

## A COMPARISON OF THE NIGERIAN ROAD TRAFFIC CRASH REPORT FORM WITH OTHER SELECTED COUNTRIES

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### ABSTRACT

Road Traffic Crash (RTC) report is the main source of information for any crash database. The preliminary crash report prepared by the Police contains factual information known immediately after the crash. Different agencies use different formats in preparing RTC reports. This paper compares the content of the Nigerian RTC report form with that of other selected ten (10) agencies from developed and developing countries in terms of three (03) traffic-related parameters. The studied RTC forms were from California, Florida, Oregon, Texas, and Louisiana, USA. Others are British Columbia of Canada, Kent of England, Bangladesh, Malaysia, and Sri Lanka. The result shows that information contents vary significantly, and agencies need to readdress the contents and coverage of the necessary information in the forms. In the Nigerian form, there is no clear information on the road surface condition at the crash scene even though the road surface condition (such as Potholes/Patching, Rutting, Hydroplaning or Slippery) contributes to lots of crashes on the Nigerian roads. Also, the forms from Nigeria, Kent County and Sri Lanka can lead to under-reporting of the collision type at the accident scene. Moreover, the information captured in the Nigerian Road Traffic Crash Information Form (RTI 01) is not comprehensive enough in conducting an in-depth investigation and analysis of the accident records. As such the study recommends improving the contents of the form.

**Keywords:** Transport safety, Highway, Road accident, Traffic.

### INTRODUCTION

Fatalities and disabilities along with significant economic and social problems arising from Road Traffic Crashes (RTC) pose a serious threat to modern societies. Every year about 1.3 million deaths (over 3000 deaths daily) occur due to RTC (Timmermans et al., 2019). Fatalities and

injuries from RTC are projected to be the 4th largest cause of healthy life years lost by the total population in 2030, and the second-largest cause of healthy life years lost by men in 2030. These figures are projected to increase on a catastrophic scale as low- and middle-income countries motorize rapidly. By 2020 the

number of deaths from road injury will increase by 80% in low- and middle-income countries (World Health Organisation, 2004). In economic terms, the cost of road crash injuries is valued at 1-2% of the gross national product (GNP) of a country. That is around US\$ 100 billion in developing countries, or twice the annual amount of development aid to such countries (Islam, 2008). Nigeria has the second-highest road accident record in the world, and the highest rate of road accidents in Africa (FMW, 2013). The cost of RTC in terms of deaths, disabilities, and highway closures is a serious burden on the Nigerian economy, and reducing these crashes has remained a national challenge (Attahiru et al., 2016; Mohammed et al., 2016). In the past three decades, countries like the Netherlands, Sweden, UK, Norway, and Japan have successfully reduced the carnage on their roads and it is worth learning a lesson from their experience and policies.

Road accident occurs as a result of three factors (the road, the vehicle, and the road user) and the interactions that occur within (Lehohla, 2009). RTC report is the main source of information for any crash database. A preliminary crash report prepared by the police (or the Federal Road Safety Corps in Nigeria) contains factual information known immediately after the crash. In the normal course of time, an investigation is usually started on receipt of this report (Keng, 2003). The available data from the crash database is reviewed by road engineers to introduce crash reduction initiatives through identification of patterns relating to the crash type, crash severity, or roadway environment, time of day, the

direction of travel before crashes, weather conditions or driver behaviours. Descriptive statistics of crash conditions (e.g. counts of crashes by type, severity, or roadway or environmental conditions) is a key part of the safety data review process. So far, the Police use a descriptive format in reporting RTC, with little consistency in recording the data. Henceforth, a new prescribed and computer-friendly format that incorporates various factors, such as weather and road environment in detail should be developed (The Hindu, 2019). Highway Safety Manual is the pioneer publication on the topic which mentions that the individual crash descriptions are compiled from Police reports (AASHTO, 2010). An example of a Police report forms from Oregon State, USA was included as an appendix. The Oregon form includes twenty-four different categories of information along with a narrative sketch in addition to the basic information like date, location, and details of involvement.

Although the RTC forms act as the basic source of data on any road crash, the contents of the crash reports vary among agencies. Individual agencies developed and approved their RTC forms per their requirements and mainly customized to fit the local environment (e.g. climatic condition) and legal issues. Some agencies provide more detailed information whereas others skip important information about the crash (Ahmed et al., 2014). For instance, Texas, USA form considers nine (9) different types of road surface conditions but the Nigerian and Louisiana, USA form does not provide any information on this. This shows that the forms were

developed without adequate consideration of the relevant factors. It is difficult to find any crash form with coverage of all the necessary data. This creates a big gap and differences among the content of the data collected and preserved by different agencies thereby complicating the process of comparing crash data amongst agencies, geographic locations, or countries. With the background information available, the study objective was set to compare the Nigerian Road Traffic Crash Information (RTI 01) form with other agencies. The goal is to review the coverage and content of the form, and uncover crucial information missing from it. Obtaining the relevant information from a crash scene will guide transportation engineers to incorporate human, and vehicle limitations in road design and maintenance ultimately reducing the number of road crashes on the Nigerian roads.

## MATERIALS AND METHODS

This study attempted to collect and compare forms from countries representing both developed and the developing world with the Nigerian accident recording form. A total of eleven (11) crash forms were studied. This includes the Oregon state form as a primary input, which is also a part of the Highway Safety Manual, 2010. Forms of Bangladesh, Malaysia, and Sri Lanka were collected from the respective Police departments and the remaining forms were downloaded from the websites of the Accreditation Commission for Traffic Accident Reconstruction (ACTAR, 2019) and Kent County, UK website

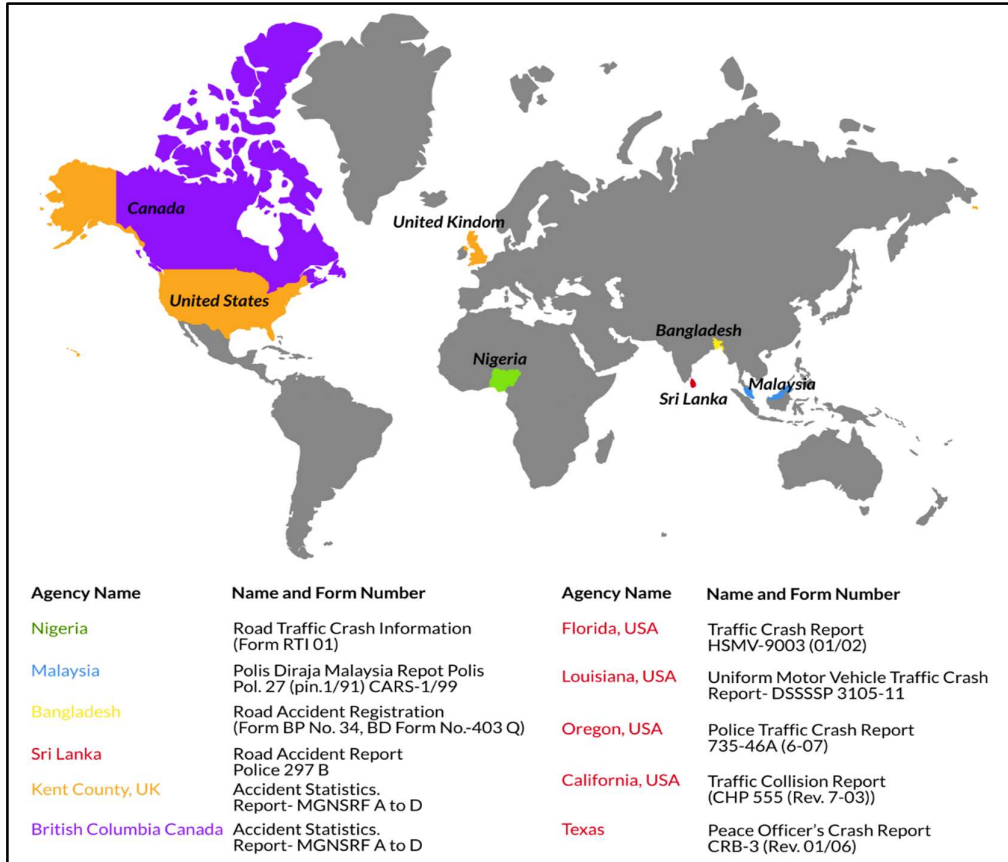
(Kent County Police, 2019). Figure 1 presents the list, names and locations of the crash report forms reviewed in this study.

## Selection of Parameters for Comparison

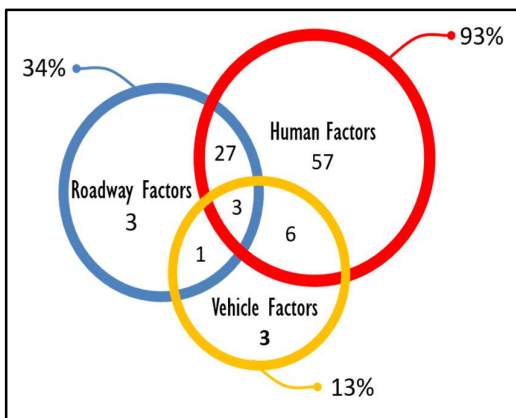
A preliminary review of the forms shows that the contents of the individual forms varied largely, and the overall formats or basic structures of the forms were different and were customized based on the agency's needs and local considerations. For example, the Oregon form considers "Snow/Slush" as one of the Road surface condition but the Nigerian form does not have it based on the local climatic condition. It was found that the difference in the basic structures of the forms made it impossible to directly compare many of the parameters. Figure 2 shows that road crash occurs as a result of three factors and the way they interact. They include Human factors-including age, driver skill, attention, fatigue, experience. Vehicle factor-including design, manufacture, and maintenance. Roadway factor- including geometric alignment, cross-section, traffic control devices, surface friction, weather, visibility. Therefore, obtaining the relevant information from a crash scene will help engineers accommodate the Roadway factors, Vehicle factors, and Human characteristics and limitations in designing the roadway system consequently reducing road crash fatalities/injuries. Therefore, it was decided that three (3) important and common parameters would be considered within the scope of this study based on the recommendations of Ahmed et al.,

2014; and Islam, 2008. They include a) detail of the crash b) road environment during the crash and c) human factor contributing to the crash. The following three (03) parameters were selected for

review and comparisons: (1) Road surface condition (2) Collision types and (3) Human (driver) factors.



**Figure 1:** List and location of the crash report forms reviewed in this study.



**Figure 2:** Crash contributing factors (AASHTO, 2010).

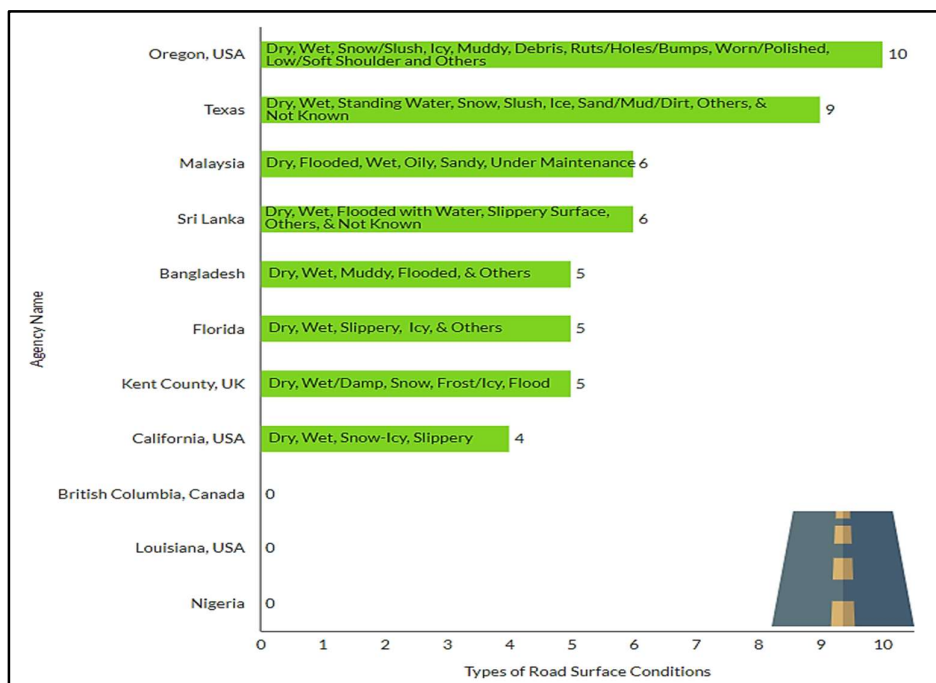
## RESULTS AND DISCUSSION

### Comparison Based on Road Surface Condition

The comparison of the forms revealed that the contents of the forms varied to a large extent. Some of the agencies considered a small number of parameters whereas others considered the parameters in a more detailed way as shown in Figure 3. In the Nigerian form, only “bad road” was mentioned on information relating to road surface conditions in the

“Probable Cause of Crash Section” of the form. This needs to be elaborated since the bad condition of highways in Nigeria significantly contributes to the high rate of accidents in the country. In Louisiana, and British Columbia forms, no information relating the cause of accidents was provided. However, the forms of California, Florida, Kent County, and Bangladesh, listed five (5) types of road surface conditions that can

lead to accidents including dry, wet, snowy-icy, slippery, muddy, oily, sandy. The Oregon and Texas form elaborate more by providing up to ten (10) different surface conditions with the option to tick one box from each column out of two columns of boxes. The surface conditions are dry, wet, snow/slush, icy, muddy, debris, ruts/holes/bumps, worn/polished, low/soft shoulder and others.



**Figure 3:** Comparison Based on Road Surface Condition

### Comparison Based on Collision Type

Figure 4 summarized the findings of the comparison based on collision type, it shows that nothing was mentioned in the Kent County and the Sri Lanka forms. The Nigerian form mentioned “Type of Collision” and five (5) different types were listed, which include head-on, rear impact, crash into an object, somersault, and side-impact. Bangladesh form listed 11 types of collision in a section with the

title “Type of Collision” and provided in a box format. The collision types are head-on, rear-end, right-angle, sideswipe, overturn, hitting road object, hitting roadside objects, hitting parked car, hit pedestrian, hit animal and others. Similarly, the Texas form included a section called “Sequences of Events” and listed eleven (11) non-collision (e.g. run-off) and ten (10) collision events (e.g. hit pedestrian). Although the forms from Bangladesh, Texas and Malaysia provide



more information than Nigerian one, the forms from Louisiana, Florida, and Oregon, USA listed between 34 to 41 collision types. Thus, providing more detailed information on the type of collision at the accident scene. The Oregon form mentioned five (5) crash

types, six (6) non-collision (e.g. overturn) and four (04) collision events (e.g. hit pedestrian), and twenty-six (26) types of collision with fixed objects. Similarly, the Florida form listed 40 different types of events including twelve (12) types of hit object collision.

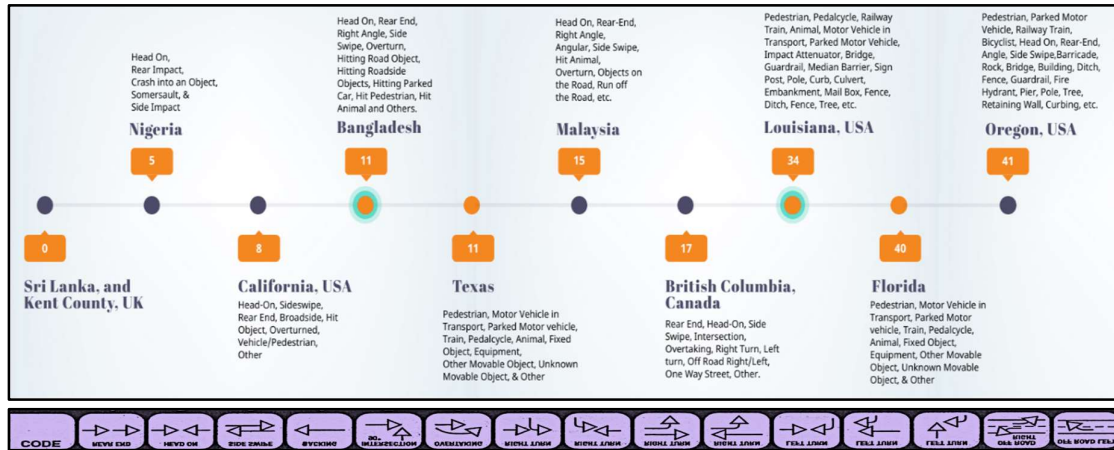


Figure 4: Comparison of the Forms based on Collision Types

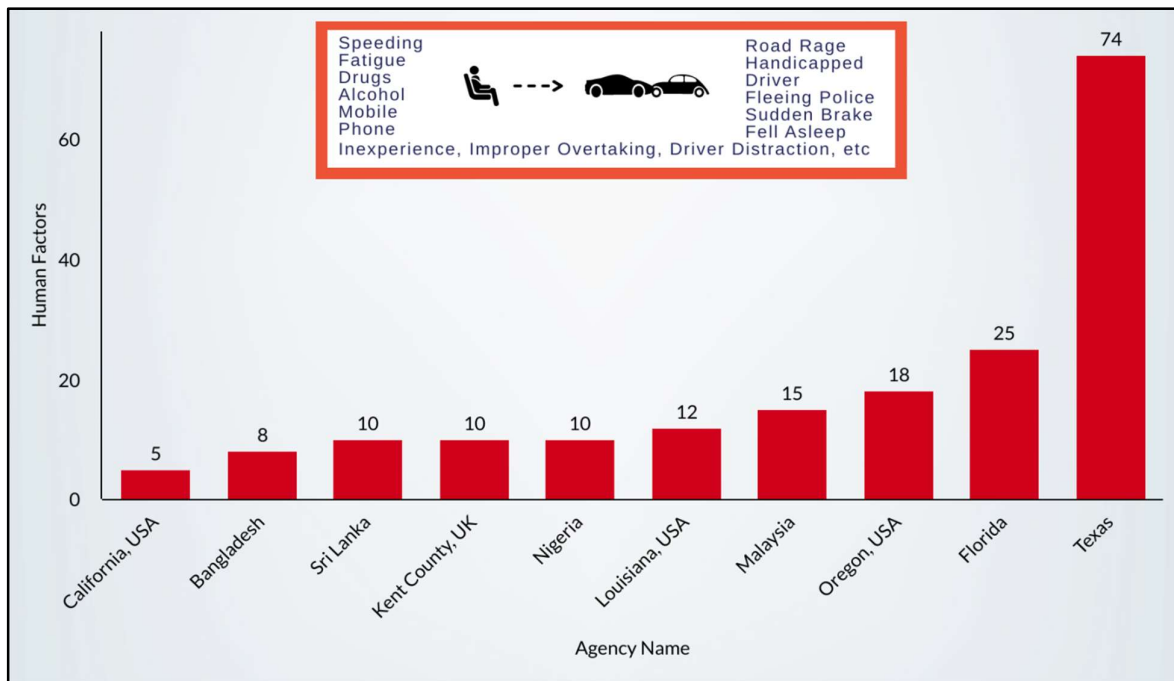
### Comparison Based on Human Factors

Result of the comparison based on Human Factors is presented in Figure 5. It shows that the Kent County, UK form mentioned driver-related factors in three categories namely i) Driver's error type-including poor turn, sudden braking etc. ii) Impairment or Distraction- alcohol, drugs, fatigue, mobile phone etc. and iii) Behavior or Inexperience- aggressive driving, nervous, uncertain, or panic. In the California, USA form, no separate section for human (driver related) error factor exists. But five (5) types of human errors namely violation of the law, improper driving, other than the driver, unknown and fell asleep were listed in the "Primary Collision Factor" section. Similarly, no separate section for human (driver related) error factors exist in the Bangladesh form but a total of eight (8)

types of driver's errors were included as contributing factors. They are speeding, reckless driving, fatigue, following too close, an improper signal of the driver, improper overtaking, improper turning, and alcohol. Although no separate section for human error factors exists in the Nigerian form; ten (10) types of driver error contributing to road crash were mentioned. They are speed violation, dangerous driving, fatigue, dangerous overtaking, sleeping while driving, route violation, light/sign violation, driving under alcohol/drug influence, overloading, and use of mobile phones while driving. The form from British Columbia, Canada does not include any information on human factors while that of Florida, USA listed twenty-five (25) types of driver and pedestrian-related factors in one section. Those factors include rare but important

factors like fleeing Police and driver distraction etc. Furthermore, Louisiana, USA form listed twelve (12) factors in a box called “Condition of Drivers and Pedestrians” to be tick marked separately for drivers and pedestrians. They include

physical impairment (Eyes, Ear, Limb) and also illness, etc. A big list of 74 different types of driver errors was provided in the Texas form, the factors include road rage, handicapped driver, taking medication while driving etc.



**Figure 5:** Comparison of the Forms based on Human Factors

### CONCLUSIONS

For the first time, the Nigerian RTI-01 form was reviewed based on selected three (03) parameters commonly present in a RTC form and the following conclusions can be made:

#### 1. Road Surface Condition:

In the Nigerian form, there is no clear information on the road surface condition of the road at the crash scene. This issue needs to be addressed because the road surface condition of the road contributes to lots of crashes in Nigeria. Information such as Potholes/Patching, Rutting, Corrugation or Slippery road surface, are missing from the form. The Texas and

Oregon, USA forms provide more details with ten (10) different types of road surface conditions including Dry, Wet, Snow/Slush, Icy, Muddy, Debris, Ruts/Holes/Bumps, Worn/Polished, Low/Soft Shoulder and Others. A higher number of road surface types offers more detailed reporting. The forms from British Columbia, Canada and Louisiana, USA forms do not include any information about the road surface conditions of the crash location hence leading to inadequate reporting in some aspect.

## **2. Collision Types:**

The Kent County, UK and Sri Lanka forms do not provide any clear information on collision type. Although the Nigerian form mentioned type of collision, only five types were listed. While the Oregon, USA form listed Forty-one (41) types of collision. Hence, the forms from Nigeria, Kent County and Sri Lanka can lead to under-reporting of the collision type at the accident scene.

## **3. Human Factors:**

In the Nigerian form, there is no separate section provided for human contributing factors; but ten (10) possible human error factors that may contribute to the road crashes were listed. The Oregon, USA form mentioned eighteen (18) factors, while the Texas form reported seventy-four (74) different types of factors. In the Kent County, UK form, the human-related factors were classified into three (03) categories namely Driver's Error Type, Impairment or Distraction, and Behavior or Inexperience factor. The classification is expected to allow a more efficient reporting of the crash information.

The study recommends that the current Nigerian Road Traffic Crash Information Form (RTI 01) needs to be strengthened because the information captured in the form is not comprehensive enough in conducting an in-depth investigation and analysis of the accident records.

## **Recommendations**

The review shows that the contents of the forms vary significantly, hence the need to maintain uniformity in the crash data formats among various agencies to enable efficient comparison of crash data

across regions/countries. The development of a model preliminary crash report format is crucial at the international level. It is recommended to develop an ideal or optimum form based on the overall information required and grouping of the factors. However, an individual agency would need to consider their local conditions. The model format recommended to be developed should be universal enough and have options open to get adjusted for individual agencies according to the local needs. The form should be simple to complete and eye-catching to prevent seeing the task of filling the form as too difficult by the Police.

Furthermore, the present manual method of the accident recording system should be replaced with a digital format using the RADAR application. It is a mobile application developed by International Road Federation (IRF) for crash recording. The application can be used on phones, tablets, for digital accident data collection from the accident scene (International Road Federation, 2018). If the proposed general accident recording form is included on the RADAR application, it will help in capturing all the necessary information required from the accident scene and will facilitate the scientific analysis of accident records across a country, continent or worldwide. This will also help in studying the cause of RTC, relating them to property damage or injuries sustained by the passengers on the vehicles and other users, which is otherwise impossible using the present set of different accident forms or formats from various agencies. This application is also equipped with a GPS facility for tracing the exact crash



location on the road network/intersection by showing the collision and condition diagram, direction, and movement of the vehicles at the time of the accident.

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