**EVALUATION OF THE LEVEL OF COMPLIANCE OF THE USE OF TRAFFIC LIGHTS AMONG MOTORISTS IN MINNA, NIGERIA.**



**1ARAOYE OLARINKOYE, AJIBOYE; 2ISMAIL GBOLAHAN, DERE; 3CHUKWUNENYE AUGUSTUS, AMAMILO; 4MICHAEL UNDIUKEYE, AMOH & 1CHINONYE CLETUS, ONAH**

**1**Logistics and Transport Technology Department, School of Innovative Technology, Federal University of Technology Minna.

**2**Department of Logistics and Supply Chain Management Technology, Nigerian Defence Academy, Kaduna.

3Department of Logistics and Supply Chain Management, Admiralty University of Nigeria Ibusa, Delta State.

**4**Transport Management Department, Ibrahim Badamasi Babaginda University Lapai, Niger State

**1aCorresponding Author:** [**araoyeoajiboye@gmail.com**](mailto:araoyeoajiboye@gmail.com) **& +2348034287013**

**ABSTRACT**

*This study seeks to evaluate the level of compliance with traffic lights in Minna among the motorists’ base on the theory of planned behavior. A reconnaissance survey of the town was carried out by the researchers to identify the location of the traffic lights and observation of happening around the traffic lights’ location. Survey research was adopted and data were gathered from it with the use of questionnaire and secondary sources while photographs were used to capture scenery of interest around the traffic lights. Furthermore, mapping of the traffic light intersections across Minna was cried out, and 400 structured questionnaires were administered to motorists, road users and traffic regulatory agency in the study areas where traffic lights are located through systematic random sampling technique for their selection and the analysis was carried out using descriptive statistics. In order to assess the degree of adherence of road users to traffic laws and regulations, personal observation of road users was conducted inside Minna where the traffic lights are placed. The counting of violated vehicles took place for a period of six days from Monday to Saturday with each day dedicated to each location. Information on the traffic offenses committed by the motorists and their penalty was collected from the traffic enforcement. The study reveals that the level of traffic violation in Minna is relatively varies from one location to another; Mandela Road junction with 22.27% has the highest traffic violation and the lowest number of violators are found on Lagos Road/Old market intersection near Obasanjo Complex with 12.89%. Generally, the lower number of violators in all the traffic light intersection is as a result of the presence of the Vehicle Inspection Officers who are stationed on the road from 8:00 am to 4:00 pm on weekdays and it also demonstrates that road users comply with traffic rules more when there are enforcement agencies on the road. Also, most of the violations took place during the evening time from the hours of 4:00 pm to 6:00 pm, when the enforcement agencies had dismissed for the day. The study therefore suggests that adequate compliance to the traffic regulations and very strict enforcement with the aid of hidden cameras will help to mitigate road traffic accidents in the study area. The policy maker should therefore ensure strict enforcement of traffic laws in Minna metropolis.*

**Key words:** Evaluation, Compliance, Penalty, Traffic lights, Traffic regulations; Traffic enforcement

1. **Introduction**

The overriding aim of Nigerian traffic regulations is to prevent and reduce traffic accidents as well as to clear obstructions off highways to allow for free flow of traffic (Ajiboye *et al* 2021a). However, studies have discovered that more than 80% of all road accidents that result in serious injuries, property damage, and fatalities were caused by motorists' insufficient awareness of traffic rules and regulations and disrespect for them (Siyan *et al,* 2019). Most of the cities in developing countries including Nigeria are experiencing rapid urbanisation and growth, leading to increase traffic congestion and traffic accidents especially in the state capitals (Albalate & Fageda, 2021). Different countries place different values on traffic laws and these laws are intended to lessen traffic and congestion in cities. Traffic lights which are crucial component of urban infrastructure, and help to regulate the flow of traffic and ensuring the safety of road users. They serve as indispensable tools for maintaining order and safety on roadways, yet their effectiveness hinges on the degree of adherence by road users (Ajiboye *et al,* 2023). However, compliance with traffic lights is a significant concern in many cities, particularly in Minna, Niger State.

***Ajiboye et al (2024). Evaluation of the level of compliance of the use of traffic lights among motorists in Minna, Nigeria***

Research have shown that non-compliance with traffic rules and regulations including the use of traffic lights is a major contributor to road crashes and congestion in most of the cities in the world in general and Nigeria in particular (Ajiboye *et al,* 2023, Ajiboye *et al,* 2022, Oluwasanmi, *et al*., 2018, WHO, 2018). In Nigeria, the situation is exacerbated by rapid urbanisation, inadequate infrastructure, limited enforcement, and cultural factors (Ajiboye *et al*, 2021). Studies have also highlighted the importance of understanding driver attitudes, road conditions, and enforcement in influencing compliance (Prasetyanto *et al*. 2021, Stanojević *et al* 2013, Glendon, 2007).

Motorists are among the most vulnerable road users, making them an important target population for reducing traffic casualties (Gana & Emmanuel, 2014; Johnson & Adebayo, 2011). Different countries place different values on traffic laws. These laws are intended to lessen traffic and congestion in cities. The earliest traffic accidents occurred in Lagos, Nigeria, around 1906. Since then, it has become a substantial cause of death in Nigeria (Tunde *et al.,* 2012). In an effort to reduce the frequency and severity of road crashes, it was necessary to create road traffic regulations to guide operation, behaviour, and other issues related to the road and the users of the road. Car owners, motorcyclists, cyclists, tricyclists, and pedestrians are only a few of the various categories of road users. Nigeria quickly adopted motorbikes and tricycles for passenger transportation during the country's economic turmoil in the early 1980s and till now (Tunde *et al.,* 2012; Ajiboye *et al,* 2021b).

The assessment of adherence to traffic control signals among drivers uncovers substantial challenges across diverse environments. Empirical findings suggest that disregard for red light indicators constitutes a widespread contributor to vehicular collisions, representing 3.9% of all accident occurrences in Poland (Szczuraszek & Klusek, 2018). In the Malaysian context, research illustrates that compliance rates among drivers diminish during periods of peak traffic, with elevated vehicle densities linked to an increase in infractions (Tey *et al,* 2016) (Kulanthayan, *et al.,* 2007). In South Africa, anecdotal observations imply that non-compliance has reached endemic levels, compounded by a deficiency of comprehensive data concerning intersection-related accidents (Sinclair, 2012). Moreover, novel methodologies employing image processing technologies have been established to monitor vehicular conduct at traffic signals, emphasising the potential of technological advancements to bolster compliance oversight (Morkaya & Korukoglu, 2010). Collectively, these investigations accentuate the imperative for focused interventions aimed at enhancing adherence to traffic signals and promoting road safety.

Enforcing traffic laws and regulations is an ongoing battle in Nigeria in general and in Minna metropolis, the capital of Niger State in particular. Traffic laws are regarded as breached when motorists and pedestrians willfully disobey expressly forbidden or socially acceptable driving regulations (Ajiboye *et al* 2023). The government of Niger State built traffic signals across the busiest junctions or most often travelled areas of the town with the intent of lowering traffic congestion and traffic accidents. Despite these measures, some motorists have continued to disregard traffic restrictions without any tangible reasons. The study evaluates the compliance level of motorists in Minna, Nigeria, with traffic lights, addressing critical issues like traffic congestion, accidents, and poor adherence to road safety regulations. As a developing city, Minna grapples with challenges from rapid urbanisation, inadequate infrastructure, and weak enforcement mechanisms, which aggravate traffic violations and safety risks. This research is important as it examines road user behavior, identifies factors affecting compliance, and pinpoints areas with high violation rates. Its findings will equip policymakers, urban planners, and enforcement bodies with data-driven recommendations to enhance traffic law enforcement, improve public safety, and reduce accidents. Additionally, the study enriches discussions on urban mobility and safety in developing nations, supporting innovative solutions like technology integration and stricter enforcement to address traffic-related challenges.

**1.1 Study Area**

***Ajiboye et al (2024). Evaluation of the level of compliance of the use of traffic lights among motorists in Minna, Nigeria***

In North-Central Nigeria, the town of Minna serves as the state capital of Niger State. It developed into a significant gathering place for agricultural products such rice, cotton, yams, shea nuts, ginger, and peanuts after the Kano-to-Baro railway opened in 1911 and the Lagos-to-Jebba line was extended to a junction in Minna in 1915. Lagos also receives shipments of pigs via train. Sorghum, yams, corn (maize), millet, peanuts, cotton, shea nuts, indigo, kola nuts, cattle, goats, poultry, and guinea fowl are the principal commodities traded locally. The area is well-known for its brassware, ceramics, woven and painted cotton linen, raffia mats, and baskets. Minna has grown as a hub of administration since becoming the capital of Niger State in 1976. It is the location of four universities and four other higher institutions; that train teachers, nurses, mid-wives, health technicians and others, several nursery primary and secondary schools, multiple hospitals. Additionally, it serves as radio transmission hub and a junction for local highways leading to the state's southern region and host state offices of national examination bodies including the Headquarter of the National Examination Council (NECO).

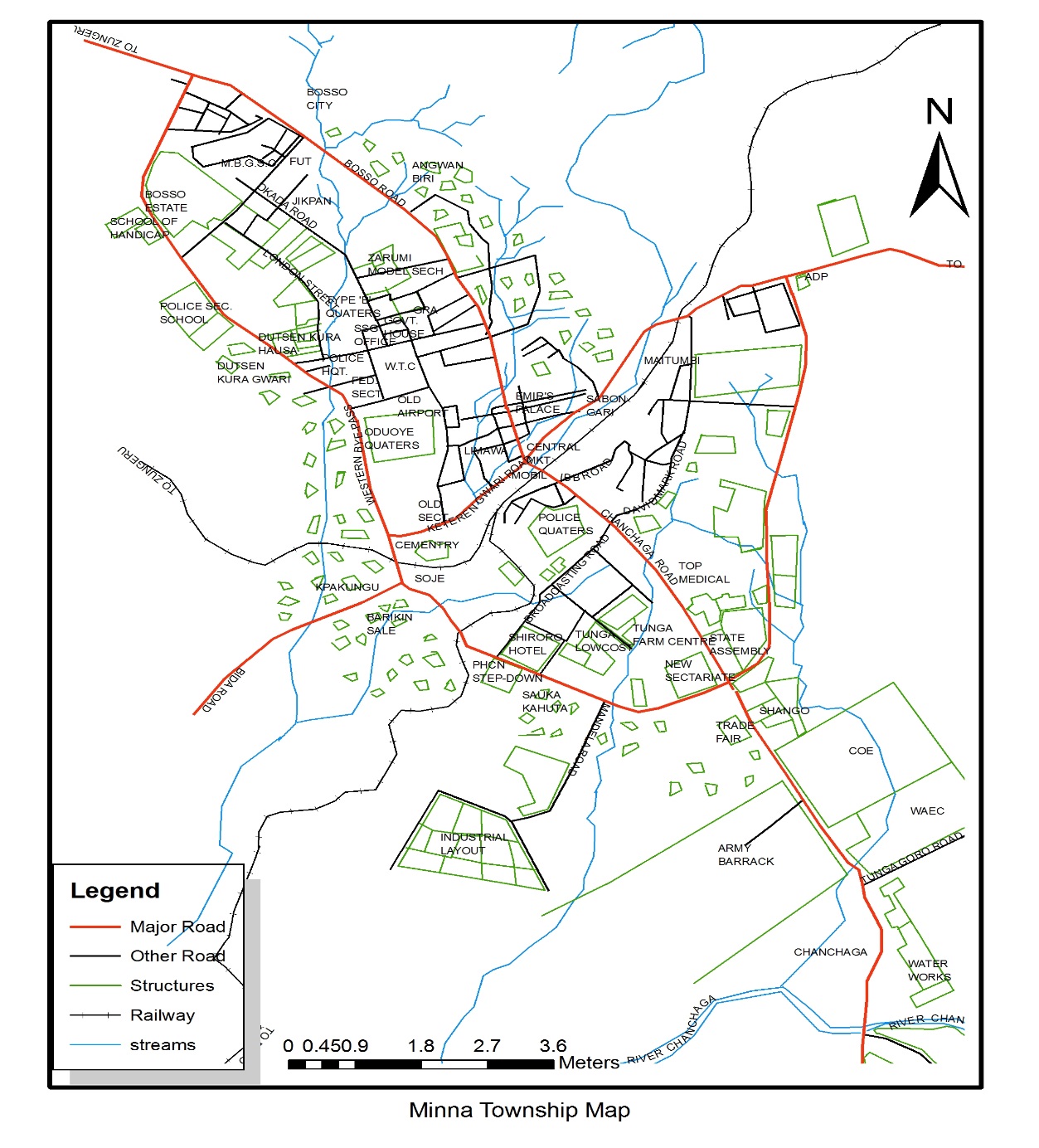
Chanchaga and Bosso are the two local government areas that make up Minna City, which also serves as the administrative centre of Niger State. However, the municipality has expanded to include nearby neighbourhoods such as Anguan Daji, Barkin Sale, Bosso, Chanchaga, Dusten Kura Gwari, Gbadnai, Gbaiko, Gbangbapi, Gidan-Kwanu, Gidan-Mangoro, Jikpan, Keteren Gwari, Kpakungu, Maikunkele, Maitumbi, Nikangbe, Shango, Tayi, Tundu-Fulani, and Tunga (See Figure1). Minna city has a surface area of around 6,789 km2, and the population was estimated at 209,341 in 2006, with a predicted population of 496,000 in 2023 using a growth rate of 3.2%. The city of Minna can be found between latitudes 9'28oN and 9'42ON, and between longitudes 6'30oE and 6'35E. A more or less continuous rock outcrop that restricts urban expansion in that direction may be found in the city's north-eastern section.

**2.0 Theoretical framework**

Traffic lights play a vital role in urban transportation systems, managing the movement of vehicles and ensuring safety at intersections. Adhering to traffic light rules is crucial for reducing accidents, alleviating traffic congestion, and maintaining the smooth flow of vehicles. However, compliance with these signals varies widely, shaped by factors such as driver behavior, law enforcement efforts, and public awareness. Analysing how motorists adhere to traffic light regulations sheds light on road safety trends and the effectiveness of current traffic management strategies. By identifying the reasons behind non-compliance, authorities can craft specific measures to improve safety, minimise violations, and foster a culture of responsible driving. This study seeks to evaluate motorists' adherence to traffic light rules and employs theoretical frameworks to understand the factors that influence their compliance.

**2.1. The theory of planned behavior**

The theory of planned behaviour (TPB) was propounded in 1985 by a social psychologist, Icek Ajzen. He suggests that an individual’s behaviour is determined by their attitudes, subjective norms, and perceived behavioural control. TPB has been applied to understand driver behaviour toward speed limits and develop traffic safety campaigns in Europe (Elliott *et al.*, 2003), to develop driver education programs in Australia, focusing on attitudes and behaviors (Glendon, 2005), the attitudes and behaviour of adolescent road users in Europe (Elliott, 2003), has been used to predict traffic violations, such as speeding and reckless driving in the United States (Forward, 2009, Parker *et al.*, 1995) and it is also applied to inform road safety policies and develop interventions in order to reduce traffic offenses in South Africa (Modipa, 2022, Seedat *et al.,* 2006). Motorists in Nigeria who believe that complying with traffic lights is important, perceive that others expect them to comply, and feel they have control over their behavior are more likely to comply.



**Figure 1:** Map of Minna Township

**Source**: Ministry of Land and Housing, Minna

This theory offers a highly relevant framework for studying the level of compliance with traffic light regulations among motorists in Minna, Nigeria. This theory effectively explains how attitudes, subjective norms, and perceived behavioral control shape an individual's intention to engage in specific behaviors, such as obeying traffic signals. For example, motorists' attitudes whether they perceive traffic lights as vital for safety or as unnecessary hindrances significantly influence their level of adherence. Similarly, subjective norms, driven by societal expectations and peer influences, can either promote or undermine compliance based on prevailing social and cultural attitudes. Perceived behavioral control, reflecting drivers' confidence in their ability to comply given road conditions, enforcement practices, and traffic dynamics, also plays a critical role in shaping behavior. Applying TPB in this research allows for a comprehensive understanding of the psychological and contextual factors influencing compliance, enabling the development of targeted strategies to improve road safety and encourage responsible driving in Minna.

***Ajiboye et al (2024). Evaluation of the level of compliance of the use of traffic lights among motorists in Minna, Nigeria***

**3.0 Literature Review**

Ajiboye *et al* (2023) assessed the level of compliance of automobile drivers to traffic rules and regulations in Bida, Niger State, Nigeria. The primary data for this research was collected by the authors through the use of questionnaires that were administered to 400 randomly selected drivers, and through observatory method while the traffic counts were conducted by the researchers to determine the number and types of vehicles plying the routes. The secondary data were collected from the regulatory agencies of the government within the study area such as the Vehicle Inspection Officers (VIOs), and the Federal Road Safety Corps (FRSC). The following five variables were applied in the study which are overloading of vehicles, non-usage of seat-belt by the drivers, route violation by the drivers, non-usage of vehicle’s number plate, and wrong parking of vehicles in order to determine the level of compliance of the drivers while the traffic count was done at seven major traffic corridors in the town. The data collected were analysed using descriptive methods such as percentages, tables and charts while the results show a high level of low compliance 6.6% among the automobile drivers in all the variables. The work recommends that mental health condition of the drivers should be determined before the issuance of driver’s license, there should be a continuous enlightenment programs for drivers in local languages, and the regulatory agencies should monitor and patrol the accident prone and high traffic violation areas.

Hassan *et al* (2022) assess the level of compliance level of road users to road traffic signs in Kaduna metropolis, Nigeria by examining ten (10) symbolic warning, regulatory/prohibitory and informative signs each. With the help of Slovin’s formula, 120 questionnaires using Likert scale were administered to private and commercial drivers, pedestrians, and cart pushers within Kaduna metropolis, out of which 105 of the questionnaires were returned and 100 was selected as well completed. Mean score was adopted in analysing each of the variables in the questionnaire to weigh the degree of responses, 2 is regarded as the cut-off point, and any item that falls below 2.0 is consider rejected response while any item above 2.0 is considered as an Acceptance. The analysis was done with the Statistical instrument and Microsoft excel data processing and charts. However, the analysis showed that there is a low level of awareness of traffic signs by road users and these variables are age, driving experience and education played a significant role in drivers’ understanding of signs while marital status and gender had no effect.

The study by Himawan, (2023) was a thorough analytical review of literature on the factors that are responsible for the compliance to traffic rules and regulations across the world in general and Indonesia in particular. The method used in the literature review was carried out by sourcing for relevant materials on the subject matter through several avenues. Such as Academia.edu, Google Scholar, DOAJ, E-resources perpusnas, Indonesia onesearch, LIPI, ResearchGate, and Science Direct with several related keywords in sourcing for the articles. The results show that there are fifteen main themes, which are age and gender, aggressiveness, behavior thinking about other issues of life without concentration and driving a vehicle in an atmosphere of tiredness, cultural factors, image of the Traffic Police, perceived risk, road-worthiness of vehicles and road infrastructure, role taking, self-control, social support, strict enforcement of law and effective implementation of the ticket program, understanding of traffic rules, and values of intrinsic, compassion, usefulness and of justice. The result shows that there is a close relationship among the factors responsible for the compliance to traffic rules and regulations and they have positive impact in reducing accidents if well implemented.

***Ajiboye et al (2024). Evaluation of the level of compliance of the use of traffic lights among motorists in Minna, Nigeria***

Olagunju (2009) notes that a number of accidents in the nation, particularly involving motorcycle operators, have been attributed to ineffective traffic law enforcement. He also made note of the participants' outrage at the motorcyclists' level of disobedience to traffic laws and regulations at a one-day course on motorcycle operations in Nigeria held by the Federal Road Safety Corps in March 2006. Numerous motorcycle accidents were caused by the actions of these commercial riders, who exhibited inadequate awareness of traffic laws and regulations, used narcotics, and were distracted by their mobile phones. He concluded that In Nigeria, one out of every four vehicles involved in collisions is a motorcycle.

The fundamental concern has always been whether these motorcycles adhere to the essential safety requirements (Ajiboye *et al*, 2021a). In a study of 500 motorcycle riders in Kagang, Selangor, Malaysia, it was discovered that 54.4% of the riders wore helmets correctly, 21.4% did not wear it properly, and the rest 24.2% did not wear them at all. The use of crash helmets was found to be substantially correlated with age, gender, race, formal education, prior accidents, experience, and the type of license carried (Kulanthayan *et al*., 2000). In developing world adherence to traffic laws and regulations by road users is a persistent problem and the management of traffic on the roads has become a serious issue in today's society. When motorists and pedestrians willfully contravene officially forbidden or generally accepted standards of driving behaviour, traffic laws are considered to have been broken (Hu *et al,* 2004).

In ensuring that drivers adhere to the regulations of the road and there is free movement of traffic in the State capital, the Niger State government installed traffic lights across the busiest or heavy traffic zones of Minna. Nevertheless, despite these initiatives, drivers, particularly those operating motorbikes, tricycles and personal automobiles, have continued to disobey traffic regulations (Gaymard, 2009). In the light of the above, this study aims to evaluate the level of compliance with traffic lights in Minna.

**3.1 Research Gap**

Various research has been conducted both globally and within Nigeria on adherence to traffic regulations, including compliance with traffic lights. However, significant gaps remain. Most studies have primarily addressed broader issues such as general traffic rule compliance, vehicle roadworthiness, and enforcement mechanisms. For instance, research conducted in Bida and Kaduna, Nigeria, has provided valuable insights into compliance levels and influencing factors. Yet, these studies fail to deeply explore the specific dynamics of traffic light adherence, especially in urban centers like Minna, Niger State, which face unique challenges driven by rapid urbanization, inadequate enforcement, and cultural influences.

Furthermore, international studies reveal a range of factors affecting traffic light compliance, such as peak-hour violations in Malaysia, technological interventions in Turkey, and psychological aspects of driver behavior in South Africa. While insightful, these findings often do not align with the socio-cultural and infrastructural realities of Minna. Much of the existing research focuses on general road user behavior without isolating the critical issue of compliance at signalized intersections. Additionally, there is a scarcity of data examining how localized factors, such as enforcement intensity, public awareness campaigns, and driver attitudes, interact to influence traffic light adherence in Minna.

This study aims to bridge these gaps by focusing specifically on traffic light compliance in Minna. It adopts theoretical frameworks, including the theory of planned behavior, to examine psychological and contextual factors and incorporates empirical data to offer practical recommendations. In doing so, the research contributes to a deeper understanding of urban traffic management challenges in developing nations and provides actionable insights for policymakers and urban planners in Minna and similar contexts.

**4.0 Methodology**

In this study, a descriptive survey design was used. Creswell (2012) asserts that the goal of a descriptive survey research design is to determine the what, where, and how of a phenomenon. The researcher picked the descriptive study strategy because it enables quick and cost-effective data collection from a bigger population. It enables researchers to gather numerical data that can then be quantitatively examined using both inferential and descriptive statistics.

A reconnaissance survey of the town was carried out by the researchers to identify the location of the traffic lights and observation of happening around the traffic lights’ location was carried out. During the survey, the researchers conduct an oral interview with officers from the VIO Office, Federal Road Safety Commission, and Traffic Division of the Nigerian Police to determine the possible reasons for non-compliance of road users to the traffic light and the variables required to be included in the questionnaires for data collection. Survey research was adopted and data were gathered from it with the use of questionnaire and secondary sources while photographs were used to capture scenery of interest around the traffic lights. Furthermore, mapping of the traffic light intersections across Minna was cried out, and 400 structured questionnaires were administered to motorists, road users and traffic regulatory agency in the study areas where traffic lights are located through systematic random sampling technique for their selection and the analysis was carried out using descriptive statistics. The information on traffic offenses committed by the motorists was collected from the traffic regulation agencies in the town which are the Vehicle Inspection Officer (VIO) Office, Federal Road Safety Commission, and Traffic Division of the Nigerian Police. However, during the actual data collection, two field assistants were employed to assist in questionnaire administration.

**4.1 Significant of Traffic Light in Minna**

The importance of this study lies in its ability to improve road safety and traffic management in Minna, Niger State, Nigeria. By examining motorists' compliance with traffic lights, the research fills a significant gap in understanding the causes of traffic violations and their effects on urban mobility. The results aim to reduce road accidents, injuries, and fatalities by offering practical insights to promote adherence to traffic rules. Policymakers and law enforcement agencies can utilize the findings to create focused interventions, strengthen enforcement strategies, and develop public awareness campaigns that encourage responsible driving.

Moreover, the research supports urban planning efforts by guiding the enhancement of traffic light systems and the strategic allocation of resources to ease congestion. In the context of Minna’s rapid urbanization, the study provides critical data to address infrastructure deficiencies and enforcement gaps that contribute to non-compliance. Its implications extend beyond Minna, offering a model for other developing cities facing similar challenges. The study also highlights the potential of technology in advancing traffic management and compliance monitoring, fostering innovative solutions. In sum, this research establishes a foundation for building safer, more efficient urban transportation systems, benefiting drivers, road users, and stakeholders in traffic and urban planning.

**5.0 Results**

**5.1 Socio-demographic characteristics of the respondents**

The socio-demographic profile of the respondents (N = 400) is outlined in Table 1. The majority of the participants were male (M = 1.35, SD = 0.48), reflecting a higher number of males compared to females. The average age of the respondents was 33.2 years (SD = 9.5), with the age group 26–35 years being the most represented, followed by the 18–25 age group. In term of education, most respondents reported attaining tertiary education (M = 2.80, SD = 1.02), with secondary education being the next most common. Regarding occupation, public sector employment emerged as the leading category (M = 2.15, SD = 0.83), while a smaller number of respondents identified as unemployed. Marital status analysis showed that the majority of participants were either single or married (M = 1.88, SD = 0.67), with only a small percentage being divorced or widowed. These results present a detailed snapshot of the varied socio-demographic attributes of the sample.

***Ajiboye et al (2024). Evaluation of the level of compliance of the use of traffic lights among motorists in Minna, Nigeria***

**Table 1: Socio-demographic characteristics of the respondents**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Characteristic** | **Category** | **Frequency (n)** | **Mean** | **Standard Deviation** |
| **Gender** | Male | 260 | 1.35 | 0.48 |
|  | Female | 140 | - | - |
| **Age Group (years)** | 18-25 | 100 | 33.2 | 9.5 |
|  | 26-35 | 180 | - | - |
|  | 36-45 | 80 | - | - |
|  | 46 and above | 40 | - | - |
| **Educational Level** | No Formal Education | 20 | 2.8 | 1.02 |
|  | Primary Education | 50 | - | - |
|  | Secondary Education | 120 | - | - |
|  | Tertiary Education | 210 | - | - |
| **Occupation** | Public Sector | 150 | 2.15 | 0.83 |
|  | Private Sector | 120 | - | - |
|  | Self-Employed | 100 | - | - |
|  | Unemployed | 30 | - | - |
| **Marital Status** | Single | 180 | 1.88 | 0.67 |
|  | Married | 190 | - | - |
|  | Divorced/Widowed | 30 | - | - |

**Source:** Field survey,2023

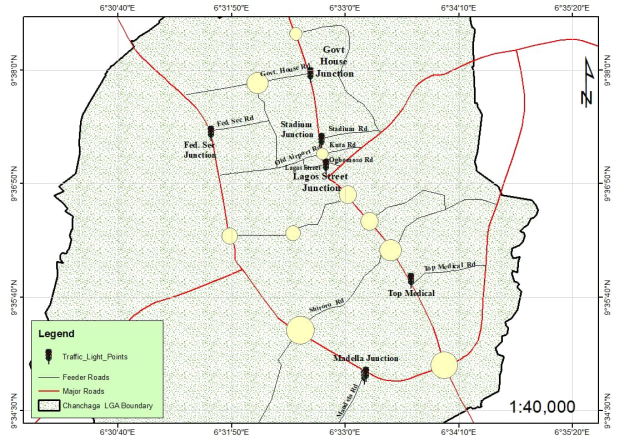
**5.2 Assessment of how well road users are aware of and perceive traffic laws and regulations**

The study identifies and map the location of traffic lights within Minna Metropolis. This was achieved by going to the six locations where traffic lights were installed in Minna and take their GPS location. The six locations (See Figure 2) where the traffic lights were installed are Government House intersection on Bosso Road, Federal secretariat on Western Bypass, Stadium/ Emir Palace intersection on Bosso Road, Old market/ Lagos Road intersection near Obasanjo Complex, Top Medical intersection, Tunga and the Mandela Road intersection on Western Bypass.

***Ajiboye et al (2024). Evaluation of the level of compliance of the use of traffic lights among motorists in Minna, Nigeria***

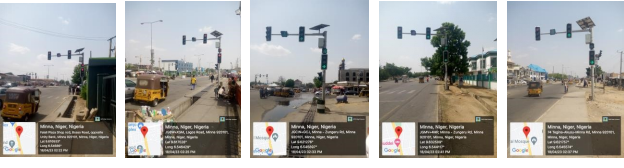
## **5.3 Level of Road User Adherence to Traffic Laws and Regulations**

The level of compliance to traffic rules in Minna was evaluated based on the survey conducted. In order to assess the degree of adherence of road users to traffic laws and regulations, personal observation of road users was conducted inside Minna at strategically chosen intersections where traffic lights are placed (See Plate 1). The counting took place for a period of six days from Monday to Saturday with each day dedicated to each location. Daily hours for the survey are 8:00am to 10:00 am, 12:00pm to 2:00pm, and 4pm to 6pm. These hours are considered as the peak hours. Tables 1 to 6 below contain the result from the survey.



## **Figure 2: Locational distribution and mapping of the six traffic lights in Minna Metropolis**

**Source: ArcGIS, 2023.**





**Plate 1:** Shows the different locations of traffic light in Minna

**Source:** Authors Field survey, 2023.

From Table 1, at the Government House intersection, it can be observed that the highest level of non-compliance was recorded in the evening between the hours of 4:00 pm and 6:00pm. This is because the Vehicle Inspection Officers (VIO) end their job for the day by 4:00pm. It was observed that during the hours of 8:00am to 10:00 am in the morning, the compliance level was high. This is due to the fact that enforcement agencies are very active during this period.

***Ajiboye et al (2024). Evaluation of the level of compliance of the use of traffic lights among motorists in Minna, Nigeria***

At High Point International School and Shiroro Road Intersection as shown in Table 2, most of the non-compliance are experienced in the evening between 04:00 pm to 06:00 pm just like in Table 1. Private vehicles and Tricycle riders are the worst culprits with a record of 734 and 956 respectively in non-compliance. The least violators are the commercial motorcycles; this is because of the government's crackdown on commercial motorcycle operators in plying major roads in Minna Metropolis.

At the Stadium Road / Emir Palace Intersection as shown in Table 3, the Tricycle operators and private vehicles top the chart in non-compliance to traffic lights. This shows that tricycle operators and private vehicles are the major impatience road users.

**Table 1: Traffic Light Compliance at Government House intersection**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Days** | **Time Slot** | **Private Vehicle** | **Commercial Vehicle** | **Tricycles** | **Private Motorcycle** | **Commercial Motorcycles** | **Total** | **Mean** | **Std. Dev.** |
| **Mon** | 8:00am - 10:00am | 0 | 1 | 3 | 2 | 0 | 6 | 1.2 | 1.47 |
|  | 12:00pm - 2:00pm | 15 | 23 | 19 | 31 | 12 | 100 | 20 | 6.98 |
|  | 4:00pm - 6:00pm | 523 | 388 | 489 | 242 | 54 | 1696 | 339.2 | 186.06 |
| **Fri** | 8:00am - 10:00am | 3 | 0 | 1 | 0 | 0 | 4 | 0.8 | 1.17 |
|  | 12:00pm - 2:00pm | 23 | 12 | 22 | 14 | 4 | 75 | 15 | 7.29 |
|  | 4:00pm - 6:00pm | 398 | 270 | 521 | 318 | 10 | 1517 | 303.4 | 180.8 |

**Source:** Authors’ Field survey, 2023**.**

Table 1 outlines vehicle counts observed during different time slots on Monday and Friday, detailing the total, mean, and standard deviation of these counts. On Monday, the 8:00–10:00 a.m. slot recorded 6 vehicles (M = 1.2, SD = 1.47), the 12:00–2:00 p.m. slot showed 100 vehicles (M = 20.0, SD = 6.98), and the 4:00–6:00 p.m. slot reported 1,696 vehicles (M = 339.2, SD = 186.06). On Friday, the 8:00–10:00 a.m. slot registered 4 vehicles (M = 0.8, SD = 1.17), the 12:00–2:00 p.m. slot recorded 75 vehicles (M = 15.0, SD = 7.29), and the 4:00–6:00 p.m. slot had 1,517 vehicles (M = 303.4, SD = 180.80). These figures highlight a significant rise in traffic volume during the 4:00–6:00 p.m. time slot on both days.

**Table 2 Traffic Light Compliance at High Point International School Intersection**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Days** | **Time Slot** | **Private Vehicle** | **Commercial Vehicle** | **Tricycles** | **Private Motorcycle** | **Commercial Motorcycles** | **Total** | **Mean** | **Std. Dev.** |
| **Mon** | 8:00am - 10:00am | 0 | 2 | 1 | 0 | 4 | 7 | 1.4 | 1.67 |
|  | 12:00pm - 2:00pm | 44 | 33 | 56 | 21 | 22 | 176 | 35.2 | 14.54 |
|  | 4:00pm - 6:00pm | 456 | 397 | 534 | 276 | 149 | 1812 | 362.4 | 149.41 |
| **Fri** | 8:00am - 10:00am | 0 | 0 | 3 | 1 | 0 | 4 | 0.8 | 1.17 |
|  | 12:00pm - 2:00pm | 23 | 42 | 12 | 34 | 11 | 122 | 24.4 | 13.09 |
|  | 4:00pm - 6:00pm | 278 | 265 | 420 | 156 | 98 | 1217 | 243.4 | 116.85 |

**Source:** Authors’ Field survey, 2023**.**

***Ajiboye et al (2024). Evaluation of the level of compliance of the use of traffic lights among motorists in Minna, Nigeria***

Table 2 provides an overview of vehicle counts during different time slots on Monday and Friday, detailing the total number of vehicles, average (mean) counts, and standard deviations for each period. On Monday, 7 vehicles were counted in the 8:00–10:00 a.m. slot, with an average of 1.4 (SD = 1.67). The 12:00–2:00 p.m. slot saw a total of 176 vehicles (M = 35.2, SD = 14.54), while the 4:00–6:00 p.m. period had the highest total of 1,812 vehicles (M = 362.4, SD = 149.41). On Friday, the 8:00–10:00 a.m. period recorded 4 vehicles (M = 0.8, SD = 1.17), the 12:00–2:00 p.m. slot noted 122 vehicles (M = 24.4, SD = 13.09), and the 4:00–6:00 p.m. slot counted 1,217 vehicles (M = 243.4, SD = 116.85). This data illustrates a clear trend of higher vehicle counts during the later 4:00–6:00 p.m. time slot on both days.

**Table 3: Traffic Light Compliance at Stadium Road Intersection**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Days** | **Time Slot** | **Private Vehicle** | **Commercial Vehicle** | **Tricycles** | **Private Motorcycle** | **Commercial Motorcycles** | **Total** | **Mean** | **Std. Dev.** |
| **Mon** | 8:00am - 10:00am | 3 | 0 | 1 | 2 | 0 | 6 | 1.2 | 1.17 |
|  | 12:00pm - 2:00pm | 20 | 12 | 32 | 0 | 2 | 66 | 13.2 | 12.49 |
|  | 4:00pm - 6:00pm | 465 | 321 | 597 | 291 | 21 | 1695 | 339 | 192.22 |
| **Fri** | 8:00am - 10:00am | 2 | 0 | 1 | 4 | 1 | 7 | 1.4 | 1.67 |
|  | 12:00pm - 2:00pm | 32 | 9 | 43 | 23 | 11 | 118 | 23.6 | 14.68 |
|  | 4:00pm - 6:00pm | 321 | 167 | 476 | 267 | 33 | 1264 | 252.8 | 138.73 |

**Source:** Authors’ field survey, 2023.

Table 3 details vehicle counts across three-time intervals on Monday and Friday, including totals, averages, and standard deviations for each period. On Monday, the 8:00–10:00 a.m. interval recorded 6 vehicles in total (Mean = 1.2, SD = 1.17). The 12:00–2:00 p.m. slot observed 66 vehicles (Mean = 13.2, SD = 12.49), while the 4:00–6:00 p.m. window showed the highest total at 1,695 vehicles (Mean = 339.0, SD = 192.22). Similarly, on Friday, the 8:00–10:00 a.m. interval accounted for 7 vehicles (Mean = 1.4, SD = 1.67), the 12:00–2:00 p.m. period documented 118 vehicles (Mean = 23.6, SD = 14.68), and the 4:00–6:00 p.m. window recorded 1,264 vehicles (Mean = 252.8, SD = 138.73). These findings

highlight a significant surge in vehicle counts during the 4:00–6:00 p.m. time slot on both days, indicating peak traffic periods.

From Table 4, the highest numbers of non-compliance motorists were recorded at the Lagos Road/ Old market intersection near Obasanjo Complex; this is because of the strategic location of this route as it is located at the centre of Minna Metropolis. Tricycle operators topped the chart of violators, due to the fact that tricycle is the most relied on means of transportation in Minna and competition between tricycle operators to meet their daily target leads to non-compliance to traffic rules and regulations.

**Table 4: Traffic Light Compliance at Lagos Road/ Old market intersection near Obasanjo Complex**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Days** | **Time Slot** | **Private Vehicle** | **Commercial Vehicle** | **Tricycles** | **Private Motorcycle** | **Commercial Motorcycles** | **Total** | **Mean** | **Std. Dev.** |
| **Mon** | 8:00am - 10:00am | 3 | 0 | 0 | 0 | 0 | 3 | 0.6 | 1.34 |
|  | 12:00pm - 2:00pm | 23 | 10 | 35 | 13 | 5 | 86 | 17.2 | 11.69 |
|  | 4:00pm - 6:00pm | 412 | 127 | 327 | 91 | 32 | 989 | 197.8 | 144.71 |
| **Fri** | 8:00am - 10:00am | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
|  | 12:00pm - 2:00pm | 32 | 12 | 44 | 18 | 10 | 116 | 23.2 | 13.65 |
|  | 4:00pm - 6:00pm | 621 | 112 | 767 | 214 | 43 | 1757 | 351.4 | 269.23 |

**Source:** Authors’ field survey, 2023.

***Ajiboye et al (2024). Evaluation of the level of compliance of the use of traffic lights among motorists in Minna, Nigeria***

The data summarized in Table 4 outlines vehicle counts for three time slots on Monday and Friday, including totals, means, and standard deviations for each period. On Monday, the 8:00–10:00 a.m. time slot had 3 vehicles recorded (Mean = 0.6, SD = 1.34), the 12:00–2:00 p.m. slot saw 86 vehicles (Mean = 17.2, SD = 11.69), and the 4:00–6:00 p.m. slot recorded the highest total of 989 vehicles (Mean = 197.8, SD = 144.71). Conversely, on Friday, the 8:00–10:00 a.m. time slot had no vehicles recorded (Mean = 0.0, SD = 0.00), the 12:00–2:00 p.m. period observed 116 vehicles (Mean = 23.2, SD = 13.65), and the 4:00–6:00 p.m. period noted a peak with 1,757 vehicles (Mean = 351.4, SD = 269.23). The data

clearly indicates the highest vehicle counts occurred during the 4:00–6:00 p.m. slot on both days.

At Top Medical Intersection, Tunga area and as shown in Table 5. The issue of motorists’ violations during the hours of 8:00am to 10:00am were nonexistent. This is as a result of the presence of the enforcement agencies and the low traffic congestion at this intersection.

**Table 5: Traffic Light Compliance at Top Medical Intersection**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Days** | **Time Slot** | **Private Vehicle** | **Commercial Vehicle** | **Tricycles** | **Private Motorcycle** | **Commercial Motorcycles** | **Total** | **Mean** | **Std. Dev.** |
| **Mon** | 8:00am - 10:00am | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
|  | 12:00pm - 2:00pm | 15 | 0 | 21 | 5 | 11 | 52 | 10.4 | 7.79 |
|  | 4:00pm - 6:00pm | 442 | 145 | 422 | 143 | 45 | 1197 | 239.4 | 156.92 |
| **Fri** | 8:00am - 10:00am | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
|  | 12:00pm - 2:00pm | 33 | 11 | 47 | 10 | 21 | 122 | 24.4 | 14.82 |
|  | 4:00pm - 6:00pm | 387 | 167 | 410 | 156 | 23 | 1143 | 228.6 | 148.74 |

**Source:** Authors’ field survey, 2023**.**

Table 5 provides an overview of vehicle counts during three-time intervals on both Monday and Friday, along with their respective totals, averages, and standard deviations. On Monday, no vehicles were counted during the 8:00–10:00 a.m. period (average = 0.0, SD = 0.00). During the 12:00–2:00 p.m. slot, 52 vehicles were recorded (average = 10.4, SD = 7.79). The 4:00–6:00 p.m. time frame saw the highest activity, with 1,197 vehicles reported (average = 239.4, SD = 156.92). Similarly, Friday showed no vehicles during the 8:00–10:00 a.m. interval (average = 0.0, SD = 0.00). However, 122 vehicles were noted between 12:00–2:00 p.m.

(average = 24.4, SD = 14.82).

The highest count again occurred from 4:00–6:00 p.m., with 1,143 vehicles recorded (average = 228.6, SD = 148.74). These results highlight a noticeable surge in vehicle counts during the late afternoon time slot on both days.

At Mandela Road Intersection on Western bypass as shown in Table 6, there is an increase in violation by commercial vehicle because most commercial vehicles from Abuja, Kaduna, Jos, Kano enroute to the southeastern part of Niger State and the western part of Nigeria such as Kwara, Oyo, Osun, Ogun and Lagos States ply this route. They are always in a hurry to get to their final destination.

**Table 6: Traffic Light Compliance at Mandela Road Intersection**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Days** | **Time Slot** | **Private Vehicle** | **Commercial Vehicle** | **Tricycles** | **Private Motorcycle** | **Commercial Motorcycles** | **Total** | **Mean** | **Std. Dev.** |
| **Mon** | 8:00am - 10:00am | 23 | 32 | 43 | 13 | 54 | 165 | 33 | 15.78 |
|  | 12:00pm - 2:00pm | 89 | 43 | 117 | 67 | 24 | 340 | 68 | 35.65 |
|  | 4:00pm - 6:00pm | 478 | 398 | 279 | 275 | 143 | 1573 | 314.6 | 110.87 |
| **Fri** | 8:00am - 10:00am | 12 | 5 | 28 | 19 | 67 | 131 | 26.2 | 23.03 |
|  | 12:00pm - 2:00pm | 92 | 24 | 123 | 53 | 31 | 323 | 64.6 | 37.93 |
|  | 4:00pm - 6:00pm | 590 | 453 | 390 | 211 | 87 | 1731 | 346.2 | 163.82 |

**Source:** Authors’ field survey, 2023.

***Ajiboye et al (2024). Evaluation of the level of compliance of the use of traffic lights among motorists in Minna, Nigeria***

Table 6 outlines vehicle counts during three time slots on Monday and Friday, detailing totals, averages, and standard deviations for each period. On Monday, the 8:00–10:00 a.m. interval saw a total of 165 vehicles (mean = 33.0, SD = 15.78), while the 12:00–2:00 p.m. period recorded 340 vehicles (mean = 68.0, SD = 35.65). The 4:00–6:00 p.m. time slot experienced the highest activity, with 1,573 vehicles (mean = 314.6, SD = 110.87). On Friday, the 8:00–10:00 a.m. slot documented 131 vehicles (mean = 26.2, SD = 23.03), and the 12:00–2:00 p.m. period accounted for 323 vehicles (mean = 64.6, SD = 37.93). The 4:00–6:00 p.m. interval again saw the highest volume, with 1,731 vehicles (mean = 346.2, SD = 163.82). These figures highlight a pronounced surge in vehicle activity during the later time slots, especially from 4:00–6:00 p.m., on both days.

Table 7 summarize the number of traffic violators from the various types of road users that travel through the six main traffic intersections in Minna. It is evident that there is a high degree of violations based on the number of violators as observed by the field survey of traffic counts of violators. This highlights the need for additional research into the variables that road users' disregard for traffic laws and regulations.

**Table 7: Cumulative Reports of the Number of Violators from the Six Traffic Points in Minna.**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Intersection** | **Monday** | **Friday** | **Total** | **Mean** | **Std. Dev.** | **% of Violators** |
| **Government House intersection** | 1802 | 1596 | 3398 | 1699 | 145.51 | 17.75% |
| **High Point International School** | 1995 | 1343 | 3338 | 1669 | 230.73 | 17.44% |
| **Stadium Road intersection** | 1767 | 1389 | 3156 | 1578 | 188.72 | 16.49% |
| **Obasanjo Complex intersection** | 1078 | 1873 | 2467 | 1233.5 | 561.98 | 12.89% |
| **Top Medical Intersection** | 1249 | 1265 | 2514 | 1257 | 11.31 | 13.14% |
| **Mandela Road Intersection** | 2078 | 2185 | 4263 | 2131.5 | 75.66 | 22.27% |

**Source:** Authors’ field survey, 2023.

Table 7 outlines traffic data for six intersections over Monday and Friday, presenting totals, averages, standard deviations, and percentages of violators for each site. The Government House intersection recorded 3,398 vehicles (average: 1,699.0, standard deviation: 145.51, 17.75% violators). The High Point International School intersection followed closely with 3,338 vehicles (average: 1,669.0, standard deviation: 230.73, 17.44% violators). At Stadium Road, there were 3,156 vehicles (average: 1,578.0, standard deviation: 188.72, 16.49% violators). Meanwhile, the

***Ajiboye et al (2024). Evaluation of the level of compliance of the use of traffic lights among motorists in Minna, Nigeria***

Obasanjo Complex recorded 2,467 vehicles (average: 1,233.5, standard deviation: 561.98, 12.89% violators). The

Top Medical Intersection noted 2,514 vehicles (average: 1,257.0, standard deviation: 11.31, 13.14% violators). Mandela Road Intersection had the highest total traffic with 4,263 vehicles (average: 2,131.5, standard deviation: 75.66, 22.27% violators). These figures emphasize notable differences in traffic volume and violation rates, with Mandela Road leading in both total vehicles and violation percentage.

**5.4 Examination of the penalty melted out to traffic defaulters**

|  |  |  |
| --- | --- | --- |
| **S/no** | **Offence/Traffic violation** | **Charges (N)** |
| **1** | ROUTES VIOLATION | N 10,000 |
| **2** | PARKING ON YELLOW LINE/ILLEGAL PARKING | N 10,000 |
| **3** | FAILURE TO YIELD TO RIGHT OF WAY OF PEDESTRIANS AT A ZEBRA CROSSING | N 10,000 |
| **4** | FAILURE TO GIVE WAY FOR TRAFFIC AT THE ROUND ABOUT | N 10,000 |
| **5** | SMOKING/DRIKING ALCOHOL WHILE DRIVING | N 10,000 |
| **6** | OVERLOADING PERSONS/GOODS | N 20,000 |
| **7** | INSTALLMENT OF MUSICAL GADGET ON MOTORCYCLE | N 10,000 |
| **8** | AN OFFENDER RESISTING ARREST | N 10,000 |
| **9** | DANGEROUS DRIVING/OVERTAKING | N 10,000 |
| **10** | UNDER AGED RIDER/DRIVER | N 10,000 |
| **11** | EXCEEDING PRESCRIBED SPEED LIMIT | N 20,000 |
| **12** | ASSAULT ON A TRAFFIC OFFICER | N 50,000 |
| **13** | ABANDONED VEHICLE ON HIGHWAY | N 10,000 |
| **14** | VEHICLE CAUSING OBSTRUCTION ON HIGH WAY IF BROKEN DOWN | N 20,000 |
| **15** | MAKING/RECEIVING PHONE CALLS WHILE DRIVING | N 10,000 |
| **16** | DRIVING WITHOUT A STRAPPED SEATBELT FOR DRIVER/PASSENGER | N 10,000 |
| **17** | TRAFFIC LIGHT VIOLATION | N 10,000 |
| **18** | TRAFFIC SIGN/MAKING VIOLATION | N 5,000 |
| **19** | APPROVED COLOR FOR COMMERCIALVEHICLES VIOLATION | N 15,000 |
| **20** | DRIVER’S LICENSE VIOLATION | N 5,000 |
| **21** | OBSTRUCTING MARSHAL ON DUTY | N 5,000 |
| **22** | EXCESSIVE SMOKE EMISSION | N 5,000 |
| **23** | NUMBER PLATE VIOLATION | N 5,000 |
| **24** | ATTEMPT TO CORRUPT MARSHAL ON DUTY | N 10,000 |
| **25** | FLYING PARTICLES VIOLATION | N 5,000 |
| **26** | FORGED PAPERS AND LICENSE | N 5,000 |
| **27** | DISOBEYING TRAFFIC CONTROL PERSONEL | N 10,000 |
| **28** | RIDING MOTORCYCLE WITHOUT RIDER’S PERMIT | N 10,000 |
| **29** | RIDING MOTORCYCLE WITHOUT CRASH HELMENT FOR RIDER | N 10,000 |
| **30** | CONVEYING MORE THAN ONE PASSENGER AT A TIME | N 20,000 |
| **31** | DRIVING MOTOR VEHICLE/MOTORCYCLE WITHOUT SIDE MIRROR INDICATORS BRAKE LIGHT OR REAR LIGHT | N 10,000 |
| **32** | MOTORCYCLE OPERATING USING HORN DESIGNED FOR MOTOR | N 10,000 |
| **33** | ILLEGAL U-TURN | N 10,000 |
| **34** | TOWING OF PRIVATE CARS | N 15,000 |
| **35** | TOWING OF COMMERCIAL CAR | N 20,000 |
| **36** | CAUTION SIGN VIOLATION | N 5,000 |
| **37** | WINDSCREEN VIOLATION | N 5,000 |
| **38** | OTHER VIOLATION/OFFENDERS | N 5,000 |
| **39** | FIRE EXTINGUISHER | N 5,000 |
| **40** | ROAD OBSTRUCTION VIOLATION | N 10,000 |
| **41** | OPERATION VEHICLE WITHIN RESTRICTED ROUTES | N 10,000 |
| **42** | PACKING OR STOPPING TO PICK PASSENGERS | N 10,000 |
| **43** | DRIVING ON THE WALK WAY/ROAD PAVEMENT | N 10,000 |
| **44** | COMMUTER OR CONDUCTOR HANGING ON TAILBOARD OF A MOVING VEHICLE | N 10,000 |

**Source:** Field survey, 2023**.**

This discussion examines the offenses and associated fines imposed on traffic violators, offering a clear framework for penalties aimed at enforcing traffic laws and enhancing road safety. The fines vary between **₦5,000 and ₦50,000**, depending on the nature and gravity of the violation. Common infractions like **route violations, parking on yellow lines, or failing to yield to pedestrians** attract standardized fines of ₦10,000. More severe offenses, such as **overloading passengers or cargo, exceeding speed limits, or leaving a broken-down vehicle obstructing the highway,** come with higher penalties of ₦20,000. The steepest fine of **₦50,000** is reserved for **assaulting traffic officers**, underscoring the critical importance of respecting enforcement personnel. Minor infractions, including **violating traffic signs, emitting excessive smoke, or ignoring caution signs**, incur lighter fines of ₦5,000. Intermediate penalties, such as **₦15,000 for non-compliance with approved vehicle colors or towing of private vehicles**, address specific regulatory breaches. This tiered penalty system aligns fines with the severity of risks posed by various offenses. By levying stricter fines for dangerous behaviors like **reckless driving, defiance of traffic control officers, or attempting to bribe marshals,** the structure emphasizes safety and upholds traffic enforcement integrity. Covering a wide range of infractions, the system ensures both individual and systemic issues are comprehensively addressed.

***Ajiboye et al (2024). Evaluation of the level of compliance of the use of traffic lights among motorists in Minna, Nigeria***

**5.0 Conclusions and Recommendations**

The study highlights that motorists' adherence to traffic light regulations in Minna, Nigeria, is heavily influenced by the presence of enforcement officers, time of day, and specific traffic dynamics at various locations. The Mandela Road intersection recorded the highest rate of violations (22.27%), whereas the Lagos Road/Old Market intersection had the lowest (12.89%). Higher compliance was observed during morning hours (8:00 am–10:00 am) when Vehicle Inspection Officers (VIO) were on duty, but violations peaked in the evening (4:00 pm–6:00 pm) when enforcement waned. Tricycles and private vehicles were identified as frequent violators, reflecting the competitive pressures of commercial transport and impatience among private drivers. Although penalties ranging from ₦5,000 to ₦50,000 aim to discourage infractions, their impact is reduced due to inconsistent enforcement and the absence of technological support.

To mitigate these challenges, a comprehensive strategy is proposed. Firstly, enforcement should be strengthened by increasing officer presence during peak violation periods, particularly in the evenings, and by deploying more personnel to high-violation areas such as Mandela Road. Secondly, the integration of technology, such as hidden cameras and automated systems at traffic lights, is essential for real-time monitoring and automatic fine issuance. Public awareness campaigns must also be launched to educate road users about the significance of compliance, involving community leaders and transport unions to promote a culture of adherence. Stricter penalties for repeat offenders should be implemented, alongside ensuring traffic light systems are well-maintained and reliable. Urban planning initiatives should prioritize redesigning congested intersections and establishing dedicated lanes for tricycles and motorcycles to reduce conflicts. Over the long term, partnerships with technology providers and legislative backing for automated enforcement systems will be critical to achieving sustained improvements in compliance, road safety, and urban mobility in Minna.

**References**

Ajiboye, A. O.,Owoeye, A. S., Yakubu-Wokili, H. & Ibraheem, A. (2021a). Assessment of road accidents in Minna. *Port Harcourt Journal of Disaster Risk Management & Development Studies,* 3(1), 92-106.

***Ajiboye et al (2024). Evaluation of the level of compliance of the use of traffic lights among motorists in Minna, Nigeria***

Ajiboye, A. O., Ohida, M. E., Abdullahi, M.I. & Komolafe, B. O. (2021b). [Operatıon and management of Trıcycle (Keke Napep) as a mean of public transport in Mınna, Nıgerıa](https://scholar.google.com/citations?view_op=view_citation&hl=en&user=kweIE4UAAAAJ&cstart=20&pagesize=80&citation_for_view=kweIE4UAAAAJ:_kc_bZDykSQC). *Asia Pacific*

*Management and Business Application*, 9(2), 179-192

Ajiboye, A. O., Folagbade, A. M., Ohida, M. E. & Kolawole, O. J. (2022). Appraisal of the success of the Federal Road Safety Corps (FRSC) in road accidents reduction in Kaduna State, Nigeria. *Port Harcourt Journal of Disaster Risk Management & Development Studies,* 4(3&4), 92-106.

Ajiboye, A. O., Owoeye, A. S., Zarumi, G. M., Oni, B. G. & Abubakar, I. D. (2023). Assessment of compliance level of automobile drivers with traffic rules and regulations in Bida, Niger State. *Centre for Human Settlements and Urban Development Journal,* 9(1), 39-55.

Ajzen, I. (1985). From intentions to actions: A theory of planned behavior. In Kuhl, J. & Beckmann, J. (eds.). Action control: From cognition to behavior (pp. 11-39). Springer.

Albalate, D. & Fageda, X. (2021). On the relationship between congestion and road safety in cities. *Transport Policy,* 105, 145-152. https://doi.org/10.1016/j.tranpol.2021.03.011

Creswell, J. W. (2012). Educational research: Planning, conducting, and evaluating quantitative and qualitative research (4th ed.). Boston, MA: Pearson.

Elliott, M. A. (2003). The attitudes and behaviour of adolescent road users: An application of the theory of planned behaviour. Prepared for Road Safety Division, Department for Transport. *Transport Research Laboratory Report (TRL)* 601.

Elliott, M. A., Armitage, C. J.& Baughan, C. J. (2003). Drivers’ compliance with speed limits: An application of the theory of planned behavior. *Journal of Applied Psychology*, 88, 964-972.

Forward, S. E. (2009). The theory of planned behaviour: The role of descriptive norms and past behaviour in the prediction of drivers’ intentions to violate. *Transportation Research Part F: Traffic Psychology and Behaviour*, *12*(3), 198-207. https://doi.org/10.1016/j.trf.2008.12.002

Gana A. J., & Emmanuel J. A. (2014). Road transportation and traffic law enforcement in Nigeria: A case study of the Federal Road Safety Corps (FRSC). *West African Journal of Industrial & Academic Research,* 11(1): 134-151.

Gaymard, S. (2009). Norms in social representations: two studies with French young drivers. *The European Journal of Psychology Applied to Legal Context,* 1, 165-181.

Glendon, A. I. (2005). Risk perception and driver behavior. *Journal of Safety Research,* 36(3), 257-265.

Glendon, A. I. (2007). Driving violations observed: An Australian study. *Ergonomics,* 50(8), 1159-1182.

Hassan, I. I., Sani, J. E., Anwar, A M., Mamman, M. M., Shehu, A.A. & Abdulrahmanm, B. (2022). Assessment of compliance level of road users to road traffic signs in Kaduna Metropolis, Nigeria. *World Journal of Advanced Engineering Technology and Sciences,* 5(2), 69–81, I: <https://doi.org/10.30574/wjaets.2022.5.2.0047>

Himawan, A, (2023). Factors influencing traffic compliance. *International Journal of Social and Management Studies,* 3(6), 33-41. e-ISSN: 2775-0809

Hu, B. L., Crewalk, J. A. M. & Ascher, D. P. (2012). Congenital sepsis caused by Eikenella corrodens. Open Journal of Pediatric, 2(02), 175-177. doi: [10.4236/ojped.2012.22029](http://dx.doi.org/10.4236/ojped.2012.22029).

Johnson O. E. & Adebayo A. M. (2011). Effect of health education on knowledge of and compliance to road safety signs among motorcyclists in Uyo, Southern Nigeria. *Global Medical Journal,* 45(3),89-96.

Kulanthayan, S., Phang., W. K, & Hayati, K. S. (2007). Traffic light violation among motorists in Malaysia. *IATSS Research*, *31*(2), 67-73. doi: 10.1016/S0386-1112(14)60224-7

Kulanthayan, S., Umar, R. R., Hariza, H. A., Nasir, M. M. & Harwant, S. (2000). Compliance of proper safety helmet usage in motorcyclists. *Medical Journal of Malaysia*, 55(1), 40-44.

Modipa, M. (2022). Analysing factors contributing to road traffic accidents in South Africa. *International Journal of Research in Business & Social Science,* 11(4), 439-447.

 Morkaya, O. & Korukoglu, S. (2010). [*Obedience testing of the vehicles to the traffic lights in video by image processing techniques*](https://ieeexplore.ieee.org/document/5654287/)*.* *Signal Processing and Communications Applications Conference*, 22-24 April 2010, IEEE, Diyarbakır, Turkey, 1-4.

Olagunju, Y. K. (2009). Safety challenges of commercial motorcycle operators in Nigeria: Case Studies of Lagos, Adamawa and Enugu States. Unpublished PhD Thesis, Lagos, University of Lagos.

Oluwasanmi, J. O., Ojo, O. A., & Ojo, O. E. (2018). Urbanization and environmental health challenges in Nigeria: A review. *International Journal of Geography and Geology,* 7(2), 21-33.

Parker, D., West, R., Stradling, S., & Manstead, A. S. (1995). Behavioural characteristics and involvement in different types of traffic accident. *Accident Analysis & Prevention,* *27*(4), 571-581 https://doi.org/10.1016/0001-4575(95)00005-K

Prasetyanto, D, Rizki M. & Maulana A. (2021). The role of attitude, behavior, and road conditions in traffic violation among workers and students in Bandung City, Indonesia. *The Open Transportation Journal*, 15, 147-159. <http://dx.doi.org/10.2174/1874447802115010147>

Szczuraszek, T., Klusek, R. (2019). Analysis of factors affecting non-compliance with the red- light signal at city intersections equipped with traffic signaling. In: Sierpiński, G. (eds) Integration as solution for advanced smart urban transport systems. TSTP 2018. *Advances in Intelligent Systems and Computing,* vol 844, 106-115. Springer, Cham. https://doi.org/10.1007/978-3-319-99477-2\_10

Seedat, M. (2006). Road safety in South Africa: A review. *Journal of Injury Prevention*, 12(2), 73-78.

Sinclair, M. (2011). Driver compliance with traffic signals in Stellenbosch. A paper presented at Southern African Transport Conference, July 2011.

Siyan, P., Oyeyemi, B. & Agunbiade, O. (2019). Road accident analysis and prevention in Nigeria: experimental and numerical approaches. *International Journal of Advanced Scientific Research & Development,* 6(6), 1 – 12.

Stanojević, P., Jovanović, D., & Lajunen, T. (2013). Influence of traffic enforcement on the attitudes and behavior of drivers. *Accident Analysis & Prevention*, *52*, 29-38.

<https://doi.org/10.1016/j.aap.2012.12.019>

Tey, L. S., Khalil, M. K. A. & Azizan, F. A. (2016). Driver Behaviour and Compliance at Signalised Intersection. In: Yacob, N., Mohamed, M., Megat Hanafiah, M. (eds) *Regional Conference on Science, Technology and Social Sciences* (RCSTSS 2014). Springer, Singapore. <https://doi.org/10.1007/978-981-10-0534-3_7>

Tunde, A.G., Taiwo, O.A. & Matanmi, O.G. (2012). Compliance with road safety regulations among motorcyclists in Nigeria. *Canada Social Science*, 8(1), 92-100.

World Health Organization. (2018). Global status report on road safety 2018. Luxembourg: World Health Organization. Retrieved from: http://www.who.int/violence\_injury\_prevention/road\_safety\_status/2018/en/

***Ajiboye et al (2024). Evaluation of the level of compliance of the use of traffic lights among motorists in Minna, Nigeria***