

UNIVERSITY OF PORT HARCOURT

***THE TERROR OF TRANSPORT AND
THE TRANSPORTATION OF TERROR***

An Inaugural Lecture

By

PROF OSI S. AKPOGHOMEH

INAUGURAL LECTURE SERIES

NO. 94

27 SEPTEMBER, 2012

Dedication

This work is dedicated to my wife Maria and our children: Keme, Oshone, and Oshogwe

Content

I	
Introduction	3
II	
The Terror of Transport – Traffic Crashes	11
III	
Terror of Transport – Environmental Pollution and Climate Change	53
IV	
Transportation of Terror	63
V	
Conclusion	84

THE TERROR OF TRANSPORT AND THE TRANSPORTATION OF TERROR

OSIGBEMEH OSI S. AKPOGHOMEH

Preamble

The inaugural lecture is an enormous challenge and the privilege to deliver one is an honour. I am glad today because it is my turn. The fourth in the Department of Geography and Environmental Management. I want to thank God for this unique opportunity. I am also indebted to my late parents Mr. Daniel and Mrs. Mary Akpoghomeh. My gratitude also goes to Emeritus Professor. M. O. Filani, my supervisor (M.Sc, Ph.D) and Professor C. O. Ikorukpo my second supervisor (Ph.D) both of whom are still my supervisors, my ogas and friends. Professor N. D. Briggs, Professor Don Baridam and Professor J. Ajiienka are also acknowledged.

Thank you Mr. Vice Chancellor, sir.

The title of the lecture is deliberately chosen not only to reflect my specialization in Transport Geography or to reflect the multi-institutional nature of Geography as a discipline concerned with providing answers to *What is Where, Why, How and the Impacts*, but also to exposit on man's most fundamental demand which has turned out to be the greatest threat to his survival.

The transport geographer, as a planner, seeks explanations to locational differences and ways to bridge the gap between places, things and activities. In the process of bridging distances there are unwanted consequences which man has no choice but to live with. Herein lies the aim of my lecture – to examine the terrific but inevitable consequences of moving from one place to another as well as

the terror facilitating uses man has found for our means of movement into. Mr. Vice Chancellor Sir, the title of my lecture is THE TERROR OF TRANSPORT AND THE TRANSPORTATION OF TERROR.

I

INTRODUCTION

Generally, transport is the movement of persons and or things across space. It could thus be defined as the relocation and distribution process of persons, goods, information, ideas etc. It is about accessibility (Ikporukpo 2002). For instance, people who live at some distance from their places of work demand transport in order to move quickly and safely from residences to their places of work. Secondly, an explorer of natural resources needs transport in order to get to the exploration site and of course to move the materials exploited to other locations where they are needed. A producer on the other hand needs transport just as any other raw material input in his production process. This is because the production of any commodity is not complete until the commodity gets to the consumers. Thus a producer of commodities, for instance, needs transport so as to move his products from the factory to the consumers. Hence, Seally (1957) stated that “transport is necessary to satisfy the function of place”, while according to Bonavia (1936), “transport aims at creating the utility of place”.

As could be observed from the examples above, transport is useful in satisfying a particular need, just as food is useful in satisfying our health and body needs. Thus, one of the major functions of transport is to bridge the time and space gap (distance) that separate people from their activities.

The role of transport is not limited to merely servicing other things, for it also often serves as a tool of development especially in the remote, undeveloped and underdeveloped parts of a country. In newly colonized areas, because of the immense uses they serve, transport routes are usually described as development lines built in anticipation of the development of traffic.

Transport innovation has bridged locations that previously seemed impossible and the increase in speed has enhanced quicker interaction along development corridors within and between the main urban centres or peripheries.

In Nigeria, transport has contributed not only to economic integration of the country but also her political unity (Filani 1988). Since 1963, Nigeria has witnessed increased decentralization of her political structure. The present 36 states structure necessitates constant interaction not only among the state capitals on the one hand but also between them and the federal capital. With the creation of the 36 states, most large industrial and commercial enterprises opened their new branches in some of the new state capitals to take care of emergent business opportunities.

1.1 Transport Demand

In transport research, transport is not considered a basic human demand like the need for food, clothing and shelter; instead, it is said to be a *derived demand*. This opinion is predicated on the fact that the demand for transport is usually *derived* from the *demand* for man needs. In other words, direct demand for transport (demand for movement for movement's sake) is comparatively rare. If this argument is sustained, it could equally be argued that no human need, no matter how fundamental, is demanded for its own sake. In other words, the so-called fundamental human needs are themselves demanded to meet other human needs and so are derived demands too. For example, nobody eats food for the sake of eating food. Man (and woman, too) eats to satisfy hunger and for growth and to sustain good health and to live. Growth, good health and the sustenance of life are thus man's actual needs as far as eating food is concerned. Consequently, transport like food, shelter and clothing is demanded to satisfy other requirements. As a matter of fact, transport demand must be satisfied for one to be able to satisfy any other human need. Consequently transport is man's most fundamental need. This no doubt makes transport a *primus enter pares* and *the demand of all demands* and not only a derived demand as is generally believed. And that is why any direct or indirect increase in transport costs draws the fiercest reaction from the people irrespective of the part of the globe. The last fuel subsidy strike in Nigeria is a case in point. In support of this line of thought Ogunsanya (2002) rhetorically asked "if the question is asked, what are the basic necessities of life? The quick answer will be that they

are food, clothing and shelter. But a little reflection perhaps will show that without transport, these necessities of life would be difficult to achieve if at all”.

1.2 Importance of Transport

Transport has historical, economic, social, and political relevance... in fact it is important in all circumstances.

Historically, transport development has played a very significant role in the growth of civilizations. An example is Egypt, where development in water transport laid the foundation for the development of the country. There is also an established relationship between transportation and the evolution and development of the city (Oyesiku 2002).

Socially, a transportation system also creates a social structure in the sense that people who travel within the bounds of a particular transportation network share ideas and experiences that further enrich society.

Economically, transport

- Determines the value of goods and services. This it does, by giving place utility to goods and services – transport development between point A and B will encourage market areas in A to purchase goods/products from distant suppliers in B that otherwise would not have been patronized. It also creates time utility by ensuring that people and products are at the proper locations at the right time.
- Increasing the Utility of goods and services by:
 - (a) *Encouraging Geographic Specialization* which allows each area to produce products and services for which its capital, labour and raw materials are best suited. In other words and in line with the principle of Comparative Advantage, an area will specialize in the production of goods and services for which it has the greatest advantage or the least comparative advantage. Moreover, geographic specialization assumes that goods produced will be demanded at distances far from the production site.

- (b) *Encouraging large scale production* as goods and services can be efficiently transported to distant areas needing them. Just like in geographic specialization, large scale production also assumes that goods produced will be demanded at distances far from the production site.
 - (c) *Increasing competition* by expanding the market area for a product.
 - (d) *Increasing the value of land* that is adjacent to transport infrastructure. This it does by making such lands more accessible and useful. It must be noted however that transport does not always have a positive effect on land values as noise and air pollution that some networks generate decrease adjacent land values. Moreover, some other residents suffer from over-accessibility.
- *Increases Mobility* – transportation network development increases the movement of people.
 - *Generates Revenue*: Transportation pays a major role in the overall economic development of any area. On the average, transportation accounted for about 20% of the Gross Domestic product (GDP) of the United States of America in 2000 and for Nigeria it was 3% in 2000. This is achieved by the use of the various modes – automobiles, aircraft, ships and pipelines; and the energy cost associated with operating them and as an employer of labour.

1.3 Theory

Two theories shall form the theoretical framework for this lecture: The Theory of Transport and Development and the theory of impact of a transportation facility.

1.3.1 Transport and Development

There is some controversy among researchers and policy makers over the degree or absence of a relationship between transport and development. From this controversy, three dominant schools of thought have emerged; they are:

- The positive school

- The negative school
- The permissive school

The Positive School

This School of thought opines that there exist a healthy and causal relationship between transport development and the rate of regional development. Therefore, one influences and determines the other.

Traces of the adoption of this belief can be linked to Smith's (1973) theory of Wealth of Nation and Lugard's (1922) postulates on how Africa can be developed. According to Lord Lugard, the material development of tropical African may be summed up in one word "transport". This stage marked the development of the railway network system for the movement of raw materials from the countryside to the coast for shipment overseas. Rostow (1974) related the postulate of this school of thought to the development of the railway system in the U.S. and regarded it as a period when increments in economic activities were facilitated. According to him the multiplier effect of the railways was such that it led to increase in productive activities in various other sectors of the economy. In Nigeria the believe in this school of thought is often exhibited in the importance attached to the transport component in all the Federal Government Development programmes, especially for the rural areas in Nigeria. Examples include: the various River Basin Development Authorities, Operation Feed the Nation (OFN) Directorate for Food, Road and Rural Infrastructure (DFRFRI), Better Life Programme, Poverty Alleviation Programme, the present National Economic Empowerment Development Strategy (NEEDS) etc.,(Akpoghomeh 2002).

The Negative School

The Negative School of thought contends that the development of transport facilities brings about a negative effect in regional development. Gauthier (1970) was of the view that the opportunity cost of investing in transportation facilities is more than for alternative investments. If investment in transportation becomes less productive, the level of regional development will be below what it would otherwise be. However, the negative effect of transportation projects

have manifested in circumstances whereby roads linking urban and rural areas, encourage rural-urban migration and hence result in development problems in both urban and rural areas. Such a centralization effect resulting in peripheral areas losing out has been observed in Britain (Botham, 1980). Furthermore, transportation could underdeveloped a place if it separates a people.

This school of thought has the least number of adherents.

The Permissive School

According to this school of thought a certain minimum of transport facilities is essential to allow for the development of any place. The problem however is that there is no general agreement on the size of the transport circle which will bring about development.

The Permissive School thus maintains a middle course between the Positive and Negative schools of thought. It does not however deny the fact that transportation investment provides opportunity for development, but such an opportunity can be translated into concrete development only if the other human and material resources required are available.

1.3.2 Transport and Regional Development

Coming from the perspective of the positive school of thought, all the possible development impacts of transportation have been categorized into three

- development effects,
- distribution effects
- spillover effects or externalities.

Development Effects

These are 'true' benefits and therefore results in the creation of wealth. These are the effects derived from the exploitation of land's natural resources. Transport provision is thus seen as arising from the need to exploit these resources. By contributing directly to productivity, such investment also increases the value of land by encouraging aggregation of other resources in a given location.

Distribution Effect

Distribution effects derive from the exploitation of a location's relationship with others and or the transportation routes connecting them. Example are found at factory sites accessibility to the market and production inputs, and the accessibility of a household to work, shopping, recreation and educational centres in such a way that travel time and expenses are minimized.

Spillover Effect

Spillover according to Goodall (1987) describes the mismatching of the area which bears the cost of providing a public good or service (e.g. transport service) and the area which receives the benefit. There are two types of spillovers – benefit spillovers and cost spillovers. These can either be positive or negative.

Benefit spillovers occur when the benefits of public service provided in area A are available to people living in area B, while A pays for the service. Cost spillovers (spillins) occur where an area has access to benefits from other areas. In which case the city or local government, for instance, imports externalities and enjoys benefits which are paid for by others.

A positive spillover effect is a beneficial one, while a negative spillover effect is a non-beneficial one. An example of negative spillover is when a place is exposed to the negative consequences of a transport infrastructure. For example a new expressway linking two cities may result in increased road accidents in the settlements along the expressway. In summary spillover effects are those benefits and costs to groups or places other than those benefits for which the transport infrasturctural development, for example, were intended. The positive spillover (benefits) in this regard include pleasant views (good scenery), recreation space and attractive structures among others while negative spillovers (diseconomies) involve mainly pollution and noise spill-over, accidents, robberies, migration etc. These diseconomies or negative spillovers, are hereby referred to as the *terror of transport*. The two major terrors (negative spillover effects) of transport are *traffic accidents (crashes)* and *enviornmental pollution*.

Vice Chancellor Sir, my esteemed audience, this Inaugural Lecture discusses current knowledge about traffic crashes, traffic induced environmental pollution and transportation-facilitated terror acts as well as the emerging strategies to tackle these *terror of transport and the transportation of terror*. *The next section shall examine the terror of transport*.

II

2.0 The Terror of Transport

Terror, according to the *Oxford Advanced Learner's Dictionary* 7th Edition in context is a person, *a situation or a thing that makes one very afraid; a violent action or the threat to violent action...*

The two major frightening and unwanted attributes of transportation (spillovers) today are *traffic accidents/crashes* and *environmental pollution* arising from the use of fossil fuels. In fact both phenomena are the most serious challenges to traffic and personal safety on one hand and environmental contamination and degradation on the other. Transportation is thus a leading source of terror to man and his environment by causing death, injury, economic waste and social dislocations, as well as a major cause of climate change.

2.1 Road Traffic Accidents/Crashes

2.1.1 A Global Outlook

A road traffic accident is a mishap, or a chance event on the road usually involving catastrophe, suffering or damage. Traffic injuries are a global problem affecting all sectors of the economy. The world's first road traffic death involving a motor vehicle may have occurred on 31st August 1969. This was when Irish Scientist Mary Ward died when she deliberately fell out of her consins steam car and was run over by it. Globally, road traffic accidents/crashes are a leading cause of death by injury. Well over 1.2 million people are killed in raod crashes around the world annually and as many as 50 million are injured. Sixty five percent (65%) of these involve pedestrians while 35 percent are children. WHO (2004) projection indicate that these figures will increase by about 65% by 2050 unless there is new commitment to prevention.

Fatality

According to the UN (2003), in 2000:

- An estimated 1.26 million people world-wide died as a result of traffic injuries.
- Road traffic injuries accounted for 2.2 percent of global mortality.
- Road traffic injuries were responsible for 25 percent of all deaths due to injury (injuries are a leading cause of death for people aged 15 – 44).
- Road traffic crashes ranked as the 9th leading cause of mortality and morbidity
- It accounts for 21% percent of all global death and disability.
- Specifically 260,000 children die from traffic collisions each year while 10 million are injured. This makes motor vehicle a leading cause of injury death among children worldwide.
- India – 105,000 traffic deaths in a year.
- China – Over 96,000 deaths in a year.
- US – 45,800 person were killed and another 2.4million injured as a result of motor vehicle collision in 2005, thus making road traffic crash the 6th leading preventable cause of death in the US.
- Canada – Motor vehicle collisions are the cause of 48% of severe injures.

(Africa Report, 2012)

World Health Organization (WHO) forecasts that by 2020 road traffic injuries could place 3rd among the causes of death and disability, ahead of such other health problems as malaria, tuberculosis and HIV/AIDS.

Economic Cost

The economic cost of road crashes and injuries has been put at 1% of gross national product (GNP) in low income countries, 1.5% for middle income countries and 2% for high income countries. The global cost is about US 518 billion every year. The low and middle income countries account for US \$ 65 billion, an amount more than they receive in aid.

Social Cost

Traffic crashes have social implications for everyone killed, injured or disabled as victims has a network of people/dependants who are affected. Thus several millions of people are coping with the death or

disability of family members from traffic injury. In fact the social cost of traffic crashes is unquantifiable.

Considering the picture painted above and the obvious enormity of the terror posed by traffic accidents/crashes, it is pertinent to observe according to the UN that very little money is invested in preventing road crashes and injuries in most countries of the world especially in the low income countries. Moreover, the mishap that is responsible for these frightening statistics are not given as much publicity as other frequent types of misfortune some of which are of lesser consequences.

2.1.2 Developing and Less Developed Countries Compared

Although there are more motor vehicles in the developed countries, fatalities from road traffic crashes are higher for developing countries. In 2000 more than 1 million (90%) people were killed as a result of road traffic injuries in the developing countries whereas 125,000 (10%) were killed in developed countries. More data for 2000 show that:

- Over 33% (435,000) of the 1.26 million annual road crash deaths in 2000 occurred in SE Asia which records the highest proportion of global fatalities and morbidity.
- Africa has a road traffic death rate of 28 per 100,000 population – the highest in world.
- Some African countries record more than 100 deaths per 10,000 vehicles.
- Road traffic injuries affect the poor and the less privileged and this leads to less chances of recovery or survival. The situation with the poor is further worsened with the emphasis on providing improved transport infrastructure for private motorized transport (the rich) while overlooking the public transport needs of the larger population.
- Gender: the road traffic mortality and morbidity rate is almost 300 percent higher for males. Males in SE Asia and Africa have the highest.
- The majority of road traffic deaths in most high income countries relate to car occupants (drivers and passengers) while in developing countries this occurs mostly among people who do not

own or have access to a car: pedestrians, motorcyclists, cyclists and users of public transport.

- WHO estimated in 1996 that by 2020 road traffic crashes would be the second leading cause of mortality and morbidity in developing countries.

2.1.3 Road Safety in Nigeria

The current road safety situation in Nigeria using 2011 data could be summed up as follows:

- Road handles about 90 percent of all transport: clear indication of the absence of alternative modes of transportation and over use of roads.
- There are 35 cars per kilometre of road – indicating inadequate road network.
- Nigeria ranks among the top 40 countries of the world with regards to cars/km.
- Over 4,700 crashes are recorded annually
- About 4 casualties (killed and injured) per crash
- For 2007 there were about 32.3 fatalities per 100,000 population as compared to 10 in the Western World (5.4/100,000 for US)
- Total loss to road crashes have been put at over 7 billion Naira annually representing about 3% of annual GDP.
- Vehicular population is over 7.6 million, that is 44.4 per 1000 population. Nigeria ranks 119 out of 138 countries.
- Total road has remained constant at about 194,000 km (made up of 34,120km Federal; 30,500km State and 129,580km of local roads) since 2004. This road network places Nigeria as the second largest road network in Africa in 2011 and 26th out of 221 countries in the world (CIA World, 2011; World Bank, 2011).
- Population/road ratio of 861 persons per kilometre road – a clear proof of intense traffic pressure on the available road network.
- Nigeria ranked 150 out of 175 on country ranking based on WHO estimated Road Traffic fatality per 100,000 population in 2007; 149th in 2009 and 127th in 2011 (FRSC, 2012).

This categorisation reminds me of the issue of Federal and State Road. The classification of some roads in the country as Federal roads has raised challenges to road network development and maintenance as well as road safety. Being the ones that are directly impacted States are now asking for full control of the federal roads in their jurisdiction. According to the proposal, the development and maintainance of all roads within any state boundary should be the State's responsibility. According to Governor Akpabio of Akwa Ibom State, it is time to "unbundle Nigeria" – that is, take major responsibilities off the Federal Government. I would like to align myself with this proposal.

2.1.4 Road Traffic Crashes (RTC) in Nigeria

Road traffic crashes (RTC) in Nigeria have been studied by some researchers since the mid-1960s (e.g. Onakomaiya 1977, 1978, 1988, 1991, 1992; Akpoghomeh 1995, 1997, 1998, 1999, 2000, 2002; Akpoghomeh and Badejo 2003; Akpoghomeh and Bell-Gam 2003; Akpoghomeh and Emenike, 2003; and Akpoghomeh and Chukwumati, 2003; Gbadamosi 2010 and many others).

Data on Road Traffic Crashes (RTC) from 1960 to 2011 are displayed in Table 1. The table shows that during this period over one million (1,001,725) road traffic accidents/crashes occurred in different parts of the country. This gives an annual average of 19,641.66 and a daily average of 53.8 crashes. This equates to one road traffic crash every 30 minutes. With regards to casualty, almost 17 percent of these crashes were fatal while serious cases accounted for 45.45 percent (62% casualty). These translate to almost 10 fatal and over 24 serious crashes every day across the country. In other words Nigeria records a road traffic crash in which at last one death is recoded in every two hours and one in which at least one person is injured in every 60 minutes.

Table 1 Road Traffic Crashes Data in Nigeria (1960 - 2011)

S/No	Year	Fatal	Serious	Minor	Total Cases	No Killed	No Injured	Total Casualty
1	1960	826	9065	4239	14130	1083	10216	11299
2	1961	193	9982	5788	15963	1313	10614	11927
3	1962	1263	9159	5895	16317	1578	10341	11919
4	1963	967	6918	11950	19835	1532	7771	9303
5	1964	911	7371	7645	15927	1769	12581	14350
6	1965	1029	7762	8113	16904	1918	12024	13942
7	1966	1680	5600	6270	13550	2000	13000	15000
8	1967	1560	5200	6240	13000	2400	10000	12400
9	1968	459	5865	5839	12163	2808	9474	12282
10	1969	1559	5199	6230	12988	2347	8804	11151
11	1970	1999	6666	7991	16656	2893	13154	16047
12	1971	129	8098	8518	16745	3206	14592	17798
13	1972	2782	9275	11130	23187	3921	16161	20082
14	1973	2981	9275	11925	24181	4537	18154	22691
15	1974	3467	11557	13869	28893	4992	18660	23652
16	1975	2834	9446	11331	23611	5552	20132	25684
17	1976	905	17352	19624	37881	6761	28155	34916
18	1977	4242	14140	17334	35716	8000	30023	38023
19	1978	4333	14444	17334	36111	9252	28854	38106
20	1979	3513	11708	14050	29271	8022	21203	29225
21	1980	1856	14855	15427	32138	8736	25484	34220
22	1981	4053	13510	16214	33777	10202	26337	36539
23	1982	4451	14838	17805	37094	11382	28539	39921
24	1983	3853	12844	15412	32109	10462	26866	37328
25	1984	4467	10557	13868	28892	8830	23861	32691
26	1985	3597	11991	14380	29968	9221	23853	33074
27	1986	3022	10075	12091	25188	8154	22176	30330
28	1987	3385	11286	13544	28215	7912	22747	30659
29	1988	607	885	680	2172	9077	24413	33490
30	1989	n.a	n.a	n.a	n.a	n.a	n.a	n.a
31	1990	6140	8796	6998	21934	8154	22786	30940
32	1991	6719	8982	6845	22546	9525	24508	34033
33	1992	6986	9324	6554	22864	9620	5759	15379
34	1993	6735	8443	6281	21459	9454	24146	33600
35	1994	5407	7522	5275	18204	7440	17938	25378
36	1995	4701	7276	5053	17030	6647	14561	21208
37	1996	4790	6964	4688	16442	6364	15290	21654
38	1997	4800	7701	4987	17488	6500	10786	17286
39	1998	4757	7081	4300	16138	6538	17341	23879
40	1999	4621	6888	4359	15868	6795	17728	24523
41	2000	5287	6820	4499	16606	8473	20677	29150
42	2001	6966	8185	5379	20530	9946	23246	33195
43	2002	4029	7190	3325	14544	7407	22112	29519
44	2003	3910	7882	2572	14364	6452	18116	24568
45	2004	3275	6948	4051	14274	5351	16897	22248
46	2005	2299	4143	2620	9062	4519	15779	20298
47	2006	2600	5550	964	9114	4944	17390	22334
TOTAL		150,945	410,618	399,486	961,049			

48	2007	n.a	n.a	n.a	8477	4673	11794	16467
49	2008	n.a	n.a	n.a	11341	6661	27980	34641
50	2009	n.a	n.a	n.a	10854	5693	27270	32963
51	2010	n.a	n.a	n.a	5330	4065	18095	22160
52	2011	n.a	n.a	n.a	4765	4327	17464	21791
Total					1,001,725	309,408	945,855	1,255,263
Annual Average	3281.41 (16.71%)	8926.48 (45.45%)	8684.48 (44.21%)	19,641.66	6066.82	18,546.18	24613.00	
Daily Average	9.5	24.45	23.79	53.8	16.62	50.81	67.43	
	Fatal	Serious	Minor	Total Cases	No Killed	No Injured	Total Casualty	

Sources: Computed from data from Nigeria Police Force and FRSC, Abuja.

n.a = not available.

Note:

1. *A fatal crash is one in which at least one person was killed*
2. *A serious crash is one in which at least one person sustained injury*
3. *A mirror accident is one in which no death or injury was recorded*
4. *Casualty is the total number killed and injured in a crash.*

During same period, a total of 309,408 persons were killed in road traffic crashes while almost one million persons were injured, thus giving an annual average of 6,066.82 and 18,546.18 persons killed and injured, respectively. This gives a daily average of 16.62 persons and 50.81 persons that were killed and injured, respectively, in road traffic crashes in Nigeria.

Table 2 Figs.1a and b show the distribution of these data in cohorts (i.e. 10 year interval). This table is necessary to enable us compare the trend growth between decades from independence. The table and the figure show that there was a steady decline in all the road traffic crash cases reported during the period an indication that much is still desired in addressing the road safety situation in the country given the high number of cases.

2.1.5 Spatial Pattern

Akpoghomeh (2000) had noted that Lagos State recorded the highest number of fatalities as well as the highest number of fatal accidents in Nigeria. Other states with high fatal accident records include Kano, Ogun, Niger, Kaduna and Edo. These states accounted for almost 40% of the variation in each parameter. However in the last five years (2007 – 2011) over half of the total road traffic crashes fatalities in Nigeria

were recorded in five states of the country and Federal Capital Territory (FCT) (FRSC 2012). The states include Kogi and Nasarawa (North Central), Kaduna State (North West) Ogun State (South West) and Edo State (South South) (fig 2). The high incidents of road traffic crashes in these states could be explained by the fact that they are nodal/gateway states which makes them handle significantly higher volumes of traffic along the major routes within the region. Other reasons include preponderance of bad road conditions and poor driver behaviour (FRSC 2012). The states of the North East and South East geopolitical zones recorded lower cases of road traffic crashes.

2.1.6 Road Traffic Crash Indices for Nigeria

The road traffic crash indices – *fatality index*, $[(f)]$; *probability of a fatal crash*; *injury index* $[x(f)]$ and *probability of a serious crash* – are given in Table 3 and figs 3a and b. As the names imply these indices measure the fatality and bodily harm arising from road traffic crashes, and the probability of these occurring in Nigeria. In their studies Onakomaiya (1991) and Akpoghomeh (1995) had established high and rising trend for all the RTC indices. As a matter of fact, when compared to other countries of the world, the trend in Nigeria has always been very disturbing. Table 3 shows the road traffic crash indices for Nigeria since 1960. The table examined the temporal trend of the indices in cohorts.

Table2: Summary of Road Traffic Crash Data for Nigeria by decades (1960 – 2011)

Period	Fatal	Serious	Minor	Total Cases	No Killed	No Injured	Total Casualty
1960 - 1969	10,447 (1,044.7)	72121 (7,212.1)	68209 (6,820.9)	150,777 (15,077.7)	18,748 (1,874.8)	104,825 (10,482.5)	123,573 12,357.3
1970 - 1979	27,185 (2,718.5)	111,961 (11,196.1)	133,106 (13,310.6)	272,252 (27,225.2)	57,136 (5,713.6)	209,088 (29,908.8)	266,224 (26,622.4)
1980 - 1988	29291 (3,254.56)	100,844 (11,174.89)	119,421 (13,269.0)	249,553 (27,728.11)	83,976 (9,330.67)	224,276 (24,919.8)	308,252 (34,250.22)
1990 - 1999	55656 (5,565.6)	78977 (7,895.6)	55340 (5,534.0)	189,973 (18,997.3)	77,037 (7,703.7)	170,843 (17,084.3)	247,880 (24,788.0)
2000 - 2011	28,366 (4,052.29)	46,718 (6,674)	23,410 (3,344.29)	139261 (11,605.08)	72,511 (6,042.58)	236,823 (19,735.25)	309,334 (25,777.83)
Total	150,945	410,618	399,486	1,001,725	309,408	945855	1,255,263
Mean (Annual)	3,281.41	8,926.48	8,654.48	19,641.66	6,066.82	18,546.18	24,613.00
Daily Average	9.5	24.45		53.8	16.62	50.81	67.43

Sources: Computed from data from Nigeria Police Force and FRSC, Abuja; Akpoghomeh (1999, 2000).

* Figures are for 2000 – 2006 only.

Note: Figures in parenthesis is the annual average for each ten year period.

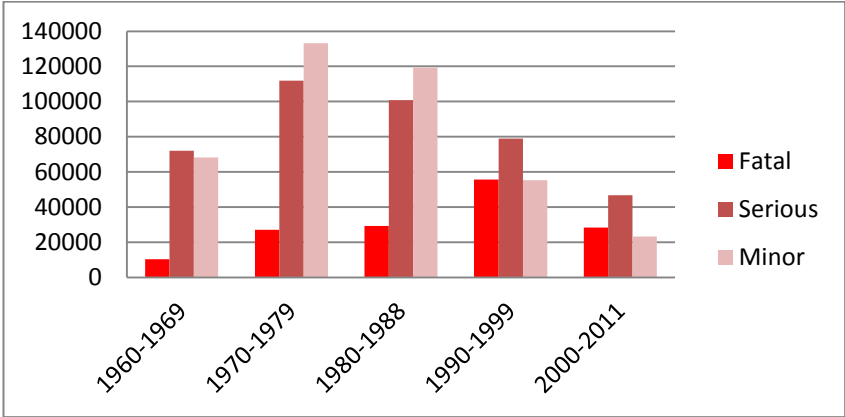


Fig 1(a) Trend in Road Traffic Crashes in Nigeria

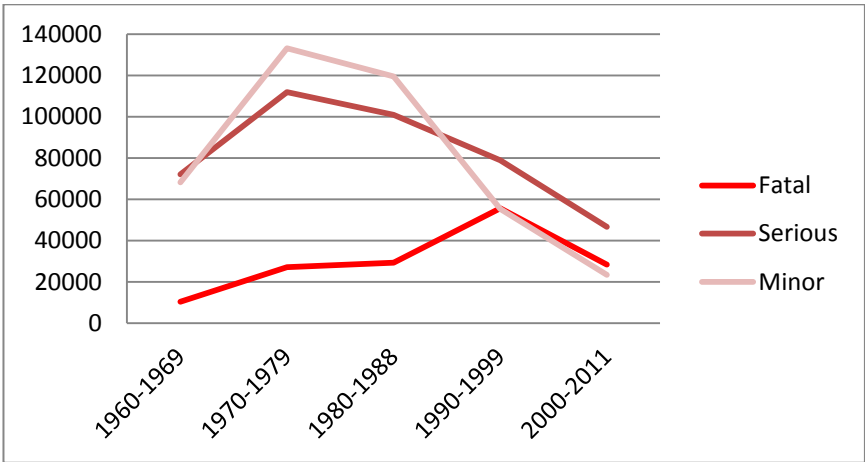


Fig 1 (b) Trends in Road Traffic Crashes in Nigeria

2.1.7(a) Fatality/Severity Index

A fatal crash is one in which at least one life is lost. An important measure of the severity of road traffic crash is the *fatality or severity index* usually measured by the number of persons killed per thousand

road traffic crashes. Table 3 and Figs 3(a) and (b) show the *fatality/severity* index of road traffic crashes in Nigeria since independence. The table and figures show a progressive increase since 1960, a trend which had earlier been observed by Onakomaiya (1981 and 1990) and Akpoghomeh (1999, 2000). Although the 52 years average puts the index at one fatal crash in every 3.3 crashes (i.e. 320 fatal crashes per 1000 crashes), the last cohort recorded a much higher figure of 525 per 1000 or one fatal crash in every two crashes. This is quite ominous for the country, especially when compared with what happens in developed economies. It is however pertinent to note that the rate of increase was on the decline (69% in 1970/79 to 29.47% in 2000/2011 (see Table 3).

Spatially, Sokoto and Jigawa States recorded the highest *fatality/severity index*. Other states with fatality/severity indices higher than the national average included Niger, Kogi, Plateau, Yobe, Taraba, Katsina, Bauchi and Kwara (see Fig 4). Notice that all the states are located in the Northern part of Nigeria. At the other extreme were Lagos, Delta and Edo States. Lagos in particular witnessed a steady decline in fatality/severity index and this Onakomaiya (1991) adduced to the relatively high level of traffic congestion which reduces the tendency to over speed as well as the fact that Lagos has the easiest accessibility to post-crash medical care in the metropolitan area and recently the most organized and efficient traffic management authority.

2.1.7(b) Probability of a Fatal Crash Index

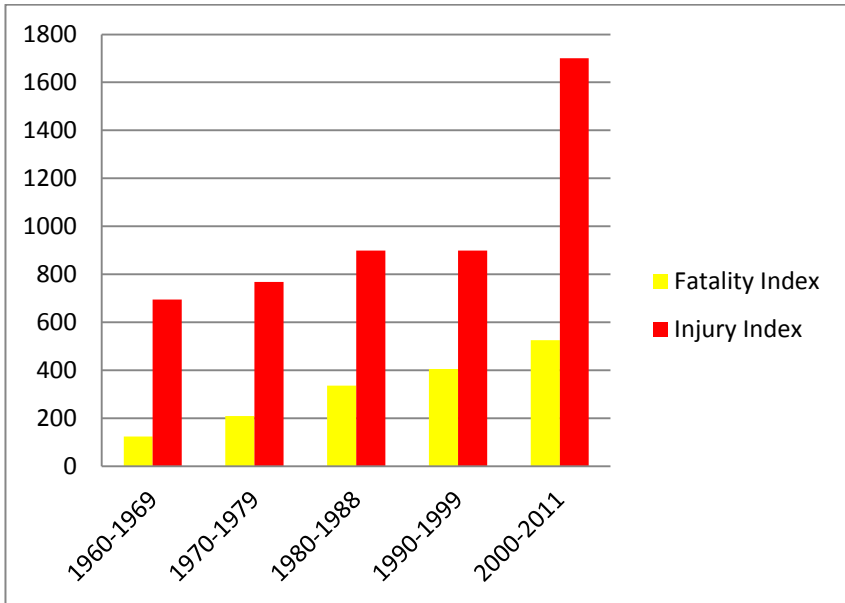
This index is the proportion of the total crashes reported which is accounted for by the number of fatal crashes Table 3 and Figures 5a and b show that there was a progressive increase from 1960 to 2011. Although the 52 year average put this index at 17.34 percent, statistics show that the index for the last decade (2010 – 2011) was as high as 58.8 percent. In other words, almost 60 percent of road traffic crashes in Nigeria involved the loss of at least one life in the last 10 years. However there was a sharp decline in the rate of increase in the last decade of study.

Table 3 Road Traffic Crash Indices for Nigeria 1960 – 2011

Period	Fatality Index	Rate of Increase	Probability of Fatal	Rate of Increase	Injury Index	Rate of Increase	Probability of Serious	Health Risk:
--------	----------------	------------------	----------------------	------------------	--------------	------------------	------------------------	--------------

	$\frac{(f) \times 1000}{y}$		Crash: $\frac{x(f) \times 100}{y}$		$\frac{x(l)x \ 1000}{y}$		Crash $\times 100$ y	$\frac{nx100,000}{p}$
1960-1969	124.29		6.9%		695.22		47.83	
1970-1979	209.86 (20%)	68.85	9.98%	44.64%	768	10.47%	41.12	6.4
1980-1988	336.5 (33.65%)	60.34%	11.74%	17.63%	898.71	17.02%	40.30	7.8
1990-1999	405.49 (40.55%)	20.50%	29.30%	149.57%	899.3	0%	41.57	8.3
2000-2011	525.0 (52.5%)	29.47%	58.80%	99.66%	1700.57	89.01%	47.43	3.71
MEAN Average	320.23		17.34		992.36		43.65	3.71

Sources: Computed from data from Nigeria Police Force and FRSC, Abuja; Akpoghmehe (1999, 2000).



3a: Fatality and Injury Indices for Nigeria 1960-2011

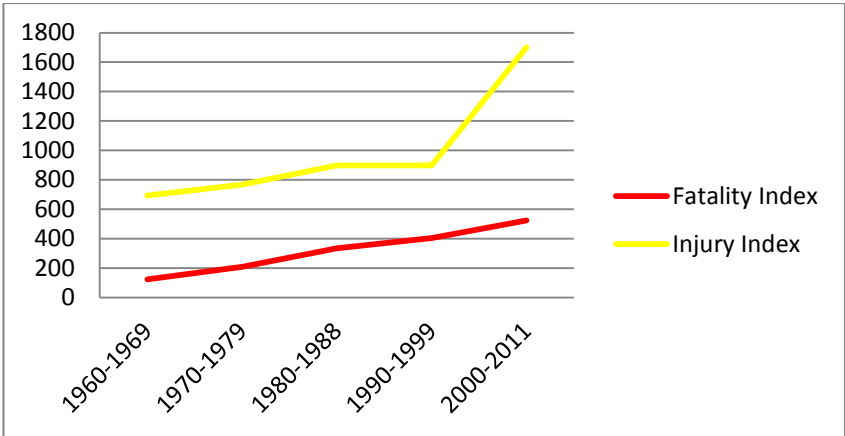


Fig 3 b: Fatality and Injury Indices in Nigeria 1960-2011

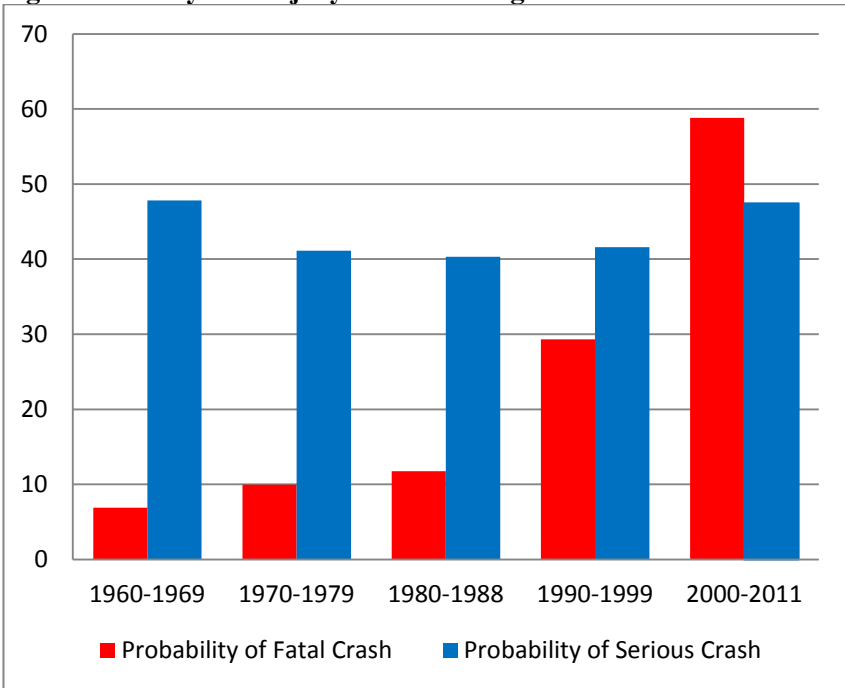


Fig 5a: Probability of Fatal and Serious Crashes in Nigeria

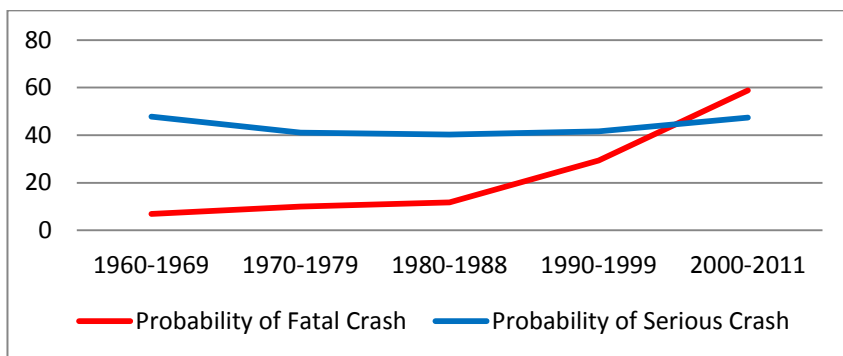


Fig 5b: Probability of Fatal and Serious Crashes in Nigeria

It is pertinent to note at this point that these indices are likely to be exaggerated due to gross under reporting of many minor cases which would have increased the total number of crashes and by extension reduce the result of the calculated indices.

2.1.7(c) Injury Index

A more meaningful appreciation of the seriousness of road crash data is when the number of persons injured is compared with the number of accidents, that is, *the injury index*. The *Injury Index* defined, is a measure of the number of persons injured in every 1000 accidents/crashes reported. Table 3 and Figures 3(a) and (b) show the country's injury index during the 5 decades under study. The table shows index for the different cohorts and the growth rates are progressively high. This is also worrisome. For instance the figures for the last decade implies that in every 1000 accidents, 1700 persons were injured. In other words, on the average almost 2 persons were injured in every road traffic crash in Nigeria between 2000 and 2011.

Spatially the *Injury Index* for states in Nigeria are equally damning. Kogi state topped the list with almost 3 persons suffering bodily harm in every road traffic crash (Akpoghomeh, 2000). This could be due to

the nodal location of the State which makes almost all north bound traffic from the south to transit through the State. In other words most of these crashes involve “through traffic”. Other states that are high on the list include Jigawa, Sokoto, Abuja, Bauchi, Katsina, Niger, Taraba, Yobe and the Federal Capital – all located in the North. States with the lowest injury index includes Ondo, Lagos and Anambra.

2.1.7(d) Probability of a Serious Crash

This probability is measured by the number of serious road traffic crashes per total traffic crashes reported. This index was virtually stable at moderately high level throughout the period but with a declining growth rate (Fig 5a and b). The 52 year average figure for this index shows that a motorist or traveler in Nigeria has a 43.6 chance of involving in a crash in which at least one person suffers bodily harm. However statistics for the last decade show a higher figure of 47.43 percent. In other words almost half of all the crashes in Nigeria involved injury of at least one person. This probability is also high and a wake up call for all road users safety agencies in the country.

The probability of being involved in a serious road traffic crash was lowest in Cross River, Akwa Ibom, Delta, Imo and Abia where any road traffic crash had about 50 percent chance of resulting in injuries. The probability was highest for Kogi, Niger, Kwara and Jigawa States. Again this could be exaggerated because the actual number of total crashes in the country is grossly underestimated.

2.1.7(e) Health Risk

This is the number of persons killed in road traffic crash per 100,000 population. In 2011, with an estimated population of 167 million people the health risk for Nigeria was 3.71. This implies that for every 100,000 people in Nigeria an average of 4 persons were killed as a result of road traffic crash in that year. It is pertinent to note on a happy note for once that the figure for the last decade (2000 – 2011) was lower than the 52 year average figure of 6.55. The decline in the trend could be attributed to the efficient and effective actions of the Federal Road Safety Corps, the Nigerian Police, all the state traffic management agencies (e.g.

Lagos, Edo, Rivers etc.) and other traffic agencies. However a lot more still needs to be done.

State with very high *Health Risks* include the FCT and Ogun, Niger, Edo, Kogi, Kwara, Cross River, Osun and Lagos States (Akpoghomeh 2000).

It must be quickly and clearly pointed out that these indices contrast sharply with UN estimates. For example, WHO (2012) estimates the number of people that will be killed in road traffic crashes in 2012 in Nigeria to be 47,865 while fatality per 100,000 population (health risk) is estimated at 32.3 and fatality per 10,000 vehicles estimated at 1,041. Using these statistics WHO placed Nigeria in the 149th position out of 175 countries in 2009. The differences in the road traffic crash statistics for Nigeria between the national record and the UN figures could be explained by the fact that WHO fatality statistics include deaths within 30 days of road traffic crash as stipulated by the United Nation and maybe unreported cases.

The figures for the above indices should not cause despair as they may be exaggerated because, as earlier noted, very many of the minor accidents/crashes in the country are not usually reported and this tends to increase the fatality/severity and injury indices in particular. Efforts must thus be made to record all crashes no matter how minor.

2.1.8 Causes of Traffic Accidents/Crashes

Causes of traffic accidents have been categorized into three – human, technical and environmental.

<i>Human factor</i>	<i>Technical Factor</i>	<i>Environmental</i>
<ul style="list-style-type: none">• Driver error• Intoxication• Distraction	<ul style="list-style-type: none">• Route design• Vehicle defects• Vehicular faults	<ul style="list-style-type: none">• Bad weather

Of these four categories, the human factors are said to be responsible for over 80 percent of all traffic crashes because the drivers' operational ability is very critical to the causes and prevention of traffic accidents.

However, and as earlier noted most of the so called causative factors are in actual fact *contributory/remote factors*. Akpoghme (2011) attempted a distinction between *actual causes* of traffic accident crashes and the *remote/contributory/exacerbating factors*. *The latter* are factors or conditions that make an accident crash/uncontrollable and its outcome worse. They expose a motorist to very unpleasant consequences in the event of unplanned and unpleasant incidents such as a crash. Infact they do not necessarily cause crashes, instead they aggravate the incident.

2.1.8(a) Remote/Contribution/Exacerbating factors

Like in many life mishaps there are always immediate and remote causes.

The Remote Causes include:

- (1) Speed of operation
- (2) Operator's skill and/or impairment
- (3) Route Design
- (4) Vehicle design

Speed of Operation

The US Department of Transportation's Federal Highway Administration reviewed research on traffic speed in 1998 and found as follows:

- That the evidence shows that the risk of having a crash is increased both for vehicles traveling slower than the average speed and for those travelling above the average speed.
- That the risk of being injured increases exponentially with speeds much faster than the median speed
- That the severity of a crash depends on the vehicle speed change or impact.
- That most crashes related to speed involve speed too fast for the conditions
- That more research is needed to determine the effectiveness of traffic calming.

Official British road casualty statistics for 2006 showed that “exceeding speed limit” was a contributory (remote) factor in 5% of all casualty crashes (14% of all fatal crashes) and that “travelling too fast for conditions” was a contributory (remote) factor in 11% of all casualty crashes (18% of all fatal crashes).

Driver Impairment

This describes factors that impinge on drivers’ optimum performance. Some of these factors include:

- Alcohol: In Canada 33.8% of motor vehicle deaths were associated with alcohol use
- Physical impairment e.g. poor eyesight and physical challenge requiring appropriate vehicle modifications
- Youth
- Old age
- Sleep deprivation – fatigue
- Drug use
- Distraction: Conversation, mobile phone usage while driving;
- Music: Classical / R and B music is considered to be calming but too much could relax the driver to a condition of distraction; Hard Rock/Hip hop may encourage the driver to step on the acceleration pedal.

Route Design

A US study showed that 34% of serious crashes had the roadway or its environment as remote/contributory factors. Research has shown that

- Careful design and maintenance
- Good Road surfaces
- Good Visibility and efficient traffic control devices can significantly reduce accident rates.

Vehicle Design

- Seatbelts: Wearing seatbelts reduces the risk of death by almost 70%.
- Maintenance: Vehicle maintenance includes good brakes, tires and well-adjusted suspension. With these in working condition a

vehicle will be more easily controlled in an emergency situation and so will be better prepared to avoid collisions.

- Innovations for occupant and pedestrian protection include: Airbags, Anti-lock brakes, Impact absorbing side panels, Front and rear head restraint, Run flat tyres, Smooth and deformable front ends, Impact-absorbing bumpers, Retractable headlamps, Thicker pillars, Safety glass, Interiors with no sharp edges, Stronger bodies, Smooth exteriors
- Centre of Gravity
The centre of gravity of a vehicle to a large extent determines its chances of “Rolling-over” in a crash. Rollover (summersault) is very common among SUV, *people carriers* and *minivans* due to higher centre of gravity.

Other remote factors include:

- All bad weather conditions rain, snow, heavy winds, flood etc.
- All technical faults for which the driver is forewarned.
- All self-induced human conditions, e.g. Alcoholism, Drugs and other stimulants

2.1.8(b) Actual Causes

The cause of a traffic crashes may include factors or conditions that affects the proper or efficient manipulation of the vehicle. Some of these include:

(i) *Fatigue/Tiredness/Sleep*

Fatigue/tiredness is weariness or lack of strength that is usually the result of overwork or lack of enough sleep. In some people persistent tiredness is caused by *depression* or *anxiety*. Other causes include:

- Long distance driving without rest
- Heavy meal before or during a journey
- Overwork/lack of rest.
- Domestic and other social problems

The end result of all of these is *drowsiness* which has caused very many crashes in the past.

(ii) *Poor Vision*

Vision involves two main components: the eye and the brain. *Medical Disorders* associated with vision which are caused by eye/brain disorder result in visual defects. The visual defects result in loss of vision which is the inability to see well or to see at all. This may develop slowly or suddenly. Every driver should go for regular eye checkup. The use of prescribed glasses is recommended in some cases. Other manifestations of poor vision include:

- *Impaired Dark Adaptation:* This is the inability of the driver to adjust to sudden darkness at night particularly when on-coming vehicles pass.
- *Tunnel Vision:* This is the narrowing of a driver's visual field such that he is unable to see what is going on either side of the road. This causative factor is exacerbated by drinking and driving.

(iii) *Hearing Loss/Deafness*

This is the deterioration in the ability of any individual to perceive sound. This problem is very critical in driving as the driver is expected to hear warning alerts from the honking of car horns and engine sounds. Hearing-aids are sometimes used to reduce deafness in some cases.

(iv) *Lack of Concentration*

This could be due to one form of challenge e.g. marital problems, other domestic problems, social problems and financial problems. The seriousness with this causative factor is that loss of concentration for a few seconds could have resulted in fatal consequences. If any motorist is faced with serious issues/problems that may disturb his/her concentration while driving, it is best not to drive.

- (v) *Driver Error*
These are careless and unnecessary mistakes e.g., failure to heed road traffic signs, poor and lack of maintenance, unsafe overtaking, driving too fast on a dangerous bend etc.
- (vi) *Distractions*
This is when a driver's attention is distracted from driving by something inside or outside the car e.g. changing CDs, looking at your mobile phone, checking out makeup in the mirror, trying to kill a fly, admiring a lady on the road,... in fact, basically anything that makes you take your eyes off the road while driving.
- (vii) *Road Design*
This includes anything from poorly placed signs blocking one's view of incoming traffic at intersections to dangerous turning off from busy roads.
- (viii) *Vehicle Defects* e.g. Brake failure, tyre blow-out etc.
- (ix) *Poor Judgement* see Box "under alcohol and driving"
- (x) *Lack of Attention/Poor Response to e-information*
Modern motor vehicles are fitted with electronic sensors that fore-warn motorists about the condition of the vehicle. Most times, especially in the developing world, either because of excruciating poverty or debilitating ignorance, most motorists do not pay proper attention/respond to such warnings when alerted. Some motorists do not even know the meaning of some of the information that appear on the dash board. Ignoring such alerts or not taking immediate action could cause a crash sooner or later.
- (xi) *Reckless Driving*

2.1.9 Causes of Road Traffic Crash in Nigeria

Table 4 shows the statistics of the ten most prevalent causes of road traffic crash in Nigeria between 2008 and 2011 (FRSC 2012). A classification of these ten most prevalent causes of road traffic crashes shows that the human causative factors accounted for 73 percent of the crashes while the technical factors were responsible for 20 percent of the causes. More specifically *speed violation, dangerous driving and loss of control*, all human causative factors, explained almost 60 percent of the human causative factors.

Table 4 Causative Factors of RTC in Nigeria (2008 – 2011)

Causative Factors	2008		2009		2010		2011	
	Total	Percentage	Total	Percentage	Total	Percentage	Total	Percentage
Speed Violation	2488	21.9	2681	24.7	1419	26.6	1253	27
Dangerous Driving	2190	19.3	2376	21.9	878	16.5	692	15
Loss of Control	631	5.6	774	7.1	508	9.5	721	15
Tyre Burst	631	5.6	703	6.5	246	4.6	394	8
Brake Failure	477	4.2	354	3.3	249	4.7	335	7
Dangerous Overtaking	791	7	955	8.8	296	5.6	293	6
Light/Sign Violation	1277	11.3	314	2.9	188	3.5	219	5
Unclassified	1518	13.4	1094	10.1	301	5.6	251	5
Mechanically Deficient Vehicle	380	3.3	391	3.6	137	2.6	126	3
Route Violation	273	2.4	265	2.4	133	2.5	128	3
Bad Road	107	0.9	185	1.8	178	3.3	76	2
Obstruction/Stationary Vehicle	279	2.5	163	1.5	168	3.2	108	2

Source: FRSC (2012)

Nigeria Road Safety Strategy (NRSS). 2012 - 2016

2.1.10 Response to the Global Problem

In April 2004, WHO and the World Bank, published the *World Report on Road Traffic Injury Prevention* and since then various initiatives and resolutions have been taken which resulted in the March 2010 UN General Assembly's resolution proclaiming 2011 – 2020 to be the Decade of Action for Road Safety (A/64/255). The primary goal of the declaration of the Decade of Action on Road Safety (2011 – 2020) is

the reduction of fatalities by 50% using 2010 figures as benchmark. The African Road Safety Action Plan 2011 – 2020 is organized under the five pillars of the Decade of Action for Road Safety 2011 – 2020 which include:

- (i) Road Safety **Management**: the institutional framework needed to implement road safety activities, thereby setting the monitoring and evaluation framework of the other pillars
- (ii) Safer **roads** and mobility: Road development, the safety of all road-users, especially pedestrians and other vulnerable users.
- (iii) Safer **vehicles**: standards, entry and exit of vehicles into and from countries.
- (iv) Safer **drivers** and other road-users: concerning driver training, testing and licensing, driving permits and enforcement of driving code, awareness and education of the public and the development of a safety culture.
- (v) Post-crash **response**: on-site care, transport and trauma care of the injured.

Nigeria was not left out of this all important world plan to stem the drift towards eternal annihilation of the human race. The Federal Road Safety Corps (FRSC) of Nigeria has put together a document called the Nigeria Road Safety Strategy (NRSS). This document sums up the country's response to the declaration. The NRSS provides a clear direction towards achieving the vision of FRSC for road safety – *“a country where road crash result in no death”*. Mr. Vice chancellor sir, it my pleasure to inform you that I was among the TEN wise men invited from across its country to do a final review of this wonderful document, in 2012.

Mr. Vice chancellor air, the next most traumatic terror of transport is the air crashes. The next action shall briefly look at its nature, causes and consequences

2.1.11 The Way Forward

Driver Education and Training

The driver of a vehicle is the most important single factor in road traffic crash. The production of high quality drivers is consequently non-negotiable. The two basic requirements in producing high quality motor vehicle drivers is proper training and licensing programmes. Well-equipped driving schools should be licensed. Driving license should be issued only to those that have been certified by approved driving schools. It is also important to note that charges by Driving Schools should be kept within the means of the low or no-income earners. If possible Federal and State Governments could consider providing grants to licensed driving schools to encourage them to charge low and affordable fees.

Traffic Education in School Curricular

Traffic education and training should be an integral part of any road safety improvement programme. They are therefore important elements in reducing road accidents/crashes.

To this end, traffic education should be introduced into the school curricula at all levels of our educational system – primary, secondary and tertiary. Moreover in view of the dearth of books on road safety especially at the primary and secondary schools levels author should be encouraged to produce books on traffic safety in Nigeria.

Motor Vehicle Testing

To a large extent traffic safety depends on the condition of the vehicle. Consequently, testing stations should be licensed where the road worthiness of vehicles especially the commercial vehicles – buses, trucks and trailers are carried out and certificates issued.

Road Infrastructure

Just like vehicles, the condition of the road infrastructure is also very important when thinking of improving road safety records in Nigeria. The state of the federal roads in Nigeria, to say the least, is deplorable. Many lives have been lost due to bad roads. However, one cannot but recognize the attempts by the Federal and especially the State Governments to improve the road condition in their states. Lagos, Akwa Ibom, Rivers, Edo State etc. are good examples in this regard.

Moreover, the Federal and State Ministry of Works, The Police Nigerian Force, the Federal Road Safety Corps and other related agencies should regularly conduct surveys to identify and mark prominent traffic spots and accident prone road sections (black spot). This would help install advance warning signs to road users. Same goes for very dangerous pot holes especially on the highways. All roads should be well marked and traffic signs appropriately located.

Enforcement

This is the bane of road safety in Nigeria because when enforcement of traffic regulations is lax, violation of these regulations becomes a common practice and this could lead to complete disregard for the regulation in the long run. Hence, for traffic laws to be effective there must be enforcement. There is thus need to enforce the traffic regulations. But not before the relevant agencies publicize the laws and regulations of the road and the penalties for violating them. These must be adequate and known by the road users. Efforts should be made to test for drunk driving. If possible motorists should be compelled by law to buy and own their own breathalyzer as this will address the problem of non-compliance if a common breathalyzer is to be used.

Pedestrians/Cyclists Right of Way

Pedestrians and cyclists should be given adequate attention in the design, and construction of roads and bridges in the country.

Accident Data Recording, Storage and Retrieval

Accident data should include other types of data to enable the user of the data understand the social, environmental and traffic flow data etc. prevalent at the time of the crash. These are known as exposure data or structural data.

Data on road traffic accidents/crashes in Nigeria are not comprehensive enough for instance causes of minor accidents/crashes are under reported. This has effect on the results of the fatality and injury indices since they are relative to the total number of accidents. *The relevant agencies should design an accident reporting form to be distributed to Transport Workers Union for on-ward distribution to their drivers .In*

the event of an accident the commercial vehicle drivers are to provide the simplest details at any crash scene and submit same at destination.

Road safety and by extension transport/traffic safety has not received sufficient corresponding consideration at both the international and national levels given the enormity of the problem. This according to the UN General Assembly could be partly explained by:

- Lack of information on the magnitude of the problem and its preventability
- A fatalistic approach to road crashes
- Lack of the political responsibility and multidisciplinary collaboration needed to tackle it effectively.

In spite of the above, much can be done to reduce the problem of this terror of transport as is evident in many high-income countries where the road traffic injury burden has been reduced by 50 percent in the last few decades.

2.2 Air Transport Safety

Air transport is the fastest and most efficient mode of transport. It is also the most convenient mode for long distance travels. In spite of the advantages of air transportation, its major challenge crashes, cannot be over emphasized. Like its road counterpart a major challenges of civil aviation is the issue of aircraft accidents/crashes. This phenomenon, often with dire consequences according to Wikipedia (2008), is an ever-present danger in air travel. However while the odds of being in a plane crash in recent times is distinctly low compared to other modes of transportation, the chances of dying in an air in one event of crash are notably higher.

The U.S. National Transportation Safety Board defined an aviation accident as follows: “*An occurrence associated with the operation of an aircraft which takes place between the time any person boards the aircraft with the intention of flight and all such persons have disembarked; and in which any person suffers death or serious injury; or in which the aircraft receives substantial damage*” (NTSB Documentary). An aviation incident on the other hand, is an occurrence

other than an accident, associated with the operation of an aircraft, which affects or could affect the safety of operations.

According to Anon (1985) flying is not inherently dangerous; but to an even greater extent than the sea; it is terribly unforgiving of carelessness, incapacity, or neglect. Since the birth of flight, aircraft have crashed, often with serious consequences. This is due to the unforgiving nature of flight, where a relatively insubstantial medium, air, supports a significant mass, should this support fail, there is limited opportunity for a positive outcome. Because of this, aircraft design is concerned with minimizing the chance of failure, and pilots are trained with safety as a primary consideration. Despite this, accidents still occur, though statistically, flying is nowadays an extremely safe form of transportation. In fact, the relative rarity of incidents, coupled with the often dramatic outcome, is one reason why they still make headline news. The high profile personalities involved could be another factor.

It is of note that in the recent past, the phenomenon of air crashes in Nigeria has been very alarming. There has been a marked increase in the cases of recorded aircraft accidents/crashes in recent times. The ugly phenomenon rose to its highest in 2005 with 7 recorded aircraft accidents/crashes including:

- Sosoliso flight 11.45am air crash of December 10
- The Bellview flight 210 of October 22
- Associated Airline jet crash of November 2
- Dornier airline crash of November 28
- Lufthansa airline crash of July 23 and
- A Boeing 727-200 air crash of June 12.

In the same year, an Air France Airbus on landing taxied into a herd of cows on the Port Harcourt International Airport (PHIA) runway crushing seven cows to death though none of its 196 passengers, most of whom were foreign nationals, was hurt. This could have been prevented if the airport had erected a perimeter fence. As at that year only the Lagos airport MM International was fenced. Kano was partially fenced while Port Harcourt and Abuja had no perimeter

fencing at all (Vanguard, 2005). It suffices to note that many of the nation's international airports have since been fenced.

2.2.1 Air crashes in Nigeria

Table 5 shows the temporal distribution of air crashes and their fatality in Nigeria from 1969 to 2011. A total of 38 air crashes occurred in Nigeria during the 43 years under study thus giving an average of almost one air crash every year. During the period, a total of 1543 persons were killed in these air crashes, thus averaging about 35.88 deaths annually from air crashes. Compared to road traffic crashes it is obvious that air travel is by far safer, but the probability of dying in a crash is higher for air transport.

2.2.2 Remote Causes of Air crashes and Challenges of the Sector in Nigeria

Like in all modes of transportation the factors responsible for aircraft accidents have been grouped into three: *environmental, technical and human* factors. These have been discussed earlier.

Table 5: Temporal Pattern of Air Crashes in Nigeria

Year of Aero accident	Number of Aero accident	Total Number of deaths.
1969	1	87
1970	-	-
1971	-	-
1972	-	-
1973	1	16
1974	-	-
1975	-	-
1976	-	-
1977	-	-
1978	-	-
1979	-	-
1980	1	-
1981	-	-
1982	-	-
1983	1	57
1984	-	-
1985	-	-
1986	-	-
1987	-	-
1988	-	-
1989	-	-
1990	1	-
1991	2	240
1992	1	163
1993	-	-
1994	2	7
1995	1	15
1996	5	246
1997	2	1
1998	-	-
1999	-	-
2000	2	3
2001	2	134

2002	3	230
2003	1	3
2004	2	2
2005	7	493
2006	2	114
2007	-	-
2008	1	3
2009	-	-
2010	1	4
2011	2	3
Total	38	1543

Source: The Nation Newspaper (8/11/2009).

<http://thenationnolineng.net/web2/articles/24546/1/Air-crashes-in-Nigeria-1970-to-2009/page1.html>. and

Federal Airport Authority of Nigeria (Security Department Report).

(a) Environmental Factors

Environmental elements, a major consideration in aviation safety, focuses mainly on weather (Maunder 1970). Bad weather conditions have been responsible for several aircraft accidents. The air crash in Kano in 1973 and 1987, as well as the ill-fated Bellview air crash of October 22, 2005 were all attributed to bad weather conditions.

Temperature, pressure (wind), ice (snow fall), fog, thick cloud cover are all elements of weather that could precipitate air crashes by their adverse effect on visibility and landing condition. Between January 10 and 15, 2007 poor weather conditions virtually paralyzed local flights at Nigeria's airports. International flights were also diverted to neighbouring countries such as Ghana. Sadly, the Nigeria Metrological Agency, NIMET, which is in-charge of weather reports and forecasts, seem to be in dire straits. The agency has had to rely on contributions from NAMA, NCAA and the World Metrological Organization, WMO, for funds to run its activities. It thus relies on obsolete, faulty and unserviceable equipment to do its job. This handicap makes it difficult for it to provide adequate and accurate information with which a pilot can do proper flight planning (Tell, 2005). The early *harmattan* haze has been associated aircraft accidents (Blair and Fite – 1965); a notable

case in Nigeria is the air crash at Emene near Enugu in November 1983. A strong wind known as *wind shear* poses a problem to the aviation industry. In the United States, wind shear has caused many carrier fatalities (McCarthy, 1989). The situation of the airports in Nigeria especially the international airports is currently being improved with the massive renovation work going on at major airports in the country. A lot still needs to be done in the modernization of communication equipment at the airports.

(b) Technical Factors

These can be summarized in all forms of engine problems including complete engine failure and hydraulic problems. A few air crashes attributed to technical factors includes the Kabo Air Bac 1 – 11 aircraft which crash-landed at the Port Harcourt Airport when the tyres could not disengage; the Sosoliso aircraft which was forced to return to Lagos when its landing gear developed a mechanical fault on December 13, 2004 (The Punch 2005). Also, an Associated Airline aircraft suddenly developed hydraulic problem which made it difficult to land although a crash was averted (This Day, March 19, 2006 pg.1 & 4). The recent Dana Airline crash is alleged to have occurred due to engine failure that was traced to poor maintenance and circumvention of other critical safety rules. However the report of the investigation of the crash cleared the airline of any misdeed.

More than two thirds of private airlines in Nigeria operate *over-aged* and often *ill-maintained* aircraft (Adeniyi, 2000) However, Government has grounded Boeing 737-100, 200 and 200c series aircraft from flying the Nigerian airspace, based on the US Federal Aviation Administration FAA report (The Punch, January 1, 2006). Many aircraft in the operation have grounded some of their fleet partly because of the high cost of keeping the “old” aircraft airworthy.

Nigeria has indeed become a dumping ground for obsolete equipment and aircraft from other countries (The Punch, December 15, 2005). The Nigerian Civil Aviation Authority discovered recently that more than 29 aircraft of the 53 operating commercial flights in the country have exceeded the 22 year age limit stipulated by the Aviation Ministry. The

regulatory authority listed many airlines as among those who operated over-aged aircraft (Vanguard, November 6, 2005). The *Sosoliso* aircraft that crashed on December 10, 2005 for instance, had been used in Europe for 27 years before it was brought into Nigeria, while the Bellview aircraft involved in the October 22, 2005 air accident got to the country after being flown in seven other countries! However some experts ask “what has age got to do with it”? According to them an “old” aircraft that is well maintained can still fly. The question is how old is “old”?

(c) *Human Factors*

Finally, most aircraft accidents have occurred due to pilot errors, air traffic controller errors, improper loading of aircraft, improper maintenance, fuel contamination, language miscommunication, pilot obstinacy (for instance an air crash can occur if a pilot insists on landing after being informed by the traffic controller of the unfavourable weather condition for landing). An example is the averted aircraft disaster at the Murtala Mohammed Airport Lagos on December 12, 2005.

Poor maintenance of aircraft and airport infrastructure constitute another problem to the efficient services in the civil aviation sector. This sometimes manifest when officers responsible for the maintenance of such facilities handle the infrastructure with nonchalance and levity, as public property are wont to be handled in this part of the world. The defunct Nigeria Airways for instance, used to own a reliable maintenance facility (hangar) which went down with its dwindling fortunes for the same reason. Currently, there is no hangar in Nigeria; this leaves operators with no choice but to *go overseas for maintenance* at a huge cost.

Still on maintenance, genuine aircraft parts need to be bought and changed as at when due. These air crash parts turn out to be very expensive due to the fact that they are imported and paid in foreign currency. Consequently in a bid to reduce operational cost, poor quality parts may be purchased and maintenance schedules could be breached.

In other words, the huge costs involved could make airlines to cut corners, while the regulatory agencies look the other way.

Furthermore, some of the *fees charged* by government agencies are too high. These agencies charge fees that are applicable in Britain and the United States, whereas the local airlines cannot afford to charge fares the way airlines in those countries do (Tell 2005).

Airplanes are supposed to be thoroughly checked by engineers and the captain, and forms signed indicating that a particular airplane has been checked by both captain and engineer before flight. However, this may no longer be the case as captains/management are more interested in the number of flights they must cover per day leaving the maintenance of the airplane to the engineer. Consequently, if the engineer did not do a thorough checkup, the plane could develop problem midair, which could cause a mishap.

The *availability of good and functional navigational facilities* is also very critical for air safety. The absence of these facilities such as Ground Proximity Warning System (GPWS), Instrument Landing System (ILS) and Terminal Doppler Weather Radar (TDWR) have at different occasions caused problems.

According to Flight International (1992), more than 75% of the world's total aircraft accident could be avoided if the airports were properly equipped. For instance, the absence of vital infrastructure like radar, navigational aids, and facilities such as the firefighting equipment, medical services, and emergency operations at the Port Harcourt International Airport according to Sunday Independent of January 2006 was largely responsible for the loss of lives during the crash of the Sosoliso plane. If these were in place, lives (like that of Mr. Julius Ibhafidon of blessed memory, my student and friend) would have been saved.

2.2.3 Actual Causes of Air Crashes in Nigeria

The table below shows the major specific causes of air crashes in Nigeria according to Akpoghomeh (2012)

Table 6: Causes of Air Crashes in Nigeria

Factor	%
<i>Loss of control</i>	16.7%
<i>Undershot runway</i>	16.7%
<i>Overshot runway</i>	8.33%
<i>Mechanical (engine problem)</i>	16.7
<i>Brake Problem</i>	8.33
<i>Fire</i>	12.5
<i>Bad weather</i>	12.5
Poor Communication	4.16
Others	4.08

Akpoghomeh, Osi S. 2012 forthcoming.

The causes of air crashes in Nigeria are listed in Table 6 above. Loss of control, over/under shooting the runway, engine problem as well as bad weather were dominant causes accounting for over 77 percent of all the crashes in the country.

A statistical analysis of these factors revealed that only poor *communication* was significantly related to air crashes in Nigeria. (Akpoghomeh, 2012). The degree of association between poor communication and air crashes in Nigeria was 89.8%, while the factor explained about 90 percent of the variation in air crashes in Nigeria. This result implies that modernizing or upgrading the communication infrastructures at the nation's airports could reduce aircraft accidents/crashes by over 80 percent, other things being equal (see also Sunday Independent, 2006; Flight international, 1992).

2.2.4 Way Forward

The way forward is simple: heavy intervention funds. The Federal government should bail out the aviation industry by injecting huge intervention funds to address the challenges.

The air transport is a very sensitive and risky sector where safety is of utmost concern to the government, operators and users of air transport services. It is highly regulated by both the Ministry of Aviation and International Civil Aviation Organization. So many safety standards are put in place to ensure the safety of the mode, the users and operators. Airline operators must comply with the regulations on the age of aircraft they operate. Major checks must be undertaken when due and the regulatory agencies must ensure that the rules of engagement are complied with. There has been appreciable development in Nigeria’s civil aviation sector. Currently massive renovation works are going on in the nation’s international airports. However a lot still needs to be done in the area of communication and navigational facilities.

Since most air crashes are due to pilot error pilots should be the focus of all air safety programmes.

2.3 Rail Transport Safety

Rail accidents in Nigeria between 2002 and 2006 are shown in the table below. Although about 75 train accidents occur in Nigeria every year during the period, casualty rate has remained at zero. The major cause of rail accident in Nigeria was derailment; this could be associated with the age of the equipment and infrastructure. The table also shows that over the period, Nigerian Railway Corporation maintained a high safety standard as it recorded no casualties.

Table 7: Accidents on Railways

Train Accidents	2002	2003	2004	2005	2006	Total	Annual Av
Total number of Accidents	84	84	89	51	58	366	75.2
Collisions	19	23	17	7	18	84	17
Derailment	32	36	55	31	28	182	36.4
Washout	6	9	4	3	7	29	6
Broken Rail	11	13	11	5	3	43	8.6
Others	16	03	02	05	02	28	5.6
CASUALTIES							
Total number of persons killed	-	-	-	-	-		

National Bureau of Statistics (2007)

2.3.1 Rail Transport Safety

The Nigerian Railway Corporation organizes, maintains and manages rail transportation in Nigeria. Although antiquated the Corporation has over the years maintained a high safety standard in its operators. In the last ten years the Corporation did not record any accidents/crashes in which lives were lost or bodily harm. The safety challenges of NRC include track maintenance and rehabilitation, outdated equipment, size of gauge, and track alignment (too many bends); many roads intersection across rail lines without provision for overhead bridges. This lecture recommends a total overhaul of the sub sector to allow for newer and more modern infrastructure.

2.3.2 Inland Waterway Safety and Challenges

The existing safety regulations for inland water transportation include:

- The provision of life jackets and floats in all boats used for passenger operation.
- Strict compliance to capacity specifications
- Use of concrete platform or jetty for the safety of passengers.

As observed in a Federal Government document, only the state and Federal Government operated services are organized. The private operations which are more in number, are unorganized, and records of their operations are poorly kept. They are poorly supervised including their safety standards especially in the interior parts of the riverine states. The types of boats used and their speed and capacity are not regulated. Other safety issues with this sub-mode include:

- Life jackets and floats are not provided
- Over loading of boats
- Many boats carry fuel along to supplement the fuel capacity of their engines.
- Many of the navigators are not educated enough to understand safety regulations.
- Many of the navigators are reckless and usually over speed.

- There are usually no concrete jetties instead any available seashore is used
- Boats are poorly maintained with the result that some have submerged mid-sea with their passengers and cargo.
- No clearly marked and buoyed navigation route; many boats have been reported missing with their passengers
- For the bigger rivers there is the problem of dredging.

2.3.3 Way Forward

Again massive intervention funding to address the above challenge

- There is need for effective regulation of inland water transport across the country. All boats must be licensed as well as operators.
- Build and operate NNPC petrol stations in the rural riverine areas.
- The water ways should be marked with direction signs, and waterway traffic signs mounted at appropriate locations
- Nigerian Inland Waterway Authority (NIWA) should partner with the Marine Police division of the Nigerian Police Force to ensure compliance of the rules and regulation of inland water ways navigation

My own Contribution

Mr. Vice Chancellor Sir, my esteemed audience, my own contributions to addressing especially the carnage on our roads are well documented in several of my publications and one of which is the board game on road safety called *ROADSENSE (figure 16)*. The Trade Mark for this game was registered in 1996 while the Patent and Design was certificated in 1997. This game is a response to the need to master the road signs by both potential and licensed drivers. Ideally to qualify as a driver, the potential driver is supposed to be tested in theory and practice. In other words, besides the practical performance of manipulating the vehicle, a driver is expected to, first of all, master thoroughly the road signs and signals (i.e. The Highway Code). Very unfortunately however, as most potential drivers, especially those in the developing countries of the world, go for the driving test they just

memorise or cram the road signs and the signals and their meanings. But once the test is over, they readily forget most of the regulations and road signs. Such drivers are no doubt potential causes of accidents themselves. Consequently, it has been argued by scholars and professionals alike that there has to be a way of constantly publicizing the road signs, signals and regulations so that potential drivers ,especially children and the youths , and even licensed drivers can unconsciously master them with little efforts. It is against this background that this game was designed. The objective of the game therefore is to encourage an unconscious mastery of the road signs and traffic regulations by both drivers and potential drivers since games have been recognized as one of the ways of learning effectively.



III

3.0 Terror of Transport on the Environment

Transportation systems are associated with a wide range of environmental impacts of all geographical dimensions ranging from environmental pollution, global warming to local weather conditions and noise. Because these negative impacts come with and leave behind dire consequences, they are therefore referred to as some of the terrors of transport, this time on the environment. The nature of the terror of transport on the environment depends essentially on its

3.1 Emission: Pollutants Emitted by Transport Systems

The pollutants from transportation are grouped into two broad categories depending in their scope of impact:

- (a) Those that impact at the local and regional levels where their externalities are more felt
- (b) Those that have a more global impact.

3.1.1 *Pollutants with Local and Regional Impacts.*

Pollutants emitted by transport systems and which have local and regional impacts include Carbon monoxide (CO), Nitrogen oxide (NO), Hydrocarbons (HC) and Volatile Organic Components (VOC), Particulates, Smog and Lead (pb)

(i) Carbon Monoxide, CO

Transportation modes are responsible for 70-90% of total carbon monoxide emissions worldwide. Carbon monoxide is usually always present along major traffic routes especially in urban areas. The gas has an asphyxiating effect on man. That is to say that when inhaled, the gas combines with haemoglobin to produce carboxyhaemoglobin which incapacitates the blood's ability to absorb oxygen.

(ii) Nitrogen oxides, NO

The quantity of these gases in the atmosphere has increased by 0.2% annually in the last 10 years (Rodrigue, 2006). These gases are a catalyst for *ozone* and a component of *acid rain* and *smog*, while when deposited in water it forms the nitrate cycle where it encourages algae boom.

(iii) *Hydrocarbons and Volatile Organic Compounds (HC/VOC).*

Hydrocarbons (HC) are chemical compounds made up of hydrogen (H) and Carbon (C). These include Methane (CH₄), Gasoline (C₈H₁₈), Benzene (C₆H₆), Formaldehyde (CH₂O), Butadiene (C₄H₆) and Acetaldehyde.

They are mostly produced from the incomplete combustion of gasoline or as a by-product of petrochemical industries. Transportation accounts for between 40 and 50% of total emissions of HC/VOC. Incomplete combustion accounts for 70% of this quota while refueling accounts for 10% and evaporation from storage, especially gas tanks, accounts for 20%. For example, a car parked overnight during the hot season releases almost 4 grams of HC/VOC. In modern house designs, in built garages are no longer fashionable.

Impacts on humans and plants include:

- All HC/VOC are carcinogens to some extent. For instance cases, of leukemia have been linked with benzene. However all HC/VOC are harmful at high concentrations.
- Heavy HC/VOC like Benzene are more carcinogen than light ones like Methane.
- They are harmful to crop and accumulate within the food chain and resulting in poisoning.
- HC/VOCs are components of *smog*, catalysts for *Ozone* and component of *acid rain*. [see section 2.2.3 b(ii) and b(iv)]

(iv). *Particulates*

These are solids/particles in suspension in the atmosphere like

- Smoke
- Soot and
- Dust

These are products of incomplete combustion of fossil fuels especially, coal. They also contain traces of HC/VOCs. Transportation accounts for

25% of all emission of *particulates*. The major transportation source is from diesel engines and secondarily from trains that use coal.

(v) *Smog*

Smog is a mixture of solid and liquid fog and smoke particles formed from the deposition of Carbon Monoxide, Ozone, HC/VOC, Nitrogen Oxides, Sulphur Oxide, water, particulates, and other chemical pollutants. Fog occurs naturally while smoke is introduced by man's activities, especially transportation. Smog is therefore strongly linked with transportation and industrial activities. The effects of smog are the combination of those of its major components. British cities are still estimated to lose between 20 and 55% of incoming solar radiation from November to March through smog (Mayhew, 1997).

(vi) *Lead, Pb.*

Lead is toxic metal mainly used as an anti-knock agent in gasoline/petrol (Lead tetraethyl – Pb (C₂H₅)₄) and in batteries as a cathode and lead dioxide as an anode. In developing countries, lead tetraethyl was the main source of atmospheric lead emissions accounting for 30% of total emissions.

3.1.2 Pollutants with Global Impacts

These include Carbon Dioxide (CO₂), Sulphur Dioxide (SO₂), Ozone (O₃), Acid Rain, Chlorofluorocarbons (CFCs)

(a) *Air Pollutants*

(i) Carbon dioxide, CO₂

Carbon dioxide constitutes 0.04% of the atmosphere. It is an important temperature regulator for the atmosphere and it keeps it at + 15⁰C instead of -15⁰C.

For the environment, increased quantities of carbon dioxide in the atmosphere is known to cause *greenhouse effect*. This is the increase in earth's temperature due to accumulation of carbon dioxide and water vapour in warm air trapped by a mass of cold air. This results in global warmen - the retention of infrared rays from the sun and increased surface temperatures, with the melting of some polar ice. Carbon

dioxide concentration in the atmosphere has risen by 0.4% on the average annually in the last decade. In the late 19th century, that is before the industrial revolution, this had risen to 275ppm and in 1989 to 340ppm. *The present level of more than 400ppm has been estimated as the limit after which changes in climate will manifest such that climate and weather will be difficult to predict as we are currently observing.*

Transportation sources include combustions (oxidation) of fossil fuels. Transportation modes account for about 30% of total carbon dioxide emissions in developed countries and 15% worldwide. Of this total emission quota, 66% comes from combustion of gasoline, 16% from diesel fuel and 15% from jet fuel. According to type of transportation modes: cars account for 43%; light trucks, 20%; heavy trucks, 14% airplanes, 14%; rail and marine, 7% and iron-oil based, 2%. Note the significance of road transportation in carbon dioxide emission.

(ii) Sulphur Dioxide, SO₂

It derives from the burning of fossil fuels like coal (especially bituminous coal) and hydrocarbon. Transportation account for about only 5% of the total Sulphur dioxide emissions – thus a minor source of SO₂ emission.

On its direct impact on the environment, SO₂ is a major culprit in the production of acid rain. Moreover, it has a counter effect on greenhouse gases by blocking radiation.

(iii) Ozone, O₃

It is a form of oxygen. It has three atoms of oxygen combined in one molecule as against two atoms as in free oxygen. The importance of this gas is that it absorbs solar ultraviolet radiation. *The gas is concentrated at about 10 – 20km above the earth where it forms a layer in the atmosphere the ozone layer (the ozonosphere).* The layer protects the troposphere and the earth's surface from the full intensity of ultraviolet radiation which are harmful to man (Buchanan 1974).

The effect of O₃ include:

- The normal/natural concentration of ozone at the ground level of the atmosphere is 0.01ppm. At concentrations of 0.15ppm and above the gas will poison the system as well as causing breathing difficulties and irritation of the eyes and respiratory system.
- It degrades metal and concrete structures through oxidation.
- It damages crops and vegetation, seeds and leaves of plants thereby reducing productivity by between 1 and 20%.
- Ozone impairs visibility.
- A 5% down in the concentration of ozone in the atmosphere could increase by 10% the incidence of skin cancer and eye cataract by 10%. (Rodrigue, 2006).

At the lower levels of the atmosphere, Ozone is formed by the action of light over a mixture of HC/VOC and nitrogen oxides. *As major producers of HC/VOC, transportation especially in urban areas is directly linked with ozone gas.*

(iv) Acid Rain and Acid Depositions (Sulphuric Acid, H₂SO₂; and Nitric Acid, HNC₃)

Acid rain forms when natural precipitation fall through atmosphere containing sulphur dioxide and or nitrogen oxide pollutants. The rain then becomes acidic. When either acid is dissolved in water both acids increase the concentration of hydrogen ions thereby lowering the pH of the water.

Acid rain directly or indirectly (as a result of runoff into water bodies) impacts negatively on humans, plants and the environment. Some of the effects include:

- Damage to artifacts – historical monuments are particularly vulnerable.
- Causes irritation of the respiratory organs.
- Change the chemical constituent of soil by breaking down complex organic matter which on a large scale has a negative impact or reduces available biomass.
- Acid rain gradually destroys life in lakes and rivers.
- Depositions which alter the ecological balance of continental ecosystems, especially in industrized areas.

As earlier noted, transportation accounts for 5% Sulphur dioxide emission, 45% of nitrogen oxides emissions, and for 40% of HC/VOC emission. Consequently, it has been estimated to account for 10 to 30% of acid rains, depending on the region. In Europe for instance, transportation is responsible for 25% of acid rain.

(v) **Chlorofluorocarbons (CFCs)**

CFCs are colourless and non-poisonous gases or liquids. At the ground level they are stable, non-inflammable and non-toxic and are used as dispersing agents (aerosols) or as refrigerants, especially *Freon, R-12*. But at the upper atmosphere they go through exothermic photochemical reaction and in the process release free chlorine radicals. The free chlorine radicals break down ozone in the ozone layer. This reaction is potentially dangerous and a terror to human health. Motor vehicle air-conditioning systems are the main sources of CFCs in transportation. Infact during its life cycle an air-conditioning system will release 100% of its CFCs into the atmosphere. Transportation accounts for about 20% of all CFC emission.

CFC emission in the developed countries has been reduced as a result of legislation against continued used of the gases as refrigerants and aerosols. This is however not the case in the developing countries where CFC emissions have remained high due to low level of technological development and the dumping of vehicles and refrigerators that are no longer used in the developed world.

- CFCs being extremely stable may stay in the atmosphere from 70 to 200 years.
- A major culprit in the global warming problem Freon, R-12, is 20,000 times more powerful in absorbing infrared than Carbon dioxide
- In fact a ton of Freon has the same *greenhouse effect* as 2000 tons of carbon dioxide.
- CFCs damages the ozone layer by reducing the concentration of stratospheric ozone which absorbs harmful ultraviolet rays.

Indirect effects as a result of (increase in ultraviolet rays exposition) include:

- Increase in growth of the incident of skin cancer, eye cataract, damage to crops and plants, deficiencies of the immune system and increase of ozone at the ground level, through photochemical smog.

(b) Water Pollution

Transportation contributes to water pollution in various ways. The two major ways include, air pollution fallouts from transportation modes impacts and as a result of construction and maintenance of transport infrastructure such as roads, railways pipelines, ports etc.

(c) Noise Pollution by Transport Systems

Noise is unwanted sound. According to Goodall (1996), sound may be socially undesirable because it interferes or disturbs or annoys people. It may be medically undesirable if the level is very high because that can cause hearing damage if present over a considerable length of time. Consequently, noise is considered as some form of pollution. Noise pollution is mainly from aircraft, road vehicles, land and industrial activities.

3.1.3 Global Warming/Climate Change

The most serious consequences of the terror of transport on the environment is global warming and the consequent climate change. *This is the rise in the average temperature of the Earth's atmosphere and oceans since the late 19th century and its projected continuation.* Global warming has been described as the greatest threat facing humanity. According to a report of the UN-sponsored intergovernmental Panel on Climate change (IPCC), global warming is “unequivocal” and “very likely”, mankind is largely responsible. Many believe that human activities are responsible for global warming which may have catastrophic consequences for climate and environment. Actually, warming of the climate system is caused by increasing concentrations of greenhouse gases produced by human activities such as burning of fossil fuels (oil, coal etc) and deforestation.

The major green house gases are:

- Water vapour which causes 26 – 70% of the green house effect
- Carbon dioxide (CO₂), 9 – 26%

- Methane (CH₄), 4 – 9%
- Ozone (O₃), 3 – 7%

Transportation accounts for between 40 and 50% of total emission wins of Hydrocarbons (HC) and volatile Organic Compounds (VOC) which includes Methane (CH₄). It also accounts for 30% of total carbon dioxide emissions in developed countries and 15% world wide (see P54). Transport is thus one of the major sources of carbon contributing to global warming.

When it comes to connecting the dots between climate change, extreme weather and health, the lines are clear. The earth is saying something with record heat, drought, storms and five. Scientists are telling us this is what global warming looks like. For example, large scale melting of glaciers and the consequent expansion of oceans as temperature of water increases, could cause sea levels to rise dastrastically simultaneously increases in temperatures could heighten storms, floods and droughts. Increases in temperature may also aid the spread of malaria, for instance, by enabling mosquitoes to spread to other areas. According to the Bulletin of the Atomic Scientists, *The danger posed by climate change are nearly as dire as those by nuclear weapon. The effects may be less dramatic in the short term..., but over the next three to four decades (from 2007) climate change could cause irremediable harm to the inhabitants upon which human societies depend for survival* (Watch Tower, 2008). More apocalyptic is the fact that some scientists believe that changes as a result of global warming are taking place more rapidly than expected. They ended by resolving that “we must act now to spur the adoption of cleaner energy sources at home and abroad”.

Weather Related Disasters in 2007

The year 2007 saw a record number of weather-related disasters for which the United Nations Office for the Coordination of Humanitarian Affairs issued 14 emergency appeals – 4 more than the previous record, set in 2005. Listed here are just some of the disasters that occurred in 2007. Keep in mind, of course, that individual events do not necessarily indicate a long-term trend (Watch Tower, 2008).

- **Britain:** More than 350,000 people were affected by the worst flooding in over 60 years. England and Wales saw the wettest May to July since record-keeping began in 1766.
- **West Africa:** Floods affected 800,000 people in 14 countries.
- **Lesotho:** High temperatures and drought destroyed crops. Some 553,000 people may require food aid.
- **Sudan:** Torrential rains left 150,000 people without shelter. At least 500,000 received aid.
- **Madagascar:** Cyclones and heavy rains lashed the island, displacing 33,000 people and destroying the crops of 260,000.
- **North Korea:** An estimated 960,000 were severely hit by widespread flooding, landslides and mud slides.
- **Bangladesh:** Flooding affected 8.5 million people and killed over 3,000, as well as 1.25 million farm animals. Nearly 1.5 million homes were either damaged or destroyed.
- **India:** Floods Affected 30 million people
- **Pakistan:** Cyclonic rains left 377,000 people displaced and hundreds dead.
- **Bolivia:** More than 350,000 were affected by flooding, and 25,000 were displaced.
- **Mexico:** Regional flooding left at least 500,000 homeless and affected more than a million.
- **Dominican Republic:** Prolonged heavy rainfall caused floods and landslides, displacing 65,000.
- **United States:** Fires across tinder-dry southern California forced 500,000 residents to flee their homes.

3.1. 4 The Way Forward: Alternative Fuels to the rescue

In recognition of the terror that transport poses to man, by way of environmental pollution and climate change, there have been concerted efforts to find a way out of the impending doom by sourcing for alternative fuel energy. Researches have thrown up the following alternative environmentally friendly fuels: *Biogas, Hydrogen and Electricity.*

- Biogas

Examples of biogas are ethanol and biodiesel. These can be produced from the fermentation of energy crops (Sugar cane, corn, cereal, etc.). A major challenge of this source of energy is that the production requires a large harvesting area that may compete with other land use. For instance it is estimated that one hectare of wheat produces less than 1,000 litres of transportation fuel per year which represents the amount of fuel consumed by one passenger car travelling 10,000 kilometers per year, (Rodrigue and Comtois 2006). This low productivity of biomass certainly does not meet the energy needs of the transportation sector.

- Hydrogen

Hydrogen is considered as the energy source of tomorrow. It is produced by the electrolysis of water. (Khare and Sharma 2003). Its advantage is that it is two times more efficient than gasoline.

The disadvantages include: lot of energy is wasted in the production, transfer and storage; production requires electricity production; it is not cost effective as hydrogen powered vehicle requires 2-4 times more energy for operation than an electric car; it is highly inflammable and it has storage challenges.

- Electricity

This is being considered as the best alternative to petroleum fuels as an energy source. The major challenges are: lack of storage system capable of providing driving ranges and speed comparable to those of conventional vehicles. For instance as at 2006 an electric car has a maximum range of 100 kilometres and speeds of not more than 100 km/hr and requiring 4 – 8 hours to recharge (Sperling 2003). However the development of vehicles with internal combustion engine and batteries (hybrid vehicles) provides the opportunity of combining efficiency of electricity with long driving range.

Poser!

Mr Vice Chancellor Sir, in view of the foregoing some questions naturally come to mind: If science eventually finds alternative to fossil fuels as the dominant energy source, what then happens to petroleum,... our dear petroleum? What then happens to our dear Niger Delta Region? What.....? What.....? What.....? The time to find answers to these questions and many more is NOW!!!

IV

4.0 Transportation of Terror

As earlier defined the word terror according to *Oxford Advanced Learner's Dictionary* (7th edition) is *the feeling of extreme fear, a person, situation or thing that makes you very afraid; a violent action or the treat of violent action, that is intended to cause fear.* Transportation of terror therefore, is the use of transport modes to achieve or facilitate terror. That is, the use of transportation mode as a means of perpetrating violence or threat to violent actions. It is the use of a transport mode – a car, aircraft, pipeline or ship etc. as weapon of violent action. The act is known as terrorism.

4.1 Terrorism Defined

According to *terrorism-Research.com*, the United States Department of Defense defines terrorism as “the calculated use of unlawful violence or threat of unlawful violence to inculcate fear; intended to coerce or to intimidate governments or societies in the pursuit of goals that are generally political, religious or ideological”

According to FBI, *Terrorism is the unlawful use of force and violence against persons or property to intimidate or coerce a government, the civilian population or any segment thereof in furtherance of political or social objectives.*

The US Department of State defines “terrorism” “premeditated politically motivated violence perpetrated against non combatant targets by sub-national groups or clandestine agents usually intended to influence an audience”

United Nations in 1992:

An anxiety – inspiring method of repeated violent action employed by (semi-) clandestine individual, group or state actors for idiosyncratic, criminal or political reasons, whereby – in contrast to assassination – the direct targets of violence are not the main targets.

According to terrorism research. com, the most commonly accepted academic definition starts with the UN definition.

According to *Terrorism.com with a history longer than the modern nation-state* notwithstanding, the use of terror by government and those that contest their power is poorly understood. And while the meaning of the word terror itself is clear but when applied to acts and actors in the real world it becomes confused. What is the difference between a criminal, a terrorist and a revolutionary? What is and not terrorism?

A car bomb on a city street and jet fighter dropping a bomb on a tank are both acts of violence and produce death and terror. This is the reasoning behind the famous phrase “one man’s terrorist is another man’s freedom fighter”

Modern day definitions of terrorism are as varied as there are ideological, religious and ethnic differences. In other words terrorism seems to have differing territorial, social, cultural and ethnic backgrounds. Terrorists are therefore non-state actors committed to the use of sensational attacks to draw attention to their cause. **Thus what is or what is not a terrorist act will depend on one’s background. For instance, sheet.**

Paul Pillar, former deputy chief of the CIA Counterterrorist Centre is quoted in Davies (2003), posits that the four key elements of terrorism are:

- *It is premeditated – planned in advance, rather than an impulsive act of rage.*
- *It is political – not criminal, like the violence that groups such as the mafia use to get money, but designed to change the existing political order.*
- *It is aimed at civilians – not at military targets or combat-ready troops.*
- *It is carried out by sub-national groups – not by the army of a country.*

According to the Watch Tower (2001), “terrorism is systematic, premeditated and calculated”. The consequent number of casualty is not the primary aim but a means to an end –. But “part of the atmosphere of shock and fear that the terrorists wishes to create in order to under mine authority and gain a hearing for his specific cause”.

Some of the factors responsible for violent acts of terrorism have been identified by to include:

- Hatred
- Oppression
- Frustration
- Injustice

Terrorism is as old as humanity and its significance changes over time and space. According to Ikporukpo (2007) the modern use of the term dates back to 1795 when it applied to the actions of the Jacobin Club during the French Revolution.

Terrorism assumed an unprecedented dimension after “Nine Eleven”; a term for the terrorist’s attacks on September 11, 2001 when nineteen hijackers in four groups each with a trained pilot hijacked four airplanes and succeeded in plunging two of the hijacked aircraft into the twin towers that housed the World Trade Centre in New York, using the aircraft as bombs (Davies 2003, Barnaby 2007). This was a classical case of the transportation of terror.

The Consequence of terrorists acts include

- Tragic loss of human lives
- Impact on national economy – enormous amount of time and resources are earmarked to fighting it and to protect people and places.
- Destroys/delays peace process
- Provokes/prolongs or entrenches conflicts and accelerates the cycle of violence
- It influences travel and the choice of travel.
- It sparks off mass movements especially of refuges.

Recent incidents across the globe suggest that the acts of terror are increasing and the list of targets has been expanded to include attacks on so called soft targets, like **mass transportation system**, sporting events, busy urban locations, hotels and tourists sites (Watch Tower 2001).

Just as well, the act has graduated from *state sponsored* to *cause-sponsored terrorism*. In fact terrorism's emerging new look includes actions and strategies that may be more difficult to prevent or fight!!

Let us take a look at the global phenomenon between 1970 and 2002.

4.2 The Geography of major Global terrorist incidents

4.2.1 Spatial Pattern

Geographically, terrorist attacks know no boundaries. They occur just anywhere in any part of the globe. Tables 9 and 10 and Fig 9. show the geographical spread of the major incidents across the globe. Of the 32 locations countries, 12 accounted for over 60 percent of the phenomenon (Table 10). The United States of America top the list; others include Lebanon, Britain, India Japan, Northern Ireland and Russia.

4.2.2 Targets

The targets of these major terror acts are usually places of maximum effect. Table 11 and Fig 10 show the targets during period understudy. Major targets included transport modes and facilities, High rise/large buildings, Embassies, Church/Mosque, Military/Police installations, Restaurant and Night clubs. These targets accounted for over 80 percent of the targets.

4.2.3 Methods

Table 12 and Fig 11 show the modus operandi in these terror acts across the globe. Eight methods were identified for achieving the terror acts. Planting bombs at the locations/target appears to be the most common method accounting for 32.14% of the cases while the use of bomb laden transport modes like aircraft, trucks and cars (as bombs or weapon of

mass destruction) accounted for 26.79% coming as the second most preferred method, earlier referred to as the transportation of terror.

4.2.4 Casualty Rate

In all the operations listed in Table 9, the casualty was 23,138 comprising of 7971 persons killed and 15,167 injured. (see Table 12) However the significance of the use of transportation mode can be appreciated when the casualty figure from attacks facilitated by transport modes and facilities are considered. Data show that of the 7971 persons that were killed, 6567 died in transport related attacks such as:

- The use of vehicles as bombs e.g. the aircraft as in 9/11
- The use of truck- and car-laden with bombs for suicide bombing,
- Planting of bombs in transport modes of facilities/infrastructure such as buses, aircraft, airports, trains, subways, bus stations, garages etc.

In other words, all the terror incidents, transport modes and facilities were involved in 82.39 percent of all those killed in major terrorist incidents across the world, while 60.35 percent of those injured were associated with transport and transport related targets/operations.

Table 9 Major Terrorist Incidents in the World: 1970 - 2002

DATE	LOCATION	TARGET	MODE	Killed.	Injured.	Remark
6/9/70.	Jordan.	Aircraft.	Hijack.	-	-	*
21/7/72.	Belfast.	General.	Bombing.	11.	130.	
31/7/72.	Claudy.	General.	Car-bomb.	6.	-	**
3/2/76.	Djibouti.	School bus.	Hijack.	5.	-	*
27/6/76.	Uganda.	Airliner	Hijack.	-	-	*
23/5/77.	Holland.	Train.	Hijack.	8.	-	*
13/10/77.	Mogadishu.	Airliner	Hijack.	3.	1.	*
16/3/78.	Italy.	PM Aldo Moro	Assassination.	1	-	
4/10/79.	Teheran.	US Embassy.	Hostage.	Many.	-	
20/10/79.	S/Arabia.	Grand Mosque.	Hostage.	250.	600	
30/4/80.	London	Iranian Embassy.	Hostage.	7.	-	
6/10/81.	Egypt.	Anwar Sadat.	Assassination.	1.	-	
18/4/83.	Beirut.	US Embassy.	Truck-bomb.	63.	120.	**
23/10/83.	Beirut.	Marine barracks.	Truck-bomb.	242.	-	**
		French barracks	Truck-bomb.	58.	-	**
12/4/84.	Spain.	Restaurant.	Bomb.	18	53	
5/6/84.	Amritsar.	Temple.	Hostage.	> 100	-	
31/10/84.	India.	PM Gandhi.	Assassination.	1.	-	
23/6/85.	Atlantic.	Airliner.	Bombing	329.	-	*
30/9/85.	Beirut.	Soviet dipl.	Kidnapping.	1.	-	
7/10/85.	Mediterranean	Cruise Ship.	Hostage.	1.	-	*
5/4/86.	West Berlin.	Night Club.	Bombing.	2.	79	
21/12/88.	Scotland.	Airliner.	Bombing.	259.	-	*
17/3/92.	Argentina.	Israeli Embassy.	Bombing.	29.	242	
26/8/92.	Algiers.	Int. Airport.	Bombing.	12.	128.	*
26/2/93.	New York.	WTCentre.	Car-bomb.	6.	> 1000.	**
25/2/94.	Hebron.	Mosque.	Shooting.	29.	150	
27/6/94.	Japan.	Residential.	Gassing.	7.	270	
24/25/94.	Algeria.	Airliner.	Hostage.	4.	-	*
20/3/95.	Tokyo.	Subway Station.	Gassing &	12.	5000.	*
	Yokohama.	Subway.	Gassing.	-	-	*
19/4/95.	Oklahoma.	Fed Building.	Truck-bomb.	166.	100s.	**
31/1/96.	Sri Lanka.	Central Bank.	Truck-bomb.	90.	>1400.	**
9/2/96.	London.	Parking Garage.	Bombing.	2.	100.	*
26/2/96.	Jerusalem.	Bus.	Bombing.	27.	80.	*
15/6/96.	Manchester.	Shopping Area.	Truck-bomb.	-	206.	**
25/6/96.	S/Arabia.	American Housing.	Truck-bomb.	19.	515.	**
20/7/96.	Spain.	Int. Airport.	Bombing.	-	35.	*
17/12/96.	Peru.	Japanese Amb.	Hostage.	-	-	
30/3/97.	Cambodia.	Demonstrators.	Grenades.	16.	100	
17/11/97.	Luxor.	Temple.	Shooting.	62.	Many	
14/2/98.	India.	General.	Bombing.	43.	200	
7/8/98.	Kenya.	US Embassy.	Bombing &	295.	>5000	
	Tanzania.	US Embassy.	Bombing	-	-	
15/8/98.	N/Ireland.	Court House.	Car-bomb.	29.	300.	**
18/10/98.	Colombia.	Oil pipeline.	Bombing.	209.	130	*
3/11/98.	Colombia.	General.	Missiles	-	-	
1/3/99.	Uganda.	3 tourist camps.	Kidnapping.	9.	-	
9/9/1999.	Moscow.	Apartment building.	Bombing &	-	-	
13/9/1999	Moscow.	Apartment building.	Bombing.	212.	300	

12/10/00.	Yemen.	American Warship.	Boat-bomb.	17.	38.	*
9/8/01.	Jerusalem.	Restaurant.	Bombing.	15.	90	
11/09/01.	New York.	WTCentre.	Aircraft as bombs.	>5000.	-	**
	Washington. Pennsylvania.					**
12/10/02.	Indonesia.	Nightclubs.	Bombing.	180	300	**
23/10/02.	Moscow.	Theatre.	Hostage.	115.	-	

Sources: 1. Davies, B 2003 Terrorism: Inside a World Phenomenon. Virgin Books. London.
2001. A Decade of Terrorism. Awake! May 22,

** Transportation of terror

* Transport facility as target

Table 10: Global Locational Characteristics of Major Terrorist Incidents 1970 - 2002

S/N.	Country	Frequency	%
1.	United States	6	10.53
2.	Lebanon	4	7.01
3.	Britain	3	5.26
4.	India	3	5.26
5.	Japan	3	5.26
6.	N/Ireland	3	5.26
7.	Russia	3	5.26
8.	Israel.	2	3.51
9.	Colombia	2	3.51
10.	Uganda	2	3.51
11.	Saudi Arabia	2	3.51
12.	Spain	2	3.51
Total.		35	61.40

Source: Computed from data

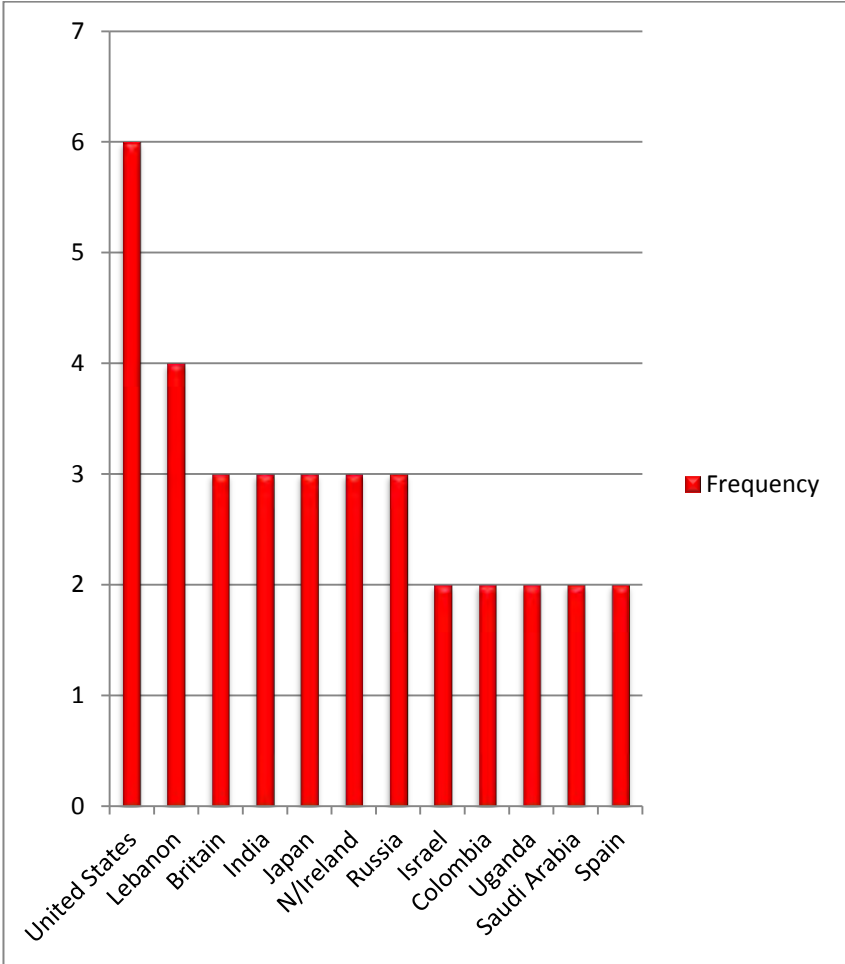


Fig. 9: Global Locational Characteristics of Major Terrorist Incidents 1970 - 2002

Table 11: Major Terrorist Targets

S/No	Target	Frequency	%
1.	Transport facility	17	34
2.	High rise/large building	9	18
3.	Embassy.	6	12
4.	Places of worship	4	8
5.	Military/Police	2	4
6.	Restaurant	2	4
7.	Night Club	2	4
8.	Bank	1	2
9.	Court	1	2
10.	Tourist Camp	1	2
11.	Theatre	1	2
12.	Others	4	8
	TOTAL	50	100

Source: Computed from data

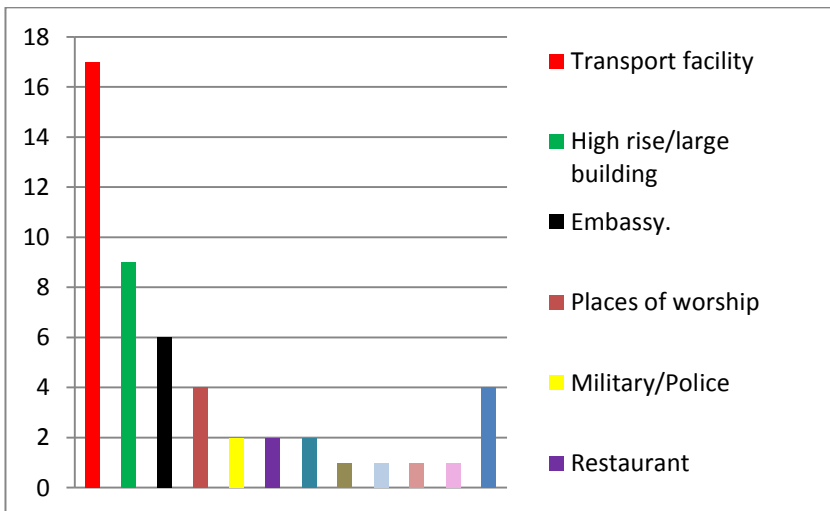


Fig.10: Major Terrorist Targets

Table 12: Mode of Operation

S/N.	Mode	Frequency	%.	Killed	Injured
1.	Plant bomb	18	32.14		
2.	Aircraft/Truck/Car bomb	15	26.79	6567	9153
3.	Hostage	8	14.29		
4.	Shooting	4	7.14		
5.	Gassing	3	5.36		
6.	Assassination	3	5.36		
7.	Hijack	3	5.36		
TOTAL		56	96.44	7971	15,167

Source: Computed from data

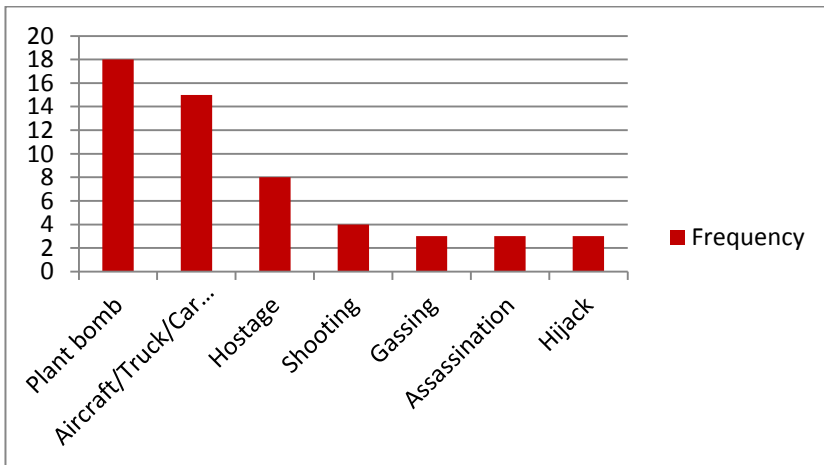


Fig. 11: Mode of Operation

4.3 Terror Attacks and the Transportation of Terror in Nigeria

Mr. Vice Chancellor sir, permit me to state that terror attacks are not new in Nigeria's terror-checked history. Since independence the country has gone through several regimes of terror attacks. Below is a list of major incidents since 1960.

Table 13a Major Terror Attacks in Nigeria 1960 – 2012

S/No	Period	Name	Geographical location
1	1963/64	Operation Wetie	South West
2	1965	Tiv Land Uprising	North Central
3	1966	Northern Revolt	North
4	1968/69	Agbekoya Peasants Crisis	South West
5	1980	Maitasine Crisis	North East
6	1989	Odua People's Congress (OPC)	South West
7	2001	Niger Delta Militancy *	South South
8	2011	Boko Haram	North East

Sources: Several

* see Ikporukpo (2007)

The table shows that geographically the North West and the South East have not experienced this type of terror. Why?

The present unprecedented reign of terror in the Northern parts of the country in particular and by extension Nigeria in general, started in the north-east in January 2011 after the killing of Mohammed Yusuf while in custody. That January attack resulted in the killing of four people. Since then, Mr. Vice Chancellor, the violence has not only escalated in terms frequency but also in terms of intensity. Like the proverbial bird on the line (rope), both Nigeria and Boko Haram have not known peace ever since.

Since 2010 more than 1400 people have been killed in brutal terror attacks across central and northern Nigeria, according to statistics released by Human Right Watch (Ori 2012). This includes more than 250 deaths in January 2012 and more than 660 deaths between January

and July 2012. The table below (Table 13b) shows the terror incidents in Nigeria between September 2010 and June 2012.

5.2.1 Spatial Pattern

A total of thirty-three terror incidents were recorded within the period under study. The locations were generally as varied as the number of incidents. However some states recorded a significantly higher incidents than others. They include: Yobe, Borno, Yobe, Adamawa, Kaduna Borno, and Kaduna States (see Table 13).

Table 13 and Fig.12 show that within the 22 months period Borno State recorded the highest number of attacks accounting for almost 24 percent of the attacks. In fact the four states of Borno, Yobe, Adamawa and Kaduna accounted for almost 60 percent of all the reported attacks in the Northern parts of Nigeria. However Kano State recorded the highest number of fatalities, and the highest incident-fatality ratio of almost 100 person killed per terror attack.

Table 12: Some Terror Attacks in Nigeria December 2011 – January 2012

S/No	Date	Location	Target	Modus Operandi	Casualty
1	2010 Sept 7	Bauchi	Prison	Prison Break	-
2.	2010 Dec. 31	Abuja	Barracks	Bombing	• Killed 4, Injured 26
3.	2011 April 22	Yola (Adamawa)	Prison	Prison Break	-
4.	2011 May 29	• Abuja • Bauchi • Zaria • Maiduguri	• Market • Market (Brigade Hq) • Military vehicle	• Bombing • Bombing • Bombing • Bombing	• Killed 2, injured 11 • Killed 13, Injured 40 • Killed none, Injured 4 -
5.	2011 June 26	Maiduguri	Beer garden	Bombing	• Killed 25, Injured 12
6.	2011 July 10	Suleja	Church	Bombing	• Killed many
7.	2011 Aug. 26	Abuja	UN Building	Car/Suicide Bombing	• Killed 21, Injured 60
8.	2011 Nov. 4	• Damaturu • Maiduguri	• Police station • Churches, • Banks	• Car bombing • Shooting • Suicide	• >100 killed
9.	2011, Dec. 4	• Azare, Bauchi State • Maiduguri, Borno State	• Police station • Church • Banks	• Bomb and gun attack on police building and two banks. • and at a wedding	• 3 killed (soldier, policemen and civilian) many injured • 2 killed
10.	2011, Dec. 7	Oriyapata area, Kaduna City	n.a	• Bomb explosion	• 8 killed, many injured
11	2011, Dec. 13	Maiduguri	Military check pt	• A bomb attack at military check point	• 10 kill 30 injured
12	2011 Dec. 17	• Darmanawa area, Kano State • Maiduguri	-	• Shootout between sect and policemen. • Accidental explosion while assembling a HMB*.	• 7 killed (3 police officers) 14 arrested • 3 killed
13	2011 Dec. 19	Damaturu	-	Accidental explosion while assembling HMB*	• 1 killed 2 injured
14	2011, Dec. 22	• Maiduguri • Potiskum, Yobe State • Damaturu (Pompomar i outskirts	n.a	• Bombs • Bomb and gun attack • Bomb and shooting	• 20 killed • 5 killed (4 policemen) • 100 killed
15	2011 Dec. 25	• Madalla, Abuja • Damaturu	• Church • Military convoy	• Bomb attack on St Theresa Catholic Church	• 42 killed Many injured • 4 killed (3 SSS)

		<ul style="list-style-type: none"> • Jos (Ray Field) • Gadaka 	<ul style="list-style-type: none"> • Church 	<ul style="list-style-type: none"> • Bomb-laden CAR rammed into military convoy 	<ul style="list-style-type: none"> • 1 killed (policemen)
16	2011 Dec. 28	Mubi, Adamawa State	Pub.	<ul style="list-style-type: none"> • Botched bomb attack on church Bombing & shooting at drinking place	15 killed
17	2011 Dec. 30	Maiduguri	<ul style="list-style-type: none"> • Military check pt 	Bomb and shooting attack at military check point	4 killed
18	2012 Jan. 3	• Biornwa Jigawa	Police station	<ul style="list-style-type: none"> • Police Station attacked 	<ul style="list-style-type: none"> • 1 killed • 1 injured
19	2012 Jan 5	<ul style="list-style-type: none"> • Gombe City • Mubi 	Church	<ul style="list-style-type: none"> • Gun attack at Church • Gun attack at Hotel 	<ul style="list-style-type: none"> • 6 killed 10 injured • 5 killed, many injured
20	2012 Jan. 6	<ul style="list-style-type: none"> • Yola • Mubi, Adamawa 	<ul style="list-style-type: none"> • Church • Church 	<ul style="list-style-type: none"> • Shootout at Church • Shootout at mourners 	<ul style="list-style-type: none"> • 8 killed, many injured • 17 killed, many injured
21	2012 Jan. 7	Biu, Borno State	Pub.	Shootout at a relaxation place	<ul style="list-style-type: none"> • 3 killed 7 injured
22	2012 Jan. 9	Biu, Borno State	n.a	Shootout	2 killed
23	2012 Jan. 10	Damaturu, Yobe State	Public	Attack at beer garden	8 killed (including 5 policemen)
24	2012 Jan. 11	Potiskum, Yobe State	Petrol station	Shot at car at petrol station	4 killed
25	2012 Jan. 13	<ul style="list-style-type: none"> • Yola, Adamawa State • Gombe City, Gombe State 	<ul style="list-style-type: none"> • Public • Public 	Attack on pubs	<ul style="list-style-type: none"> 4 killed 2 injured
26	2012 Jan. 17	Maiduguri	Military check point	Attack on military checkpoint	6 killed (including 4 BH gunmen)
27	2012 Jan. 20	Kano	<ul style="list-style-type: none"> • Police station • SSS office 	<ul style="list-style-type: none"> • Shooting 	185 killed, > 57 Injured
28	2012 Jan. 22	Kano	n.a	Multiple bombings	> 200 killed
29	2012 Jan 24	Kano	n.a	Shooting	2 killed (BH members)
30.	2012 Feb 8	Kaduna	• Army HQ	• Car/suicide Bombing	1 killed
31	2012 Feb. 16	Kaduna	• Prison	• Prison Break	-

32	2012 June 3	Bauchi	Church	• Bombing	15 killed
33	2012 June 17	Kaduna	• 3 Churches	• Bombing	> 50

* HMB is Homemade Bomb

Source: The Nation, 2012 “Some recent attacks in Nigeria” Tuesday August 7, 2012
p.4 en.wikipedia.org/wiki/Boko_Haram

Table 13: The Geography of terror attacks in Nigeria (Sept. 2012 – June 2012)

S/No	State	Frequency %	No. Killed	Average
1	Borno State (Maiduguri 8, Bui,2)	10 (23.81)	172	17.2
2	Yobe State (Potiskum 2, Damaturu,3)	5 (11.90)	121	24.2
3	Adamawa State (Mubi 2 and Yola 3)	5 (11.90)	51	10.2
4	Kaduna State (Kaduna 4, Zaria 1)	5 (11.90)	59	12
5	FCT Abuja	4 (9.52)	69	17.4
6	Kano State (Kano,4)	4 (9.52)	394	98.8
7	Bauchi State (Bauchi 3, Azare 1)	4 (9.52)	31	8
8	Gombe State (Gombe 2)	2 (4.75)	6	3
9	Jigawa State (Jigawa, 1)	1 (2.38)	-	-
10	Plateau State (Jos 1)	1 (2.38)	n.a	-
11	Niger (Suleja 1)	1 (2.38)	n.a	-
Total		42 100		

Computed from data

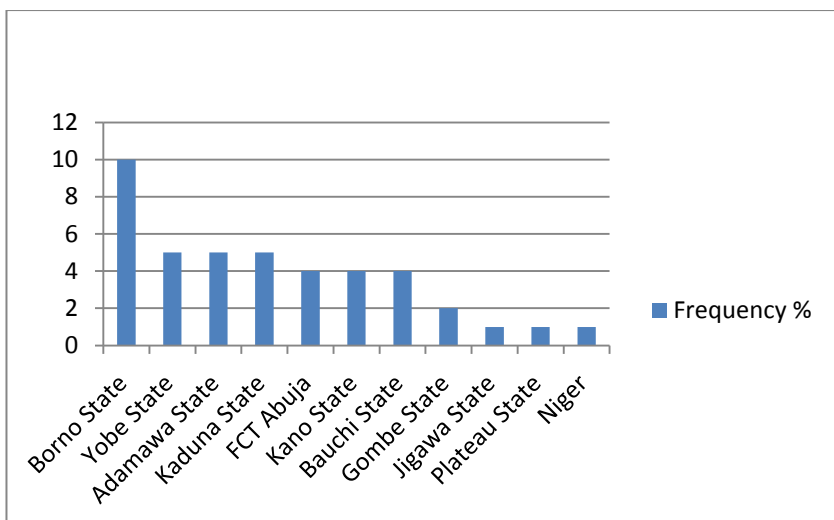


Fig.12: Geography of terror attacks in Nigeria (Sept. 2010 - June 2012)

4.3.1 Targets of Terror Attack in Nigeria

With regards to the targets of the attackers, Table 14 shows that three locations were the main targets. These include:

- Police station/check points (including JTF)
- Hotels / Pubs
- Churches

These three targets accounted for 76.67 percent of the attacks and almost 100 percent of the fatalities, thus making them very effective in achieving the intended terror effects.

Table 14: Targets of Terror Attacks in Nigeria

S/No	Target	Frequency	%
1	Military/Police	9	30.0
2	Church	8	26.67
3	Hotel/Pub	6	20.0
4	Bank	2	6.67
5	Prison	2	6.67
6	Market	2	6.67
7	Embassy (UN)	1	3.33
Total			100.00

Computed from Data

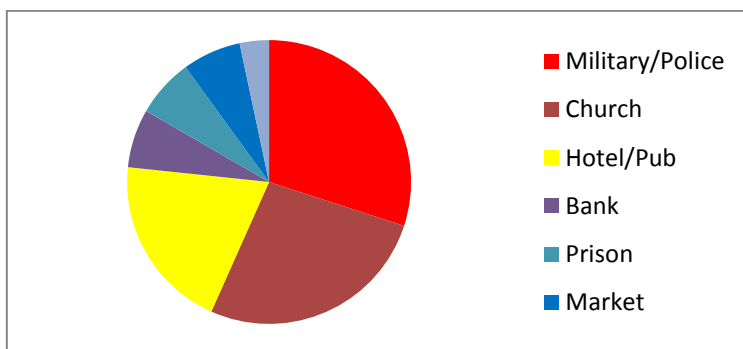


Fig: 13: Targets of Terror Attacks in Nigeria

4.3.2 Mode of Operation

Due to the nature of data on terror, it was difficult segregating the data into specific bombing, type: consequently this analysis shall consider all bombings together. Table below shows that bombing and shooting seem to be the main methods of terror attack. Both methods accounted for 95.40 percent of the terror incidents.

Table 15: Mode of Operation

S/No	Method	Frequency	%	No Killed
1	Shooting	26	50.00	270
2	Bombing (Incl. Car/truck Bomb)	22	42.29	639
3	Assassination	1	1.92	1
4	Prison Break	3	5.77	-
Total		52	100	909

4.3.3 Why Transportation of Terror?

An important feature in many of the terror attacks is the use of transportation modes either as the bombs, (the use of bomb-laden vehicles) or most recently in Nigeria, the use of motorbikes to access and toss explosives at the targets (Michael, 2012). This is the transportation of terror. It is thus obvious that transportation facilitate terrorism either by being used as the weapon or used to facilitate the terror.

Consequently, to check terror attacks, one way is to curtail movements. This probably explains why curfews are usually imposed and police/military check points mounted at strategic points in areas where there are massive attacks. For instance, in July 2012, an attack on one of the churches in Okene, Kogi State, was repelled by security operatives who stopped an explosive laden vehicle parked by the road side. The success of police/military checkpoint as a strategy may have prompted the shift by the terrorists to the use of motorbikes for terror attacks in recent times. Motorbikes have proved very effective in surprise terror attacks and quick getaway from the scene. It is thus imperative to review the policy on the use of motor bikes in terror-attack prone areas. As a first step, should government restrain the use of motor bikes to the rider only? In other words, no passenger(s) is carried on motor bikes? Should

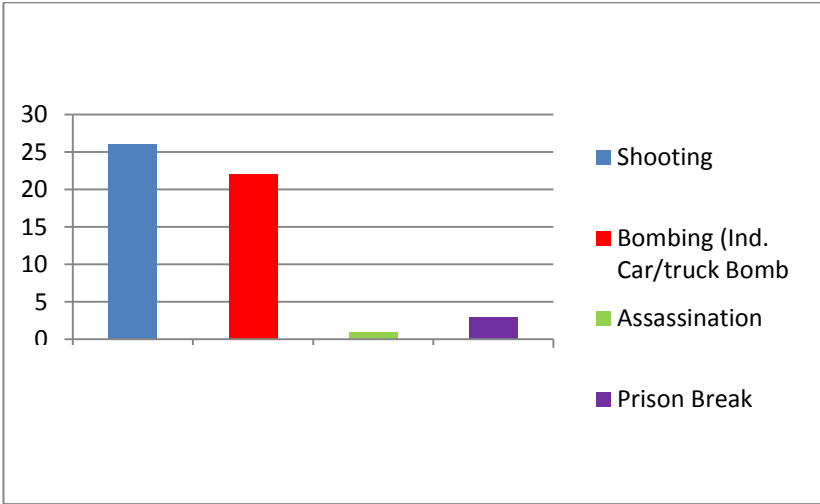


Fig. 14: Mode of Operation

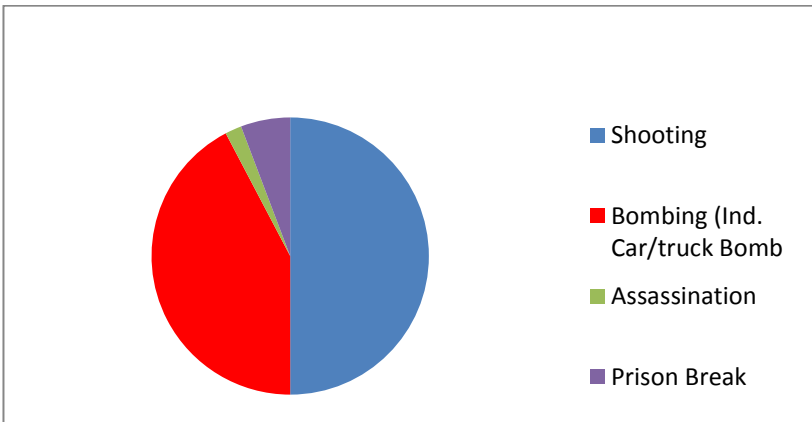


Fig. 14: Mode of Operation

government ban the importation and use of certain categories of motor bikes? Or as a last resort, temporarily place a complete ban on the use of motorcycles in the affected areas? This has worked *has not been most effective for a total ban on motorbikes in the city of Maiduguri did not*

deter the militants, as they now use unmarked cars to carry out their deadly operations (www.momentng.com 20/9/12). However the lull in suicide bombings may be due to lack of vehicles for suicide bombings operations. This is predicated on the fact that on the 6th of August 2012, the Nation newspaper reported that the JTF in Maiduguri alerted the public to the plan of the terror sect to undertake massive snatching of vehicles in Maiduguri and environs which they will later use for suicide missions. The vehicles according to the task force would be laden with explosives and used to bomb strategic locations and cause breach of the peace in the town. JTF thus urged those whose vehicles have been stolen to immediately report the theft to the nearest police station or JTF. The task force however warned that anyone who failed to report and his/her vehicles is used as a courier of bombs would be treated as accomplice of the sect”

4.3.4 The Way Forward

It is a truism that terrorist apparently want to pass a strong message to leaders but as observed by many researchers there often seems to be no connection between their reason and the target. The targets are usually ordinary people, the policemen, soldiers or civilians. They are people who have nothing to do with the terrorists determined cause. Could this be true of the Nigerian situation? Terrorism is said to be a manifestation and not a cause. According to Shimoff quoted in Watch Tower (2001) the long term goal should be to eliminate the underlying social and political causes of terrorism by ensuring freedom, dignity, justice and humanitarian values and it is only when these are effective, shall we be able to dismantle our counter – terrorism and anti-terrorism operations.

V

5.0 Conclusion

The safety of lives and property is a sine quanon for continued existence of any socio-economic system. The transport sector is one where this affirmation cannot be over-emphasized. The importance of transport has been stressed but permit me Mr. Vice Chancellor, sir, to note that no

nation can be more developed than its transport sector. In fact the nature or level of development of the transport sector is a measure of the level of development of that country.

To achieve an efficient and effective transport system in an economy, huge investments in human and material resources are involved. But due to mismanagement and misappropriation, the transport sector in Nigeria is highly under developed and more prone to accidents/crashes. Transport infrastructure are usually subjected to occasional damages or losses resulting from various ecological, structural, mechanical and human factors associated with the socio-economic system.

Past governments in Nigeria have consistently neglected and undermined the development of the transport sector especially as it concerns safety and security. Consequently, a good proportion of the country's scarce resources, including human resource have been wasted. The totality of these incidents in the entire transport sector is alarming. It is pertinent to note at this point that the prevailing unhealthy economic environment in the country today has certainly placed fewer resources at the disposal of government thus the need to ensure that our transport infrastructure, lives and property are adequately protected in terms of safety and security. The importance of road safety cannot be over-emphasized. This is because the problem once thought of as belonging to the industrial world is here with us. As a matter of fact the issue of traffic safety especially on the road has taken a global dimension. Nigeria with a very damning road safety record cannot be left out.

The sad situation of road traffic accidents/crashes in Nigeria has been painted in earlier sections of the lecture. It is now time to proffer solutions. In view of the fact that human factors are responsible for a great percentage of road traffic crashes in Nigeria, this lecture is of the view that road safety measures must be aimed at the drivers/pilots/captains of motor vehicle, cyclists and pedestrians. This lecture hereby recommends that for effective traffic safety management, the following are necessary:

Adequate Funding for Transport Safety

My research tells me that only very limited resources are made available for road safety works in Nigeria. There is therefore need to adequately fund the Federal Road Safety Corps and the Nigerian Police Force as a way of strengthening these institutions so as to be able to tackle the complex problem of traffic safety. Efforts to increase safety on our roads must be based on good and efficient data collection, storage and retrieval methods. Consequently, data and statistics of road accidents/crashes are therefore essential and necessary requirements.

On Transport and Environment

There is need to implement the Kyoto agreement as far a carbon emission reduction is concerned in the transport sector. As a developing country this could be difficult given our low level of technological advancement and poverty. *Eco driving and smarter choices/soft measures* (Cairretal 2004) should therefore be encouraged.

Aspect of eco-driving include:

- Accelerating gently, keeping speed constant and changing gear at the optional time
- Adhering to speed limits
- Limiting the use of air conditioning
- Reducing drag by driving with the window and empty roof racks removed
- Avoid idling the engine
- Not warming the engine up before starting off
- Ensuring the tyres are filled to the optimum pressure
- Shedding excess weight from the car
- Keeping a safe distance from the car in front

Source: Commission for Integrated Transport 2007

Smarter Choices/Soft Measures

- Workplace travel plans
- School travel plans
- Personalized travel planning
- Public transport information and marketing
- Travel awareness campaigns
- Car clubs

- Car shaming
- Tele working
- Teleconferencing
- Home shopping

Source: Cairns et al 2004.

On Terror

Mr Vice Chancellor Sir, please permit me to draw down this lecture with part of the address of His Imperial Majesty Haile Selassie in his address to the United Nations on October 4th 1963, as the then founding Chairman of the then Organization of African Unity (OAU), now AFRICAN UNION,...

*..that until the philosophy that holds one race superior and another inferior is finally and permanently discredited and abandoned;
that until there are no longer first class and second class citizens of any nation;
that until the color of a man's skin of no significance than the color of his eyes;
that until the basic human rights are equally guaranteed to all without regards to race; that until that day, the dream of lasting peace and world citizenship and the rule of international morality will remain fleeting illusions to be pursued but never attain. ...
until bigotry and prejudice and malicious and inhuman self-interest have been replaced by understanding and tolerance and goodwill;
until all Africans stand and speak as free beings, equal in the eyes of all men, as they are in the eyes of Heaven; until that day, the African continent will not know peace.*

Until... Until... Until.....

THANK YOU ALL FOR LISTENING.

REFERENCES

- Adedokun, A 2001 “Nigeria lost N4.4bn to pipeline Vandalisation in six months “*The PUNCH* Lagos Nigeria Thursday July 26 p.7.
- Akpoghomeh O.S. 1999: *The Development of Air Transportation in Nigeria. Journal of Transport Geography*, 1999.pp. 135 – 146.
- Akpoghomeh O.S. 2000 Recent trends in Road Traffic Accident Parameters in Nigeria. *Annals of the Social Science Academy of Nigeria*. January – December 2000, No. 12
- Akpoghomeh, O.S. 2000 “River craft Accidents and Safety in the Eastern Niger Delta Region of Nigeria” *Nigerian Geographical Journal New Series* Vol.3 & 4. Pp.132 – 147.
- Akpoghomeh, O. S. 1996 *Roadsense*. A Board Game on Road Safety Patent and Design certificate No. 5488 of 1997. Trade Mark and Registration No. TP 29269 of 1996
- Akpoghomeh, O. S. 2003 *Understanding the Rules of the Road* Transport Study Group, Department of Geography and Environmental Management, UNIPORT..
- Akpoghomeh O.S. 2003: *Transport – Development, Analysis and Planning*. Emhai Press, Phc.

- Akpoghomeh, O.S. 1984: *Air Transport in Nigeria: A Geographical Analysis*. Unpublished M.Sc. Thesis. Dept. of Geography, University of Ibadan.
- Akpoghomeh, O.S. and G. Emenike 2003. *Constraints on Drunken Driving Management in Nigeria*. Monograph Series No. 2. Transport Study Group, Department of Geography & Environmental Management, University of Port Harcourt, Port Harcourt.
- Akpoghomeh, Osi S. 1995 “The Development of Air Transportation in Nigeria 1936 – 1987.” *The Nigerian Geographical Journal*. New Series Vol. 2 pp. 50-63.
- Akpoghomeh, Osi S. 2011 “Exacerbating Factors and Actual Causes of Traffic Accidents”. Paper delivered at FRSC Regional Conference Port Harcourt 2011.
- Akpoghomeh, Osi S. 1998 “Temporal Variations in Traffic Accident Parameters in the Port Harcourt Metropolis” *Journal of Transport Studies* Vol. 2 pp. 16-37.
- Allstate 1996 *Drunken Driving Facts*. Allstate Insurance Co. Northbrook II.
- Allstate 1997 *Drunken Driving* Allstate Insurance Co. Northbrook II.
- Anon, E.W. 1785: *Aviation Fatalities* (Chicago).
- Blair, T.A. and R.C. Fite 1965: *Weather Elements – A Test in Elementary Meteorology*. Prentice-Hall, New Jersey.
- Barnaby, F. 2007 *The Future of Terror*. Granta Books. London.
- Cahill, M. 2011 *Transport, Environment and Society* McGraw Hill, England.

CIA World Fact book 2011 Guide to Country Comparisons.
<https://www.cia.gov/library/publications/the-world-factbook/rankorder/rankorderguide.intnl> (Assessed 23/02/12).

CIA World Fact book.

en.wikipedia.org/wiki/traffic-collision “Road Traffic Deaths Index 2009 Country Rankings Retrieved 2010-02-02. Accessed on on 15/07/2012.

Federal Road Safety Commission 1989. *The Revised Highway Code* Federal Republic of Nigeria, Abuja.

Federal Road Safety Commission 2012 News Bulletin 2012. [http://Road Traffic Crashes Leading Causes of Death among Youth People. FRSC Abuja.](http://RoadTrafficCrashesLeadingCausesofDeathamongYouthPeople.FRSCAbuja)

Federal Road Safety Corps (2012) Annual Report 2011. Abuja: FRSC.

Flight International (1992). *The Error that could happen. November, 4 – 10.*

Filani, M.O 2000 “Transport and the Environment” *Nigerian Geographical Journal* New Series Vol. 3 & 4 pp. 15 – 28.

Filani, M.O. 1988 *Mobility and Survival: A Nation’s Dilema.* A Inaugural Lecture. University of Ibadan.

Ibanga, N. (2001) “War on Pipelines Vandalization” *THISDAY* Lagos, Nigeria. Tuesday, February 13.p.22.

International Monetary Fund (2011) *World Economic Out-Look: Slowing Growth, Rising risks.* Washington: IMF.

Ikporukpo C.O 2007 *The Niger Delta: The Geography of Terrorism and the Terror of Geography* A lecture to mark the retirement of Prof. M.O. Filani. Dept. of Geography University of Ibadan.

- Ikporukpo, C. O. 2002 *Spatial Engineering and Accessibility*. Inaugural Lecture. University of Ibadan
- Maunder, W.J. 1970: *The Value of Weather*, Methuen London. Ministry of Supply, Canada 1987.
- Michael, Ekenyerengozu 2012 ‘Sundays No Longer Safe in Lagos’ *THE GUARDIAN*, Sunday August 26.
- National Highway Traffic Safety Administration 1997.
Nigerian Tide 1993 “*Increase in Traffic Accidents.*” April 4th.
- Onakomaiya, S. O. 1988 *Unsafe at any Speed* (Towards Road Transportation for Survival) Inaugural Lecture, University of Ilorin.
- Onakomaiya S.O 1991. “General Trend of Safety and Accident Records in Nigerian Transport Sector” in Bolade T. and A. Ogunsanya (eds) *Accident Control and Safety Measures in Mass Transit Operations in Nigeria* Ibadan University. Press pp. 11 – 22.
- Onakomaiya, O.S. 1977 “Understanding Road Traffic Accidents in Nigeria: Some preliminary Findings and Research Needs” in Onakomaiya S.O. and N.F. Ekanem eds. *Transportation in Nigeria National Development*. NISER. Pp.445 – 489.
- Onakomaiya, S.O. 1992 *Towards Effective Road Safety Research and Action Programmes*. Paper presented at Abuja International Conference on Road Safety Experience and Practice in Africa. NICON-NOGA, Abuja. 26th -29th October.
- Oman, Al-Hinai 2005 United Nations General Assembly Verbotin Report Meeting 38, Session 60 p6, on 26 October 2005 (Retrieved 2008-07-09 accessed on en.wikipedia.org/wik/traffic-collision 15/07/2012.

Ori, Konye Obaji 2012 “Boko Haram and Nigeria: Attacks and Revenge Attacks Quagmire”
www.theafricareport.com/index.php/news Posted on Monday
13th August 2012. 16:25.

Oyesiku, O. O. 2002 *From Womb to TOMB*. Inaugural Lecture. Olabisi Onabanjo University, Ago-Iwoye.

Sangers, Tom 2009 The Common Causes of Road Traffic Accidents.
<http://EzineArticles.com>.

Subsaharan Africa Transport Policy Program (2012). *Scaling-up Efforts to address the Road Safety Challenge* Article 5 in SSATP Newsletter No 9 April 2012.

Sunday Independent, Jan 1, 2006 “*Sosoliso Plane Crash: Port Harcourt Airport Poorly Equipped*.” Jan 1, p. A3.

Sunday Punch, January 1, 2006 “*The aviation Nightmare*” p.51.

The 9/11 Commission Report. *Final Report of the National Commission on the Terrorists Attack upon the United States*. Norton. New York, London.

Tell Magazine 2005 *Flying With One Wing* No.45 November 7.

The Africa Report (2011) *Road Traffic Accidents Cost Africa US and 10 billion*. Posted on Thursday 10 November 2011 16:58.www.theafricareport.com.

The Day 2006 “*Another plane crash averted in Lagos*” March 19, Vol.3. No. 3984. Page 1 and 4.

The Punch, 2005 “*Crashed Plane was 27yrs old*” December 13, Vol.17. No 19. Page 14.

The Punch, (2005) p.35 “*Mapping Out a New Order for Air Operations*” Dec. 15th

- Transport Canada 1987a *Smashed*. Ministry of Supply and Services, Ontario, Canada.
- Transport Canada 1987b *How Safe can you be?* Ministry of Supply and Services, Ontario, Canada.
- Ugwuanyi, E. (2001) “NNPC Records N4.4bn loss to Vandalization” *Vanguard* Lagos, Nigeria. February 20, p.17.
- United National 2003 General Assembly Verbotim Report Meeting 86 Session 57 *Global Road Safety Crisis* p2 on 22nd May 2003 accessed on en.wikipedia.org/wiki/traffic-collision on 15/07/2012.
- Vanguard, 2005 “*What Next, after a Week of Double Tragedy*”.November 6, pg.3.
- Vanguard 2005 “*NEMA blames crash on Bellview*” by Emmanuel Aziken. October 27, Vol. 21,p 1.
- WHO 2004 *WHO Disease and injury estimates* WHO Retrieved November 11, 2009 Accessed on en.wikipedia.org/wiki/traffic-collision on 15/07/2012.
- World Health Organization (WHO) 2007 “Estimated Traffic Death”.
- World Health Organization (WHO) 2007 “Road Traffic Crash Report”.
- World Health Organization (WHO) 2007 Youth and Road Safety. World health Organization.
- World Bank Document on Lagos Urban Transport Project (2002).
- World Health Org. 2010 *Global Status on Road Safety* 2009 [en.wikipedia.org/wiki/Traffic Collision](http://en.wikipedia.org/wiki/Traffic_Collision). Accessed on 15/07/2012.

World Health Organization (2004) *World Report on Road Traffic Injury and Prevention*. Summary Geneva:

Watch Town 2001 “Terrorism Gets a New Look” Awake May 22 P. Benin City.

World Health Organization (2007) Conference Report: in Proceedings of the Africa Road Safety Conference Report. Accra, Ghana 5-7 February 2007 accessible online at http://www.who.int/roadsafety/events/4arsc/accra_report.pdf.

www.momentng.com/en/news/3133 posted and updated 20/09/12
www.terrorism-reseach.com

CITATION ON
PROFESSOR OSIGBEMEH OSI SOLO APKOGHOMEH
B.Sc., M.Sc., Ph.D. (Ibadan) CMILT, MANG



On the 23rd of July 1954 a baby boy came tumbling out to register his presence in the family of Mr. Daniel Akpoghomeh and Mrs. Mary Akpoghomeh who both hail from Igiode, Agenebode, in modern day Edo State. The child was promptly named Osigbeme - *God is with me*.

Professor Osigbeme Osi Solo Akpoghomeh had his primary school education in Uyo, in modern day Akwa-Ibom State. He attended Annunciation Catholic College, Irrua, from 1968 to 1972 where he obtained the West African School Certificate. He completed the Higher School Education in Edo College, Benin City, from 1973 to 1975. In 1977, he proceeded to the University of Ibadan where he obtained the Bachelor of Science degree in Geography in 1981. In his quest for further education, Professor Osigbeme Osi Akpoghomeh enrolled for the Master of Science degree in 1983 and specializing in Transport Geography as he completed the programme in 1984. As a result of his undying passion for educational exploits, he registered for the Doctor of Philosophy degree programme in the same area of specialization, Transport Geography, and in the same University, the prestigious University of Ibadan in 1984. He completed this programme in 1989.

Upon graduation in 1989, the alluring qualifications of Professor Osi Akpoghomeh, endeared him to the Unique University of Port

Harcourt, an institution with the propensity for employing top flight specialists in diverse academic disciplines. Indeed, Professor Osi Akpoghomeh proved his mettle by asserting himself as a consummate cross-spectrum teacher. In this regard, he produced veritable palimpsests by etching the overwritten manuscript legibly on the young impressionable minds the University assigned him for tuition.

The publications of this venerable intellectual which include six books, numerous monographs and over forty journal articles, chapters in books, creative works and technical reports bear eloquent testimony. He has attended several conferences, workshops and seminars. It cannot come as a surprise, therefore, that Professor Akpoghomeh, having distinguished himself, has relished steady promotion over the years in the University of Port Harcourt. Employed in December 1989 as Lecturer II, he was promoted to the rank of Lecturer I in October, 1994; Senior Lecturer in October, 1998 and Professor in March, 2006.

Professor Osigbeme Akpoghomeh, on account of his achievements, has enjoyed the privilege of being invited to serve as consultant by numerous organizations which include United Nations Development Programmes (UNDP), Niger Delta Development Commission (NDDC), Power Holden Company of Nigeria (PHCN), DAR AL-HANDASAH (UK)/UPTONVILLE (Nigeria), and Shell Petroleum Development Company (SPDC). In a parallel vein, Professor Osigbeme Akpoghomeh has served as external examiner in various Universities both at the undergraduate and graduate studies levels. These Universities include Federal University of Technology, Owerri; University of Uyo, Uyo, Olabisi Onabanjo University, Ago-Iwoye in Ogun State, University of Calabar, University of Ibadan.

Vice Chancellor, Sir, here is Professor Osigbeme Akpoghomeh, a man who has been fascinated, and yet, intrigued by MOVEMENT – movement within the earth’s four component systems: the lithosphere (rocky exterior), the hydrosphere (waters of the earth), the atmosphere (air), and the biosphere (the system of living things). His fascination with the movement of living things, particularly human beings, from one destination to the other is complete and irresistibly profound. This is in tandem with the manner his father sojourned from Agenebode to Ahoada (Rivers State), Aba (Imo State) and then to Uyo in Akwa Ibom State. He himself has improved on this impressive family record of

being adventurous by moving to Irrua and Benin for his secondary school education and then to Ibadan for his University education. Professor Osigbeme Akpoghomeh has had to move to Abeokuta for the national youth service corps programme and then move again to Port Harcourt in search of the Golden Fleece. Professor Akpoghomeh is a man whose circumstances of birth define him as ‘born curious’ and ‘born to move’. The consequence of this is that he has a mind that is naturally predisposed to inquiry, inquiry being the magnificent elixir of research.

As water runs from Texas, extending through the rocky mountain states to the pacific coast thereby producing a most spectacular scenery by forming canyons on its path, so has our skilled cartographer, Professor Osigbeme Akpoghomeh, committed pen to paper to produce maps of uncharted territories. His active, eventful and productive career has produced such monumental publications of high utility value as *Street Map: Port Harcourt Metropolis and its Environs* and *Street Map: Warri/Effurun Metropolis and Environs*. These have since become collectors’ items to tourists who besiege these cities of high commercial importance.

Apart from being an upwardly mobile scholar, Professor Osigbeme Akpoghomeh has carried out numerous administrative functions diligently in the University of Port Harcourt which include serving as Dean, Faculty of Social Sciences, 2010-2012; Associate Dean, Student Affairs Department, 1994-97; Ag. Head, Department of Geography and Environmental Management, 2000-2002; President, Senior Staff Club 2007- 2009.

Outside the University of Port Harcourt and at various times, Professor Osigbeme Akpoghomeh is currently as Chairman, Chartered Institute of Logistics and Transport, Rivers/Bayelsa States Chapter, Member of Council, Association of Nigerian Geographers and Member, of Council, Chartered Institute of Logistics and Transport, Nigeria; National Secretary, International Geographical Union (IGU), Nigeria; Managing Editor, *Journal of Transport Development Initiatives*, Editor, *Port Harcourt Journal of Social Sciences*; Editor, *Ikogho*, a multi-disciplinary journal. He has served as Editor, *Nigerian Geographical Journal*, Chairman of the Port Harcourt Branch of Annunciation Catholic College, Irrua, Old Boys Association USAGBE Club of

Nigeria from 2006 to 2007 and Chairman of the Port Harcourt Branch of the same social club from 2011 till date. He was Chairman, Harvest Planning Committee of the Chapel of Annunciation Catholic Chaplaincy Uniport in 2011.

Apart from being an upwardly mobile scholar, Professor Osigbeme Akpoghomeh is a member of various professional bodies and the list includes Chartered Institute of Logistics and Transport (CMILT), Nigeria; Nigerian Geographical Association; International Geographical Union, Nigeria; Environmental Behaviour Association of Nigeria, Lagos; Nigerian Environmental Study/Action Team, Ibadan. He was a Special Marshal, Federal Road Safety Commission, Rivers State Command, Port Harcourt in the 1990s.

Vice-Chancellor Sir, permit me to quote William Shakespeare who has observed in *Twelfth Night* that “Some are born great, some achieve greatness, and some have greatness thrust upon them”. Professor Osigbeme Akpoghomeh is an embodiment of all these as he was born great, has achieved greatness and has had greatness thrust upon him. This achiever par excellence has been revered and honoured by many and the list includes the Port Harcourt Branch of **Association Internationale des Étudiants en Sciences Économiques et Commerciales (AIESEC)**, the Port Harcourt Command of Man O’ War, Nelson Mandela Hall Management, and the Millennium *Most Outstanding Lecturer* award conferred on him by Nigerian Universities Geography Students Association (NUGSA) in 2000. In two consecutive years, 2005 and 2006, Professor Osigbeme Akpoghomeh was honoured by the University of Port Harcourt Chapter of the Nigerian Universities Geography and Environmental Management Students’ Association (NUGEMSA) with *Certificates of Excellence*. Just last month, the Nigerian Federation of Catholic Students Uniport honoured him as a deserving patron.

Vice-Chancellor, Sir, it is my privilege and honour to present to you an erudite scholar with highly developed cognitive, intellectual, communication, leadership and personal skills to deliver the 94th University of Port Harcourt Inaugural Lecture. Sir, I present to you this intellectual colossus with a developed capacity for grounded lateral thinking and a scholar who is accustomed to research and workshop settings as he is gifted with a flair for combining theoretical approaches

with definitively practical action. Vice Chancellor Sir, I present to you a roman catholic, a man of vision, integrity, transparency and honesty, an advocate and practitioner of transformational leadership, an indubitable pathfinder, Professor Osigbemeh Osi Solo Akpoghomeh.

Professor Emmanuel Emasealu