

Rest Stop Realities: Analysing Design, Typology, And Driver's Perceptions of Rest Stops Amidst Nigeria's Poor Road Management

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Abstract

The poor implementation of road laws and policies in Nigeria, along with high airfare costs and prevailing insecurities, has created significant challenges for drivers, leading to fatigue and accidents. The lack of well-designed rest stops for long-distance travelers exacerbates these issues. This research analyzes the design and typology of rest stops and how these factors influence driver perceptions and usage patterns in Nigeria. By examining the interplay between rest-stop infrastructure and road management issues, this study highlights existing gaps and proposes recommendations for enhancing travel experience and safety on Nigerian roads. A mixed-methods approach, utilizing both quantitative and qualitative research strategies, was employed. Secondary data were gathered through direct observation and relevant documents from previous studies. Findings indicate that drivers perceive rest stops on Nigerian highways as poorly distributed, with a mean response of 1.84, significantly lower than the criterion mean of 3, and a low standard deviation indicating consistent responses. Although the Federal Road Safety Corps (FRSC) is responsible for enforcing prohibitions on highway parking and establishing designated parking areas, the provisions for highway rest stops have not been effectively promoted or implemented. To mitigate fatigue-related accidents, the study recommends encouraging resting through, repositioning, and refocusing the FRSC and other law enforcement agencies. Incorporating drivers' preferences into rest stop design such as providing facilities for driver exchange, opting for single-story layouts, implementing outward-oriented designs for improved visibility, and designing segregated parking areas for larger and smaller vehicles could improve driver perceptions and encourage the use of rest stops.

Keywords: Rest-stops: typology: Accidents

Introduction

Incessant road traffic crashes on Nigerian roads are very perturbing. Like a hydra-headed monster, these auto accidents on Nigerian highways have snuffed out the lives of many promising youngsters and sent many illustrious citizens to the great beyond. Thousands of Nigerians have become permanently deformed and disabled due to the loss of one body part or another in road accidents they were involved in at various times. It is alarming that auto crashes, especially on Nigerian highways, are on the rise daily, showing no sign of abetting. On the one hand, the frequent crashes have also become stumbling blocks towards achieving national

security in the country. The latest Nigeria's National Security Strategy 2019, a document produced by the Office of the National Security Adviser, Babagana Monguno, recognised land transportation as a vital aspect of the socio-economic well-being of Nigeria. It is a major facilitator of growth and development and promotes manufacturing, food security, industrial development, tourism, education, health and socio-economic development, thus making it an enabler of national security. The land transportation system covers about 204,000km of roads and accounts for over 80 per cent of the national transportation needs, but the roads are very bad (plate 1) (Olugbenga, 2016).



Plate 1. A Nigeria road at Sango Ota Tollgate, around Lagos
Source: Opinion - (Olugbenga, 2016).

MOST times, we have good ideas and our policy makers, as always, would come up with programs we thought would advance our causes in good directions. But at the end, we fail because of poor and bad implementations, misplaced priorities, disrespect by the affluence and privileged circumstances. Geographically, Nigeria covers a wide expanse of land requiring that we should have adequate to enough road networks to serve the exploding population. Unfortunately, we are still contending with most of the major roads put in place by our colonial masters, narrow and squeezing. Our supposedly ultra modern roads, built from the 1970s, are not particularly wonderful and some of them are death traps. Our people are being killed on them in thousands every year and we are not bothered.

To manage these roads and our road users, our policymakers came up with different programs and agencies including, but not limited to, the Federal Road Safety Commission, FRSC, the Federal Road Maintenance Agency, FERMA, all kinds of both state and local government traffic control programs and personnel, yet lives are lost on our roads in thousands because of our carelessness and lackadaisical behaviors. The paradigm shift from our narrow colonial roads to ultra-modern roads of the 1970s and all the traffic control programs and personnel associated with them are nothing but false paradigm.

This is not to criticize the programs because it is not good and appreciated when criticized, but criticism is healthy when it attracts changes and developments. If we want growth and changes in these programmes, we must all get involved, speak with one voice and move towards one goal and would not allow any distraction or divides in the programs. The programmes are good, but poorly implemented and heavily influenced by the privileged. The questions are: What are the jobs of the FRSC, the FERMA, all the state and local government traffic control programs and personnel while we have: Potholes on almost all our roads, except, maybe, inside the Abuja Capital City (Obiadi, 2013).

Moving products services and individuals from one location to another is essential for sustaining a strong economic and political link across regions and domains. However, the movement that occurs might be specific to the region and technological advancement, but the necessities stay constant (Falola et al, 1986). According to Kayode (2015), road transportation in Nigeria has remained the most popular method of transportation, thus becoming the most extensively utilized medium of transportation for people, services, and products, due to the drawbacks associated with the other two media (air and water). A pretty strong system of highway network and a good number of transport operating businesses with up-to-date cars, as well as its economic viability, has firmly placed road transportation for people and even freight at the forefront of transportation activities among other available options (Ofordile, 1994). This prompted Adebayo and Olamigoke (2013), to conclude that road transportation permeates the human environment more deeply than other modes of transportation. As a result, it may be argued that road transportation expands economic opportunities, boosts agricultural production, revitalizes commerce, and has a favorable influence on the urbanization process of any region. Other modes of transportation, such as air, train, and water, might have contributed, but they are either prohibitively dear or inactive. therefore, road transportation has significant and complementary roles in keeping the economy running. Road transportation could hence be seen as the lifeblood of a local region and by extension, a growing economy (Olubomehin, 2012).

Trucks, buses, trailers, and other autos facilitate road transportation, as well as walking or using animals such as horses, camels, and donkeys. The demand for trucks, buses, trailers, and other vehicles as mediums for road transportation may be traced back to the requirement to convey a significant number of products, people, and services, particularly on long-distance excursions (Ogunbodede, 2008). Because this study focuses mostly on land transportation services in Nigeria, it will look at the transportation activities of both drivers and passengers when they stop at highway rest areas in the country's south-eastern states of Nigeria on their approach to Lagos.

Over time, the methodical progression from the path to the road, from streams and rivers to seas, and from train to the sky has expanded the area for human movement and means of transportation (Mkpuma, 2002). Furthermore, according to De Chiara and Callender (1983), the rise and development of road transportation has coincided with breakthroughs in mobility technology as well as the enhancement and extension of the national highway system. Fabuyi (2002), underlined that modes of transportation have evolved over time, and with the development of technology, they have become a supporting tool for humanity's survival. According to these beliefs, this marked the beginning of rest zones throughout the highway network to improve commuter comfort.

Consequently, as the highway network expanded, more suitable transportation equipment became available, and routes became longer, covering greater distances, the need for places where passengers and drivers could rest and recover from the fatigue associated with long-distance travels, as well as obtain services for their automobiles, became critical. According to the World Report on Road Traffic Injury Prevention, over 1.2 million people are killed in road collisions each year, with up to 50 million wounded. Many factors contribute to this high percentage, including drinking, irresponsible driving, bad road conditions, and so on. However, tiredness is a developing latent safety hazard in the road transport business today (for both drivers and passengers), and it is difficult to notice and diagnose (Munala and Maina, 2012). As a result, rest stops were established along roadways. A road rest stop, also known as a roadside rest stop or travel plaza in certain countries, is a public facility or space on highways and roads where drivers and passengers may relax to alleviate driver fatigue while on the road. According to Lina (2014), it might be described as a spot for drivers to stop for fuel refills and or to relax and have a snack, hence improving the trip experience, as shown in plate 2 below.



Plate 2. Aerial view, Bottrop rest area on the A2 motorway with truck parking, Ruhr area, North Rhine-Westphalia, Germany

Source: Rest stop, (retrieved June 18, 2022)

Furthermore, the Queensland Department of Main Roads (2014) defines a rest stop as a roadside development that provides essential services for the safety, comfort, and convenience of all users of a limited access road, adjacent to or near, and with direct or indirect access to the limited access road. Rest-stops are also crucial for safeguarding lives and properties in road

transportation since they encourage users to take breaks to prevent or lessen accrued weariness and to reduce the likelihood of vehicles running out of gasoline and other services, in addition to boosting and enhancing the travel experience.

According to Munala and Maina (2012), the concept of establishing road rest areas is founded on the assumption that road users may alleviate fatigue, frustration, and monotony associated with road transportation by breaking up their journey with frequent stops on a frequent basis. According to Obiadi (2015), abuse of road infrastructure, such as parking along highways, hawking, and roadside repair and maintenance activities, exacerbates the problems that road users face, coupled with the recently increasing numbers of checkpoints on the Nigerian highway, creating traffic congestion. As a result, rest stops could provide additional opportunities for travelers to safely pull over and rest, reenergize, obtain travel information, and enjoy the unique character of the regions through which they travel (Policy on Safety Rest Areas for the National System of Interstate and Defense Highways, 1958). A road service and support center may also include water fountains, vending machines, pay telephones, bathrooms, petrol stations, restaurants, or convenience shops (Reed, 2008).

Rest places along highways, According to Lina (2014), are enormous complexes that include cafés, restaurants, motels, or small hotels as well as areas designated for open-air recreational activities. In addition, such complexes include automobile maintenance and repair facilities, a gas station, and a shop. Rest places are scarce in certain countries, such as Spain, therefore motorists are directed to enterprises that serve both the traveling public and the local population, but entry to a rest area is only feasible via a freeway in others (Lina, 2014). Road service and support centers are called by several titles such as 'motorway rest area', 'safety rest area', and 'rest stop' 'Autobahn,' 'Raststätte' in Germany, Rasthof 'or 'Autohof' in Australia, 'Travel plazas' in Asia, and transit parks by the Nigerian shipper's council (Ortise, 2017).

As seen earlier, the poor implementation of the road laws and policies in Nigeria, the high cost of airfare as well as insecurities, already created lots of abnormalities on the Nigerian roads which inclusive of other factors, build up fatigue in drivers on the Nigerian road and lead to accidents. This has increased the yearning for places that would allow these drivers to rest, rejuvenate and in turn increase their alertness to continue safely on their journey, hence reducing the prevalence of fatigue-related accidents, which is a contributing factor to road accident in Nigeria.

Statement of the Problem

Despite the critical role rest stops play in providing comfort and safety for drivers on long journeys, they receive low patronage, stemming from dysfunctional designs, inadequate facilities, and Poor Road management practices. This has led to low patronage of rest stops by drivers, who do not perceive these facilities as safe or suitable, thus driving longer than required and hence contributing to thousands of deaths among drivers and their passengers due to fatigue, which could have been prevented by just resting.

Aim

This research aims to analyze the design and typology of rest stops, exploring how these factors influence long-distance driver perceptions and usage patterns in Nigeria. By examining the interplay between rest-stop infrastructure and road management issues, this study highlights the gaps and proposes recommendations for enhancing the overall travel experience and safety of long-distance journeys on Nigerian roads.

Research Methodology

The disciplinary area of focus in this work is the fatigue-related road accidents on Nigerian roads, the case of bad roads, and poor management practices by the government road management agencies as such, the instrument of more than two research strategies; quantitative and qualitative research methods and their tactics were used. Secondary data were based on direct observation and relevant documents from previous studies on the related matter.

Findings

Building typology refers to the categorization of buildings according to their essential characteristics. In architectural discourse, building typology refers to the classification or categorization of buildings based on their form, function, usage, or architectural characteristics. It helps architects, urban planners, and researchers understand different building types and their specific attributes.

The study of building typology traces back to ancient architectural treatises, where Vitruvius, in his work "De Architectura," categorized buildings according to their functions and proportions. Throughout history, scholars and architects have contributed to the development of typological studies, with notable works such as "The Seven Lamps of Architecture" by John Ruskin and "Space Syntax: The Geometry of Urban Layouts" by Bill Hillier and Julienne Hanson. Building typology plays a crucial role in shaping architectural discourse and urban development strategies. By understanding the characteristics and requirements of different building types, architects and urban planners can design more contextually relevant and sustainable environments. Typological studies also inform preservation efforts, helping to identify and conserve architectural heritage. In contemporary design practice, building typology serves as a valuable tool for architects and designers to analyze precedents, generate design concepts, and optimize spatial layouts. By studying successful examples within a typological category, designers can leverage proven strategies and solutions while adapting them to specific project requirements. Moreover, advancements in digital technologies and data analysis have facilitated the exploration of complex typological relationships and the development of parametric design tools.

Reststop buildings play a pivotal role in providing travelers with essential amenities, comfort, and a brief respite during their journeys. The concept of rest stops dates back centuries, with ancient civilizations establishing stations along trade routes for weary travelers. However, the modern rest stop as we know it emerged in the early 20th century alongside the proliferation of automobiles and highways. with the advent of automobile travel and the construction of

interstate highways. Historical studies highlight the transition from basic roadside facilities to designed rest areas, reflecting changes in transportation modes and societal needs.

Designing rest-stop buildings according to Anderson and White (2010) involves balancing aesthetic considerations with functional requirements. It further emphasizes the importance of user-centric design, accessibility, safety, and integration with the surrounding landscape. Studies also explore the spatial layout, circulation patterns, and amenities offered within rest stop complexes, such as restrooms, food services, picnic areas, and information centers Anderson and White (2010).

Wang and Ryan (2014) identified distinct design typologies associated with different interstate highways, ranging from traditional vernacular styles to contemporary and thematic designs. Joanna, (2021) noted that basic rest stops were designed around a central architectural theme which was established in the toilet building and then reflected in the other structures, most commonly picnic and information shelters. Rest stop structures, and the sites as a whole, were designed to be both functionally and aesthetically satisfying, creating environments that were at once relaxing and engaging which usually meant that the buildings had basic geometries and had single floors as shown in plates 3 and 4 below.



Plate 3. Rest room building at I55 Illinois highway, United States Of America,
Source: Joanna, (2021)



Plate 4. I61 east Bound Rest Stop At Kentucky, United States Of America
Source: Joanna, (2021)

Recent developments have seen rest stops develop into commercial developments, as shown in plates 2, 5, and 6, having several amenities catering to the needs of travellers. This service includes traditional facilities such as restrooms, restaurants, and picnic areas, as well as malls, sickbays and maintenance workshops, gas stations, hotels, motels, playgrounds, information centers, and malls. This has seen more recent rest stops become more of a complex, with multiple floors, as well as multiple buildings, serving different purposes, and having clear expectations of use. With a façade expressive of different functions, and is designed to captivate travellers while creating scenic views. This expansion, in the scope of facilities and functions of rest stops, has also necessitated the need for several security measures to be deployed to lives and properties as well as help in creating rooms for driver's exchange where fatigue could be properly relieved. (Ezezie, et al 2019). The typology could be therefore said to be dynamic and align with its function. Seeing these stop areas gives special joy to the travelers and most times, their perceptions are interpreted differently, but all boils down to something good,



Plate 5. Façade view of Kariya rest stop Japan
Source: <https://www.bing.com/images/>



Plate 6. Aerial view, Iowa 80 truck stop, United States of America
Source: <https://www.bing.com/images/>

Perception, according to Schacter (2011) is the process of organizing and interpreting sensory information to understand the world around us. User perception is a critical aspect of research, as it can impact user satisfaction, usability, and overall user experience. Perception serves as a gateway to cognitive processing, influencing how individuals acquire, interpret, and integrate sensory information. Qiong (2017), hence noted that perception is the process of attaining awareness or understanding of sensory information around us. Therefore, Perception could be said to serve as the foundation upon which humans navigate and make sense of the world

around them. Perception studies, encompassing a diverse array of disciplines, hold immense importance in unraveling the intricacies of human cognition, behavior, and societal dynamics.

User perception is the process by which sensory stimulation is translated into organized experience. User perception plays a pivotal role in determining the success or failure of a project, business, product, or service. Understanding how users feel while interacting with a project, business, product, or service is essential for creating memorable and engaging experiences.

Understanding users' perceptions has emerged as a pivotal aspect across diverse disciplines, driving research endeavors and shaping organizational strategies. In marketing, understanding consumers' perceptions is fundamental for crafting effective marketing strategies geared toward increasing sales. According to Kotler and Keller (2016), consumers' perceptions significantly influence their purchasing decisions, brand loyalty, and overall satisfaction. By delving into consumers' perceptions, marketers can tailor their offerings to meet consumers' needs and preferences, thereby gaining a competitive edge in the market.

Psychological research emphasizes the role of perceptions in shaping individuals' attitudes, behaviours, and emotions. As noted by Festinger (1957), an individual's perceptions of their environment profoundly impact their cognitive dissonance and subsequent actions. Understanding users' perceptions enables psychologists to comprehend human behavior more comprehensively, facilitating interventions and therapies aimed at fostering positive outcomes.

Perception profoundly influences architectural design decisions, as architects strive to create spaces that evoke specific emotions and responses in users. According to Pallasmaa (2005), architecture is experienced through the senses, and understanding how users perceive space informs design choices regarding scale, proportion, light, and materials. Perception studies provide architects with valuable insights into how users interact with their surroundings, enabling them to design spaces that resonate with human experience. Environmental psychologists such as Gifford (2007), emphasize the reciprocal relationship between the built environment and human behavior, highlighting the impact of architectural design on mood, productivity, and well-being. By integrating findings from perception studies and environmental psychology into their practice, architects can create environments that promote health, comfort, and productivity as well as leave positive impressions on users. perception studies are indispensable to architectural practice, guiding design decisions, and enhancing user experience. By embracing insights from perception research, architects can create spaces that are not only aesthetically pleasing but also functional, sustainable, and enriching for users. Moving forward, continued integration of perception studies into architectural education and practice is essential for advancing the field and creating built environments that positively impact society.

Rest stops, often considered an oasis for weary travelers on long-distance journeys, are expected to provide a haven of convenience and comfort. However, the review of the operational National transport policy in Nigeria as noted by Ezezue et al (2019) has revealed that no provision was made for the establishment of rest stops on highways in Nigeria. from observations, since there are no structured rest stops, several negative aspects significantly detracted from the overall experience of what a rest stop should be from the places currently being used by travelers in Nigeria.

From observations, the majority of these places are privately owned and operated and are either restaurants, fuel stations, or service stations, they had basic restaurant design spaces and parking. However, because of the unstructured nature of most of these places, they barely meet the needs of the drivers, and or have enough parking to accommodate the volume of guest they host, during peak periods. This lack of sufficiency in amenities could also be seen in the interior spaces, where few seats and eating tables were provided. The majority of the rest stops lacked essential amenities that are expected to be standard. Insufficient seating, limited shaded areas, absence of scenic views to captivate visiting travellers, this contributed to a subpar experience. Travellers rely on rest stops for a break from the road, and the absence of basic amenities diminishes their utility, leaving visitors also fatigued and frustrated (plates 7 to 10).



Plate 7. Picture Showing Interior Of Food Way
Source: Kikanme, 2023

One of the first disconcerting observations was the lack of cleanliness in the restrooms. Despite being a public space, some facilities were poorly maintained, with overflowing trash bins, wet floors, unpleasant odor and privacy concerns. Clean and well-kept restrooms are essential for the well-being of travelers, and neglecting this aspect can lead to discomfort and dissatisfaction.



Plate 8. Picture Showing Interior of a rest stop's unhygienic urinal
Source: Kikanmen, 2023

Furthermore, some rest stops exhibited inadequate security measures, creating a sense of unease among visitors. Poor lighting in parking areas, lack of surveillance cameras, and absence of security personnel heightened the vulnerability of both travellers and their belongings, as well as poor safety for pedestrians within the area.



Plate 9. Exterior of a rest stop without any clear separation between pedestrian and vehicular users
Source: Kikanmen 2023

Ensuring the safety of those using rest stops should be a top priority to foster a secure environment. On inquiry as to the motive for stopping by drivers, some respondents noted that several factors influenced their choice of stopping, which includes, the need to rest from the

monotony of staying within a confined space over a long distance and obtaining services for their vehicles also some drivers noted that their stopping at a rest stop was motivated by their passengers.

The choice of where they choose to stop also was influenced by incentives placed by the operator of most fast-food outlets, which encouraged drivers to stop for their passengers to patronize them, with the hopes of getting free meals. In addition, safety and access to services such as restrooms, and service stations also occupied some of the reasons why they choose a particular rest place.

The research noticed that most drivers drive more than 4 hours before taking a break, which is above the standard driving time,



Plate 10. Exterior of Foodway Rest Stop
 Source: Kikanme (2023)

From observations, few drivers agreed to the fact that they do not stop while traveling noting that there was no reason to stop as they had all the services they could need before embarking on the journey. This meant that they drove more than 6 ours without taking a break.

In this research study, the primary data collection method used in this research work was by the administration of questionnaires. The data collected from the respondents through the questionnaire administration are presented below.

Table 1: Socio-demographic characteristics of the respondents

	Frequency	Percent
<i>Age group</i>		
15 -30	11	5.7
31 – 40	31	16.0
41- 50	133	68.6
51 – 60	3	1.5
above 60	16	8.2

Gender		
Male	194	100.0
Level of Education		
Primary school and complete	30	15.5
Secondary school and complete	149	76.8
University and complete	15	7.7
Years of experience driving		
2 - 5 years	35	18.0
6 - 10 years	11	5.7
11 - 15years	129	66.5
Above 15 years	19	9.8
Frequency of long-distance travel		
Daily	129	66.5
Weekly	17	8.8
Monthly	13	6.7
Occasionally	35	18.0
Frequency of rest stop use while travelling		
Rarely	12	6.2
Always	129	66.5
Passenger's induced	19	9.8
Never stop	34	17.5
Type of vehicle		
A minivan (conventional type: sienna, homer bus, hiace, etc)	164	84.5
Coaster bus	20	10.3
Others	10	5.2
Type of employment as a driver		
Full time	145	74.7
Part time	49	25.3

According to the data shown in Table 1, the majority of the respondents, which accounts for 68.6% of the total, fall within the age range of 41 to 50 years, and all of the respondents are male. The vast majority of responders (76.8%) have completed their secondary education, which meant they could understand and communicate in basic English. 66.5% of them have between 11 and 15 years of experience behind the wheel. Over sixty-six percent of them travel long distances on a daily basis, and sixty-six and a half percent (66.5%) of them always utilize the rest stop. This showed a reasonable knowledge of the use of what a rest stop is, and corroborates the research by Ezezue, et al, (2019) whose study showed that 95.7% of respondent drivers prefer using rest stops while on their journey. Eighty-four point five percent (84.5%) of drivers are full-time drivers, and the most common kind of vehicle that they drive is a minivan category (this includes traditional models such as the Sienna, Homer Bus, and Hiace, among others).

The data on the prevalence of fatigue-related road accidents in Nigeria over recent years indicates significant fluctuations.

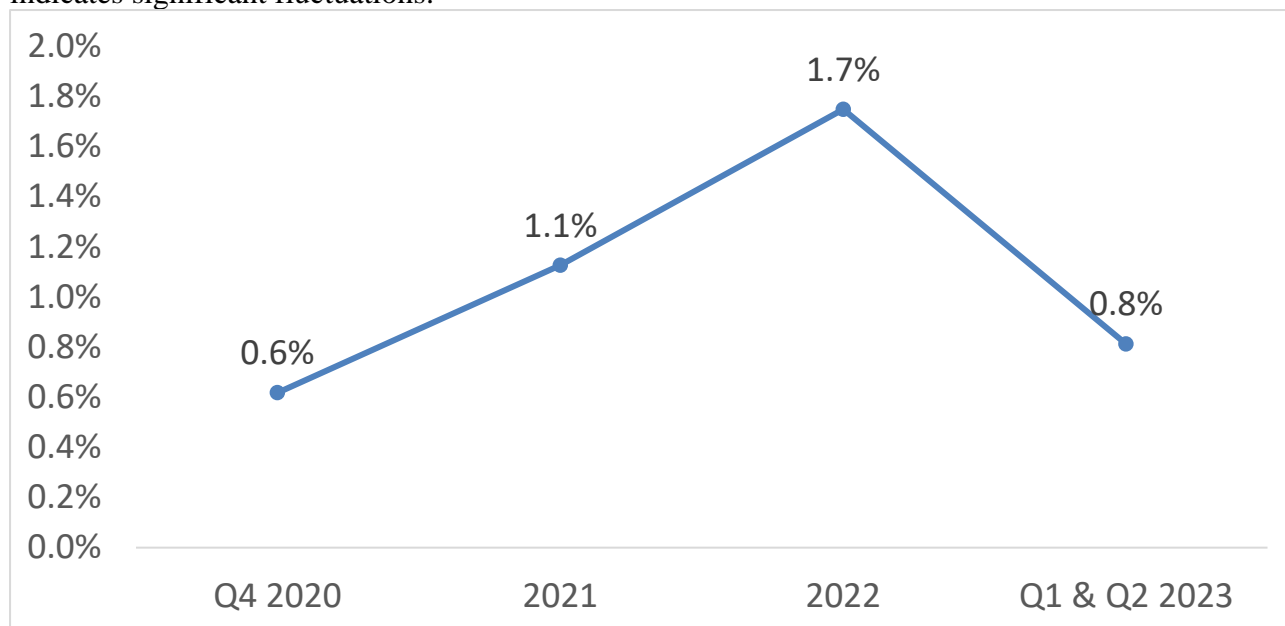


Fig 1: Prevalence of fatigue-related road accidents in Nigeria

Figure .1 shows that in the last quarter of 2020, the prevalence of fatigue-related road accidents in Nigeria was 0.6%, . It increased to 1.1% in 2021 and further increased to 1.7% in 2022 before decreasing to 0.8% in the 1st and 2nd quarters of 2023. suggesting a worsening situation. Recall that travel increases significantly during the festive seasons, therefore it is expect that by the time the 2023 full year data is available, it will show a significant increase in fatigue-related road accidents from 2022 to 2023. This result however answers the research question 1 noting that there is a prevalence of fatigue-related accidents in Nigeria and it is on an increasing trajectory, hence steps needs to be taken to mitigate it.

Table 2: Capacity and Location of rest areas

<i>Name of Rest stop</i>	<i>n (%)</i>
Vincent's	14 (7.2)
Nipco	33 (17.0)
Foodway	63 (32.5)
Akanchawa	30 (15.5)
Ore sunshine tailer park	40 (20.6)
De apple resturant and bar	2 (1.0)
Ore sunshine park	12 (6.2)
Who owns/ operates it?	
Privately	142 (73.2)

Government	52 (26.8)
	Average
Driving distance to the rest stop	342.58km
Driving time from take-off to the rest stop	6hrs 12mins
Total area of the rest stop facility in square meters/feet	1828.97m ²
Maximum capacity of vehicles the rest stop can accommodate at once	243.43

Table 2 shows the names of the rest stops and 73% of them are privately owned. The average driving distance to the rest stops is 342.58km, the average driving time from takeoff to the rest stop is 5hrs, 72mins, the average total area of the rest facility is 1828.97m², and the average maximum capacity of vehicles the rest stop can accommodate at once is 243.43.

Country	Type	Standard Spacing (Km)
U.S.	Service Area	100
	Safety Rest Area	40–50
Japan	Service Area	50
	Parking Area	15
U.K.	Service Area	48
	Service Area	100
Australia	Simplified Service Area	50
	Parking Area	30
China	Service Area	60
France	Service Area	20
Finland	Rest area	20
Spain	Rest Area	25
	Service Area	70
Poland	Rest Area	40
	Service Area	80
Korea	Service Area	25
	Safety Rest Area	42
Malaysia	Service Area	25
	Safety Rest Area	80
Nigeria	Rest Area	30
Denmark	Service Area	30
	Rest Area	70
Germany	Service Area	35
	Parking Area	10

Table 3. Different types and spacing of rest stops by different countries
 Source: Alkhatni et al (2021)

It could be seen from table 3 that all of the rest stops identified by the drivers as places they use as rest areas had distances from start points that are far beyond the standards. The research by Alkhatni et al (2021), which is presented in figure 4.3 shows the spacing in an ideal scenerio,

The National Highway Traffic Safety Administration (NHTSA) in the United States also promotes the "4-hour rule" as part of its guidelines for preventing driver fatigue. According to the NHTSA, drivers should take a break every 2 hours, with an average of 6hrs 12mins, as indicated by the survey result, its certain that the drivers would have accumulated fatigue to an even greater level. As studied by Philip et al (2005), who found that prolonged wakefulness and restricted sleep significantly impaired driving performance, leading to increased lapses in attention and slower reaction times. The study highlighted the importance of regular rest breaks

to mitigate the negative impact of fatigue on driving abilities. In addition, Maycock (2006), corroborated this in his study that examined the effectiveness of fatigue management strategies for professional drivers. His findings emphasized the importance of taking regular breaks during long-distance driving to prevent fatigue-related accidents. Maycock (2006), recommended that drivers should not drive for more than 4 hours continuously without taking a rest break to minimize the risk of fatigue.

The indicating that most rest stops utilized by the respondents are not properly located on the road. It could also be seen from figure 2, that the none adoption of the rest area system as in other countries like Japan, and Australia, has created more burden for drivers to drive longer distances to get to these identified rest stops, which they stop at partly because of the incentives they get from commercial operators or positive perception towards these rest stops.

Table 4: Building design features of the existing rest stops.

	Frequency	Percent
<i>Architectural Typology</i>		
Single storey	148	76.3
Multiple storey	44	22.7
Single building design	48	24.7
Multiple building (complex) design	139	71.6
Are there designated areas for the following purposes?		
Restaurants	191	98.5
Conveniences	141	72.7
Information center	0	0.0
Maintenance workshops	52	26.8
Inn/motels	0	0.0
Pharmacy and sickbay	0	0.0
Gas station	179	92.3
Picnic area	0	0.0
Supermarkets	0	0.0
Law enforcement post	7	3.6
Parking for small vehicles	39	20.1
Parking for large and articulated vehicles	6	3.1
How is noise control incorporated into the design of the rest stop's spaces?		
By zoning	158	81.4
By utilizing sound-insulated surfaces	163	84.0
By providing buffer zones like lobbies between quiet and noisy areas	122	62.9
By utilizing sound-absorbent materials and surfaces	0	0.0
How is thermal control incorporated into the design of the rest stop's spaces?		
By passive means	173	89.2
By active means	21	10.8
Which of the following security mechanisms are available?		

Physical deterrence mechanisms.	31	16.0
Psychological deterrence mechanisms	1	0.5
Clear expectations for use	129	66.5
Surveillance technological deterrence mechanism	177	91.2
What is the orientation of the rest building?		
Outward facing orientation	158	81.4
Inward facing orientation	36	18.6
What room design type exists for drivers?		
Personal rooms	43	22.2
Communal rooms	151	77.8

Table 4 shows that majority of the drivers (76.3%) reported that the rest stops are single storey building while 71.6% reported that they are multiple building (complex) design. The rest stops have the following designated areas Restaurants (98.5%), Conveniences (72.7%) and Gas/fuel stations. The noise control incorporated into the design of the rest stop's spaces are By zoning (81.4%), By utilizing sound-insulated surfaces (84.0%) and By providing buffer zones like lobbies between quiet and noisy areas. They conveyed that thermal control is incorporated into the design of the rest stop's spaces by passive means (89.2%), while the security mechanisms available are *Clear expectations for use* (66.5%) and Surveillance technological deterrence mechanisms (91.2%). The orientation of the rest buildings is outward facing orientation while communal room (77.8%) is the room design type existing for the drivers.

Table 5: Driver's perception of highway rest stops in Nigeria.

s/n		Strongly agree n (%)	Agree n (%)	Indifferent n (%)	Disagree n (%)	Strongly disagree n (%)	Mean ± SD
1	The rest stops on the Nigerian highway are well-distributed	35 (18.0)	0 (0.0)	11 (5.7)	0 (0.0)	148 (76.3)	1.84 ± 1.56
2	The rest stops on the Nigerian highway allows for driver's exchange	0 (0.0)	0 (0.0)	1 (0.5)	11 (5.7)	182 (93.8)	1.07 ± 0.27
3	The rest stops on the Nigerian highway are easily accessible	17 (8.8)	11 (5.7)	0 (0.0)	0 (0.0)	1 (0.5)	3.22 ± 0.62
4	The rest stops currently existing are at the appropriate location	35 (18.0)	1 (0.5)	20 (10.3)	137 (70.6)	1 (0.5)	2.65 ± 1.16
5	The services at rest stop meet all my immediate needs while travelling	20 (10.3)	10 (5.2)	28 (14.4)	4 (2.1)	132 (68.0)	1.88 ± 1.39
6	The restroom and other facilities at the rest stops are adequate	54 (27.8)	0 (0.0)	11 (5.7)	126 (64.9)	3 (1.5)	2.88 ± 1.35
7	I feel very safe at Nigerian rest stops, even at night	0 (0.0)	2 (1.0)	33 (17.0)	148 (76.3)	11 (5.7)	2.13 ± 0.50
8	The facilities at rest areas are clean	18 (9.3)	33 (17.0)	12 (6.2)	131 (67.5)	0 (0.0)	2.68 ± 1.06

9	The facilities at rest areas are properly maintained	32 (16.5)	22 (11.3)	11 (5.7)	129 (66.5)	0 (0.0)	2.78 ± 1.18
10	There are appropriate provisions of shading/protection from elements of weather such as excessive sunshine and rainfall at rest stops	4 (2.1)	0 (0.0)	2 (1.0)	37 (19.1)	151 (77.8)	1.29 ± 0.69
11	Rest areas are properly landscaped	38 (19.6)	16 (8.2)	11 (5.7)	126 (64.9)	3 (1.5)	2.79 ± 1.24
12	The environment at the rest stop offers a picturesque view, giving value for time spent there	2 (1.0)	36 (18.6)	11 (5.7)	0 (0.0)	145 (74.7)	1.71 ± 1.25
13	Rest stops are unnecessary and waste travel time	35 (18.0)	19 (9.8)	1 (0.5)	11 (5.7)	128 (66.0)	3.92 ± 1.64
14	The parking areas at rest stops are never full to capacity	3 (1.5)	48 (24.7)	11 (5.7)	4 (2.1)	128 (66.0)	1.94 ± 1.36
15	The rest stops allow for separation of parking between busses and longer vehicles	16 (8.2)	2 (1.0)	1 (0.5)	29 (14.9)	146 (75.3)	1.52 ± 1.15
16	The rest stops are well-lit	21 (10.8)	0 (0.0)	2 (1.0)	139 (71.6)	32 (16.5)	2.17 ± 1.06
17	The rest areas in Nigeria are well-ventilated	19 (9.8)	0 (0.0)	20 (10.3)	155 (79.9)	0 (0.0)	2.39 ± 0.91
Grand Mean							2.29 ± 0.73

Table 5 shows that the drivers are of the opinion that the rest stops on the Nigerian highway are not well-distributed. This is indicated by a mean response of 1.84 lower than the criterion mean of 3 and a low standard deviation indicating low variability of response. The drivers are in disagreement of the following: The rest stops on the Nigerian highway allows for driver's exchange (1.07), The rest stops currently existing are at the appropriate location (2.65), The services at rest stop meet all my immediate needs while travelling (1.88), The restroom and other facilities at the rest stops are adequate (2.88), safe at Nigerian rest stops, even at night (2.13), The facilities at rest areas are clean (2.68), and The facilities at rest areas are properly maintained (2.78). These were indicated by mean response values less than the criterion mean of 3. The drivers also were in disagreement with the following statements: There are appropriate provisions of shading/protection from elements of weather such as excessive sunshine and rainfall at rest stops (1.29), Rest areas are properly landscaped (2.79), The environment at the rest stop offers a picturesque view, giving value for time spent there (1.71), The parking areas at rest stops are never full to capacity (1.94), The rest stops allow for separation of parking between busses and longer vehicles (1.52), The rest stops are well-lit (2.17) and The rest areas in Nigeria are well-ventilated (2.39). However, the drivers held the perception that the rest stops on the Nigerian highway are easily accessible (3.22) and that Rest stops are not unnecessary and a waste of travel time (3.92). A grand mean of 2.29 which is less than the criterion mean of 3 indicates that the drivers have a negative perception of rest stops.

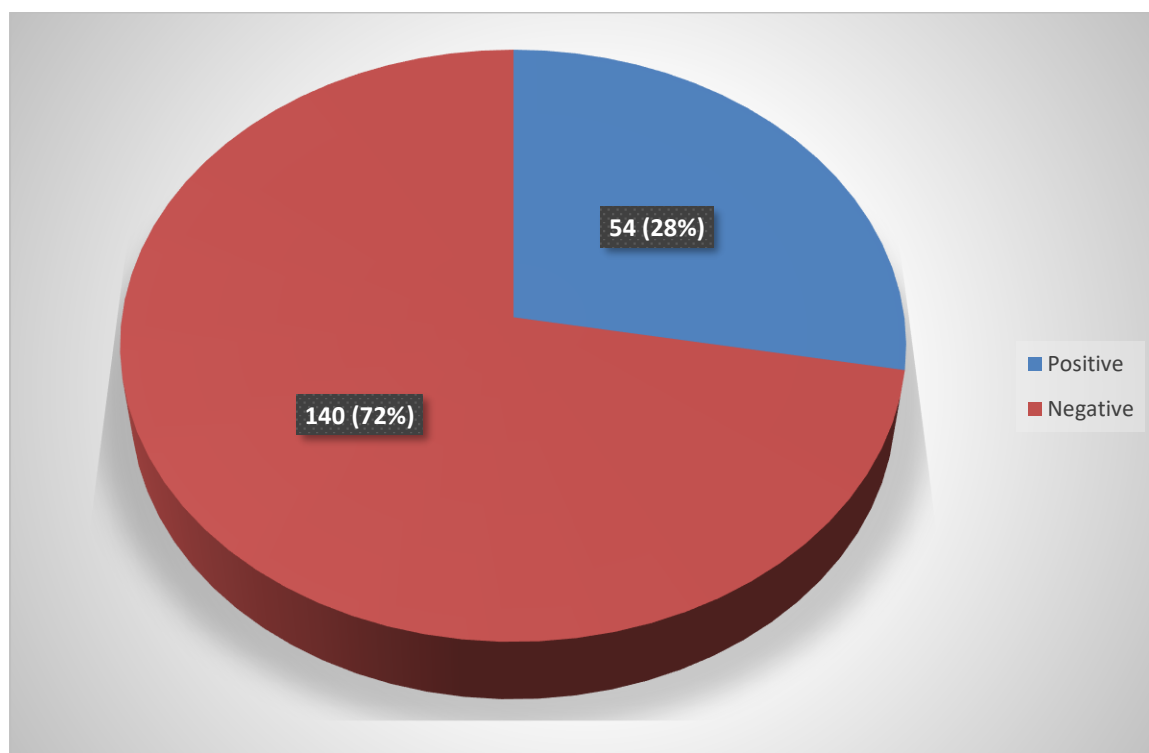


Fig 2: Summary of Driver's perception of rest stops
 Source: Kikanmen, 2023

Figure 2 shows that in summary, 72% of the respondents have a negative perception of rest stops. This negative perception shows a great level of dissatisfaction with the existing situation of rest stop by the respondents, in terms of location, distribution along the highway, services and amenities provided as well as safety. The foregoing is in line with Beck (1976) study on cognitive distortions and irrational beliefs which underscores how negative perception suggests a feeling of dissatisfaction with a phenomenon and hence contributes to anxiety, depression, and dysfunctional behavior patterns, hindering individuals' ability to thrive and flourish. This might also be the reason why the respondents have to drive for an extended period to get to their identified rest area or their non-participation in rest breaks. However, this is potentially dangerous to the drivers as this exposes them to the risk of accidents as noted by Maycock (2006). Hence proposing a design that takes into consideration these factors would lead to a positive perception of rest stops by drivers as well as increase usage. This will in turn reduce the amount of fatigue related road accidents as drivers would be alert and well energized to continue their journey safely.

Table 6: Rest stop design preference of the drivers

s/n		Preferred n (%)	Indifferent n (%)	Not preferred n (%)
1	Rooms are to be provided for drivers' exchange	183 (94.3)	11 (5.7)	0 (0.0)
2	Single storey buildings	194 (100.0)	0 (0.0)	0 (0.0)
3	Multiple storey buildings	54 (27.8)	0 (0.0)	140 (72.2)

4	Single building design	65 (33.5)	0 (0.0)	129 (66.5)
5	Multiple building (complex) design	183 (94.3)	0 (0.0)	11 (5.7)
6	Parking lots	194 (100.0)	0 (0.0)	0 (0.0)
7	Conveniences	194 (100.0)	0 (0.0)	0 (0.0)
8	Information center	164 (84.5)	15 (7.7)	15 (7.7)
9	Maintenance workshops	183 (94.3)	11 (5.7)	0 (0.0)
10	Inns / motel	130 (67.0)	50 (25.8)	14 (7.2)
11	Pharmacy	132 (68.0)	47 (24.2)	15 (7.7)
12	Sick bay	164 (84.5)	15 (7.7)	15 (7.7)
13	Gas station	194 (100.0)	0 (0.0)	0 (0.0)
14	Covered Picnic areas with benches	129 (66.5)	0 (0.0)	65 (33.5)
15	Supermarkets	131 (67.5)	44 (22.7)	19 (9.8)
16	Law enforcement post	148 (76.3)	11 (5.7)	35 (18.0)
17	OUTWARD FACING ORIENTATION (an orientation, in which the parking lots are between the major use area and the road)	175 (90.2)	0 (0.0)	19 (9.8)
18	INWARD FACING ORIENTATION (an orientation, in which the major use area housing the rest buildings, conveniences, and other facilities separates the highway from the parking area)	183 (94.3)	0 (0.0)	11 (5.7)
19	Private rooms	150 (77.3)	33 (17.0)	11 (5.7)
20	Communal rooms	69 (35.6)	0 (0.0)	125 (64.4)
21	Physical deterrence mechanisms.	194 (100.0)	0 (0.0)	0 (0.0)
22	Psychological deterrence mechanisms	24 (12.4)	136 (70.1)	34 (17.5)
23	Clear expectations for use	148 (76.3)	14 (7.2)	32 (16.5)
24	Surveillance /technological deterrence mechanism	182 (93.8)	12 (6.2)	0 (0.0)

Table 6 shows that the following designs are preferred for rest stops by drivers. They include Rooms are to be provided for drivers' exchange (94.3%), Single storey buildings (100.0%), Multiple building (complex) design (94.3%), Parking lots (100%), Conveniences (100%), Information center (100%), Maintenance workshops (94.3%), Inns / motel (67%), Pharmacy (68%), Sick bay (84.5%), Gas/fuel station (100%), Covered Picnic areas with benches (66.5%), Supermarkets (67.5%), Law enforcement post (76.3%), outward facing orientation (an orientation, in which the parking lots are between the major use area and the road) (90.2%), inward facing orientation (an orientation, in which the major use area housing the rest buildings, conveniences, and other facilities separates the highway from the parking area) (94.3%), Private rooms (77.3%), Physical deterrence mechanisms (100%), Clear expectations for use (76.3%) and Surveillance /technological deterrence mechanism (93.8%). An average of 76% of the respondents indicated various preferences for rest stop design.

Conclusion

The advent of road travel worldwide necessitated the administration and supervision of both the roadways and the individuals using them. Web (1906, 1929) said in section 3.9 (Toll roads, Turnpike) that the local parish has been responsible for maintaining the condition of the roads from the Tudor era. The parish of Radwell, Hertfordshire sent a petition to Parliament in 1656, seeking assistance in the preservation of their portion of the Great North Road. The act enacted by Parliament granted the local justices the authority to construct toll gates along a specific segment of the Great North Road, spanning from Wadesmill in Hertfordshire to Caxton in Cambridgeshire, and Stilton in Huntingdonshire. This authority was granted for a duration of eleven years, with the resulting revenues intended for the upkeep of the Great North Road within their respective jurisdictions. According to Webb (1906, 1929), the toll gate constructed at Wadesmill emerged as the first and efficient toll gate in England.

In 1707, a turnpike act was enacted to create the first plan including trustees who were not justices. This scheme specifically pertained to a segment of the London-Chester road, spanning from Fornhill to Stone Stratford. The fundamental concept was that the trustees would oversee the allocation of resources from the several parishes traversed by the highway, supplement this with tolls collected from users outside the parishes, and allocate the whole towards the upkeep of the main route. The aforementioned phenomenon emerged as a recurring trend in the development of several roads, driven by individuals who aimed to enhance the efficiency of commercial activities within their respective regions of a county (Webb, 1906, 1929).

According to Whelan (2015), Stanton, Ramsamy, and Seybold (20120), and Sengupta (2080), Ashoka constructed roads, edicts, water wells, education centers, rest houses, and hospitals for humans and animals along the highways across the Indian subcontinent between 268 BCE and 22 BCE. Additionally, he planted trees such as banyan and mango groves to assist travelers. Highway rest areas have been a longstanding feature of highway and road networks worldwide, with its origins dating back to 268 BCE in the Indian subcontinent. However, it is worth noting that in developing nations, these rest zones may not be as well established and organized as they are in more developed countries. The historical practice of establishing designated places along roads and cultivating diverse tree species to enhance the comfort of highway users has evolved over the ages, resulting in the current manifestation of highway rest zones in developed economies.

The management of both roads and highway users in Nigeria is a well-established idea. The founding of the Vehicle Inspection Officers (VIO) in 1949 marked the culmination of the government's longstanding efforts in regulating and maintaining roads and highways via various programs and agencies. The major goal was to establish itself as the most effective road maintenance management company, with the aim of improving the economic prosperity and welfare of Nigerians. On January 1, 1949, the Road Traffic Act was passed, leading to the creation of Vehicle Inspection Officers (VIO) in all regions. With the establishment of states in 1967, each state's Ministry of Works established their VIO Department under the Directorate of Mechanical Engineering (VIO, 1949). Following that, the Nigerian government developed more road management and maintenance agencies, including as FRSC, FERMA, and various local tax forces, as mentioned above. These organizations are primarily responsible for road maintenance and administration. As previously mentioned, the responsibilities of the Federal

Road Safety Commission (FRSC) encompass the prohibition of parking or waiting on a highway, as well as the establishment of designated parking or waiting areas. Additionally, the FRSC is responsible for ensuring that there is sufficient space for vehicles approaching or leaving adjacent premises. The laws of Nigeria provide provisions for highway road stop places, but they have not been effectively promoted. Therefore, there is a need for properly established road lay-bys and rest stops along Nigerian roads.

Recommendations

In order to curb the menace of road crashes, the FRSC has previously introduced many precautionary measures including speed limiters, reflexive stickers, and helmets for drivers but without any tangible results. Nevertheless, to overcome the scourge, the Federal Government should reposition and refocus the FRSC. The laws and our programmes, in most part, favour the bad guys who are reckless and could easily intimidate the other road users and agencies monitoring the roads and the road users. Our city bus drivers are in the world of their own and without control. They excessively speed, run the road shoulders and, most times, overloaded (Obiadi, 2013).

Perhaps we can start by carving out a transport police department whose job should be policing the transportation sector. Also, the days when people can walk in and out of the FRSC office with a driving license without having been through thorough training must come to an end. Finally, a proper testing agency must be instituted to make sure that people go through the necessary training before driving licenses are issued to them as suggested by Olugbenga (2016). The consideration of age and experience factors in designing road stop areas, incorporate features that cater to the needs and expectations of drivers at different stages of their careers. This may involve creating spaces that accommodate varying preferences and requirements, ensuring inclusivity and satisfaction for a diverse range of drivers. Collaborating with relevant stakeholders, including transportation authorities, driver associations, and regulatory bodies, to ensure a holistic approach to rest-stop designs is recommended.

Establishing a feedback loop to gather insights from users, allowing for continuous improvement and adaptation to evolving preferences and needs would help a lot.

The survey findings reveal a critical need for a comprehensive re-evaluation and redesign of rest stops in Nigeria to better align with the preferences and requirements of drivers. To address the dissatisfaction and improve road safety, the following recommendations are equally proposed:

1. **Redesign and Redistribution of Rest Stops:** Collaborate with transportation authorities to strategically redesign and redistribute rest stops within the standard distances. Consider the identified points where drivers prefer rest stops and optimize their distribution to reduce the average driving distance and time. Aim for a network that ensures accessibility within reasonable intervals, promoting driver safety and well-being. And lastly removal of check points on the highway and instead collapse them

into the design of rest stops so that a rest stop would be seen as a place to rest but also a Hub for government agencies to operate from.

- 2. Integration of Driver Preferences:** Incorporate drivers' preferences into the architectural design of rest stops. This includes providing rooms for driver exchange, opting for single-story layouts, implementing outward-oriented designs for improved visibility, and designing segregated parking areas for longer vehicles and smaller buses. Aligning rest stop design with driver preferences will contribute to a more pleasant and functional experience.

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