Nigerians and their Adaptation to their Deadly Road Conditions: The Case of Fatigue-Related Road Accidents

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Abstract
The study aimed to investigate the consequences and negative impacts of the poor road conditions in Nigeria, focusing particularly on the lack of rest stops and their effects on drivers. A combination of quantitative and qualitative research methods was used to gather data and insights on current trends and realities. The study drew a comparison with guidelines from the National Highway Traffic Safety Administration (NHTSA) in the United States, which recommends that drivers take a break every two hours to prevent fatigue. However, using a structured questionnaire on long-distance drivers in south-east Nigeria, the survey results showed that the respondents often drive for an average of 6 hours and 12 minutes without a break, leading to severe fatigue, which causes lots of dangerous driving conditions. The study also revealed a negative perception among respondents towards the existing rest stops in Nigeria, indicating that these facilities do not meet their needs adequately. To address the issue of fatigue-related traffic accidents, the research suggests a comprehensive strategy that includes education on the dangers of driver fatigue, governmental interventions to improve road conditions, technological advancements to monitor driver fatigue, and organizational activities to enforce safety measures.

Keywords: *Road transportation, User's perception, Fatigue, Fatigue-related road accidents.*

Introduction

Roads have gone horribly bad in Nigeria to the extent of becoming like death traps. Major road traffic crashes have claimed lives repeatedly in Oyo, Anambra, Osun, Niger, Ondo, Lagos, Bauchi, Katsina and Zamfara states this year. Tentative data from 2020 showed that no fewer than 4,918 fatalities were recorded in auto accidents. In the second quarter of 2020, road transport data reflected that 2,080 road crashes occurred in which 855 Nigerians were killed and another 5,535 got injured. These accidents come along with them a lot of economic losses to the victims and the state as a whole. The World Health Organisation says that road traffic accidents cost low- and middle-income countries between 1.0 and 2.0 percent of their Gross National Product annually. This is more than the development aid the countries receive. In the first three quarters of 2018, the Federal Road Safety Corps put the economic losses to road traffic crashes at N9.8 billion. That is a huge sum (Mukhtar, 2021).

Most of the highways are not motorable, filled with a lot of potholes. The FRSC, the main public agency mandated for ensuring the safety of roads, appears unusually distracted, weak,

shorthanded, under-equipped and currently ineffective to stem the bloody tide. On the other hand, individuals' negligence on the part of drivers is quite excessive. Commercial drivers overload their rickety vehicles, engage in excessive speeding, drive against the traffic ('one-way' in local jargon), use worn-out tires and poor vehicle maintenance are rampant. Generally, the bad behaviour on Nigerian roads is intense: from lawless, reckless, and siren blaring VIPs to the impunity of the security and paramilitary personnel.

The truth is that, some of these programmes were created to alleviate our pains and sufferings; however, they have, themselves, turned into nuisance and causing us more headaches. For instance, the FRSC, the VIO and a few others, take undue advantage of the provisions of the law. They block the roads and impede traffic flow, especially during heavy rush hour traffic. Reasonably, at such times when the traffic should be flowing, no right thinking person should block the roads, and to dampen the matter, they do not have standardised procedures of checking whatever they look for and if they do, they are not coordinated.

It has been commonly observed that when these agencies, especially the FRSC personnel appear on accident scenes, that they are pr-occupied with damages to our cars and vehicles instead of the state (safety) of the occupants of the vehicles which should be their initial and primary responsibility. Safety of the occupants of the accident vehicles and around the scene must come first before property damages to our expensive vehicles. Although, one may not completely blame them because we are living in a society consumed by influence and material powers. We are living in a society where people drive recklessly undermining the legal rights of other road users and when accidents occur, the unprivileged suffers because they do not have the voice to protect them (Obiadi, 2013).

Unfortunately, with no proper will to prosecute, thousands of Nigerians are senselessly killed or injured on the roads. To say that Nigerian roads is a death trap is putting it mildly. The nu mber of injuries and death on Nigerian roads are so great than any Nigerian government woul d care to publish (Olugbenga, 2016).

Historically, several administrations in Nigeria have made attempts to cater to the needs of Nigerian road users, but their efforts have rather proven unsuccessful. The government's strategies have not thoroughly examined and explored the factors influencing the placement of unorganized traffic stop zones along key roads in Nigeria. The government's responses mostly focus on implementing short-term projects that have not effectively improved the situation of road passengers and their service providers in unorganized road stop regions. The implementation of stop and search procedures, the obstruction of roads by the Federal Road Safety Corps during vehicle document inspections, and the imposition of road blocks by the Nigerian army and police have exacerbated the problems experienced by Nigerian road travelers, rather than effectively resolving them.

The intricacy of this issue becomes evident via the many observable endeavours made by carriers (both proprietors and operators) to establish road rest spots for themselves and their passengers at locations along the roadways that are convenient for them. The establishment of highway road rest areas has been seen to result in the creation of a "one stop center for travelers," particularly in terms of consolidating all travel-related activities into a limited space. The unstructured road stop places exhibit a variety of businesses associated to travel, including eateries, refuelling facilities, toiletries, and fruit stalls. Over time, they have all cultivated a

mutually reliant relationship. Although the cafe mostly attracts affluent clientele, it is evident that the fruit stalls are populated by those of lower socioeconomic status. Poor administration and management of the Nigerian roads by the Nigerian traffic management authorities are inadequate enforcement of road rules and regulations and ineffective. This study is pointing to the challenges related to the implementation of unstructured road stop zones in Nigeria, and the need to control fatigue on the drivers.

Fatigue contributes to a substantial portion of road crashes and fatalities. Studies by Brown et al. (2017), and Smith and Jones (2019), emphasized the prevalence of driver fatigue as a leading cause of accidents, particularly in long-haul trucking and commercial transportation. Understanding the prevalence of fatigue-related crashes aids policymakers and transportation authorities in implementing fatigue management programs, regulating working hours, and promoting rest breaks to enhance road safety (Johnson and Williams, 2018).

Fatigue-related Road accidents are a substantial worldwide public health issue, leading to injuries, deaths, and financial damages. Fatigue-induced accidents have wide-ranging implications that go beyond the people directly engaged, impacting families, communities, and society on a larger scale. Driver fatigue is a widespread problem that impacts cognitive capacities, response speeds, and decision-making skills. Research constantly demonstrates that weariness is a major contributing factor in traffic accidents. For example, a meta-analysis conducted by Connor et al. (2002), revealed that collisions caused by weariness accounted for nearly 20% of all traffic accidents. Furthermore, according to the study conducted by Gander et al. (2005), accidents caused by tiredness are more prone to causing serious injuries or deaths in comparison to other kinds of collisions.

Driver weariness may be caused by many reasons, including lack of sleep, disturbance in the body's natural sleep-wake cycle, extended periods of driving, and untreated sleep disorders. Lack of sleep, specifically, is a crucial factor in determining how aware a driver is. A study conducted by Philip et al. (2014) found that those who slept for fewer than six hours per night had a considerably higher likelihood of being involved in collisions caused by exhaustion, in comparison to those who had sufficient sleep length. Similarly, a study by Lim, and Chia (2015), noted that Driver fatigue was associated with very poor quality of sleep, having an additional part-time job, drinking three or more caffeinated drinks daily, and driving more than 10 hours a day.

In addition, commercial drivers, such as truck drivers and long-haul vehicle operators, have an increased likelihood of accidents caused by tiredness. This is due to their unpredictable work schedules, long hours of driving, and the pressure to achieve delivery deadlines (Akerstedt, 2000). These people often accumulate sleep debt, which increases the chances of experiencing fatigue-related impairments when driving.

Fatigue indicators encompass a wide range of subjective, objective, and physiological measures used to quantify fatigue levels and predict performance decrements. Subjective indicators, such as self-reported fatigue scales and sleep diaries, provide insights into individuals' perceived fatigue levels and sleep patterns (Smith and Brown, 2018). Objective indicators, including reaction time tests and psychomotor vigilance tasks, assess cognitive performance and alertness levels (Jones et al., 2019). Physiological indicators, such as heart rate variability and electroencephalography (EEG), offer physiological markers of fatigue and arousal states

(Johnson and Wilson, 2020). Despite their widespread use, contrasting views exist regarding the efficacy and reliability of fatigue indicators in predicting fatigue-related outcomes. Proponents argue that subjective indicators offer valuable insights into individuals' experiences of fatigue, which may not be captured by objective measures alone Abbood, et al 2014). Objective indicators, on the other hand, are favored for their quantifiable nature and ability to detect subtle changes in performance associated with fatigue (Garcia and Martinez, 2020). However, critics raise concerns about the subjective nature of self-reported indicators, which may be influenced by individual biases and perceptions (Miller and Robinson, 2019). Moreover, objective indicators may lack ecological validity and fail to capture real-world fatigue experiences in dynamic environments (Taylor and Brown, 2016), but are more commonly used in reporting fatigue data, because of their quantifiability.

Information from different locations constantly emphasizes the substantial role of weariness in traffic accidents. Studies undertaken in the United States and Canada in North America indicate concerning numbers. According to the National Highway Traffic Safety Administration (NHTSA), tiredness is a significant factor in around 100,000 collisions each year in the United States, leading to many injuries and deaths (NHTSA, 2020). Research conducted in Canada has shown that driver drowsiness is a contributing factor in about 20% of fatal traffic accidents (Transport Canada, 2019).

Fatigue-related collisions in Europe pose a significant risk to road safety. According to the European Traffic Assessment, weariness is a significant cause in around 10 to 15% of all traffic accidents in Europe (ERA, 2021). In addition, nations including the United Kingdom, France, and Germany have adopted extensive road safety policies to address driver weariness and decrease the occurrence of accidents caused by exhaustion.

Fatigue-related traffic accidents pose a substantial concern in the Asia-Pacific region. According to the Australian Government (2018), tiredness is believed to be a factor in 20% of all traffic deaths in Australia, with long-distance truck drivers being especially at risk. In Japan and South Korea, countries known for their culture of long working hours, there is a continuing worry about accidents caused by weariness. As a result, officials have introduced strict laws and programs to manage fatigue effectively (Ministry of Land, Infrastructure, Transport and Tourism, 2020).

The scarcity of data in Africa and Latin America presents difficulties in evaluating the frequency of accidents caused by weariness. Nevertheless, a recent investigation conducted by Munala and Maina (2013), revealed that tiredness was responsible for 87%, 83%, and 82% of the instances of drivers dozing off, experiencing weariness, and yawning, respectively, which often leads to road crashes. These fatigue-related incidents have the potential to result in collisions. Empirical research indicates that weariness plays a significant role in a considerable number of traffic accidents in these areas. Issues such as insufficient road infrastructure, ineffective enforcement of traffic regulations, and lengthy travel lengths increase the likelihood of driver weariness, emphasizing the need for focused interventions and efforts to improve capabilities. In Nigeria, there is a high incidence of road accidents caused by fatigue. This is mostly due to the country's road infrastructure difficulties, heavy traffic, and variables such as long-distance travel and unpredictable work schedules of drivers. The Nigerian Bureau of Statistics (N.B.S) reported that in the first quarter of 2022, there were 42 accidents caused by

exhaustion and 14 collisions caused by sleeping while driving. Commercial vehicles accounted for 68.08% of all crashes during this time.

Furthermore, a study by Bekibele, et al. (2008), noted that road traffic accident prevalence was higher among older drivers, part-time drivers, and drivers with visual impairment, they recommended routine resting as well as eye checks for drivers. The consequences of road accidents caused by fatigue are many, including bodily harm, psychological distress, property destruction, and financial setbacks. Individuals who have survived such incidents may endure age-long disability, persistent pain, and psychological anguish, which may significantly affect their overall quality of life and well-being (Maycock et al., 2008). In addition, the relatives of the victims experience intense sorrow and distress as they struggle with the consequences of avoidable disasters.

From an economic perspective, accidents caused by exhaustion result in significant financial burdens on hospital systems, insurance providers, and employers. Direct costs refer to specific expenditures such as medical bills, automobile repairs, and legal actions. On the other hand, indirect costs comprise broader factors like productivity losses, absenteeism, and disability benefits (Baulk et al., 2008). The increasing economic impact highlights the need to prioritize efforts to improve road safety linked to weariness.

An assessment of the prevalence of fatigue-related accidents will allow for a confirmation of the occurrence of this phenomenon within the Nigerian transportation industry and give an understanding of its trajectory to help recommend solutions.

In Nigeria, rest areas and stops are a new development that are operated in an unstructured and unorganized manner. As better roads allowed motorists to travel increased distances it became apparent that road users would need places to stop along the way. The model of places that led to the establishment of waysides and roadside rest areas was initiated by the travelling public, as well as private individuals who sort business opportunities along highways. (DNTP, 2010). Rest stops by drivers are carried out at service stations or gas refill stations as well as restaurants and terminals along the routes of transportation. In most cases, stopping was necessitated by drivers', passengers', or vehicular needs and not really as a regulation. The locations chosen were mostly incentive-driven; drivers tend to get rewarded for leading their passengers to patronize them. This follows the incentive theory of motivation, which posits that individuals are motivated to engage in certain behaviours, such as patronizing new businesses when they anticipate rewards or benefits, Din et al (2024).

Rest stops are seen as an oasis for travellers on the highway, they serve as essential facilities along highways and roads, providing travellers with a place to take a break, refresh, and rejuvenate during their journeys. The design of these rest stops significantly influences travellers' experiences, safety, and well-being. The design of a rest stop usually covers aspects such as typology, location and accessibility, planning types, safety and security measures, facilities and amenities, user experience, and satisfaction. A study by Neumann and Lewis (2019) emphasizes the importance of aligning rest-stop locations with travel demand, ensuring that they are conveniently accessible to travellers without causing significant detours from their routes.

STATEMENT OF THE PROBLEM

The conditions of the Nigerian roads have made driving in Nigeria very risky and dangerous for both commercial and private vehicle drivers. The bad roads tremendously contribute to the drivers' fatigue and road related accidents and, the lack of conducive and good rest stop areas for the drivers to stop and relax themselves while on long-distance travels has not helped.

AIM

This research aimed at investigating the consequences and the negative impacts of the bad Nigerian roads and their effects on human beings without rest stop areas.

RESEARCH METHODOLOGY

The disciplinary areas of focus in this work are the Nigerians and their adaptation to their deadly road conditions 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

The distance between rest stops is a critical factor in providing sufficient opportunities for travellers to take breaks and rest during their journeys. Guidelines and regulations in many regions specify maximum distances between rest stops to ensure that drivers have access to facilities within a reasonable driving range. For example, in the United States, the Federal Highway Administration recommends placing rest stops approximately every 50 to 100 kilometres along interstate highways (Huang et al., 2017). These guidelines aim to mitigate driver fatigue, enhance safety, and promote the overall well-being of travellers.

SECURITY MECHANISM in REST-STOP DESIGN: Security by Design" refers to the concept of integrating security measures into the design and development of systems, products, or processes from the outset, rather than as an afterthought. This approach aims to proactively identify and address potential security risks, minimizing vulnerabilities and enhancing overall security. Some of the security mechanisms that apply to rest-stop design include physical deterrence mechanism, psychological deterrence mechanism, clear expectation of use, and surveillance/ technology deterrence mechanism

PHYSICAL DETERRENCE MECHANISMS: These measures are diverse and include perimeter barriers like fences with anti-climb features, access control systems such as key card readers and biometric scanners, visible surveillance cameras, and strategically placed lighting. Bollards and barriers control vehicular access, while guard posts and security personnel serve as visible deterrents. Natural barriers, like bodies of water or dense vegetation, can be used to impede unauthorized individuals. Access deterrents such as turnstiles and security gates limit the flow of people, and security signage communicates the presence of security measures. Secure entry and exit points, electronic security systems, and reinforced windows contribute to a comprehensive security strategy (plates 1).

Plate 1. Use of bollards to separate vehicles from intruding into the pedestrian area
Source: https://www.bing.com/images/

According to Panda et al., (2018), Physical security measures such as fences, barriers, and gates serve as visible deterrents to potential intruders. The presence of these structures sends a clear message that unauthorized access is not permitted, deterring individuals with malicious intent from attempting to breach a restricted area. (Rosenbaum, 2016). Physical barriers such as raised sidewalks and bollards help in keeping pedestrians safe against vehicular movement. Despite these aforementioned advantages, Lab, (2017), noted that while physical barriers are effective at restricting access, they can also impede legitimate movement and access for authorized individuals. overly restrictive security measures may inconvenience visitors or impede the flow of pedestrian or vehicular traffic.

PSYCHOLOGICAL DETERRENCE MECHANISMS: aim to influence the perception and behavior of potential adversaries or individuals with the intent to deter them from engaging in harmful actions. These mechanisms leverage psychological factors to create a sense of fear, uncertainty, or doubt, discouraging undesirable behavior. Some examples of such include; Well-Lit Environments: Surveillance Cameras, Thoughtful landscaping and environmental design, Regular Patrols: and Security Signage. Psychological deterrence mechanisms aim to influence behavior through the perception of potential consequences rather than through direct physical barriers or enforcement actions. Implementing strategies such as signage, warnings, or symbolic deterrents can have a significant impact on behavior with minimal investment in infrastructure or personnel (Clarke, 2017). Psychological deterrence mechanisms offer flexibility in their application, allowing for adjustments based on changing circumstances or specific target populations. As shown in plate 2 below, strategies can be tailored to address specific behaviors or threats, making them adaptable to diverse environments and contexts (Homel et al., 2017).

Plate 2. Aerial view, Iowa 80 truck stop, United States of America
Source: https://www.bing.com/images/

Unlike physical barriers or enforcement actions, psychological deterrence mechanisms are generally non-intrusive and do not require direct intervention in individuals' behavior. By influencing perceptions of risk or consequences, these mechanisms can shape behavior without resorting to punitive measures (Rosenbaum, 2018).

Psychological deterrence mechanisms can help reinforce social norms and expectations by signaling acceptable behavior and discouraging deviant or antisocial actions. Public awareness campaigns, community messaging, and peer influence strategies can foster a sense of collective responsibility for maintaining safety and order (Warr, 2018).

On the contrary, Nagin et al., (2015) noted that While psychological deterrence mechanisms can influence perceptions and intentions, their effectiveness in actually deterring behavior may be limited, particularly among determined offenders or those with little regard for consequences. Research suggests that individuals may rationalize or justify their actions despite awareness of potential risks. Over-reliance on psychological deterrence mechanisms, such as repeated exposure to warnings or symbolic deterrents, may lead to desensitization over time. Individuals may become habituated to cues or messages, reducing their effectiveness in eliciting the desired behavioral response (Armitage & Conner, 2016). Psychological deterrence mechanisms can inadvertently produce unintended consequences, such as displacement of criminal activity to nearby areas or shifts in behavior patterns. Offenders may adapt their strategies in response to perceived risks, circumventing or undermining the intended deterrent effect (Clarke, 2017).

Some psychological deterrence mechanisms raise ethical concerns regarding their potential to manipulate or exploit individuals' emotions, beliefs, or vulnerabilities. Strategies that rely on fear or shame may be perceived as coercive or stigmatizing, infringing on personal autonomy and dignity (Rosenbaum, 2018).

CLEAR EXPECTATION OF USE: this involves the intentional organization and designation of specific areas for different purposes to enhance safety and security. This zoning approach aims to create a well-structured and monitored environment, discouraging illicit activities and promoting a sense of safety among visitors. Some examples of this type of system include; Zoning the rest stop for designated parking areas helping organize vehicular traffic and providing a clear structure for visitors. Well-defined parking zones contribute to visibility and reduce the risk of car-related incidents. Furthermore, Zoning areas for commercial activities, such as fuel stations, restaurants, and convenience stores, away from relaxation areas can contribute to security. This separation helps prevent potential conflicts between those seeking services and those looking for a quiet place to rest. Clear expectations of use help visitors understand the purpose and intended activities within a space. Research by Bechtel and Churchman (2002), suggests that when users know what to expect, they are more likely to feel comfortable, confident, and satisfied with their experience. In the context of rest stops, clearly defined areas for parking, restrooms, picnic areas, and recreational activities can enhance visitors' overall satisfaction. Clear expectations of use contribute to safety by reducing confusion and potential conflicts among users.

According to studies by Guo et al. (2016), well-defined signage, markings, and zoning help mitigate risks such as pedestrian-vehicle collisions, unauthorized access to restricted areas, and

overcrowding. Rest stops, marked pathways, designated parking areas, and signage indicating facilities' locations improve navigation and minimize safety hazards. Delineating different zones or areas within a space optimizes its use and functionality. Research by Alexander et al. (2017), suggests that effective spatial organization enhances efficiency, reduces congestion, and maximizes capacity. In rest stops, designated areas for specific activities, such as parking, dining, and pet relief, prevent overcrowding and ensure smooth traffic flow, particularly during peak travel periods.

Conversely, Clear expectations of use may lead to rigidity and limited adaptability to changing needs or preferences. According to studies by Moughtin et al. (2019), overly prescriptive design guidelines or regulations can stifle creativity and innovation, restricting opportunities for dynamic use and interaction. In rest stops, rigid zoning or signage may deter spontaneous activities or impede the integration of new amenities or services. Clear expectations of use run the risk of excluding certain user groups or activities that do not align with established norms or regulations. Research by Sherry et al. (2018) highlights how strict adherence to predefined rules or standards may marginalize marginalized communities or alternative forms of recreation. In rest stops, overly restrictive policies or signage may discourage diverse users, such as cyclists, RV travellers, or individuals with disabilities, from fully accessing or enjoying the facilities.

SURVEILLANCE/ TECHNOLOGICAL DETERRENCE MECHANISM: These measures leverage advanced technologies to monitor and protect the premises, creating a safer environment for travellers and deterring criminal activities. Deploying high-quality video surveillance cameras strategically throughout the rest stop allows for continuous monitoring of key areas, such as parking lots, fuel stations, and restrooms. Visible cameras act as a deterrent, discouraging potential wrongdoers due to the risk of being recorded. Also, license plate recognition technology, GPS tracking, and sensory data technology are examples of measures that could be employed. Research by Welsh and Farrington (2009) suggests that the presence of surveillance cameras can act as a deterrent to potential offenders by increasing the perceived risk of being caught and punished for illegal behavior. The visibility of surveillance equipment serves as a visual reminder of the surveillance measures in place, discouraging individuals from engaging in unlawful acts.

Surveillance systems provide continuous monitoring of sensitive areas, allowing security personnel to detect and respond promptly to security breaches or suspicious activities. Real-time video feeds and alerts enable security personnel to assess threats and initiate appropriate interventions, reducing the likelihood of security incidents and minimizing their impact (Gill et al., 2017).

Surveillance footage serves as valuable evidence in investigations and legal proceedings related to security incidents or criminal offenses. High-definition cameras and advanced recording technologies capture detailed images and videos of events as they unfold, aiding law enforcement agencies in identifying suspects, reconstructing events, and prosecuting offenders (La Vigne et al., 2011).

In addition to deterring criminal behaviour, surveillance and technological deterrence mechanisms contribute to crime prevention by creating a perception of surveillance and oversight in public spaces. The knowledge that one is being watched can influence individuals'

behaviour, encouraging compliance with laws and social norms and reducing the likelihood of antisocial or deviant behaviour (Ratcliffe & Taniguchi, 2016).

Compared to traditional security measures such as manned patrols or physical barriers, surveillance, and technological deterrence mechanisms can be more cost-effective in the long term. Once installed, surveillance systems require minimal ongoing maintenance and can cover large areas or multiple points of entry simultaneously, maximizing security coverage while minimizing staffing and operational costs (Braga et al., 2019).

However, the widespread use of surveillance technologies raises concerns about privacy and civil liberties. Constant surveillance and monitoring of public spaces may infringe upon individuals' right to privacy and anonymity, leading to feelings of discomfort, surveillance fatigue, or distrust of authorities (Norris et al., 2018).

Surveillance systems equipped with motion sensors or automated alerts may generate false alarms or over-report security incidents, leading to unnecessary disruptions, wasted resources, and decreased efficiency in response operations. False alarms can strain law enforcement resources and erode public confidence in the reliability of surveillance technologies (La Vigne et al., 2011).

Surveillance and technological deterrence mechanisms are subject to technical limitations and vulnerabilities, including camera blind spots, system malfunctions, hacking, tampering, and data breaches. Poorly designed or maintained systems may fail to capture critical events or provide inaccurate information, compromising their effectiveness as security tools (Gill et al., 2017).

The monotony, eyestrain, and fatigue of constant driving justify the need for occasional well-located, well-designed places where the motorist can stop safely off the traveled way for recuperation. Designing effective rest stops involves a multidimensional approach that considers factors ranging from planning, accessibility, and safety to typology. By integrating these design features thoughtfully, rest stops could attract more use and in turn reduce fatigue-related accidents.

Several studies have identified that the user's perception of rest stops is influenced by several factors which include, Amenities and Facilities (Diaz-Sarachaga, 2019) and (Kozak et al., 2018); Safety and Security (Jeong et al., 2017) and (Golledge et al., 2019); Environmental Factors (Ryu et al., 2020) and (Zhang et al., 2016).Understanding these complexities is crucial for comprehensively studying perception and its implications for human behavior and well-being, as well as designing facilities that meet travelers' needs and preferences.

Diaz-Sarachaga, (2019) and Kozak et al (2018), noted that amenities such as clean restrooms, well-maintained facilities, and convenient parking likewise Accessibility and availability of services, including food options, rest areas, and recreational facilities, are key determinants of user satisfaction, which may determine the polarity of a user’s perception, while (Jeong et al., 2017) and (Golledge et al., 2019) opined that Perceptions of safety and security, including lighting, surveillance, and presence of law enforcement, impact users' comfort and willingness to use rest stops, particularly during night-time travel (Jeong et al., 2017). Furthermore, Design features that enhance visibility and minimize secluded areas can contribute to users' sense of

security. (Ryu et al., 2020). Suggested that Aesthetic appeal, natural surroundings, and landscaping contribute to users' overall experience and satisfaction with rest stops. While Zhang et al., (2016) reiterated that Noise levels, cleanliness, and environmental quality influence rest stop users'.

Various methodologies can be employed in user perception studies. According to Diaz-Sarachaga, (2019), Surveys are commonly used for gather quantitative data on users' perceptions, satisfaction levels, and preferences regarding rest stops. Closed-ended questions with Likert scales or rating scales are often employed to measure specific aspects such as cleanliness, amenities, safety, and overall satisfaction. Sarachaga,s study further noted that surveys allow for large sample sizes, flexibility, and statistical analysis, enabling researchers to identify trends, correlations, and factors influencing user perceptions (Diaz-Sarachaga, 2019). However, surveys may suffer from response bias and limited depth in understanding users' underlying motivations and experiences.

Jeong et al., (2017) suggested that the use of interviews offers insights into users' perceptions, attitudes, and behaviors through in-depth discussions while allowing researchers to explore individual experiences and perspectives in detail, uncovering nuanced insights. Although, may be resource-intensive and subject to researcher bias in data interpretation. Observational studies can also be employed according to Kozak et al., 2018). but, noted that observational studies may be time-consuming and limited in capturing users' subjective experiences and perceptions.

According to Ryu et al., (2020). A mixed approach is more appropriate combining the strengths of both qualitative and quantitative research methodologies while providing a holistic view of users' perceptions and behaviours, facilitating nuanced interpretations and actionable recommendations. Even though noting that time constraints might hamper its effectiveness. Several studies have been conducted on users' perception of rest stops and areas, examining various aspects such as availability, safety, location, and overall satisfaction.

A study by Todd, Gates, and Savolainen's (2013), evaluated Traveller Preferences, Values, and Behaviours Associated with Public Rest Areas investigated How travelers select and value public rest areas. They utilized survey research, with the primary objectives of this survey being to identify the reasons motorists stop at public rest areas versus commercial service facilities, estimate the value of services provided by public rest areas, and determine the probable action taken by motorists if a public rest area was unavailable. Their Results indicated that patrons at both public rest areas and commercial service facilities generally preferred rest areas for basic services (e.g., restroom use, short break) primarily because of the convenient freeway access. The median patron-reported value of services at standard public rest areas was $1.68 per stop compared with $2.21 per stop at rest areas that included a traveller information centre. Even though drivers of commercial vehicles were the most frequent users of public rest areas, they tended to be less satisfied and gave a lower value to the services provided. Had a particular public rest area not been available, approximately two-thirds of travellers in private vehicles would have diverted off the freeway to a commercial service facility, whereas one-quarter would have continued to the next rest area along the route. Commercial truck drivers were equally likely to continue to the next rest area as to divert off the freeway.

Another study by Gunatillake,(2003) on the Public perceptions of rest areas in Victoria, which aimed to understand Victorians' use of rest areas, their inclusion in trip planning, and actions

to manage driver fatigue, using a survey method. Results showed that 76% of respondents stop at rest areas during long-distance trips, with 50% claiming it is very likely. Reasons for stopping included fatigue, fatigue-related reasons, and refreshment. 29% took power naps, highlighting the impact of tiredness on concentration and safety. Most drivers take breaks every two to three hours. Older drivers, holidays, and passengers are more likely to stop.

Davis (1997), also Studied using a survey methodology, the preference drivers for privately or publicly owned truck stops for overnight or long-term rest needs. It also addressed a perceived need for additional commercial vehicle parking space along U.S. Interstate highways by generating a nationwide description of truck parking spaces at public rest areas; detailed models of trucker demand for and utilization of public rest area parking spaces; and an evaluation of the ability of privately owned truck stops throughout the country to accommodate parking needs. (Davis, 1997).

Davis's study discovered that most commercial truckers, motor carriers, and even some privately owned truck stop owners agreed that parking is limited at particular places and times. The study anticipated a lack of 28,400 truck parking places in public rest areas across the country. It also estimated that almost one-third of privately held truck stop operators want to expand their parking facilities over the next three years, boosting overall projected capacity at truck stops by approximately 28,000 spots. Although part of the gap at public rest sites may be filled by private expansion activities, differences in survey techniques prevented a clear assessment of substitutability. Furthermore, the truck drivers polled did not appear to prefer privately operated truck stops over public rest facilities, as both looked to be serving (Davis, 1997). Another study by Boris, and Brewster (2018), using a mixed method to investigate truck parking shortage,

The researchers created and implemented a 14-day truck parking travel diary study to investigate detailed truck parking shortage impacts without relying on historical recollections. A total of 148 US drivers took part, providing detailed data for 2,035 days of parking activity and 4,763 unique stops. To facilitate the comparison of truck parking survey data with diary data, the analysis focused on truck parking topics with a link to previous survey findings related to drivers, state departments of transportation and enforcement activities, and other stakeholders. Overall, the truck parking diary findings supported the survey findings. Almost 90% of drivers park in an unauthorized location at least once a week, which supports survey findings that a majority of drivers find parking difficult (Boris, and Brewster, 2018).

Furthermore, Chatterjee and Wegmann's (2000), survey on public rest areas in Tennessee at night, covering all 7 days of the week, to learn about the occupancy characteristics of trucks and the availability of space in private truck stops near interchanges. This study noted that Truck parking spaces in the public rest areas and pull-out areas along Tennessee's Interstate highways are filling up at night, and large trucks are parking along the shoulders of ramps to these areas. Trucks are also parking along regular interchange ramps and, in some cases, along through lanes. This is a potentially hazardous situation for travellers.

In Nigeria, few researches exists within the topic area, however, a study on Safety Rest Areas and Fatigue Related Road Accidents in Enugu, Nigeria by Ezezue, Ibem, and Kikanme, (2019) investigated how the provision of safe rest areas can contribute to a reduction in the incidence of fatigue-induced road accidents in Enugu southeast Nigeria. The research design adopted was

a cross-sectional survey involving the administration of a structured questionnaire to 93 randomly selected drivers in the study area. The study found that 86.2% of drivers in Enugu southeast Nigeria drive over 6 hours daily, with 95.7% preferring rest stops. Fatigue, sleeping, and lack of concentration were major causes of road accidents. Drivers involved in accidents were six times more likely to stop over. The study suggested that governments should prioritize the provision of road rest areas to reduce the high incidence of accidents caused by long driving hours and fatigue in developing countries. using a similar method, Efoh, & Agbo (2021), investigated the prevalence of kola nut use among long-distance drivers and their perception of its influence on road traffic accidents. A mixed-method design was used, with 104 all-men drivers completing the Psychoactive Substance Abuse Questionnaire. The results showed a high prevalence of kola nut use, with 84.62% of the sample using it. The study also found positive perceptions among drivers about kola nut use.

In conclusion, this review noted that Perception is a crucial aspect of human cognition, behaviour, and societal dynamics, as it influences user satisfaction, usability, and overall user experience. It plays a pivotal role in determining the success or failure of projects, businesses, products, or services, and understanding how users feel while interacting with them is essential for creating memorable and engaging experiences. Perception studies are essential in various disciplines, driving research endeavours and shaping organizational strategies.

In marketing, understanding consumers' perceptions is fundamental for crafting effective marketing strategies geared toward increasing sales. In environmental psychology, perception studies provide architects with valuable insights into how users interact with their surroundings, enabling them to design spaces that resonate with human experience. Perception can be positive or negative, influencing individuals' attitudes, behaviours, experiences, and decision-making. Positive perception promotes a psychological state of acceptance, well-being, and satisfaction, while negative perception leads to distress, disillusionment, and maladaptive coping mechanisms. The polarity of perception exerts profound effects on individual behaviour and decision-making processes across various domains, including architecture, transportation, health, education, and organizational settings. Various methodologies can be employed in user perception studies, such as surveys, closed-ended questions, and qualitative methods. By incorporating these findings, planners and policymakers can create rest stops that enhance user experience, promote safety, and contribute to overall satisfaction during travel.

PHYSICAL FIELD OBSERVATIONS

Rest stops, often considered an oasis for weary travellers on long-distance journeys, are expected to provide a haven of convenience and comfort. However, 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 travellers 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 3 to 6).

Plate 3. Picture Showing Interior Of Food Way
Source: Kikanmen, 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 4. 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 5. 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 researcher noticed that most drivers drive more than 4 hours before taking a break, which is above the standard driving time,

Plate 6. Exterior Of Foodway Rest Stop
Source: Author 2023

From observations, few drivers agreed to the fact that they do not stop while travelling 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 hours without taking a break,

In a study, investigating Nigerians and their adaptation to their deadly road conditions, the case of fatigue related road accidents, a research was conducted and the primary data collection method used was by administration of questionnaires. The data collected from the respondents through the questionnaire administration were analysed, prepared and presented below.

Table 1: Socio-demographic characteristics of the respondents

	Frequency	Percent
Age group		
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.

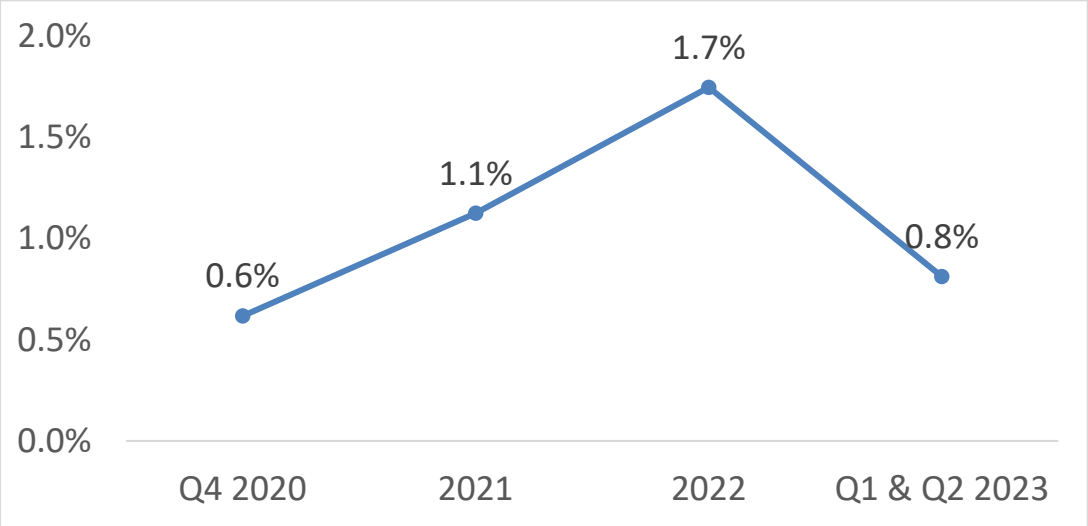

Fig 1: Prevalence of fatigue-related road accidents in Nigeria
Source: Kikenmen

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

Name of Rest stop	***n (%)***
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 4.2 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 1828.97m^2, 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 Safety Rest Area	100 40–50
Japan	Service Area Parking Area	50 15
U.K.	Service Area Service Area	48 100
Australia	Simplified Service Area Parking Area	50 30
China	Service Area	60
France	Service Area	20
Finland	Rest area	20
Spain	Rest Area Service Area	25 70
Poland	Rest Area Service Area	40 80
Korea	Service Area Safety Rest Area	25 42
Malaysia	Service Area Safety Rest Area	25 80
Nigeria	Rest Area	30
Denmark	Service Area Rest Area	30 70
Germany	Service Area Parking Area	35 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 4.3, 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
Architectural Typology		
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.

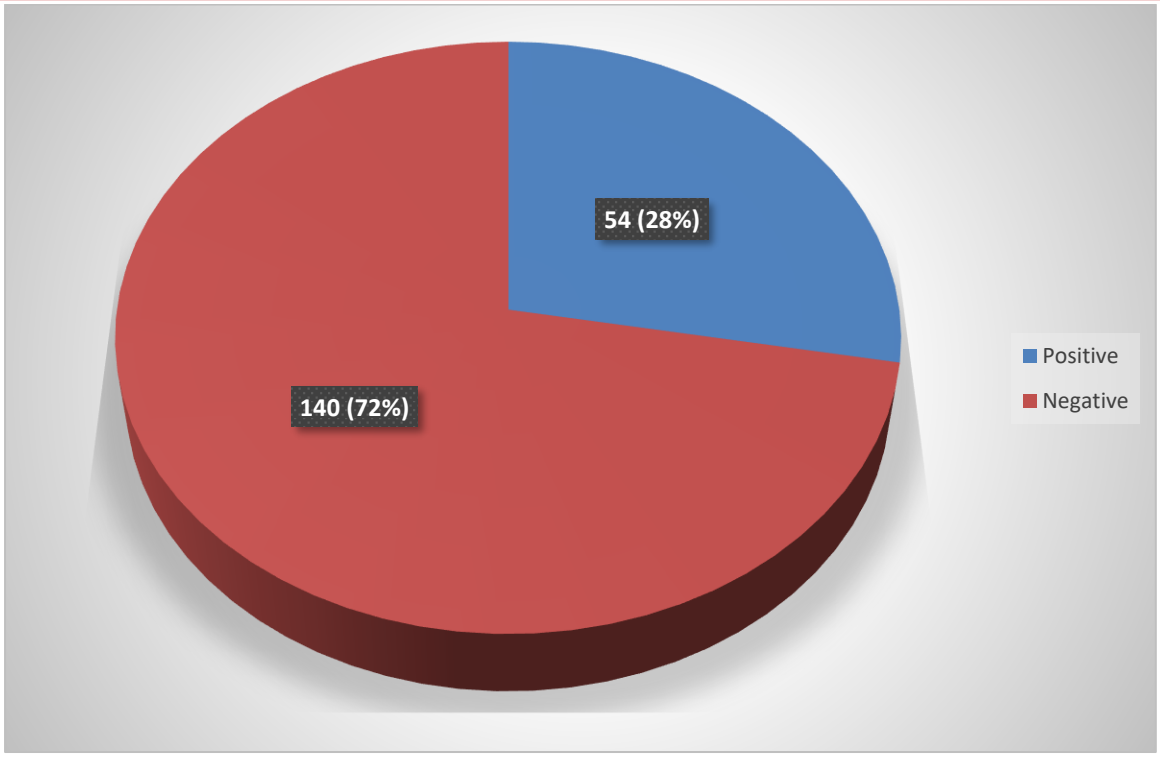

Fig 2: Summary of Driver's perception of rest stops

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 behaviour 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 centre (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.

RECOMMENDATIONS

It is commendable now that the Federal Government has recently given a green light to the Nigerian National Petroleum Corporation for the construction/rehabilitation of twenty-one federal roads across the country. This will surely contribute immensely towards bringing sanity to the road transport system in Nigeria (Mukhtar, 2021).

To effectively tackle fatigue-related traffic accidents, Knipling et al. (2004) suggest implementing a comprehensive strategy that combines education, governmental interventions, technical developments, and organizational activities. Education initiatives targeting the promotion of safer behaviours and increased driver knowledge may effectively raise awareness about the hazards of driving when tired. Furthermore, it is crucial to enact legislation that governs the number of hours drivers may be on the road, requires them to take regular breaks, and enforces procedures to manage tiredness. This is especially important for drivers in the commercial sector. The rest space on the Nigerian road proves to be useful in such situations and more are recommended. Pepple, & Adio (2014), recommended that the use of depressants while driving should be penalized. Blood alcohol content (BAC) levels should routinely measured by road safety personnel in Nigeria. Periodic eye exams should be carried out for all commercial drivers.

CONCLUSION

From the survey carried out, there is great dissatisfaction among drivers with the distribution and amenities of rest stops in Nigeria. It was also noticed that there is a significant increase in the prevalence of fatigue-related accidents in Nigeria year on year between 2020 and 2022. Furthermore, It was also noted that there is an average driving distance of 342.58km from the start point which is the various parks in south-eastern Nigeria to the points that the drivers identified as rest stops. This indicated a 6hrs 12mins driving time, which is potentially hazardous, According to Wang and Pei (2014), who noted that when driving continuously for over 4 hours, all aspects of driving performance are influenced significantly.

In addition, the perception of drivers towards Nigerian rest stops, showed a negative perception, indicating that the existing rest stops did not satisfactorily meet the needs of the drivers. On analyzing the driver's preferences, it showed that drivers preferred rest stops that included rooms that allowed for driver exchange, single-story design, an outward-oriented layout, as well as segregated parking between longer vehicles and smaller buses. The drivers' building design preferences indicated that the rest stop complex should have the following, in other to optimize the experience in a rest stop; scenic views, designated areas for picnics with covered seats and tables, law enforcement outpost, to check for compliance, and security purpose, sickbay and pharmaceutical stores.

It was noticed that the driver's rest stop preferences increased with an increase in age and experience, indicating more knowledge and acceptance of the use of rest stop with an increase in driving experience.

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