

Economic Effects of Bad Roads on Vehicle Maintenance in Nigeria

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Abstract- In Nigerian, most roads are in bad shapes leading to negative economic effects. One of the factors affecting vehicle maintenance is bad road network in Nigeria. The economic effects of bad road networks in Nigeria are studied. The estimated current total road network in Nigeria is about 194,000 kilometers. The analysis showed that about 19% of Nigerian roads are paved. All unpaved roads which is about 13% are bad roads. Both the paved and the unpaved roads in Nigeria are deteriorating by the day and has become a source of worry to all vehicle users. Annual losses (from vehicle maintenance), due to bad roads is valued at over N133.8billion. This is outside all other economic losses from bad roads in the areas of air Pollution, delayed movements, armed robbery and incessant accidents on the roads. Out of a total of 703 respondents, over 51 % had their cars damaged in a month due to bad roads in their areas. By extension, about 51% of vehicle users in Nigeria will experience one or more damages to the vehicles in a month. This should be of great concern to any serious government.

Index Terms- Bad roads, Vehicle Maintenance, Economic Effects, Losses.

I. INTRODUCTION

A road is a [thoroughfare](#), route, or way on land between two [places](#), which has been [paved](#) or otherwise improved to allow travel by some [conveyance](#), including a horse, cart, or [motor vehicle](#) (<https://en.wikipedia.org/wiki/Road>). Road could be referred to a facility that provide access for the movement of man, goods and services, animals with use of vehicles, motor bikes, horse, carts etc. between two locations. According to CBN (2003), current total road network in Nigeria is about 194,000 kilometers out of which about 17% belongs to the Federal Government (trunk 'A' roads), 16% belongs to the State Government (trunk 'B' roads), and while the remaining 67% are Local Government roads- trunk 'C' roads (see Table 1). World Fact Book of Central Intelligence Agency (2004) has it that out 193200km of total road network in Nigeria, 28,980 km are paved while 164,220 km are not. The unpaved are bad roads.

Nigeria has the status of a developing country where road facilities are grossly inadequate to cater for the teeming population of road users (Agbonkhese *et al.*, 2013). There are many potholes and detours on most Nigerian roads and this means that vehicles keep breaking down so that on many of Nigeria's roads emergency mechanics have sprung up to assist stranded commuters sometimes with disastrous consequences. Apart from disrupting the smooth flow of traffic, the dug up roads in the city are also adding to the financial burden on

citizens. Therefore, this study aims at analyzing the economic and social effects of bad roads in Nigeria and the extent of deterioration of Nigerian roads; the effects of poor investment in the maintenance of Nigerian roads. It also show the economic effects on the maintenance of vehicles used on Nigerian roads.

II. ROAD TRANSPORTATION

Roadways are the means of transportation on land. It not only includes the modern highway system, but also the city streets, feeder roads and village roads, catering for a wide range of vehicles and the pedestrians. Transportation by road is one of the best modes which can give maximum service to one and all. This mode of transportation has the maximum flexibility for travel with respect to route, direction, time and speed of travel etc (Gupta, 2009). The passengers and the goods have to be transported first by road before reaching a railway station or airport for further journey. Hence, according Singh (2008) it can be said that out of all types of transport systems, road is nearest to the man.

Many types of roads exist around the world, all of which are thoroughfares which can be used by motorized traffic. Different terms are used in different countries for broadly the same design, although there are differences.

- i. **Driveway:** Driveway is a type of private road for local access to one or a small group of structures, and is owned and maintained by an individual or group. Driveways rarely have traffic lights, but some that bear heavy traffic, especially those leading to commercial businesses and parks, do.
- ii. **Arterial Road:** An arterial road or arterial thoroughfare is a high-capacity urban road. The primary function of an arterial road is to deliver from collector roads to freeways or expressways and between urban centres at the highest level of service possible.
- iii. **Highway:** A highway is any public or other public way on land. It is used for major roads, but also includes other public roads and public tracks. It is not an equivalent term to freeway or a translation for autobahn, autoroute etc.
- iv. **Expressway:** This may refer to as a controlled-access highway, the highest grade type of highway with access ramps, lane dividers etc for high speed traffic.

- v. **Street:** A Street is a public thoroughfare (usually paved) in a built environment. It is a public parcel of land adjoining buildings in an urban context, on which people may freely assemble, interact and move about. A Street can be as simple as a level patch of dirt, but is more often paved with a hard, durable surface such as concrete, cobblestone or brick. Portions may also be smoothed with asphalt, embedded with rails, or otherwise prepared to accommodate non-pedestrian traffic (Wikipedia, 2014).

Most roads in Nigeria are poorly maintained. Figure 1 below shows the traffic situation in a typical Nigerian road.



Figure 1: A typical road traffic gridlock in Lagos, Nigeria

Source: Agbonkhese *et al.*, (2003)

Before passengers and goods get to the railway station, airport and seaports, they have to be transported through the road. Hence it can be said that the road is the nearest to all people among the systems of transportation. Characteristics of road are as follows:

- **Adaptability:** Different types of vehicles can be adapted to move on the roads. For example, bicycles, motor bikes, cars buses and trucks make use of the roads.

- **Initial Investment Cost.** The construction of roads is much cheaper than railway tracks, docks, harbors and airports.
- **Flexibility:** Road offers a complete freedom to road users to transfer their vehicles from one lane to another or from one road to another as per convenience and need of user. The flexibility of changes in direction, speed and timings of travel is not available in other modes of transportation. (Gupta, 2009)
- **Accident Rate:** It is subjected to a high degree of accidents due to the flexibility of movements offered to road users. The speed of movement is directly related with the degree of causality
- **Accessibility:** Road is the only mode transportation that offer easy accessibility to all communities alike. (Singh, 2008)

2.1 BENEFITS OF GOOD SYSTEM OF ROAD

- Road are essential for economic development of a country. For speedy transportation of commodities and quick movements, a good road network is essential.
- Good system of roads helps to save time considerably in all of our daily activities.
- Good system of roads serves as feeder line for other modes of transport and thus helps indirectly in their development.
- For the efficient defense of the country during wars, good system of roads is an essential.
- Good system of roads helps in the growth of trade and other economic activities all over the country.
- During emergency conditions like accident, the injured persons can be rushed immediately to hospital through good system of roads and have the life saved. (Singh, 2008).
- Improvement in the living standard of the people in that community
- Lower cost of maintenance of vehicles used on such roads

2.3 CAUSES OF BAD ROADS

Structural failure of roads is due to some or all of the following reasons carefully structured in the figure 2 below.

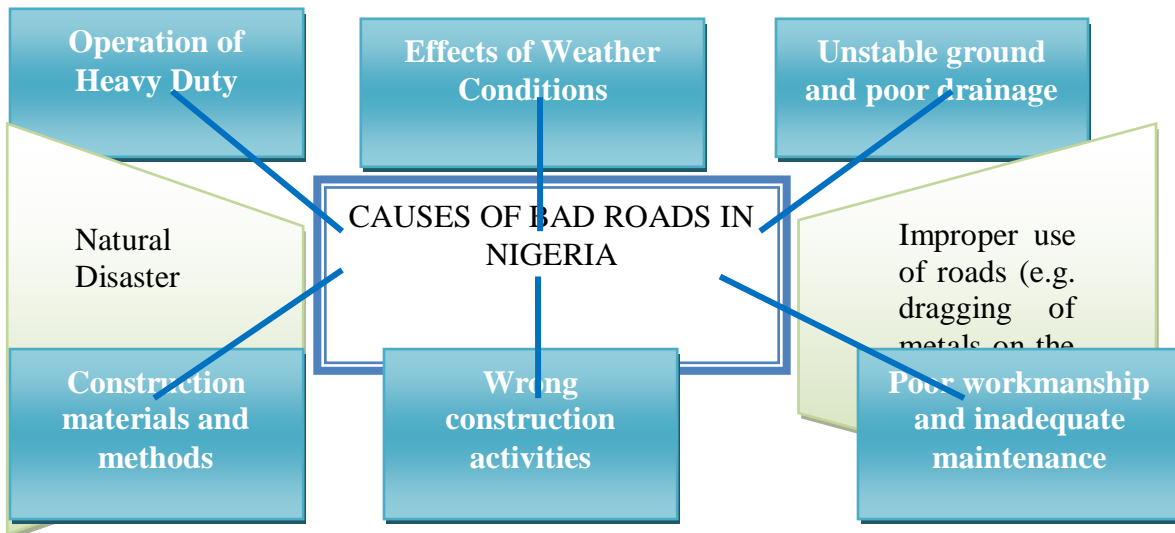


Figure 2: Causes of Bad roads in Nigeria

appropriate services, maintenance cost must be kept as low as possible.

The Total Cost (T_c) of maintenance comprises three parts which include:

- * Corrective maintenance cost (CMC)
- * Preventive maintenance cost (PMC)
- * Indirect maintenance cost (IMC)

Hence, the total cost of maintenance is given by:

$$\therefore T_c = CMC + PMC + IMC$$

The Indirect cost involves costs due to loss of production output through breakdown, extra cost of production due to badly maintained vehicle and defective output due to poor maintenance. (Enwerem G.C., 2005)

3.2 ROAD OWNERSHIP STRUCTURE IN NIGERIA

Road networks in Nigeria belong to the three tiers of Government: the Federal, State, and Local Government. This road ownership structure in Nigeria is shown in the chart below.

III. METHODOLOGY

A review of literature on effects of bad roads on vehicle maintenance in Nigeria and its impact was done. Data were collected from libraries, as well as online through internet search engines and relevant information extracted from other writer's report. Maintenance cost due to bad roads in Nigeria was considered as a factor during the research. For the purpose of analysis the data presented by Austin (2011) whose locational analysis covered some cities in the commercial hub of Nigeria (Lagos State), was also considered.

3.1 MAINTENANCE COST

Maintenance demands enormous resources of manpower and materials. Therefore, to remain in business, and render

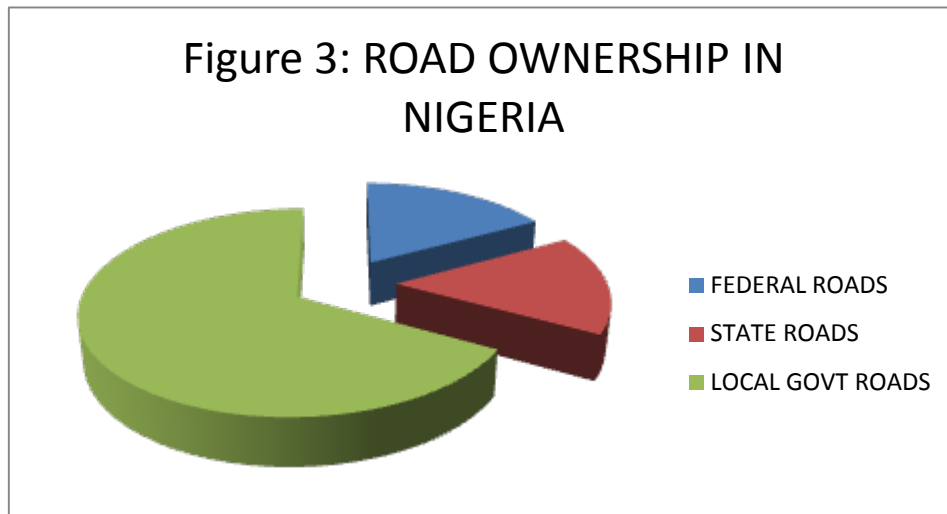


Table 1 below shows the state of the roads (Trunks A, B and C) in the different tiers of Government.

Table 1: Structure of road ownership

	Federal	State roads	L. G. Roads	Total	Percent
Paved main roads	26,500	10,400	-	36,900	19%
Unpaved main roads	5,600	20,100	-	25,700	13%
Urban roads	-	-	21,900	21,900	11%
Main rural roads	-	-	72,800	72,800	38%
Village Access Roads	-	-	35,900	35,900	19%
Total	32,100	30,500	130,600	193,200	100%
Percent	17%	16%	67%	100%	

Source: CBN, (2003)

IV. ANALYSIS

The growth of economic activities prompted the need, for improvement in roads. Consequent upon this, the quality of road constructions over the years has improved as the length and network continued to increase. According to CBN (2003), the estimated current total road network in Nigeria is about 194,000 kilometers. Only 19% of these roads are paved, while the rest are at different stages of dilapidation.

Bad roads exert wear and tier on the vehicles. Eight (8) cities in Lagos State were analysed and the effects of bad roads on vehicles plying the roads in such were presented by Austin (2011) in table 2 below.

Table 2: Effects of bad roads on vehicle maintenance

	Damage to car	Delay in movement	Robbery	Air pollution	Car accident	Total
Alimosho	67	28	1	0	0	96
	69.8%	29.2%	1.0%	0.0%	0.0%	100%

Apapa	30	20	0	0	0	50
	60.0%	40.0%	0.0%	0.0%	0.0%	100%
Eti-osa	50	40	2	1	1	97
	51.5%	44.3%	2.1%	1.1%	1.1%	100%
Ikeja	44	31	3	4	2	84
	52.4%	36.9%	3.6%	1.2%	3.6%	100%
Kosofe	34	42	3	1	3	83
	41.0%	50.6%	3.6%	1.2%	3.6%	100%
Shomolu	90	10	0	0	0	100
	90.0%	10.0%	0.0%	0.0%	0.0%	100%
Mushin	25	39	10	9	15	98
	25.5%	39.8%	10.2%	9.2%	15.3%	100%
Surulere	19	40	12	14	13	98
	19.4%	40.8%	12.2%	14.3%	13.3%	100%

Source: Austin, (2011)

Further analysis will give rise to table 3 below. Table 3 shows that more than half of the respondents (51.07%) have had specific damages done to their cars due to bad roads. By extension if one million (1,000,000) Nigerians own a car, over

500,000 cars will experience one damage or the other in a month due to bad roads.

Table 3. Effects from bad roads

	Bad road Effects	Number of respondents	% respondents
1	Damage to cars	359	51.07
2	Delay in movements	250	35.56
3	Robbery	31	4.41
4	Air Pollution	29	4.13
5	Accidents	34	4.83
	TOTAL	703	100

From CBN reports of 2003, the annual loss due to bad roads is valued at N80 billion, while additional vehicle operating cost resulting from bad roads is valued at N53.8 billion, bringing the total loss per annum to N133.8 billion. This is outside all other economic losses from bad roads in the area of Air Pollution, delayed movements, armed robbery and incessant accidents on the roads.

V. CONCLUSION

Most Nigerian roads are in bad shapes leading to negative economic effects. The total economic effects of such bad roads to the nation, the health of the citizens, operation of businesses, safety of lives and properties are unquantifiable. Any investment in the reconstruction and proper maintenance of Nigerian roads (at all levels) will enormously ease road transportation of goods

and services and improve on the standard of living of the citizens.

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