



# Effect of Communication on Road Safety Management in Federal Capital Territory (FCT), Abuja, Nigeria

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## Abstract

Effective communication is fundamental to the success of all organisations, whether public or private, as it facilitates the dissemination of information and promotes the achievement of organisational goals. In the context of road safety management, communication serves as a critical tool for informing, regulating, warning, and guiding road users, thereby contributing to safer and more efficient transportation systems. This study examined the effect of communication on road safety management in the Federal Capital Territory (FCT), Abuja. Specifically, it sought to identify and evaluate road safety and traffic-related issues contributing to increased road traffic crashes (RTCs) and traffic gridlocks, assess road users' attitudes and behaviours towards road safety, examine the impact of road accidents and congestion on development, and identify mechanisms for preventing road crashes and enhancing road safety within the FCT. The study was anchored on the Cybernetics Theory developed by Norbert Wiener (1948), which emphasises communication and control systems as essential elements in achieving effective coordination and regulation. A survey research design was adopted, and primary data were collected through the administration of structured questionnaires. The study population comprised 249 respondents, and a census sampling technique was employed to ensure that all members of the population were included in the study. Data were presented and analysed using descriptive and inferential statistical tools, including frequency tables, mean scores, correlation analysis, regression analysis, and chi-square tests. The findings revealed that communication plays a significant role in road safety management within the Federal Capital Territory. The study further identified time pressure, poor road conditions, information distortion, and distractions as the major barriers to effective communication in road safety management. These factors were found to contribute significantly to road traffic crashes, traffic congestion, and other road safety challenges. The study concludes that improving communication systems, strengthening road infrastructure, enhancing public awareness, and promoting compliance with traffic regulations are essential for reducing road accidents and improving road safety outcomes in Abuja. The study recommends increased investment in road safety communication strategies, public education campaigns, and effective traffic management systems to enhance sustainable development within the Federal Capital Territory.

**Keywords:** *Communication gadgets, Road signs, Traffic safety, FCT roads*

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### **Background to the Study**

Transportation is a critical component of socio-economic development, facilitating the movement of people, goods, and services from one location to another. An efficient road transport system contributes significantly to economic growth, social integration, and national development. However, the effectiveness of any transport system depends largely on the ability of road users to communicate and interact safely within the road environment. Communication therefore plays a central role in ensuring order, safety, and efficiency on roads. Communication refers to the process of transmitting information, ideas, instructions, or messages from one party to another in a manner that ensures understanding and appropriate response. In the context of road transportation, communication enables traffic authorities, road engineers, and law enforcement agencies to provide guidance, warnings, regulations, and directions to road users. Effective communication helps motorists, cyclists, pedestrians, and other road users make informed decisions, thereby reducing confusion, traffic congestion, and the likelihood of accidents. All organisations, whether public or private, depend on effective communication to achieve their objectives and convey information to their target audience. Similarly, road transport systems rely heavily on communication mechanisms to ensure the safe and orderly movement of traffic. Effective communication contributes to the reduction of road crashes, injuries, and fatalities by providing timely and accurate information to road users. It also facilitates traffic management during emergencies, road construction, diversions, and periods of heavy congestion.

Communication devices are indispensable tools in modern traffic management. These devices are traffic control instruments used primarily to communicate information between traffic authorities and road users. According to Ogunmola (2013), communication devices in transportation are designed to regulate, warn, inform, and guide road users within the traffic system. Such devices include traffic signs, road markings, traffic signals, reflective studs, pedestrian crossings, and parking control measures. These tools combine both linguistic and non-linguistic elements to convey messages effectively and ensure that road users understand their responsibilities and obligations while using the road network. Traffic signs provide information about regulations, warnings, directions, and road conditions. Road markings assist in directing vehicle movement, defining lanes, and promoting orderly traffic flow. Traffic signals control the movement of vehicles and pedestrians at intersections, thereby reducing conflicts and enhancing safety. Collectively, these communication tools play a significant role in minimising collisions, improving traffic efficiency, and promoting road safety.

Despite the availability of these communication devices, road traffic crashes continue to occur due to factors such as non-compliance with traffic regulations, poor understanding of traffic signs and signals, reckless driving, and inadequate enforcement of road safety measures. Consequently, it is essential not only to provide communication tools but also to ensure that road users understand and obey them. Increased awareness, education, and compliance can significantly enhance road safety outcomes and contribute to sustainable national development.

### **Statement of the Problem**

Road traffic accidents remain a major public safety concern in Nigeria, particularly in urban centres such as Abuja. Despite improvements in road infrastructure, vehicle safety standards, and public awareness campaigns, road crashes continue to result in significant injuries, loss of lives, and economic costs. These accidents undermine national development by reducing productivity, increasing healthcare expenditures, and causing emotional and social hardship for affected families and communities. Several studies have examined road safety challenges in Nigeria; however, there is still limited research focusing on the role of road user behaviour, communication effectiveness, and traffic conflict analysis in understanding the causes of road crashes in Abuja. Furthermore, many road users fail to comply with traffic signs, signals, and regulations, thereby increasing the risk of accidents and traffic conflicts.

Given the increasing rate of road crashes and their negative consequences, there is a need to identify and evaluate the factors responsible for unsafe road user behaviour and traffic conflicts in Abuja. This study therefore seeks to examine the causes of road traffic crashes, assess the effectiveness of communication and traffic control measures, and explore strategies that can reduce accidents and promote safer road usage in Nigeria's Federal Capital Territory.

### **Research Questions**

This study seeks to answer the following questions:

- i). What are the major causes of road traffic crashes resulting in injuries and fatalities in Nigeria?
- ii). What are the impacts of road traffic accidents and crashes on national development?
- iii). What mechanisms can be implemented to prevent road traffic crashes and accidents in order to promote national development?

### **Objectives of the Study**

The main objective of this study is to examine the role of communication in road safety management in the Federal Capital Territory (FCT), Abuja.

The specific objectives are to:

- i). Assess the overall performance of road safety management in the Federal Capital Territory, Abuja.
- ii). Examine the effect of communication on road safety management in reducing road traffic crashes, congestion, and traffic gridlocks in Abuja.
- iii). Determine the attitudes and behaviours of road users towards road safety regulations and communication tools in the Federal Capital Territory.
- iv). Identify and evaluate the major causes of road traffic crashes resulting in injuries and fatalities in Abuja.
- v). Examine the impact of road traffic accidents, traffic congestion, and road crashes on socio-economic and national development.
- vi). Assess the effectiveness of traffic communication tools such as road signs, road markings, traffic signals, and other traffic control devices in promoting road safety.
- vii). Identify strategies and mechanisms for preventing road traffic crashes and improving road safety management in the Federal Capital Territory, Abuja.

## **Literature Review**

### **The Study Area: Abuja, Federal Capital Territory**

The Federal Capital Territory (FCT), Abuja, serves as the administrative capital of Nigeria and occupies a strategic location in the centre of the country. Situated between Latitude 8°56'N and 9°08'N and Longitude 7°22'E and 7°32'E, Abuja covers approximately 256 square kilometres within the larger Federal Capital Territory. The city is characterised by notable geographical features such as Aso Rock and Zuma Rock and functions as the seat of the Federal Government of Nigeria.

Abuja has experienced rapid urbanisation and population growth since becoming Nigeria's capital city. With an annual urban growth rate estimated at over 8 per cent, the city has become one of the fastest-growing urban centres in Africa. This rapid expansion has significantly increased the demand for transportation services and road infrastructure. Consequently, the city's road network experiences increasing pressure from commuters, commercial vehicles, and inter-state transport operators.

The road network within Abuja consists of expressways, arterial roads, collector roads, and local streets. While the city possesses one of the most extensive road networks in Nigeria, increasing population growth, urban expansion, and rising vehicle ownership have contributed to traffic congestion, road crashes, and safety concerns. These challenges have heightened the need for effective road safety management and efficient communication systems capable of regulating traffic movement and promoting safe road use.

### **Communication and Road Safety Management**

Communication is a fundamental component of road safety management. It involves the transmission of information, instructions, warnings, and regulations designed to influence road user behaviour and promote safe transportation practices. Effective communication enables traffic authorities to disseminate information regarding road conditions, traffic regulations, emergencies, and potential hazards, thereby reducing the likelihood of accidents and traffic conflicts. According to Ogunmola (2013), traffic communication tools serve as a medium through which traffic engineers and regulatory authorities communicate with road users. These tools provide information, regulate traffic flow, warn road users of potential dangers, and guide movement within the transportation system. Communication is therefore not merely an administrative function but a critical safety mechanism that contributes to accident prevention and efficient traffic management. Furthermore, effective communication facilitates coordination among relevant stakeholders, including traffic management agencies, law enforcement authorities, emergency response organisations, and road users. During traffic incidents, clear communication enables rapid response, minimises congestion, and reduces the risk of secondary accidents.

### **Traffic Communication Tools**

Traffic communication tools, also referred to as traffic control devices, are essential instruments used in regulating and managing road traffic. Mathew and Krishna Rao (2007) define traffic communication tools as mechanisms installed on roads or roadsides to convey information between traffic authorities and road users.

These tools generally include:

- i. Traffic signs
- ii. Road markings
- iii. Traffic signals
- iv. Reflective studs and markers
- v. Parking control devices
- vi. Variable message signs

The effectiveness of these communication tools depends on their visibility, clarity, uniformity, and the extent to which road users understand and comply with them. According to Kadiyali (1987), effective traffic communication devices must be simple, easily recognisable, and capable of conveying clear messages within a short period.

Traffic communication tools may be classified into three broad categories:

1. **Regulatory Devices** – These communicate legal requirements and restrictions, such as speed limits, stop signs, and parking regulations.
2. **Warning Devices** – These alert road users to potential hazards, including sharp bends, pedestrian crossings, and roadworks.
3. **Informational Devices** – These provide guidance regarding destinations, routes, distances, and other travel-related information.

When properly designed and maintained, these tools significantly reduce traffic conflicts and improve overall road safety.

### **Road Traffic Crashes and Traffic Gridlocks in Abuja**

Road traffic crashes remain a major public health and developmental challenge worldwide. According to the World Health Organization (WHO, 2015), approximately 1.25 million people lose their lives annually as a result of road traffic crashes, with millions more sustaining injuries and disabilities. In Abuja, road traffic crashes and traffic congestion have become increasingly common due to rapid urbanisation, population growth, and increased vehicle ownership. Major contributing factors include excessive speeding, reckless driving, poor compliance with traffic regulations, inadequate road infrastructure, poor road maintenance, driving under the influence of alcohol or drugs, and ineffective traffic management systems.

Research indicates that human behavioural factors account for a significant proportion of road traffic crashes. Treat et al. (1979) reported that approximately 90 per cent of road crashes are attributable to human errors and behavioural deficiencies. Similarly, Rolison et al. (2018) identified risky driving behaviours such as speeding, distracted driving, and substance abuse as major contributors to road traffic crashes. In addition to human factors, poor road conditions and inadequate traffic communication infrastructure contribute significantly to traffic congestion and accidents in Abuja. The absence or poor maintenance of road signs, road markings, and traffic signals often creates uncertainty among road users, thereby increasing the likelihood of crashes and traffic conflicts.

### **Road Markings and Signage as Safety Features**

Road markings and traffic signs constitute critical elements of road safety communication. They provide visual guidance, regulate traffic movement, and alert road users to potential hazards. According to the Federal Ministry of Works (2013), road markings are designed to communicate official information directly through markings placed on road surfaces. Road markings include lane markings, pedestrian crossings, stop lines, directional arrows, rumble strips, and reflective markers. These devices enhance visibility, improve lane discipline, regulate speed, and promote safer interactions among road users. Studies have demonstrated that effective road markings and signage contribute significantly to accident reduction. Grosskopf (2001) observed that properly maintained road markings can substantially reduce road fatalities by improving driver awareness and response times. However, poor maintenance and fading markings remain common challenges on many Nigerian roads, reducing their effectiveness and increasing accident risks. Consequently, ensuring the availability, visibility, and maintenance of road markings and traffic signs remains essential for improving road safety outcomes in Abuja.

### **Theoretical Framework Cognitive Model**

This study is anchored on the Cognitive Model, a psychological approach that explains road safety behaviour based on individuals' cognitive processes, including perception, judgement, decision-making, and risk assessment. The model emphasises that road users' actions are largely influenced by how they perceive and interpret information within their driving environment.

Michon (1985) reviewed various driver behaviour models and criticised behavioural adaptation theories for their inability to adequately explain how individuals perceive and respond to risk. He proposed a control theory approach that focuses on understanding the underlying cognitive mechanisms that influence driver behaviour. According to Michon, understanding these cognitive processes is essential for predicting the effectiveness of different road safety policies and interventions.

The model draws heavily on the work of Klebelsberg (1971, 1977), who argued that road users continuously balance subjective risk perceptions against objective levels of risk. According to this perspective, safety problems arise when the actual level of risk exceeds an individual's perception of that risk. Conversely, when individuals perceive a level of risk that exceeds the actual danger present, they tend to adopt more cautious behaviours, thereby creating a wider safety margin.

Michon (1989) further distinguished between aggregate models and process models of road user behaviour. Aggregate models, which are often economic in nature, explain behaviour at the population level and assume rational decision-making. Process models, on the other hand, focus on individual cognitive and psychological processes and provide a more detailed explanation of actual driver behaviour. The relevance of the Cognitive Model to this study lies in its ability to explain how communication influences road users' understanding of traffic

signs, road markings, signals, and safety information. Effective communication enhances road users' perception of risks and hazards, thereby encouraging safer driving behaviours and reducing the incidence of road traffic crashes.

### **Research Methodology**

This study adopted the survey research design. The survey method was considered appropriate because it enables the collection of data from a relatively large number of respondents and allows for the generalisation of findings to the target population. The study focused on road users within the Federal Capital Territory (FCT), Abuja, including drivers, commuters, and other users of the road transport system. Data were collected to assess perceptions regarding communication and road safety management, as well as attitudes towards traffic regulations and road safety measures.

Both primary and secondary sources of data were utilised. Primary data were obtained through the administration of structured questionnaires, while secondary data were sourced from textbooks, journal articles, government publications, reports, and other relevant scholarly materials relating to road safety management and communication.

### **Population, Sample Size, and Sampling Technique**

The population of the study comprised 249 respondents drawn from drivers, commuters, and other road users within selected motor parks and traffic locations in the Federal Capital Territory, Abuja. Given the relatively small size of the study population, the entire population was used for the study. Consequently, a census sampling technique was adopted. Census sampling involves studying every member of the population rather than selecting a subset. This approach was considered appropriate because it ensured comprehensive coverage of all respondents and enhanced the reliability of the findings. The use of the census technique also eliminated sampling error and provided an opportunity to obtain responses from all categories of road users relevant to the study.

### **Method of Data Collection**

Primary data for the study were collected using a structured questionnaire designed by the researcher. The questionnaire contained both closed-ended and Likert-scale questions aimed at obtaining respondents' views on communication, road safety management, traffic regulations, road user behaviour, and factors contributing to road traffic crashes within the Federal Capital Territory. The questionnaires were administered directly to respondents at selected locations and retrieved upon completion. The instrument was chosen because it provides a cost-effective and efficient means of gathering data from a large number of respondents while ensuring uniformity in responses. Secondary data were obtained from academic literature, government documents, policy reports, conference proceedings, and relevant publications on road safety management and communication.

### **Method of Data Analysis**

The data collected for this study were presented and analysed using both descriptive and inferential statistical techniques. Descriptive statistics, including frequency distributions,

percentages, mean scores, and tables, were used to summarise and present the data. Inferential statistical techniques were employed to test the relationships between variables and determine the significance of the findings. These techniques included correlation analysis, regression analysis, Relative Importance Index (RII), F-tests, and the coefficient of determination (R<sup>2</sup>). The Statistical Package for the Social Sciences (SPSS) was used to facilitate data processing and analysis. The results obtained from the analysis were used to draw conclusions regarding the effect of communication on road safety management in the Federal Capital Territory, Abuja, and to provide recommendations for improving road safety outcomes.

## Data Analysis and Results

**Table 1.**

	<b>Questionnaires</b>	<b>Frequency</b>
1	Copies of the questionnaire administered	249
2	Copies of the questionnaire returned	200
3	Percentages of the valid questionnaire returned	80%
4	Percentages of the questionnaire not returned	20%

This section set out to inquire the factors that could serve as barriers and breakdowns in communication systems at the Federal Capital Territory Safety Management Process. Responses from the commuters, drivers and road users at various parks suggest that factors such as selective listening, distraction, time pressure, illiteracy, and prejudice were some inhibiting factors to communication.

**Table 2:** Barriers and Breakdowns in Communication Systems that affects effectiveness in communication in Road Safety Management in FCT, Abuja

	N	Mean	Median	Std. Dev.	Minimum	Maximum	T-test	Rank
							T-value = 1	
1.	200	3.48	3.5	1.007	1	5	34.885**	3 <sup>rd</sup>
2.	200	3.51	4	1.121	.	.	31.671**	2 <sup>nd</sup>
3.	188	3.44	3	0.809	2	.	41.385**	5 <sup>th</sup>
4.	197	3.40	.	1.063	.	.	31.714**	4 <sup>th</sup>
5.	192	3.74	.	1.031	.	.	36.824**	1 <sup>st</sup>

**Note:**

1. *Selective Listening*
2. *Distraction*
3. *Time Pressure*
4. *Illiteracy*
5. *Prejudice*

\*\* . T-test is significant at the 0.01 level (2-tailed).

Results on the Table reveal that there is no significant difference in the weight each observed barrier poses to effective communication as the means of the observed barriers were close. Meanwhile the one-sample t-test results indicated that though all the means are close, compared to the expected weight of 1 for each barrier or breakdown; each barrier can be expressed as significant. The test value of 1 was used to signify the non-relevance or importance of the respective barrier to communication; which also illustrates how much respondents strongly disagrees to the factor as a barrier to effective communication.

**Table 3.**

Question	Options	Responses	Percentages	Mean
How would you rate the effectiveness of road safety management in Abuja?	Strongly Ineffective 20, Ineffective 30, Neutral, Effective 50, Strongly Effective 100	[20, 30, 0, 50, 100]	[10.0, 15.0, 0.0, 25.0, 50.0]	40.0
Do you feel that road safety policies in Abuja are being properly enforced?	Strongly Disagree 30, Disagree 30, Neutral, Agree 40, Strongly Agree 100	[30, 30, 0, 40, 100]	[15.0, 15.0, 0.0, 20.0, 50.0]	40.0
Do you believe that road safety information communicated to the public helps in reducing traffic accidents in Abuja?	Strongly Disagree 20, Disagree 30, Neutral, Agree 70, Strongly Agree 80	[20, 30, 0, 70, 80]	[10.0, 15.0, 0.0, 35.0, 40.0]	40.0
How effective do you find the current methods of communication in addressing road safety issues in Abuja?	Very Ineffective 25, Ineffective 25, Neutral, Effective 50, Very Effective 100	[25, 25, 0, 50, 100]	[12.5, 12.5, 0.0, 25.0, 50.0]	40.0
How often do you follow road safety rules while driving in Abuja?	Never 20, Rarely 30, Sometimes 50, Often 50, Always 50	[20, 30, 50, 50, 50]	[10.0, 15.0, 25.0, 25.0, 25.0]	40.0
Do you believe that other road users in Abuja follow road safety rules consistently?	Strongly Disagree 40, Disagree 35, Neutral, Agree 45, Strongly Agree 80	[40, 35, 0, 45, 80]	[20.0, 17.5, 0.0, 22.5, 40.0]	40.0

### Discussions of Findings

The mean score of 40.0 suggests a generally neutral overall perception of road safety issues in Abuja, indicating that respondents neither overwhelmingly approve nor disapprove of current conditions.

Findings on the effectiveness of road safety management reveal that 50% of respondents rated it as “strongly effective,” reflecting a generally positive assessment of institutional efforts. Similarly, perceptions of road safety policy enforcement were mixed, with 50% of respondents agreeing or strongly agreeing that existing policies are being properly enforced, while others expressed less confidence in enforcement consistency. Public communication strategies, including road signage and media campaigns, were largely viewed positively. Approximately 40% of respondents agreed and another 40% strongly agreed that such communication efforts

contribute to accident reduction. In the same vein, current communication methods on road safety were rated as effective by half of the respondents, suggesting that awareness initiatives are yielding measurable impact, though not universally across all groups.

Regarding behavioural compliance, a majority of drivers reported that they “often” or “always” adhere to road safety regulations, with 50% indicating high levels of compliance. However, concerns were raised about the behaviour of other road users, as 40% of respondents disagreed or strongly disagreed that compliance is consistent among all road users. This highlights a perceived gap between individual compliance and broader traffic discipline.

## **Conclusion**

### **Effectiveness of Road Safety Management and Policy Enforcement**

The study reveals that road safety management in Abuja is generally perceived as moderately to highly effective. However, divergent responses indicate that while improvements are acknowledged, there remains a significant perception gap regarding the consistency and overall impact of enforcement mechanisms.

### **Public Awareness and Communication**

Public enlightenment initiatives, including signage, media campaigns, and other communication tools, are considered effective in enhancing road safety awareness and reducing accidents. A majority of respondents affirmed the importance of sustained sensitisation efforts, underscoring the role of communication in shaping road user behaviour. Nevertheless, there is room for improvement in targeting and reach, particularly among less compliant road user groups.

### **Driver Adherence and Behavioural Compliance**

The findings indicate relatively high levels of self-reported compliance with road safety rules among drivers, particularly regarding speed limits and seatbelt usage. However, inconsistent adherence among other road users remains a concern. This suggests that while individual awareness is improving, broader behavioural enforcement across all categories of road users is still inadequate.

## **Recommendations**

The study recommends the following:

1. Government should engage and collaborate with external agencies and international organisations with proven expertise in road safety management to strengthen institutional capacity and ensure sustainable improvements.
2. There is a need for the enactment and strict enforcement of robust road safety legislation that is consistent, impartial, and free from undue influence, ensuring accountability regardless of social or political status.
3. Comprehensive regulatory frameworks, including effective insurance systems, should be strengthened to safeguard lives and property, while ensuring adequate compensation for victims of road traffic accidents.
4. Road signage and informational systems should be standardised, modernised, and

- clearly designed to reflect the realities of urban traffic conditions, thereby improving visibility and comprehension among road users.
5. Continuous sensitisation and education programmes should be intensified, targeting drivers and motor park operators, particularly on the dangers of illicit drug use, non-compliance with traffic regulations, and improper interpretation of road signs.

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