

Commercial Motorcycle Safety in Nigeria: The Past and Opportunity for Future Improvement

Oluwasegun O Aluko

Department of Civil Engineering, Ekiti State University, Nigeria

Corresponding author: Oluwasegun O Aluko

-----ABSTRACT-----

This paper introduces commercial motorcycle as a popular and useful para-transit mode in Nigeria. After reviewing the historic background of this transport mode, it points out its safety problem, nothing that it has been difficult to address this problem. It goes further to review several studies on commercial motorcycle but notes that their findings and recommendations have not improved safety performance in commercial motorcycle operation. Presenting the concepts of driver behavior, and organizational culture and climate it suggests the use of the principles identified in these concepts to address commercial motorcycle safety problem. These principles include developing solutions that take cognizance of the influences on driver behaviour as well as developing policies that can tackle commercial motorcycle operating culture so as to improve its safety climate.

KEYWORDS - *commercial motorcycle, driver behaviour, para-transit, safety.*

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I. INTRODUCTION

Public transport operation in many developing countries is poorly organised and provides inefficient service to the largely captive users in these countries. This partly explains the reason why different para-transit modes operate in these places, and make worse the already bad transport situation rather than improve it (Sietchiping et al., 2012). However, these para-transit modes provide an indispensable service in these places (Júnior and Filho, 2002). One of these para-transit modes is the commercial motorcycle. Commercial motorcycle transport, though a para-transit mode, has some peculiar characteristics which often makes it a favoured transport mode both for operators (drivers) and users for relatively short distances. These include its reliability, ability to navigate more easily through congested roads/roads impassable for other vehicle types, provision of door to door service, avoidance of waiting time and many more for the user. It is also a source of employment for drivers many of who might otherwise have no alternative reliable means of livelihood.

In spite of these benefits, this transport is plagued by some problems. Some of these problems include accident, criminality, pollution, and congestion, amidst others. (Konings, 2006b; Konings, 2006a; Menzel, 2011). Accident occurrence, for instance, is a widely reported problem. This is more so as motorcycle safety is an issue the world over. For example, motorcyclists' fatality accounts for about 15% share of total traffic fatality in the United State (Oster and Strong, 2013). It is however worse in developing countries, particularly where they are used for both private and commercial purposes. Thus, they are described as "the most hazardous mode in Taiwan, Malaysia and Vietnam" (Tien-Pen et al., 2003, p.40).

This paradox in commercial motorcycle transport has come to make its study topical in transport research particularly in some part of Africa where it is the most common informal transport mode (Sietchiping et al., 2012). It is in this group of countries that Nigeria belongs.

In Nigeria, studies on commercial motorcycles cover: income (Arosanyin et al., 2011; Ogunrinola, 2011; Yakubu, 2012; Fasakin, 2002); accident predisposition (Oluwadiya et al., 2009; Solagberu et al., 2006; Iribhogbe and Odai, 2009; Morenikeji and Umaru, 2012); socio-economic characteristics of drivers (Olvera et al., 2012; Mahlstein, 2009; Beekers, 2009) and many other themes. An important feature of this transport mode is the fact that the operating characteristics are similar across many cities and towns where it operates with only small variations. Olawole et al. (2010) show this in their comparison of commercial motorcycle risk perception across three administrative states in Nigeria. Policy direction across various locations in Nigeria also attest to this feature. For example, the ban of commercial motorcycle in Abuja (central Nigeria) was premised on safety and criminality associated with the mode. Similar reasons were given in Imo State, Rivers State and Cross Rivers State (south-eastern part of Nigeria). The attempt to curtail their operation in Lagos is premised on the same reasons. In Ekiti State, legislation on commercial motorcycle operation was undertaken with similar concern. With respect to safety, Morenikeji and Umaru (2012) in a north-western city and Ogunrinola (2011) in a south-

western city observe that as many as 54.2% and 56% respectively of drivers had previously been involved in accident. Similarly, Solagberu et al. (2006) in a north central city in Nigeria finds the share of motorcycle accident to be 27% while Arosanyin et al. (2011) find the national average between year 2000 and 2009 to be 26%. These similarities across many regions and cities in Nigeria show that commercial motorcycle operating characteristics are fairly similar across Nigeria as reported in the various studies. The discussion below provides an historic view of commercial motorcycle operation with emphasis on its safety problem in Nigeria. It also mentions the problem with its regulation and makes recommendations based on driver behaviour and organisation safety studies.

II. COMMERCIAL MOTORCYCLE IN NIGERIA

2.1 Commercial motorcycle emergence in Nigeria

Commercial motorcycle transport goes by names such as “okada”, “alalok” etc. in Nigeria (Iribhogbe and Odai, 2009; Mahlstein, 2009). Arosanyin et al. (2012) describe it as the use of motorcycle for passenger transport while Iribhogbe and Odai (2009, p.359) describe it as “transport(ing) passengers and goods from one location to another for a fee”. Its emergence is largely attributed to the mobility challenges of the late eighties. The huge transport need and the difficult economic terrain of the late eighties in Nigeria naturally made motorcycle owners to offer their vehicle for hire, initially on a part-time basis before it eventually became a trade (Ogunbodede, 2008). As found by Ogunbodede (2008, p.12), “one way by which the public responded in beefing up the supply of public transport was the use of motorcycle as means of urban transport”. It has now spread from the big cities to medium and small cities across Nigeria.

But it has been widely acknowledged that this transport mode predates this time (Gbadamosi, 2006; Olubomehin, 2012). Previously, commercial motorcycles served the riverine areas of the south where roads were sparse, as well as the dispersed settlement of eastern Nigeria; they were exclusive to these locations until they finally emerged in cities. They were therefore novel when they eventually emerged as intra-urban transport mode.

2.2 Commercial motorcycle importance in Nigeria

Commercial motorcycles have now become an important transport in many towns and cities in Nigeria. This is corroborated by Oyesiku and Odufuwa (2002) who find that as much as 80% of commuters use commercial motorcycle transport on a daily basis. Cerevo (2000) reports that as much as 70% of Nigerian cities with population of 250,000 and above inhabitants rely on motorcycles, at least in part, for intra-city public transport services. Odumosun and Yaro (undated) in a study find amidst other things that majority of the respondents needed commercial motorcycle service for their everyday life. Commercial motorcycle transport offer immeasurable benefit in Nigerian cities and towns. They serve various uses to their patrons: in some instances, they are the only means of transport available to some passengers. In some others they are required to complete a trip. Yet, others need it to beat regular traffic jam in their commute trips. The growth in the number of registered motorcycles is an indication of the importance of this mode. Arosanyin et al. (2011) reports that motorcycle registration in Nigeria grew from 19,589 in 1995 to 35,788 in 1997, to 344,215 in 2000, to 617,739 in 2001 before slightly falling and to 501,809 in 2003 falling further to 439,536 in 2005. This importance is further underscored by the various dimensions of studies committed to it. Studies on commercial motorcycle transport covers income, accident predisposition, socio-economic characteristics of drivers, amidst others.

2.3 Commercial motorcycle safety challenge in Nigeria

Commercial motorcycle operation however, started to become "knotty" soon after it emerged as a transport mode in Nigeria. For example, Olubomehin (2012) shows that the number of motorcycle accident in Lagos, Nigeria, rose from 144 in 1989 to 699 in 1999. Similarly, the share of motorcycle accident in traffic accident rose from about 11-14% in the pre- commercial motorcycle days to as much as 26% (Solagberu et al., 2006; Gbadamosi, 2006; Olubomehin, 2012). In addition, other problems such as mob action and motorcycle related crimes were linked to them. Nevertheless, accident is the most commonly reported challenge faced by commercial motorcycles. Accident share of motorcycles in Nigeria has been as high as 27% (Oluwadiya et al., 2004; Solagberu et al., 2006) while fatality has been shown to be as much as 33% (Eze et al., 2012). This high accident share is substantiated by Ogunrinola (2011) who found the scale of accident frequency to be such that 56% of 642 commercial motorcycle drivers randomly selected from two cities have had accident at least once while 27% have had accident three times or more. Similarly, Oluwadiya et al. (2009) show that while only about 42% of motorcycles involved in crash were being used as commercial motorcycles at the time of the incident, they were responsible for 63.9% of motorcycle accident victims. These authors do not conclude without pointing out what should be done to address the behaviour and operating conditions of commercial motorcycles.

2.4 Commercial motorcycle and research recommendations

As a result, these studies generate various recommendations. For example, Odumosu and Yaro (undated) conducted their study on commercial motorcycle operation after its ban in Abuja, Nigeria. The study was intended to find out about the issues of commercial motorcycle acceptability amidst the populace. It concludes that the ban is not acceptable to the people since “majority of users (80% of respondents) prefer the continuous operation of commercial motorcycles in Abuja city”. It recommends infrastructural provision through public-private partnership (PPP) arrangement and the integration of commercial motorcycle into the National Transport System. To the study making the mode safer (rather than outright ban) is what is required. Thus it suggests other things such as the provision of motorcycle lanes and a list of other regulatory measures. Adisa (2010) in his work recommends reducing expensive ownership options amidst drivers and improvement on strict enforcement. Oluwadiya et al. (2009) in their work observed the risky nature of the drivers and advocated that policies should be developed to address it. Similarly, Iribhogbe and Odai (2009) recommend improved training as essential for improved driving safety as well as improved enforcement, improved licensing, and better road safety education as ways of achieving it. Other studies follow similar path of identifying the problems with commercial motorcycle operation and making recommendations about them. These include Morenikeji and Umaru (2012), who recommend the gradual phasing out of commercial motorcycles and Etukumana et al. (2010), who recommend improved road safety education. Others are Alti-Muazu and Aliyu (2008) and Salako et al. (2013) who propose improved enforcement and Fasakin (2000) who recommends that commercial motorcycle should not be banned. Arosanyin et al. (2012) and Ogunrinola (2011) suggest more safety education and improved licensing enforcement while Arosanyin et al. (2011) suggests the regulation of mode, including provision of motorcycle lanes. Table 1 provides a summary of some studies on commercial motorcycle and, amidst other things, notes the recommendations suggested by the authors. But how has these recommendations performed

Table 1: Tabular review of literature on commercial motorcycles in Nigeria

	Odumosu & Yaro [undated]	Adisa, 2010	Olowokudejo & Adulopin, 2010	Iribhogbe & Odai, 2009	Solagbemi et al., 2006	Alti Muazu & Aliyu, 2008	Fasakin, 2000	Fasakin, 2001	Fasakin, 2002	Ogunrinola, 2011	Oluwadiya et al., 2009	Olubomeshin, 2012	Arosanyin et al., 2011	Arosanyin et al., 2012	Arosanyin et al., 2013	Morenikeji and Umaru, 2012	Salako et al., 2013	Ukwanyi, 2013
Purpose of study																		
1 Safety and driver behaviour		X	X	X	X	X				X	X			X		X	X	
2 User satisfaction	X																	
3 Driver's Income							X	X	X	X			X		X			
4 Historical context of mode												X						
5 Crime																		X
Method applied																		
1 Descriptive statistics	X			X	X	X					X						X	X
2 Econometric models		X	X				X	X	X	X			X	X	X	X		
3 Other methods												X						
Findings																		
1 High-risk behaviour	X	X	X	X	X	X				X	X	X		X				X
2 Poor regulation and weak enforcement					X						X	X						X
3 High profit in the trade							X	X	X	X		X	X		X			
Recommendations																		
1 Stricter enforcement		X		X	X	X				X						X	X	
2 Ban (phasing out mode)																X		
3 Education		X				X				X				X		X	X	
4 Regulation and mode integration	X		X	X							X	X	X	X	X			
5 Provision of supporting infrastructure	X						X	X	X									

2.5 Commercial motorcycle regulation

Oyesiku and Odufuwa (2002) note that commercial motorcycle problems are widespread and were initially ignored by the government and policy makers. However, this neglect was not to be for long, especially as the problem grew in intensity. A number of attempts have therefore been made in Nigeria to combat commercial motorcycle safety problem. Mahlstein (2009) and Ayodele (2010) both show that several attempts have been made by various administrative state governments in Nigeria to regulate the operation of commercial motorcycles.. Ayodele (2010) observes that some of the regulatory frameworks developed were not successful as some were eventually relaxed due to agitation from the public while some were abandoned due to both enforcement and non-compliance problems. He identifies five administrative states in Nigeria that have resorted to banning commercial motorcycle operation in their capital cities. Mahlstein's (2009) work is from an anthropological perspective. He studied the regulatory attempt by an administrative state (Cross Rivers State) in Nigeria. The study observes that the lack of trust between the regulators and the drivers and the lack of sincerity on the part of enforcement agencies in pursuing the provisions of the regulation eventually caused a well-conceived regulatory design to fail. The trend in Nigeria has therefore been to impose a ban of commercial motorcycle operation. This is despite the various recommendations available and the implementation of some of them. What then is common to commercial motorcycle studies on the cause of its problems?

III. COMMERCIAL MOTORCYCLE SAFETY STUDIES AND DRIVER BEHAVIOUR

Accident is the most commonly reported challenge faced by motorcycles in general and commercial motorcycles in particular. Thus most commercial motorcycle related studies in Nigeria usually treat safety as a core part of their interest and make recommendations for safety improvements. This safety concern is so important that even studies whose core interest is not safety still do make safety related recommendations (Fasakin, 2002; Arosanyin et al., 2011; Ogunrinola, 2011 are examples of such non-core safety studies). One of the reasons for these safety related recommendations is the attribution of driver behaviour to safety incidences (Oluwadiya et al., 2009). This attribution is also widely acknowledged in literature on driver behaviour (Cheng et al., 2011; Stanojević et al., 2013). Problems such as vehicle overloading, lack of pre-license test, unlicensed drivers, disregard for the use of crash helmet and other protective clothing, alcohol use amidst others have been observed among commercial motorcycle drivers in Nigeria (Ehikhamenor and Agwubike, 2004; Iribhogbe and Odai, 2009). Odumosun and Yaro (undated) find that over-speeding was the most serious complaint about commercial motorcycles, voted by 55% of respondents ahead of accident which got 18% of the vote as the most serious problem. Furthermore, Oluwadiya et al. (2009) show that many of the drivers exhibited risk taking behaviours with 17% being lone crashes, more than 90% not using crash helmet, over 60% being without drivers' licence, 17.5% moving against traffic. Iribhogbe and Odai, (2009, p.356) in their study, find that commercial motorcycle drivers were "ill-prepared and ill-equipped for the road (and that this) is a recipe for traffic crash-related injuries and fatal motorcycle crashes" All these point to the high risk nature of drivers. The high risk nature of drivers has, however, been attributed to the difficult condition under which drivers work. Cervero (2000, p.38) note that commercial motorcycle drivers in sub-Saharan Africa have higher accident rate "because many drivers take drugs to immunize themselves from the hot sun and rigours of work". This also agrees with the work of Adisa. Adisa (2010) studied substance abuse and its effect on drivers. He found that commercial motorcycle ownership and alcohol use index were related and that educational level, experience, income, and working period per day correlate with alcohol index. Similarly, Fasakin (2000) points at the difficult terrain under which the drivers work. He opines that regulatory effort might fail when it has not taken cognizance of the operating cost of operators. Still further on drivers' condition of service, Mahlstein (2009) observes that there is the problem of trust between drivers and enforcement agencies and this often affect drivers' behaviour and compliance. Thus the relationship between driver behaviour and condition of operation is established in these literature. The following section therefore review the literature on driver behaviour and work environment factors.

3.1 Road safety and the human factor

The three broad factors of accident causation are the human, road environment, and the vehicle. Of all these three, human factor is known to be the most significant contributor to accident causation (Davey et al., 2007; Özkan et al., 2006; West et al., 1993). Moreover, Qzkan et al. (2006) note that the concept of driving skills (driver performance) and driving style (driver behaviour) are the two main components of human factor in road safety. Driver performance are related to information processing and motor skills while driver behaviour is influenced by motives, attitudes and personality traits: performance concern the ability the driver has to control the vehicle: behaviour reflects the habitual modes of operating the vehicle on the road. Thus West et al. (1993) suggest that it should be possible to improve understanding about human causes of accidents by investigating the variations in driver performance and behaviour and judging what may be related to accident rates.

Moreover, the study of individual differences in accident involvement assumes that different degrees of accident involvement are in part a product of differences in driver behaviour or driver performance as opposed to chance factors (West et al., 1993). Both style and skills are empirically related to each other and interact together to influence crash risk. Nevertheless it is the view that driving behaviour may be more important than performance for an average driver (West et al, 1993). This has led to more concentration on driver behaviour rather than driver performance. Thus driver behaviour which reflects driving habit can be used, for example, to estimate the amount of risk a driver accommodates as he uses the roadway. This is obvious in commercial motorcycle operation and substantiated by Adisa (2010) who found commercial motorcycle ownership to be related to some risky habits.

The focus of driver behaviour theories is on the concept of risk with risk measures viewed as a major control variable in driver behaviour (Summala, 1996). There is the concept of zero-risk theory: which suggests that drivers adopt a dynamic safety margin below which they operate in comfort. This concept of dynamic safety margin leads to the concept of behaviour adaptation which indicates that the “risk of collision is generally not relevant in the decision-making” (Fuller, 2005, p.461) process of the driver: he drives with learnt habitual patterns and without the thought of risk but based on the developed safety margins. This dynamics occurs such that with experience, drivers adapt to situations which at first provoked a risk response. This margin is changing from time to time. This is noticeable in commercial motorcycle operation and probably forms the reason why they are viewed as highly risky.

3.2 Safety culture and climate

In addition to looking at individual driver's behavior, organizational safety culture and climate is another way of assessing safety and driver behaviour relationship, especially when it is considered that the vehicle is a work place. Safety culture and climate started with organizations but has now been extended to road safety. Culture and climate in this context have close meaning. This is particularly because organizational climate is not different from the manifestations and reflections of cultural assumptions (Öz et al., 2014). Climate is a temporary state of an organisation and is being affected by changes within the organisation. Culture, on the other hand, is the structure in place that shapes the feeling of everyone about safety. Thus in commercial motorcycle operation, the culture is what Konings (2006b) describes as the drivers seeing themselves as master of the road. Arosanyin et al. (2011) observe that the drivers' union/ associated decide for members on the rules to follow and those to ignore. Improving on commercial motorcycle safety climate will require changing these cultural assumptions.

IV. RECOMMENDATIONS

This paper has provided a review of commercial motorcycle operation in Nigeria emphasizing its benefits as well as safety problem. It notes that there is an enormous amount of studies on commercial motorcycle but without a known successful regulation. The need to understand the safety problem from driver behaviour and organisation safety perspective is therefore presented. It points out that for the commercial motorcycle drivers, it is possible that their behaviour is influenced by motives (such as to make as many trips daily as possible so as to increase their earnings), attitudes (e.g., the perception that because their service is essential, all other road users should give them priority) and personality traits (which may include the fact that most of these drivers are poorly educated, have low self esteem, and essentially occupy a low social status in the community). It is shown that these factors may be related to the high level of risks they can accommodate. To improve safety in their operation, these influences on behaviour should be visited.

Similarly, it is noted that the culture and climate of commercial motorcycle operation as manifested in the similarities in driver behaviour should be given attention. While culture is qualitative, climate is quantitative and can be measured with dimensions such as management, risk, work pressure, and competence (Öz et al., 2013). These measures affect both the violation tendency of drivers and the safety climate within which they work (Öz et al., 2014). A review of commercial motorcycle management, their work pressure amidst others is important to improving safety in commercial motorcycle operation.

Finally, as indicated by Shams et al. (2011), the extent of safety improvement achievable will depend on the understanding of the local conditions and what policy measures are decided in addressing these local conditions.

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