

THE INCIDENCE OF HIGHWAY ACCIDENTS IN EDO STATE, NIGERIA AND HIGHWAY ACCIDENTS PREVENTION

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Abstract

This paper, highlights the consequence of highway accidents, after which it explores the incidence in Edo State between 1996 and 2002. Using the State's condition, it mirrors the entire country, thereby emphasizing the need for finding the causes and solution, and stressing that neglecting finding solution to such hazard is like agreeing to make annual human sacrifice to highway transportation. Subsequently, the paper discusses the causes under three major classes, which include: human causes, vehicle and equipment causes and highway/environment causes. It rounds up by discussing the preventive measures, stressing that there cannot be any better solution to highway accidents than prevention. Featuring prominently among the preventive measures are; driving licenses suspension/withdrawal/denial, driver education, speed control, issuance and use of vehicles' road worthiness certificates and timely and adequate road maintenance and improved road alignment.

Introduction

Death toll and economic loss throughout the world to highway accidents are so enormous that to ignore the search for their causes and solution is tantamount to making an annual human sacrifice to highway transportation. It is such a sinister event whose next victim no one knows. In the United States of America in 1978, 51,500 people died in highway accidents while 2,000,000 were injured. (Clarkson and Gary Hicks, 1982:448-449), According to the same source, 18.3 million individual accidents occurred involving 31.5 million vehicles that year. Back here in Edo State, the number of deaths associated with highway accidents is startling and that is why it is intended to use the State to mirror the entire country and subsequently examine the common causes of accidents and suggest solutions.

The paper is divided into three sections. The first section examines the incidence of highway accidents in Edo State and uses it as a base for the projection into what the picture is likely to be at the national scale. The second section x-rays the common causes of highway accidents while the last section suggests the possible ways of preventing them generally.

Highway Accidents in Edo State

The Road Traffic Accident Statistics (RTAS) of Edo State from 1996 to, 2002 (Table 1) portrays a picture of steady decline in accidents from 1336 accidents in 1996 to 138 in 2001, though it went up to 177 in 2002. But the number of recorded deaths is not steady, for it rose from 246 in 1996 to 300 in 1998, fell to 249 in 1999, rose again to 400 in 2000 and finally declined steadily to 143 in 2002 (Table 1). This fluctuation makes valid statement on whether death arising from highway accidents is on the decline or increase difficult. This ipso-facto suggests the search for an alternative means of generalization. This explains why the mean annual number of deaths is used here. The mean annual number of deaths in Edo State from 1996 to 2002 is approximately 266, whereas the projected population of the State from 1991 figure of 2,080,855 to the year 2002 is 3,340,909. Deriving from the mean annual deaths and the projected population, the annual probability of death through highway accidents is 0.0008 or 8/100,000 (266/334909). Stated in another way, it means that 8 out of every 100,000 die annually through highway accidents in Edo State. Though conditions in the remaining 35 States may not be similar to that in Edo State, the fact remains that no State is accident free and that whenever they occur, most of them result at least in injuries and loss of material.

Table 1: (Road Traffic Accident Statistics in Edo State 1996-2002)

S/No	Year	Total number of Accidents	Number Fatal	Number Serious	Number of People Killed	Number of People Injured
1	1996	1336	249	1087	246	912
2	1997	1286	232	795	323	799
3	1998	891	307	584	300	878
4	1999	273	133	140	249	607
5	2000	383	175	208	400	643
6	2001	138	61	76	202	570
7	2002	177	62	64	143	346

Source: Road Safety Corps, The Nigeria Police, Edo State Command 2002.

For such a phenomenon (Highway accident) whose next victim no one knows, to be left at its current State without any attempt at its reduction, is like agreeing to make annual human and material sacrifices to highway transportation. Such sacrifices can be disastrous and that is why exploring the causes

and possible solutions to highway accidents are very necessary. They (causes and possible solutions) are therefore considered hereunder.

Common Causes of Road Accidents

Highway accident causes are of three general classes and these include human causes, vehicle and equipment causes and the highway/environment causes. The human causes of highway accident include all failures associated with the vehicle drivers, other road-users, and highway law enforcement agents. The vehicle and equipment causes include failures associated with motor vehicles, motorcycles etc. using the roads while the highway environment causes include highway failures and faulty alignments of the highway.

1. Human Causes. A substantially high percentage of the highway accidents is caused by improper driving and law violation by the driver. These in turn are due to either the physical characteristics of the driver, or inadequate education of the driver and other road users. It could also be as a result of the driver's frame of mind, the temporary conditions of drivers and excessive speeding. Other human causes include faulty licensing of drivers and vehicles and inadequate highway law enforcement.

The number of driving licenses issued in Edo State in 1999, 2000 and 2001 respectively are 2649, 3916 and 4587 (Edo State Licensing Office, Benin City, 2002) and the number keeps increasing over the years. But apart from those drivers licensed in Edo State, some drivers licensed in other States drive in Edo State while some of the drivers licensed in Edo State drive in other States of the Federation. Against this background, therefore, it is considered that if only licensed drivers drive motor vehicles, it means that in the year 2001, close to 4587 drivers drove vehicles in Edo State. These drivers vary in their physical capability and characteristics with some really deficient in the ability and physical characteristics required of a good driver. These human elements in drivers' accident involvement include:

(a) **Age** Scholars' opinions are divided on the role of age in accident involvement. Some people argue that aged drivers are more prone to accidents because reflexes and physical ability diminish with age. Another school of thought claims that involvement rate is higher among teenage drivers because of their recklessness. But highway accident fatality experience per licensed driver in the United State is higher among the under 20 drivers than the oldsters. (Clarkson and Gary Hicks 1982). In Tact according to them, oldsters are more cautious, make fewer wrong decisions and are less aggressive than the youngsters.

(b) **Diseases and Ill-Health.** Certain diseases like epilepsy, heart disease, diabetes, mental illness, etc. affect the coordination of thought with sight and as such make their sufferers prone to accidents. Other physical defects that can cause accidents include defective sight and deafness.

(c) **Driver Education.** inadequate education of the drivers, particularly their inability to understand road signs and lack of knowledge of the Highway Code is a major cause of highway accidents. Most drivers in Nigeria are illiterates. Majority of them neither went to any formal educational institution nor any driving school. They can therefore not read nor understand the road-signs and Highway Code. This is why they commit blunders on the highway thereby involving themselves and others in accidents.

(d) **Drivers' Frame of Mind** There is a relationship between safe, lawful and courteous driving and the emotional makeup, social adequacy and risk taking tendency of drivers. Drivers, who are emotionally balanced, tolerant of others and less prone to risk taking, drive more safely than otherwise. Teenage drivers are mostly overconfident and take unnecessary risks with very narrow margin of safety hence, have higher accident involvement rate. A study in Minnesota, USA, showed that the under 25 drivers formed 20% of the drivers in that State but 30% of the arrest for drinking and driving and 50% for speeding (Clarkson and Gary Hicks, 1982).

(e) **Temporary Driver Conditions.** The temporary conditions, which predispose drivers to accidents, include exhaustion (fatigue), drowsiness, drunkenness, drug addiction and excessive speeding.

As for exhaustion and drowsiness, driver simulation test had shown that efficiency begins to diminish within two hours after the commencement of driving. The result is that efficiency becomes lowered with continuous driving without the driver knowing, a phenomenon called trip hypnosis, thereby leading to accident. In the Nigerian, situation, this is common among commercial vehicle drivers.

Drunkenness among drivers, cyclists and even pedestrians is a very serious cause of road accidents all over the world. According to the National Standard on Alcohol and Highway Safety of the USA; the 0.10% blood alcohol level is presumptive evidence of intoxication- Also for majority of people, blood alcohol levels less than 0.05% produces some sedation and tranquility, but above that level, there is inability to coordinate visual sense and vehicular control. This explains why alcohol is dangerous for drivers. In fact alcohol is a major cause of accidents in Nigeria.

Drugs, such as marijuana, opiate, amphetamine, antihistamines, barbiturates etc. affect drivers'

behaviour. They give them a sort of dutch courage and as such increase their accident involvement chances. Drugs give drivers the courage to take unnecessary risk which they will not take under normal condition thereby bringing them in most cases into head-on collision with on coming vehicles.

Another temporary condition of the driver, which predisposes him to accident, is excessive speeding. The role of speed in highway accident involvement is of two parts. One part is the way it causes the accident while the other is that when accidents occur, speed makes them more fatal. The first part is explained by "speed too fast for the condition". When the speed of the vehicle is too much for the particular circumstance the result is accident. For example, the speed of 110k/h could be okay along a lonely rural highway or on an expressway/freeway where conflict with other vehicles may not exist and there is long sight distance with the attendant ample opportunity for avoiding accidents. On the contrary, on a busy street or road, where the chance for accident is high and sight distances are short, a speed of 80k/h can be dangerous. The second aspect is amplified by the effect of speed on the severity of accident and the law of mechanics in physics explains this. This law states that any moving body (this time, the vehicle and the bodies of the occupants) possesses kinetic energy; the magnitude of which increases as the square of the velocity. When accident occurs, the kinetic energy must be dissipated in doing some work much of it in the form of damaging the vehicle and its occupants. For example, if the energy dissipated at a speed of 50k/h is unity (1), the magnitude of the energy dissipated at other speeds of 100k/h; 150k/h; 200k/h are respectively 4, 9 and 16. From this analysis the capability of speed to increase the fatality of accident is obvious.

(f) **Faulty Driver Licensing** Driver licensing power is vested on the police in order to protect public health and safety. But because of the importance of transportation to living and making a living, the right to drive is given legal recognition and protection. For this reason, any over-zealous regulation aimed at denying people the right to drive or testing procedure, which will deny people the right to drive, could be challenged legally. Between these two extreme conditions of protecting public safety and the legal recognition and protection of the right to drive, the police are left with no other option than to operate arbitrarily. That is why licenses are given to some high-risk drivers, sometimes even in return for gratification. The result is the dangerous driving one finds on the highway and the attendant accident risk.

(g) **Inadequate Traffic Law Enforcement** There is lack of continuous or consistent traffic law enforcement, thereby leaving room for excessive speeding and other traffic law violations which eventually result in accidents. Sometimes, this is due to the fact that the area of jurisdiction of the road safety command and the police is too large for it, thereby resulting in inadequate coverage of the area. This reason is substantiated by the fact that the fear of arrest and punishment causes drivers to conform with traffic laws and regulations, thus reducing accident probability. But on the other hand, the absence of the law enforcement agents means freedom for non-conformist drivers and rise in accident probability. Another reason for inadequate enforcement is that the traffic law enforcement agents sometimes gloss over or ignore traffic law violation after accepting gratification from drivers.

2. Vehicles and Equipment Causes These are factors related to vehicles' failure, motorcyclist, bicyclists and pedestrians collision with one and other. Among the phenomena embraced in vehicle failure, the most common include tyre failure, brake failure and sometimes engine failures. Another factor has to do with horsepower weight ratio. When the load exceeds what the engine horsepower is designed for, the probability for accident is high. This is a common phenomenon in Nigeria.

Motorcyclists accident is rampant the world over and has a high fatality rate simply because the motorcyclists take greater risks. Secondly, the cyclist is not cushioned in and protected by a vehicle of considerable mass and finally the rider on impact continues his forward motion at pre-collision velocity, usually head first, until he strikes a vehicle or fixed object or slides to a halt. According to Clarkson and Gary Hicks (1982) motorcycle and motor scooters registration in the United States increased from 600,000 in 1960 to 5 million in 1978, but during the same period, deaths from this mode increased from 750 to 5100 (from 2% to 10%) of deaths through highway accidents.

Yet another serious accident factor is the bicycle and pedestrian collision with motor vehicles. Cyclists sometimes violate traffic laws by failing to heed stop signs, travelling in hazardous manner through the traffic and ignoring the cycle path and sidewalks in favour of the roadway thereby getting themselves involved in collisions with motor vehicles or even with other cyclists. In the same way pedestrians sometimes dash out into the street, away from intersections or dash out at intersections thereby getting themselves involved in collision with vehicles.

3. Environment Factors These are factors related to the condition of the highway. These include bad road conditions, inadequate road right of way and poor highway design.

(a) **Poor highway surfacing** Most of Nigerian highways have very rough surface characterized by series of potholes. These potholes develop either as a result of poor construction work or were cut by erosion arising from the tropical storms, which reduce the life span of Nigerian roads. When vehicles on high speed fall into these holes their drivers lose control resulting in serious accidents.

(b) **Sometimes Too, The Road Right of Way is Inadequate** The roads are narrow considered along

side with the traffic they carry. Broken down vehicles sometimes reduce the effective width of the highway thereby causing collision between other vehicles struggling for the use of what is left. Another phenomenon which reduces highway capacity, thereby making them road accident-prone includes highway/street trading, a phenomenon which is common in Nigeria.

(c) Faulty Highway Alignment is Another Factor that Makes the Roads Accident-Prone.

Sometimes the road bend is so sharp that it reduces the sight distance required for safe driving. Sometimes too the grades are so high that apart from the passenger cars and minibuses, other vehicles climb with difficulty. A typical example of this high grade is the Ewu hill along Benin - Auchi -Okene road. The grade is so high that hardly is there any month of the year where a truck does not fall on that hill. A much more friendly alignment would have been achieved if more cut and fill were done.

Highway Accident Prevention

There can never be any better solution to highway accident problem than the preventive measures. In like manner, there cannot be any better preventive measures than finding out the causes so that they can be avoided. To prevent the causes of accidents is to prevent accident from occurring. This is why accident investigation is necessary any time accident occurs. The aim is not always to find out who is guilty for crucifixion. The emphasis is on finding out the causes so as to forestall their future occurrence. It is for this reason that the initial part of this write-up was devoted to a thorough exploration of highway accident causes.

Discussed hereunder are the precautionary measures necessary for warding off accidents from our highways:

(i) License Suspension/Withdrawal/Denial

(a) Suspension/Withdrawal Licensed drivers caught drunk while driving should have their driving licenses suspended or withdrawn. Also included in this category of drivers whose licenses should either be suspended or withdrawn are convicted drivers and drug addicts. Drivers convicted for violation of driving codes should have their licenses suspended for months or years. Following this will be license withdrawal, should the offence be repeated. As is done elsewhere in the world, a tallying system whereby conviction or accident involvement is tallied by the licensing authority against the drivers should be adopted. In this system, when any driver's score reaches a stipulated level in the tally, the license is suspended or withdrawn. Known drug addicts should have their licenses withdrawn outright. People with certain physical infirmities, such as people who have suffered epilepsy, heart diseases, mental diseases, sight defects and hearing defect should have their licenses withdrawn.

(b) License Denial People within certain age brackets should be denied driving license. These include people of ages below twenty (<20 years), between twenty and twenty-four (20 - 24 years) and above seventy (>70 years). This is because, while the drivers aged below twenty and those between the ages of twenty and twenty-four are reckless, the reflexes of those above seventy years of age have started failing. The result is that these categories of people are very accident-prone. Also people who had from birth suffered the aforementioned diseases should be denied driving licenses because they can manifest traces of such diseases hence they become accident-prone. This is why they are called high-risk drivers.

(ii) Driver Education Ability to interpret highway signs should be insisted upon as one of the conditions for obtaining driving licenses. Whereas the prospective driver need not obtain a University degree, a minimum of junior school certificate is not too high. This apart, all commercial vehicle drivers must show evidence of having attended accredited driving schools where they should have been taught the meaning of road signs. As a follow-up, the ability to interpret these signs must be demonstrated by a prospective driver before being granted the license to drive. To achieve this goal, driving test has to be done and passed before any person is given driving license. There should also be on a continuous basis, public enlightenment programmes through the electronic media such as radio and television and the print media.

(iii) Control of Speed Excessive speeding should be checked through various means including:

- (a) Erections of sign post carrying the maximum speed limit at regular intervals of five kilometers for every highway condition. Such speed limit for the tangent should not exceed 55 mph (88.5 k/h) and very much less than that for the curves.
- (b) The Road Safety Commands and the Federal Highway Patrol Units should be equipped with high speed vehicles and electronic equipment to enable them track down highway code violators particularly the speed limit violators.
- (c) The Federal Highway Patrol Units should really patrol the highways and stop forthwith, the habit of staying at a point for over a long period of time.

(iv) All vehicles, whether private or commercial should be certified roadworthy by the Vehicle Inspection Officer (VIO) before being put on the road. The vehicle which should be properly maintained should carry along with it, the road worthiness certificate issued by the VIO or the Road Safety Officers. These road safety officers should be monitored against corrupt practices such as colluding with law violators particularly as it concerns roadworthiness.

(v) **Highway Maintenance** The highways should be properly maintained so as to get rid of highway conditions that are capable of impeding highway capacity. The shoulders of many highways in Nigeria are overgrown by weeds where not paved or are taken over by deep gullies, which are like death traps to vehicles where they were initially paved. Such shoulders should be maintained to enable them serve as the reservation for broken down vehicles. The various potholes, which bedevil the highways, should also be mended immediately they start developing,

These apart, future highway projects should avoid accident-prone road intersections particularly when they are at grade. Other options such as grade separated junctions with the accompanying interchanges though costlier are better and in the long run, they become cheaper when one considers their accident reduction capability. Another area that requires urgent review is the grade and curvatures status of Nigerian highways. They should be made more gentle than is the case today. In fact, grade should not exceed 5% no matter the nature of the terrain. Enough earthworks (cutting and filling) should be done so as to reduce the grade. In like manner, the curvature should be reduced so as to enhance the sight distance necessary for safe driving. Even the existing roads should be considered for such grade and curvature reduction particularly where they will not involve the payment of much compensation.

(vi) **Highway Law Enforcement** The government should foster continuous, consistent and adequate highway law enforcement. It is obvious that at the current state of highway affairs, the Nigerian highways are not adequately policed. There is inadequate coverage and the law enforcement outfit is corrupt and often colludes with the highway law violators.

To bring about adequate coverage, the numerical strength of the Road Safety Command and the Federal Highway Patrol should be substantially increased. These highway law enforcement agents should be monitored so as to forestall their involvement in corrupt practices and colluding with law violators. They should be adequately armed so that they can adequately defend themselves against undesirable elements on the highway.

Another area that is often neglected is that the work of the highway law enforcement outfit is risky. This is why they should be encouraged with incentives in the form of hazard allowances so that they may shun corruption and work with zeal. It may even be necessary to get their lives insured against hazards.

Conclusion

The danger of highway accident all over the world is enormous, Death toll and economic loss it causes are so high that no nation can afford to ignore finding out the causes and solution to it. Here the incidence of highway accidents in Edo State had been explored and used as a base for illuminating the highway accident picture at the national scale. This in turn was used to highlight the necessity for finding out its causes and solutions. The causes were discussed under three categories, which include human causes, vehicle and equipment causes and highway/environment causes. The paper is rounded up by discussing the preventive measures, stressing that the best remedy to highway accident hazards is prevention. Prominent among the preventive measures discussed are, driving license suspension/withdrawal/denial, speed control, driver education, issuance and use of vehicle roadworthiness certificates, proper highway policing and timely and adequate highway maintenance construction.

References

Baker, R.F. (1971). *The Highway Risk Problem*. New York: Wiley.

Binder, R.H. (1976). *The Traffic Engineering*. New York: Wiley.

Carios, F.D. (Dec. 1995). *Continuum Theory of Traffic Dynamics for Freeways with Special Lines*. Boston, Kluwer Academic Publisher.

Clarkson, H.O.; and Gary Hicks, R. (1982). *Highway Engineering*. New York: Wiley.

Datta, N. Godbole (Jan. 2000). *Safety and Throughput Analysis of Automated Highway System*. Oxford: U.K. UNESCO, EOLSS Publisher.

Edo State Licensing Office, Benin City (2002).

Forbes, T.W. (1972). *Human Factors in Highway Traffic Safety Research*. New York. Wiley.

Nacaetaenen, R.; and Summah, H. (1976). *Road User Behaviour and Traffic Accidents*. New York: American Elsevier.

Ran, J.G.; and Wooten, D.C. (1980). *Environmental Impact Analysis Handbook*. New York: McGraw Hill.