy to use and no time delay), (b) the fact that the crossing was on their route and (c) safety were the reasons for their use of the formal crossing points. These all were in broadly equal proportion. It should be noted, however, that in Sharples and Fletcher (2001)'s study pedestrian bridge was one of the nine crossing types and that the responses were collected mainly from those pedestrians who used the bridge.



Furthermore, Idham , Shirly, & Mimi, (2018), compared the usage of two pedestrian bridges located close to a market and around an educational area (elementary school), the result shows that pedestrians close to the market commute more via the pedestrian bridge (effective) more than pedestrians around the educational area (ineffective) pedestrian bridge, analyzing the interest of pedestrian bridge users convenience was ranked higher than safety, according to the non-users they feel safer using other wading facilities for crossing to the pedestrian bridge. A similar study conducted by Traffic Data Incorporated (TDI) in Columbia height, Minnesota, using two video cameras one pointing to the major four lane road the other to a pedestrian bridge over the road watched for twenty four hours, the study indicated that approximately 44% of the 170 total pedestrians and bicyclists crossed using the pedestrian bridge, that means the majority picked convenience over safety in this case. The reason for this was people tend to view the extra distance as a burden that will cause too much delay to them. With the signal providing some gaps in the traffic flow, no physical barriers to prevent the at-grade crossing, and a wide median to allow some pedestrians to cross only half of the road at a time, the safety risk may seem small to a lot of pedestrians.

More so, Ohadugha, et al. (2017) conducted a study on the “anthropometrics” (dimension of human form at different ages, class and race) and “ergonomics” (design form of bridges to reduce fatigue, discomfort or injury) of the pedestrian bridges in Minna. The study revealed that configuration of the human body especially size and relationship of space requirements are important factors to be considered in the construction of pedestrian bridges. It was discovered that the width of the old pedestrian bridges would not allow very free passage of two or more pedestrians at a time. However, the width of the new pedestrian bridges is in compliance to the principles of ergonomics. The study concluded that the design and construction of the old pedestrian bridges in Minna did not consider anthropometry as well as the population of intended users. Also, the taking off base and risers of the pedestrian bridge did not consider the aged people as well as the physically challenged (see plates 1 and 2).

### **Research methodology**

The study generated data from both primary and secondary sources. The primary data was obtained through structured questionnaires administering and

physical observation by the researcher. The questionnaire contained the socio-demographic characteristics of the respondents and other questions bordering on their perceptions for using and/or not using the pedestrian bridge. On the other hand, the secondary data were sourced from journals, periodicals, government agencies and internet. The study employed the use of purposive sampling technique, where the sampling elements (target respondents) were chosen using the criteria of those who do not make use of the pedestrian bridges. Also, the selected bridges were chosen on the premise of high traffic volume at peak hours and the rate of fatal accidents before and after the construction of the pedestrian bridges. Thus, the selected pedestrian bridges are; Palmgroove, Anthony, Maryland, Ojota and Ketu. The data for the Ojota Bus-Stop pedestrian bridge was extrapolated for the other remaining four (4) pedestrian bridges being the busiest of the five selected (5) pedestrian bridges. Therefore, the sample frame are the people (pedestrians) crossing the road within 30 meters of the Ojota Bus-Stop pedestrian bridge. Ojota pedestrian bridge was chosen because the population of pedestrians making use of the facility is considerably high compare to other selected bridges.

A reconnaissance survey was carried out before the detailed field survey, whereby an inventory of the number of people that crosses the road within 30 meters distance from the Ojota Bus-Stop pedestrian bridge was taken. This was done in the beginning of the week (Monday) during the peak hours of morning (7 – 9 am), afternoon (2 – 4 pm) and in the evening (5 – 7 pm). The inventory revealed that a total of 843 people crossed the road within 30 meters of the pedestrian bridge. Using the simplified formula for sample size proportion by Yamane Taro (1967:886) with the precision level of 90% (an allowable error of within +/- 10% of the true prevalence) at the interval of 3 respondents respectively, the sample size is eighty-nine (89), which implies an average of six (6) questionnaires to be administered each in the three stated peak periods (morning 7 – 9 am, afternoon 2 – 4 pm, and in the evening 5 – 7 pm) for the five (5) selected pedestrian bridges (Palmgroove, Anthony, Maryland, Ojota and Ketu) in the study area .

Thereafter, the field survey proper was conducted following the same three stated peak hours of the five selected pedestrian bridges along Ikorodu Express Road, so as to determine the proportion of pedestrians complying and those not complying with the use of the pedestrian bridges. The field survey was

facilitated with the assistance of 10 field survey personnel, whereby 2 persons manned each area selected for this study. Statistical Package for Social Sciences (SPSS 23) was used for the analysis, where the Likert scale and descriptive tool (simple percentage tables and weighted mean to rank analysed variables) was adopted. Also, a Chi-Square ( $X^2$ ) test was used to establish and analyse the relationship between the use of pedestrian bridge and the achievement of safety and convenience. The significant level of analysis was determined at 0.05.

### Results and discussions

Of all the 89 administered questionnaire on the socio-demographic characteristics and the perception of the respondents regarding the usage of pedestrian bridge in the study area, 86 questionnaire were retrieved from the respondents (filled and completed), the questionnaire retrieval level indicates a response rate of 96.6%. In essence, the data analysis is based on the response from the 86 retrieved questionnaires from respondents (pedestrians) crossing the road within 30 meters of the selected pedestrian bridges in the study area. Table 1 below shows the analysis of the rate of questionnaires retrieval.

Table 1: The sampled pedestrian bridges

Locations	Number of questionnaires administered	Number of questionnaires retrieved	Percentage of retrieved questionnaires
<b>Palmgroove</b>	18	17	94.4
<b>Anthony</b>	17	16	94.1
<b>Maryland</b>	18	18	100
<b>Ojota</b>	18	17	94.4
<b>Ketu</b>	18	18	100
<b>Total</b>	<b>89</b>	<b>86</b>	<b>96.6</b>

Source: Authors' Field Work, (2020)

### Socio-demographic analysis

Table 2 below spells out analysis bordering on the socio-demographic information of the respondents. The analysis on respondents' gender revealed a preponderance of female (58.1%) than male (49.1%). This is not spurious as share population of women in core areas of developing economy are house

wives that engage in home petty trading. While their husband settle for artisanship and trading businesses outside the neighbourhood to supplement family income. As regards the age structure and the marital status, respondents who were between 41 – 50 years and those who were married accounted for 37.2% and 62.8% respectively.

Most of the respondents were working in various formal and informal enterprise, either within the residential corridors or outside the neighbourhood along major routes in the study area and other areas in Lagos Island. A large proportion of the residents engaged in informal enterprises (trading and private organization). Majority are traders who engaged in private businesses, while others are in civil service. The informal sector accounts for about 72% of non-agricultural jobs in Sub-Saharan Africa, while it contributes to roughly 60% of urban jobs (ILO, 2002; UNHabitat, 2008). Meanwhile, very small proportion of the respondents (5.8% and 2.3%) were artisans and unemployed respectively. Findings shows that majority of the respondents (47.7%) passed through secondary school and 34.9% of respondents passed through primary school. While a total of 12.8% and 4.7% of the respondents had no formal education and those that had tertiary education respectively. This implies that majority of the respondents are secondary school holders. The situation further explain why majority of the residents settle for employment in the informal sector, which is a flexible and low capital form of employment that do not require special skills unlike formal employments.

Table 2: Socio-demographic analyses

Questionnaire Parameters	Variables	Frequency	Percent
Sex	Male	36	49.1
	Female	50	58.1
	<b>Total</b>	<b>86</b>	<b>100</b>
Occupational structure	Unemployed	5	5.8
	Trading	29	33.7
	Artisan	2	2.3
	Private organization	27	31.4
	Civil servant	15	17.4
	Others	8	9.3

	<b>Total</b>	<b>86</b>	<b>100</b>
Age structure	Below 20 years	2	2.3
	21 – 30 years	11	12.8
	31 – 40 years	29	33.7
	41 – 50 years	32	37.2
	51 – 60 years	9	10.5
	Above 61 years	3	3.5
	<b>Total</b>	<b>86</b>	<b>100</b>
Educational attainment	No formal education	11	12.8
	Primary	30	34.9
	Secondary	41	47.7
	Tertiary	4	4.7
	<b>Total</b>	<b>86</b>	<b>100</b>
Marital status	Married	54	62.8
	Single	22	25.6
	Divorced	1	1.2
	Separated	6	7.0
	Widowed	3	3.5
	<b>Total</b>	<b>86</b>	<b>100</b>

Source: Authors’ Field Work, (2020)

### Analysis on respondents’ perception on the use of pedestrian bridge

Table 3 presents information on respondents’ perception on the use of pedestrian bridge and how pedestrians comply with the use of this facility. A glance at the table, revealed that majority of the residents (77.9%) are aware of the risk/dangers associated with not using the pedestrian bridge. This response motivated the researcher to inquire further on how often they make use of the pedestrian bridge. 65.1% of the respondents indicated that they make use of pedestrian bridge occasionally. Also, an in-depth investigation was made to determine the reasons why people make use of pedestrian bridge, 51.2%, 23.3%, 12.8%, 7% and 5.8% of the respondents indicated safety, convenience, comfort, time saving and other reasons respectively. It was revealed that relatively high proportion of the respondents (36%) agreed that pedestrian bridge provides both “safety” and “convenience” function for pedestrians. On



Plate 1



Plate 2

the rationale for not using pedestrian bridge, 23.3%, 18.6%, 15.1%, 10.5% and 9.3% of the sampled respondents indicated that using pedestrian bridge is stressful, no reason at all, time consuming, poor design/appearance and distance respectively. However, on enforcement level for non-compliance, 37.2% of the respondents indicated that enforcement level is moderate. See plates below:

**Plate 1:** Showing the newly constructed ever-busy Ojota pedestrian bridge

**Plate 2:** Showing the old Palmgroove pedestrian bridge (with narrow passage-way)

Essentially, as shown in the analysis, by ranking using the weighted mean; several reasons for non-usage of pedestrian bridge had 4.33 weighted mean, perception of respondents on “safety” and “convenience” function of pedestrian bridge had 3.13 weighted mean, enforcement level for non-compliance had a weighted mean of 3.12, reasons for making use of pedestrian bridge had a weighted mean of 3.02, pedestrian bridge usage had a weighted mean of 2.34, while awareness on the danger in non-usage of pedestrian bridge had a weighted mean of 1.34. It is therefore, equivocal to say here that majority of the sampled respondents in the study area do not comply with the use of pedestrian bridge to get to their respective destinations. Also, there is considerably low awareness on the danger for non-usage of pedestrian bridge in the study area.

Table 3: Respondents' perception on the use of pedestrian bridge

Questionnaire Parameters	Variables	Frequency	Percent	Weighted Mean	+STD	Rank
Reasons for non-usage of pedestrian bridge	Time consuming	13	15.1	4.33	2.952	1 <sup>st</sup>
	Very stressful	20	23.3			
	No reason at all	16	18.6			
	Acrophobia	1	1.2			
	Insecurity	6	7			
	Distance	8	9.3			
	Health reason	4	4.7			
Opinion on "safety" and "convenience" function of pedestrian bridge	Poor design/appearance	9	10.5	3.13	1.509	2 <sup>nd</sup>
	Old age	4	4.7			
	Not needed in the location	2	2.3			
	Others	3	3.5			
	<b>Total</b>	<b>86</b>	<b>100</b>			
Enforcement level for noncompliance	Strongly disagreed	24	27.9	3.12	1.152	3 <sup>rd</sup>
	Disagreed	4	4.7			
	Indifference	11	12.8			
	Agreed	31	36.0			
	Strongly agreed	16	18.6			
	<b>Total</b>	<b>86</b>	<b>100</b>			
Reasons for making use of pedestrian bridge	Very low	7	8.1	3.02	1.029	4 <sup>th</sup>
	Low	18	20.9			
	Moderate	32	37.2			
	High	16	18.6			
	Very high	13	15.1			
	<b>Total</b>	<b>86</b>	<b>100</b>			

Pedestrian bridge usage	All the time	9		10.5	2.34	0.915	5 <sup>th</sup>
	Occasionally	56		65.1			
	Indifferent	4		4.7			
	Not at all	17		19.8			
	<b>Total</b>		<b>86</b>	<b>100</b>			
Awareness on the danger in non-usage of pedestrian bridge	Yes	67		77.9	1.34	0.679	6 <sup>th</sup>
	Indifferent	9		10.5			
	No	10		11.6			
	<b>Total</b>		<b>86</b>	<b>100</b>			

Source: Authors' Field Work, (2020)

### Analysis on respondents' opinion to improve on the compliance with the use of pedestrian bridges in Ikorodu expressway

Table 4 below presents information on respondents' opinion on how to achieve high compliance level in the use of pedestrian bridge. Substantial percentage of respondents (52.3%) agreed that constant public sensitization will go a long way to correct peoples' psyche on the use of pedestrian bridge, 41.9% respondents strongly agreed that the introduction of iron barricades inbetween road medians will help in this wise, 53.5% respondents disagreed that provision of sign post and other traffic signs will help, 41.9% strongly agreed that periodic maintenance/renovation of pedestrian bridges will help to make people comply in its usage. More so, those respondents who agreed that enforcement measures by relevant Government agencies will help in this regards accounted for 58.1%, 25.6% of the sampled respondents agreed that design/structural consideration for the aged and physically challenged persons will make people comply with the usage of pedestrian bridge, while as high as 52.3% agreed that location of pedestrian bridges in traffic and accident prone areas will definitely change the perception of pedestrians on the use of pedestrian bridges to gain access to their destinations.

Evidently, by ranking the variable with the highest weighted mean is the periodic maintenance/renovation of pedestrian bridges (4.00), enforcement measures by relevant Government agencies had a weighted mean of 3.77, constant public sensitization had 3.71 weighted mean, provision of sign post and other traffic signs with 3.67 weighted mean, introduction of iron barricades in-between road medians had a weighted mean of 3.31, design/structural



consideration for the aged and physically challenged persons had 3.10 weighted mean, while location of pedestrian bridges in traffic and accident black spots had a weighted mean of 2.38.

Therefore, this analysis implies that majority of the respondents believes that constant public sensitization, introduction of iron barricades in-between road medians, periodic maintenance/renovation of pedestrian bridges, enforcement measures by relevant Government agencies, design/structural consideration for the aged and physically challenged persons, location of pedestrian bridges in traffic and accident prone areas will definitely change the perception of pedestrians on the use of pedestrian bridges to gain access to their destinations.

Table 4: Public opinion on how to improve on the compliance with the use of pedestrian bridges in Ikorodu Expressway

Opinion	Variables	Frequency	Percent	Weighted Mean	+STD	Rank
Periodic maintenance/renovation of pedestrian bridges	Variables	Frequency	Percent	4.00	1.138	1 <sup>st</sup>
	Strongly disagreed	4	4.7			
	Disagreed	7	8.1			
	Indifference	10	11.6			
	Agreed	29	33.7			
	Strongly agreed	36	41.9			
	<b>Total</b>	<b>86</b>	<b>100</b>			
Enforcement measures by relevant Government agencies	Variables	Frequency	Percent	3.77	1.002	2 <sup>nd</sup>
	Strongly disagreed	6	7			
	Disagreed	2	2.3			
	Indifference	13	15.1			
	Agreed	50	58.1			
	Strongly agreed	15	17.4			
	<b>Total</b>	<b>86</b>	<b>100</b>			

Constant public sensitization	Strongly disagreed	1	1.2	3.71	0.956	3 <sup>rd</sup>
	Disagreed	12	14			
	Indifference	13	15.1			
	Agreed	45	52.3			
	Strongly agreed	15	17.4			
	<b>Total</b>	<b>86</b>	<b>100</b>			
Provision of sign post and other traffic signs	<b>Variables</b>	<b>Frequency</b>	<b>Percent</b>	3.67	1.132	4 <sup>th</sup>
	Strongly disagreed	6	7			
	Disagreed	46	53.5			
	Indifference	7	8.1			
	Agreed	10	11.6			
	Strongly agreed	17	19.8			
	<b>Total</b>	<b>86</b>	<b>100</b>			
Introduction of iron barricades in-between road medians	<b>Variables</b>	<b>Frequency</b>	<b>Percent</b>	3.31	1.710	5 <sup>th</sup>
	Strongly disagreed	22	25.6			
	Disagreed	13	15.1			
	Indifference	3	3.5			
	Agreed	12	14			
	Strongly agreed	36	41.9			
	<b>Total</b>	<b>86</b>	<b>100</b>			
Design/structural consideration for the aged and physically challenged persons	<b>Variables</b>	<b>Frequency</b>	<b>Percent</b>	3.10	1.320	6 <sup>th</sup>
	Strongly disagreed	12	22.1			
	Disagreed	19	4.7			
	Indifference	18	20.9			
	Agreed	22	25.6			

	Strongly agreed	15	17.4			
	<b>Total</b>	<b>86</b>	<b>100</b>			
Location of pedestrian bridges in traffic and accident black spots	<b>Variables</b>	<b>Frequency</b>	<b>Percent</b>	<b>2.38</b>	<b>1.29</b>	<b>7<sup>th</sup></b>
	Strongly disagreed	15	17.4			
	Disagreed	8	9.3			
	Indifference	11	12.8			
	Agreed	45	52.3			
	Strongly agreed	7	8.1			
	<b>Total</b>	<b>86</b>	<b>100</b>			

Source: Authors' Field Work, (2020)

### Restatement of Hypotheses

**H<sub>1</sub>**: there is significant relationship between the use of pedestrian bridge and the achievement of safety and convenience in the study area.

**H<sub>0</sub>**: there is no significant relationship between the use of pedestrian bridge and the achievement of safety and convenience in the study area.

### The Relationship between pedestrian bridge usage and the achievement of safety and convenience in Ikorodu expressway, Lagos

Table 5 below shows the Chi-Square ( $\chi^2$ ) analysis on the relationship between the use of pedestrian bridge and the achievement of safety and convenience in the study area. The analysis in table 5 shows that the calculated value i.e. the 'p' value (0.000) is less than the chosen significance level i.e. Alpha value ( $\alpha = 0.05$ ), then the null hypothesis (**H<sub>0</sub>**) is rejected. Rather, it can be concluded that there is enough evidence to suggest an association/relationship between the use of pedestrian bridge and the achievement of "safety" and "convenience".

Table 5: Chi-Square Tests on the relationship between pedestrian bridge usage and the achievement of safety and convenience in Ikorodu expressway, Lagos

	Value	df	Asymptotic Significance (2-sided)
<b>Pearson Chi-Square</b>	46.596 <sup>a</sup>	12	.000

<b>Likelihood Ratio</b>	47.561	12	.000
<b>Linear-by-Linear Association</b>	.996	1	.318
<b>N of Valid Cases</b>	86		

a. 15 cells (75.0%) have expected count less than 5. The minimum expected count is .19.

### Conclusion

From the foregoing, this study obviously revealed that considerably high percentage of pedestrian choose not to make use of pedestrian bridges despite being aware of the risk/dangers in not complying with the usage, making these facilities grossly under-utilized in some parts of the study area. Consequently, this implies low level of compliance as a result of the reasons discussed earlier. However, in order to improve the level of compliance in the use of pedestrian bridges in Lagos State, the study recommends that; constant public sensitization should be initiated, introduction of iron barricades in-between road medians, periodic maintenance/renovation of pedestrian bridges, enforcement measures by relevant Government agencies, design/structural consideration for the aged and physically challenged persons, location of pedestrian bridges in traffic and accident prone areas to change the psyche of pedestrians on the use of pedestrian bridges to gain access to their various destinations. All these measures will help in reducing the high rate of traffic accidents in the study area and Lagos state in general.

### References

- Aworemi, J. R., Abdul-azeez, I. A., Olabode, S.O., (2010). Analytical study of the causal factors..of..road..traffic..crashes..In...southwestern...Nigeria"...International..Research..Journals..Educational...research...1(4)118- 124....Available...online: <http://www.interestjournals.org/ER>
- Gehl, Jan (2011). Life between buildings, Washington DC: Island Press. Highway Capacity Manual: Special Report 209. Transportation Research Board, National Research Council, Washington, D.C., 1997.
- Huan, M, Yang, X. B. and Jia, B. "Crossing reliability of electric bike riders at urban intersections," Math. Probl. Eng., vol. 2013, 2013.
- Ibrahim Khalil Umar, Samir Bashir, Abba Alfanda and Abdulwarith Ibrahim Bibi Farouk (2018): Pedestrian's Utilizations of Footbridge in Kano-Nigeria. ALKU Journal of Science 2019, Vol 1(1): 33-39.

- Idham Syarifudin, Shirly Wunas, and Mimi Arifin (2018): The Effectiveness Of The Utilization Of Pedestrian Bridge (On Perintis Kemerdekaan Road in Makassar City) IOSR Journal of Mechanical and Civil Engineering (IOSR-JMCE) e-ISSN: 2278-1684, p-ISSN: 2320-334X, Volume 15, Issue 4 Ver. III (Jul. - Aug. 2018), Pp 21-25 [www.iosrjournals.org](http://www.iosrjournals.org)
- ILO, 2002; Jantjie. Xaba, Pat. Horn, Shirin. Motala and Andrea. Singh: Informal sector in Sub-Saharan Africa. ILO Working Papers from International Labour Organization. [http://www.ilo.org/public/libdoc/ilo/2002/102B09\\_212\\_engl.pdf](http://www.ilo.org/public/libdoc/ilo/2002/102B09_212_engl.pdf). (application/pdf). 17/04/2021. Jordan Traffic Institute (2011). "Traffic accident statistic report for the year 2000-2011". Ministry of Interior, Jordan (BtGA)
- Khisty, C. J. (1993): Evaluation of Pedestrian Facilities: Beyond the Level-of-Service Concept. In Transportation Research Record 1438, TRB, Washington, D.C., 1993, pp. 45-50.
- Kretz, T., Hengst, S., ROCA, S., Arias, A.P., Friedberger, S., Hanebeck U.D, (2011). "Calibrating dynamic pedestrian route choice with an extended range transportation system". Computer vision work (ICCV Workshop), IEEE International conference. 166-172.
- Nwite, (2019): Sanwo-Olu's Lagos and the Menace of Suicidal Nigerians who Refuse to Use..Pedestrian...Bridges...Retrieved...from: <http://saharareporters.com/2019/07/16/sanwo-olus-lagos-and-menace-suicidal-nigerians-who-refuse-use-pedestrian-bridges-samuel-on> 18th March, 2021
- National Highway Traffic Safety Administration (NHTSA), (2000): Safety Recall Campaigns...Retrieved..at...<https://one.nhtsa.gov/About-NHTSA/Press-Releases/2000/ci.NHTSA-Publishes-List-Of-September-2000-Recalls.print>. On 16th March, 2021.
- Ohadugha, C. B., Okafor, O. J., Anozie, R. N., Akande, S. O and Ndana M., (2017): Assessing the level of compliance to the use of pedestrian bridges in Minna, Niger State. Department of Urban and Regional Planning, Federal University of Technology, P.M.B. 65 Minna Niger State.
- Ohakwe, J., Iwueze, I. S. and Chikezie, D.C. (2011). Analysis of Road Traffic Accidents in Nigeria: A Case Study of Obinze/Nekede/Iheagwa Road in Imo State, Southeastern, Nigeria. Asian Journal of Applied Sciences, 4: 166-175.
- Punch Newspaper, (2020). COREN probes Enugu pedestrian bridge collapse. Retrieved from: <https://punchng.com/coren-probes-enugu-pedestrian-bridge-collapse/> on: 16th March, 2021
- Samuel Nwite, (2019): Sanwo Olu; Lagos and menace suicidal Nigerians who refuse to use pedestrian bridges. <http://saharareporters.com/2019/07/16/sanwo-olus-lagos-and-menace-suicidal-nigerians-who-refuse-use-pedestrian-bridges-samuel..In...Sahara> Reporters. Accessed on 21<sup>st</sup> May, 2020.
- Sharples J M and Fletcher J P., (2001): Pedestrian perceptions of road crossing facilities. The Scottish Executive Central Research Unit. The Scottish Executive Central Research Unit.
- Sisiopiku V. P and Akin D (2003): Pedestrian behaviors at and perceptions towards various pedestrian facilities: an examination based on observation and survey data. Transportation Research Part F 6 (2003) 249–274
- Sisiopiku V. P and Akin D (2000): Assessment of Pedestrian Crossing Options.

- The Nation Newspaper; 2nd May (2015). “Why we prefer crossing express to using pedestrian bridges” Retrieved from [www.thenationonline.net/suicide-mission-why-we-prefer-ww-crossing-express-without-using-pedestrian-bridges/](http://www.thenationonline.net/suicide-mission-why-we-prefer-ww-crossing-express-without-using-pedestrian-bridges/) on 3/4/2020. UN-Habitat, 2008: World Cities Report/ Urbanization and Development: Emerging Futures.
- World Health Organization, (2018): Global status report on road safety 2018. Retrieved at: <https://www.who.int/publications/i/item/9789241565684>. 17<sup>th</sup> June 2018 Report..On 16/08/2020
- World Health Organization (2015) “Global status report on road safety 2015. Geneva: WHO.” 2015.
- World Health Organization (2013). “More than 270 000 pedestrians killed on roads each year”...retrieved...from:  
[http://www.who.int/mediacentre/news/notes/2013/make\\_walking\\_safe\\_201305\\_02/en/](http://www.who.int/mediacentre/news/notes/2013/make_walking_safe_201305_02/en/). On 14/04/2020.
- World Health Organization (2004): Road safety: a public health issue. Retrieved from: [https://www.who.int/features/2004/road\\_safety/en/](https://www.who.int/features/2004/road_safety/en/). On 14/04/2020
- Yamane, Taro. 1967: Statistics, An introductory Analysis, 2<sup>nd</sup> Edition., New York: Harper and Row.
- Zegeer, C.V., 2002. Pedestrian facilities users guide: providing safety and mobility, Diane publishing.
- Zegeer, C.V., I. Sandt, M. Scully, M. Ronkin, M. Cynecki, P. Lagerwey, 2006. How to develop a pedestrian safety action plan. University of North Carolina, highway safety research center, pedestrian and bicycle information center.