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Assessment of Causes and Design Solution to Road Traffic Accident Along Onitsha-Owerri Expressway in Eastern Nigeria

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ABSTRACT

The incessant road crashes on Onitsha-Owerri road is worrisome. It has become a norm that a day will not pass by without a record of accident on that road. This prompted the researchers to assess the dominant factors of such incidence and proffer solution. 300 questionnaires were prepared and distributed in the study area to source information from drivers, out of which 267 participated. The SPSS tool was used to analyze the data obtained from the respondents. The findings showed different causes of accidents which include driving under the influence of alcohol/drugs, uninspected vehicles, bad roads, and overloading. But the major factor found is purported wrong establishment of roadblocks at hilly, supper elevation and sharp bend using for checkpoint. The study recommends the construction of a toll gate with checkpoint on a good terrain at Oba and Awo-Omamma. The researcher sketched a toll gate with checkpoint, height barrier to avert overloading and a digital camera that will serve as a point of inspection. This would eliminate all unprofessional and unwanted road block/checkpoints in the area and creates an avenue for good revenue which will be a benefit to our economy. The issue of overloading would be tackled at the tollgate, where road height barriers are positioned to stop drivers from carrying excess loads and a weighing bridge would be positioned at the side of the toll gate to measure the weight of overloaded vehicles.

INTRODUCTION

Road traffic accident (RTA) is an incident that transpires unexpectedly which involves unwanted forceful contact of two or more vehicles, or thwacking of a vehicle and other road users or even running into Stationary objects that take effects on the roads open to traffic movement Bun (2012). It is obvious that road traffic accidents generally causing harm and vandalizes properties Hailemichael *et al* (2015).

The “Main Market” Onitsha being the largest market in West Africa, have much inter-state transport system in Nigeria. People from all quarters in Nigeria have made the market a commonplace for daily business transaction. Onitsha-Owerri road is the major route for seven states leading to the market, has a high daily traffic volume. The accident occurrence on that road is alarming. There is never a day goes by; a record of crashes would not be seen. It is amazing that most of these crashes occur at so called roadblocks using as checkpoints. The reason for this is yet to be known to common man of which this research will find out the problem. There are many human factors causing RTA, though the researchers seek to know the most dominant factors in the study area and proffer possible solution. The incessant occurrence drew the attention of federal legislature to investigate and review those checkpoint locations with mindset of mitigating further occurrence of such ugly incident.

Review of Effect of Reported Road Traffic Accidents

Road traffic accident has high rate of deadly and non-fatal injuries, which have fitness consequences. World Health assessment on road accidents surmised that 1.4 million

road users lost their lives yearly in road traffic accident and also about 50 million got impaired (WHO 2010). Road crashes have been declared the major cause of deaths all over the world, terminating mostly the youths between the ages of 15 and 29 years (WHO 2015). The high rate of accident occurrence on the roads has made people to tag it “pandemics” and has been considered as the core public health threat Adejugbagbe *et al* (2015). RTC is depopulating the world and causing forceful negative impact to the global economy. The purpose of road construction is not to reduce the population of people in RTA but for comfort and easy movement, though otherwise is the outcome including the study area. The rate of road crashes in Nigeria is worrisome. There is never a day that passes by without a report of fatalities and casualties on the highways. The daily and frequent accident occurrence has become a norm in Nigeria that posits a serious challenge on how to curb it out. The first quarterly report by NBS for the year 2022, said that 3,345 road traffic accidents were recorded amounting to 37 road crashes per day, statistically, an average of 37 road crashes occur within 24 hours. (NBS JUNE 09,2022)

Data from the federal road safety corps and the national bureau of statistics says between 2013 and 2020, at least 41,709 persons have lost their lives to road crashes in Nigeria. (NBS January 17,2022)

The high rate of road transport contributed to the Gross Domestic Product (Siyan 2017) & (Sumaila 2013). The analysis of relationship between GDP and road traffic deaths in Botswana and Zambia, reported that GDP growth caused an increase in the rate of traffic fatalities (Weibe *et al.*, 2016). (Elvik 2014) in his research on

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economic development and road casualties' relationship stated the technique that describe the relationship between economic development and number of casualties: economic development results in heightening volume of traffic and exposure to risk; increased drivers carrier for young people, which constitutes high-risk transport modes; excessive speeding and drink-driving.

These common factors posit a challenge to most African countries. The economic development creates more opportunity to construct modern tarred roads to enable vehicles to move around within a short period on highways, though, lack of proper human management turns to be a threat for what should be valuable and useful to boost life and economy of our great Nation.

Globally, economic populace increase and industrialization has created much movement of people and goods from one place to another. This onward motion generates investment in transport infrastructure which exerts a heavy strain on the transport system, leading to frequent usage of road (Jha.N *et al* 2003).

It is quite clear that highway transport system is the most flexible modes of transportation in Nigeria. More than 90 percent of travelers make use of roads and thus make it the most prevalent means of transportation of all the transport systems in Nigeria (Siyan 2017) & (Sumaila 2013).

One of the national newspapers "The Nation" on their report dated 18th February, 2022 titled "Ihiala fatal crash: one carnage too many" said that a motor accident occurred at Azia Police checkpoint along Onitsha-Owerri expressway. The ugly incident of the multiple auto crash claimed lives of many passengers whereas others got injured. The reporter recall A heavy duty vehicle collided into six vehicles with several passengers on board. The same episode repeated itself on 30th May, 2022, whereby a Police Officer makeshift road blockage was the cause of a fatal accident at same venue which amounted to the death of a trailer driver, his second and more than ten passengers on board. Giving an instance on the same accident occurrence, a FRSC officer who were at the scene frowned his face and reported that on 4th November, 2021, three vehicles collided at same checkpoints, three children and six adults lost their lives.

On the same premise, an online report "Thisnigeria.com" said that on 28th November, 2021, four passengers died, while twelve others had a severe injury at checkpoints in Ihiala along Onitsha- Owerri road. The accident occurred around 2:30pm adjacent a Police station. It was said that a trailer and two buses containing sixteen passengers on board were involved in the accident. According to an eye witness, said that the heavy duty rammed into the two buses being checked by Police officers at the checking point.

The researchers had witnessed several accidents at one of those checkpoints in Abbot Boys' Secondary School. One of the incidents is where a vehicle fell on others while trying to navigate the roadblocks using as checkpoints. The most painful aspect of the whole thing is that government ideology for establishing those checkpoints are neglected. It is observed that policemen are using the

avenue for harassment and extortion of money from the road users. The so-called checkpoint is a threat to the community and passersby. People keep on queuing up while going to their various daily activity and it becomes worst when accident occur. Most drivers make use of alternate routes(village) and are charged by miscreants for making use of their roads. This road leads to the State University. Most staff get to their offices late due to unnecessary delays.

Previous studies on factors instigating the several crashes in Nigeria are summarized into four elements, viz: human factors, mechanical/vehicular factors, road and environmental factors (Austroads 1994, Arron & Strasser, 1990; Balogun & Abereoje 1992). Among the factors of RTA listed, it has been observed that human factor constituted the most (Hijar *et al*, 2000).

Eke *et al* (2000), used statistics accumulated from the University of Port-Harcourt Teaching Hospital (UPTH) from January 1986 to December 1995 said that 70% of the whole accidents in Port-Harcourt Nigeria occurred during the wet seasons and that most accidents took place for the duration of the weekends.

This research focuses on Onitsha Owerri road which has been having numerous road traffic accidents and has cost citizens their life and properties. The aim of this research is to study the causes of road accidents, to collect the necessary information on the pattern of road traffic accidents in the study area, and finally to provide possible solutions to road accidents in the study area.

METHODOLOGY

The methods used for this research are

Questionnaire

The use of questionnaire was implored in the process of data collection and to source information from the road users. The questionnaire had different sections containing information on the study area. Total number of 300 questionnaires were prepared and distributed but 267 participated

Data Analysis

The procedures involved include interim analysis, data entry and storage and coding and developing category system. The method guiding the analysis is comparative cases where researchers compares response from key informant and come up with themes and concepts related to the topic under study. This was facilitated through Statistical Package for the Social Science (SPSS) was used to analyze the data obtained from the participants to properly assess the dominant factors of road accident in Onitsha-Owerri expressway.

Observation

Observation method was also used by researchers to obtain some factors of accident crashes, especially on the checkpoints to assess and obtain the reasons of accident occurrence on the study area, most especially on checkpoints

RESULTS AND DISCUSSIONS

Table 1: Assessment of Drivers' Behavior Towards Driving

How do you explain the behavior of drivers in Onitsha- Owerri road?	Frequency	Percentage
Good	37	13.9
Better	46	17.2
Bad	184	68.9
Total	267	100.0

The result here described that 184(68.9%) of the participants had bad behavior, 46(17.6%) had better driving behavior, leaving only 37(13.9%) with good moral character, which is infinitesimal to keeping sanity on the roads. Based on the assumptions of the factors

Table 2: Assumptions on The Dominant Factors of Accidents in The Study Area

What are the leading factors of road crashes in the study area ?		
Alcoholism/Drugs	38	14.2
Driving Behaviour	12	4.5
Uninspected Vehicles	26	9.7
Bad Road	54	20.2
Overloading	66	24.7
Checkpoint	71	26.6
Total	267	100.0

contributing to the incessant accident, the analysis revealed the followings: alcoholism/drugs 38(14.2%), uninspected vehicles 26(9.7%), bad road 54(20.2%), overloading 66(24.7%) but they over emphasized on checkpoint as the major factor 71(26.6%). On this finding, conclusion is yet to be made pending the result of general assessment which would be a guide to know if the findings here are really the most common factors to accident in the study area. Table 3 presents the result of the mechanical

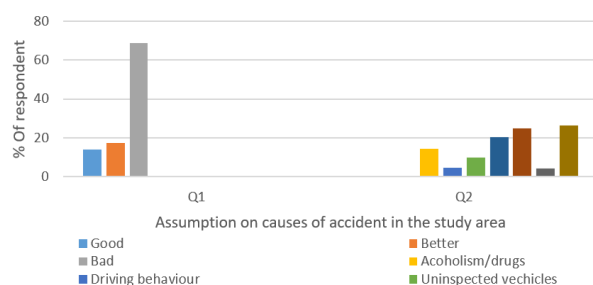


Figure 1: Drivers' Behavior and Assumption on The Causes of Accident

and seasonal factors of road accident. From the table, it is observed that mechanical factors contributes to road accident most especially break malfunctioning 190(71.2%) of which is part of human factor; It is the duty of driver's to constantly check and refill the brake

Table 3: Key mechanical/Seasonal Factors

Accident occur due to lack of brake fluid	Frequency	Percentage
TRUE	190	71.2
FALSE	77	28.8
Total	267	100.0
Accident occur due to tyre burst		
TRUE	153	57.3
FALSE	114	42.7
Total	267	100.0
Accident occur due to inadequate back view with mirror		
TRUE	159	59.6
FALSE	108	40.4
Total	267	100.0
Accident occur due to lack of horn before overtaking		
TRUE	112	41.9
FALSE	155	58.1
Total	267	100.0
Accident occur mostly during festive period		
TRUE	221	82.8
FALSE	46	17.2
Total	267	100.0
Accident occur during rainy season		
TRUE	191	71.5
FALSE	76	28.5
Total	267	100.0
Accident occur during dry season		
TRUE	192	71.9
FALSE	75	28.1
Total	267	100.0

fluid. Sequel to that effect, one of the reasons for accident occurrence on checkpoints was discovered. Some drivers while approaching checkpoints could not control their vehicles due to brake failure thereby colliding with other road users and thus causing casualties and deaths. On the other hand, accidents occur at all the reason as shown on the above table but increases during the festive period 221(82.8%). This may be attributed to alcohol influence. Due to many activities during the Season, free drinks are being declared on occasions and thus excessive alcohol intake by drivers is affecting their driving system leading to commotion and accidents on the roads.

Table 4 investigates on some major FRSC general safety rules to drivers to maintain adequate driving on highways. Generally the result here proved that all contributes to the road crashes, which is another human factor. The participants outlined that negligence on speed limit/ over speeding 236(88.4%) is one of the causes of road traffic accident followed by lack of co-driver for a long journey 235(88.0%). The paramount predicament found

Table 4: FRSC General Safety Guide

Lack of co-driver for a journey long distance-12 hours and more	Frequency	Percentage
NO	32	12.0
YES	235	88.0
Total	267	100.0
Insufficient/no proper rest for drivers		
NO	21	7.9
YES	246	92.1
Total	267	100.0
Negligence on speed limit/over speeding		
NO	31	11.6
YES	236	88.4
Total	267	100.0
The abuse of using headlamps at night		
NO	69	25.8
YES	198	74.2
Total	267	100.0

is inadequate/no proper rest for drivers 246(92.1%). And no proper rest causes driving and sleeping. This result clarify why most drivers in the study area ran out of track, some jumped inside the bush while some crash to each other causing fatalities on the highways. According to the

result obtained in table 5, the analysis made it clear that 58.2% of the respondents strongly agree that incessant road blocks and wrong location for checkpoints are the major factors found for accident occurrence in the study area. This result is in line with the result in table 2.

Table 5: General Assessment of drivers' Attitude towards the dominant factors of Road Traffic Accidents

	Strongly agree	Agree	Somehow agree	Disagree	Strong disagree	Total
Alcohol intake and drug influence	46.07	40.07	9.36	2.10	1.5	100.0
The mode of driving	24.0	28.8	40.8	4.5	1.9	100.0
Lack of incentives to drivers	21.0	43.4	26.6	6.7	2.3	100.0
Being in a haste	45.1	32.6	17.2	1.1	4	100.0
Overloading	51.1	28.5	12.7	3.7	4	100.0
Night movement	39.7	36.0	16.9	6.3	1.1	100.0
Uninspected vehicles	47.6	23.2	19.1	7.9	2.2	100.0
Bad road	45.3	30.0	19.5	3.7	1.5	100.0
Poor Road Sign	26.2	45.3	19.1	8.2	1.2	100.0
Incessant wrong check point/ roadblocks	58.2	20.7	11.1	3	7	100.0

Table 6: Category of accident occurrence in the study area.

What category of road users are mostly affected?	Strongly agree	Agree	Somehow agree	Disagree	Strong disagree	Total
Most road traffic accident along Onitsha Owerri road happening is between people versus car	30.3	36.7	23.6	6.7	2.7	100.0
Most road traffic accident along Onitsha Owerri road happening is between people versus motorcycle	6.0	30.7	39.0	18.0	6.3	100.0
Most road traffic accident along Onitsha Owerri road happening is between cars versus motorcycle	12.7	37.8	32.2	12.7	4.6	100.0

The most common road traffic accident along Onitsha Owerri road occur between car and car	29.6	49.8	17.6	2.0	1.0	100.0
The most common road traffic accident along Onitsha Owerri road is happening between public transport versus individual cars	21.0	51.7	17.6	8.2	1.5	100.0

On the aspect of general assessment of category accident occur more, the result obtained showed that accident occur mostly between public transport and individual cars 138(51.7%) followed by cars and cars 33(49.8%), finally public cars and public cars 109(40.8%). This result indicated that passengers on board are mostly affected among the road users than others. The frequent death occurrence in road accident is reducing the population growth. Also goods that are being damaged during the scene are affecting the economy of the country. With this, there is a need to find the lasting solution to curb out the accident menace on the roads.

The results here clarified the reasons for what is happening on checkpoints. The establishments of those checkpoints are not serving its purpose for both the road users and the government owing to the fact the officers in charge are extorting money and thus causing long queue on the roads. The common reason for checkpoints is to checkmate the road users from smuggling country-bound goods but the mission here is the other way round. Since the checkpoint has been turned for tolls, the money should be a revenue to governments. The road users said that those checkpoints are located in supper elevation, hilly, and sharp bend. Thus vehicles especially

Table 7: Assessment of Checkpoints

Are the checkpoints beneficial to road users and Government?	Frequency	Percentage
YES	22	8.2
NO	245	91.8
What are the major causes of delay and queue in checkpoints?		
Inspection of vehicles	5	1.9
Extortion of money	197	73.8
Accident occurrence	65	24.3
Are the locations of those checkpoints okay?		
YES	6	2.2
NO	261	97.8
Reasons to back up your answer on location of checkpoints		
Good terrain	4	1.5
Supper elevation, hilly, sharp bend	263	98.5
Why heavy duties are mostly affected?		
Rough driving	67	25.09
Navigation on purported zig-zag roadblocks using as checkpoints, overloading etc	200	74.91
Proposed Locations for Checkpoints		
Oba	89	33.33
Oraifite	20	7.50
Amorka	45	16.85
Amiri	33	12.36
Awo-omamma	65	24.34
Njaba	15	5.62

heavy duties, find it difficult to navigate the zig-zag road blocks been used as checkpoints, losses control and causing accident. Oba 89(33.33%) and Awo-Omamma 65(24.34%) have high frequency as good location for establishing checkpoints. Suggestions were made by road users to avert the frequent fatalities in the study area. Based on table 8,

the major response on that aspect are, avoiding driving under the influence of alcohol 42(15.7%), construction, reconstruction and maintenance of roads 45(16.9), a good means to stop overloading 41(15.3%). But in all, most participants suggested construction and erecting of checkpoints at good locations 76(28.5%) and a sample design of the proposed checkpoint was shown in figure 3

Table 8: Road Users Opinion and suggestion on solution to reduce road accident

What should be done to reduce the incidence of road traffic accident in Onitsha Owerri road Anambra State?	Frequency	Percentage
Installation of flyover	10	3.7
Avoid driving under the influence of Alcohol	42	15.7
Construction of Speed Limit (bumps)	25	9.4
Construction, reconstruction and maintenance of roads	45	16.9
Erecting proper checkpoints	76	28.5
Horn before Overtaking	12	4.5
Installation traffic signals	1	.4
Proper rest for Drivers	15	5.6
Stop Overloading	41	15.3
Total	267	100.0

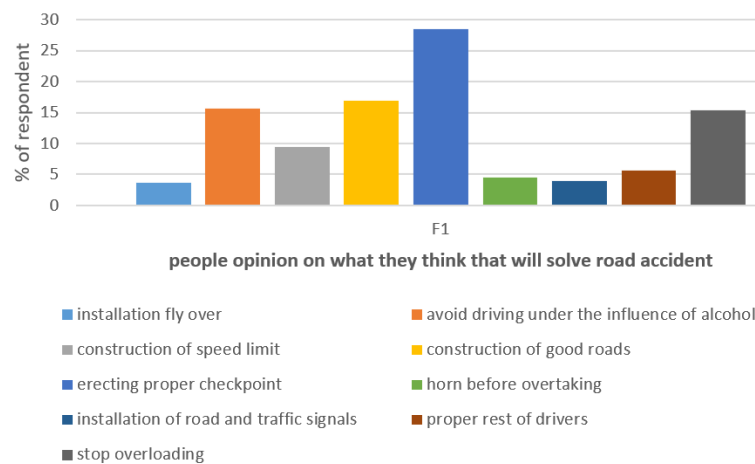


Figure 2: Suggested solution to traffic accident on the major area

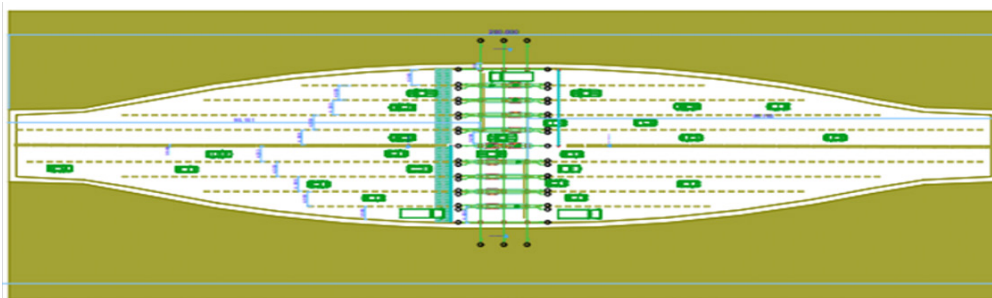


Figure 3: Proposed Sample Plan for Checkpoints



- RED BARRIER
- WEIGHING GAUGE
- CAMERA

Figure 4: Proposed Elevation View for Checkpoints

CONCLUSION

The following conclusions were made based on the findings of the study

1. Apart from accident, policemen are contributing to long queue due to money extortion
2. The driving pattern and habit were indicated as a factor of frequent accident occurrence
3. Some other factors found are driving under the influence of alcohol, non-compliance of speed limit, abuse of using headlamps at night and bad roads.
4. Improper rest/no rest and no co-driver for a long journey is also another factor.
5. Another factor leading to road accident is tyre burst and brake malfunctioning due to fluid.
6. Those that are mostly affected are passengers on board.
7. It is observed that those checkpoints are located in supper elevation, hilly and sharp bend
8. In all, unnecessary road blocks/installation of checkpoints at wrong locations and overloading are the paramount leading factor of road traffic accident in the study area.

RECOMMENDATION

The following recommendations were made by the researcher to curtail road accident in Onitsha Owerri road which include

1. To establish standard checkpoints which will include toll gate that will serve as a point of inspection for vehicles. This would totally eliminate all unprofessional and unwanted road blocks/check points on the highways where drivers would slow down and be properly inspected depending on the type and purpose of their individual vehicles.
2. The proposed toll gate will generate revenue to government for road maintenance and thus stop in Police extortion.
3. To introduce vehicle height barriers near toll gates to avert overloading/loading on top of a vehicle by drivers. This will stop illegal collection of money from agency in charge of road affairs to cover up drivers crime
4. A weighing bridge would be introduced and positioned at the side of the toll gate to measure the weight of overloaded vehicles which is another factor for road traffic accident. The defaulters should be treated with caution.
5. The toll gate will also have a camera scanner which will be able to scan a vehicle for contraband and any illegal material in the vehicle, and that will serve as a solution for uninspected vehicles in the study area.
6. A breathalyzer should be made available to measure volume of alcoholic consumption for drivers and also the defaulters should be jailed and driver's license be ceased.
7. The federal government should quickly maintain the road as at when due to avert accident and other environmental factors
8. The agency should train drivers on good and moral character to maintain sanity on the roads. Passengers on

board should quickly report unsafe driving to the agency via phone calls once it is discovered.

9. The study found out that Oba in Idemili North LGA of Anambra State and Awo-Omama in Imo State are good locations to establish toll/checkpoints

10. The proposed standard checkpoints/toll is attached for perusal

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