

# Problems of Vehicular Traffic and Its Implications on the Economy: A Study of Calabar Metropolis

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**Abstract:** - This research project focused on "The problem of vehicular traffic and its implications on the economy a case study of Calabar Metropolis." This study focuses on three flash points that were randomly mapped out - UNICAL Roundabout and its environs, Watt Market Roundabout and its environs and Atimbo Roundabout. 150 structured questionnaires were administered totaling 450 respondents around these flash points. Rush hours in the morning between 7am-7:30am and afternoon peak periods of 6pm-7:30pm were considered appropriate times for the study. It was observed that congestion causes health related hazard, low productivity and other economic related problems. A comparative analysis was checked and it was discovered that developed counties traffic congestion was not a challenge despite their increased passenger car units (PCU). The descriptive statistics, simple percentages and the one way analysis of variance (ANOVA) was used to determine the significant difference in the spatial distribution of traffic congestion within the traffic points. The critical F- value was rejected because it was lower than 3.478 hence there is no significant difference in the distribution of traffic and health hazards in the metropolis. All recommendations presented were the one's given by these respondents.

**Keywords:** Roundabout, Watt Market, Atimbo, Metropolis, Traffic, Passenger

## I. BACKGROUND OF THE STUDY

Vehicular traffic problems have remained a major thread due to the ever increasing number of vehicle on the road and this has led to series of traffic challenges especially in developing countries. Urban transportation is a major issue in the planning of any city. Movement from one part of the city to another (Urban migration) constitutes major problems to countries of the world today including Nigeria. Vehicular traffic emission remains a threat to the environment and health related issues as vehicle ownership increase. Over 800 million people globally are minute-by-minutes exposed to hazardous level of traffic generated pollutants according to the United Nations Statistics in 2006.

Human exposure to air pollution in Nigeria due to traffic in flow is believed to constitute severe health challenges especially in urban area where population levels are daily on the increase. Traffic experts often compare traffic to a fluid, assuming that a certain volume must flow through the road system at a certain time and period to fill any available space (Eke, 2009). The discharge of carbonmonooxide according to (Ndem, Unuaefe, Edogi, 2019), said is not just dangerous to

health but also very dangerous to plants; as it is capable of suffocating plants to death.

Vehicular traffic is the aggregation of things (vehicular and commuters) going on a particular road during a specified period of time, these include cars, bicycles, motor cycles, buses and trucks. The vehicular traffic problems stem from a number of interrelated factors. On the growing population, it has become difficult for individuals to move because of the great demand for transportation. There is also increased household income which led to the rise in car ownership. Urban motor/ vehicle ownership and wage is growing even faster than the ability of the government of the day to provide road space or packing lot.

Traffic congestion plagues in most Urban areas, has created huge financial burden to the government. In Calabar metropolis for example, after the ban on commercial cyclist (motor cycles) traffic congestion is still a very serious problem due to increase in the ownership of cars with limited road space. During the rush hours which is between the hours of 7:30am to 9am there is high traffic gridlock on some flash points in Calabar such as Calabar Road/Mary Slessor, Etta-Agbor Road that stretches to Orok-Orok roundabout etc due to increased in movement to various establishments and other commercial activities. Having viewed some of the implications of vehicular traffic problems, the need to embark on a research of this kind becomes obvious. It is intended to investigate the implications of vehicular traffic in a growing city like Calabar Metropolis. In mathematics and civil engineering, traffic flow is the study of interactions between travelers (including) pedestrians, cyclist, drivers and their vehicles) and infrastructure inducing signage, highways and traffic control device), with the aim of understanding and developing an optimal transport network with efficient movement of traffic and minimal traffic congestion problems.

Vehicular traffic phenomena are complex and non-linear, depending on the interactions of a large number of vehicles. Due to the individual reactions of human drivers, vehicles do not interact simply following the laws of mechanics but rather show phenomena of duster formation and shock wave propagation, both forward and back ward, depending on vehicle density in a given area. In a free-flowing network, vehicular traffic flow theory refers to the traffic stream variables of speed, flow and concentration these relationship are mainly concerned with uninterrupted traffic flow,

primarily found on freeways or highways. Flow conditions are considered “free” when less than 12 vehicles per mile are on the road. “Stable” is sometimes described as 12 – 30 vehicles per miles per lane. As the density reaches the maximum flow rate (or flux) and exceeds the optimal density (above 30 vehicles per mile), traffic flow becomes unstable and even a minor incident can result in persistent stop – and – go driving conditions. “Breakdown” conditions can occur when traffic becomes unstable and exceeds 67 vehicles per-miles. “Jam density” refers to extreme traffic density associated with completely stopped traffic flow, usually in the range of 185 – 250 vehicles per mile per lane. However, calculations within congested networks are more complex and rely more on empirical studies and extrapolations from actual road counts. Because these are often Urban or suburban in nature, other factors (such as road–user safety and environmental considerations) also dictate the optimum conditions.

Calabar metropolis is currently faced with major vehicular traffic problems. Public transport drivers especially tax and bus drivers within the city have to a larger extent constituted a men on the road. Most of the drivers though aware of traffic rules and regulations purposely flout them or do not observe them. There is also the problem of atmospheric pollution. Fumes or carbon monoxide from motor vehicles constitute one of the most unpleasant effects from motor vehicles. Poor maintenances culture and importation of vehicles that are already unfit to be used are used here in Nigeria (note Nigeria is a consumer nation/ dumping ground) are in the class of vehicles known as “super emitters” with high emission rates that are harmful to both man and plants. Automobile related accidents have been on the increase due to the bad state of such vehicles. According to the World Health Organization (WHO), about 180 people die from roads accident per one thousand vehicles in a year. Accidents occur as a result of bad braking system; driver’s poor co – ordination , cars drivers licence, failure to adhere to safety regulations such as the non – fastening of seatbelts, non – availability of brake lights, poor lights for visibility, poor state of roads etc.

Another major problem arising from vehicles traffic is the problem of congestion of roads; for these are fundamental social and economic causes of wastage in man hours. According to Lewis (2008), “a reduction in speed means a direct time cost equal to the total increment in time of other commuters and drivers resulting from each Kilometric on the road”. For example one could get to Marian Road from the university of Calabar main Gate in 5minutes but when there is traffic congestion (hold–up) one could remain on the road for more than 30 minutes. This leads to getting to ones destination late, reduction in productivity growth and thus reduces the economic base of the person. Traffic congestion can also lead to the death of sick victims who are being taken to hospitals so it is a problem when it comes to negative urban growth.

## II.LITERATURE REVIEW

Karbeger (2004) observed that there is always negative environmental impact in the use of various transportation modes hence increase per capital emissions which can in turn be attributed to the age of such used vehicles, maintenance standards, the state of roads and driving habits, etc.

Adefolula (2007) presented a gloomy look at the problems of transportation in Urban centre when he observed that traffic congestion in the city of Lagos, is the “Most serious and intractable.” He outlined the physical and human factors involved in traffic congestion, the consequences and how best these problems can be resolved in other traffic congested – prone areas.

However, Adedimila (2010) observed the alarming rate which traffic congestion is shining its flow in Calabar he attributed this to chaotic situation to inadequate road design and maintenance, lack of adequate control device, too much cars competing for limited space and inadequate Government owned public transport system. Onoyom (2012) outlined the physical, human and institutional matrix affecting traffic flow in Calabar Metropolis. His observation which support Adeniyi (2000) and complemented by Oyefesobi (2010) outlined the various measures that can be used to improve traffic and reduce accidents in urban centres in Nigeria. Hence traffic education on drivers and pedestrians was mentioned. Planning on vehicular traffic was the main thrust of the Buchana Report (2006) in that report it has it that a town or a place should be studied before roads are made to pass through it because the more fumes injected with air born diseases.

In a view to identify the road cause of traffic in the Calabar Metropolis, the Special Adviser on Transportation, Barrister I. Edem in a seminar conducted by the Federal Road Safety Commission (Oyefesobi 2010) addressed road users and commuters that a large number of vehicles have been introduced into the streets of Calabar with no consequential upgrading of the existing infrastructures and the road users should always make use of other alternative roads so as not to cause gridlocks as it is been experienced on a daily basis. He went on to say that the underlisted problems were identified as additional causes of traffic hold-up:

1. Complete failure of motorists to obey driving traffic rules due.
2. Inappropriate and sometimes wrongly placed signs, bus-stops and stands and loading bays.
3. Insufficient presence of regulators and absence of effective and efficient traffic enforcers.
4. Wrong and unsafe placement of refuse bins and its evacuation at inappropriate tours (7 am – 8 am).
5. Indiscriminate and unregulated location and multiplicity of speed bumps.
6. The poor timing of traffic lights.
7. Illegal street trading.
8. Absence of effective regulations and control of taxis and buses in the metropolis.

9. Unauthorized and unregulated rallies be it the political ones or church rallies.
10. Too much in – road interactions and stops over cause vehicular road traffic.

Several studies investigated air pollution and its effect on health. The worst offenders here are heavy duty truck drivers and taxi drivers. Lung cancer is one of the most commonly studied effects. A study in Denmark has it that 28, 744, men with lung cancer was reported in 2003 alone and taxi drivers and truck drivers were mostly affected because most of their period was behind the wheels and when compared with other employers that work in the offices it was not up to 1,000 (Onokomaiye 1990). Other studies has it that fumes from diesel propelled engines may be the primary cause of lung cancer as well as the effect of respiratory conditions have also been associated with professional driving. A study in shanghai in a data base has it that in a 100 professional driver, 92 suffers from respiratory symptoms and chronic respiratory disease. These in most times come with bouts of throat pain, phlegm, chronic rhinitis and chronic pharyngitis.

There are a number of specific circumstances that aggravates or causes traffic congestion which the government of the day has it part to play and the people using these roads have their own part to play an such as not parking indiscriminately or total disobedience to road traffic congestion became obvious due to the rapid increase in the number of car owners and the lack of alternative means of local transport such as rail or water transportation, unplanned road network with little or no practical diversion, broken down vehicles left in the middle of the road, poor road maintenance, issuance of road worthy certificate to rickety and unworthy vehicles and license to incompetent drivers who disregard rules and regulation while driving.

### III. METHODOLOGY

This research work uses discreet and attributes data. Types of data used are traffic counts from locations in the study area, numbers of registered cars both commercial and private from the cross river state licensing office. Data was also obtained from structured questionnaire. Data used for this work were obtained from both primary and secondary sources.

The primary sources were gathered with the help of traffic counts, direct personal observation, interviews with transport agencies and other individuals affected by this problem.

Structured questionnaire was also administered to 50 respondents and any responses gotten are unbiasedly treated.

For secondary sources various journals, textbooks, internet resources government publications were consulted, also libraries were visited such as University of Calabar library, the State library and the National library. Data were also obtained through Electronic media.

#### 3.1.1 Sampling Technique and Sampling Size

The sampling technique used in this study was stratified random sampling where the population was divided into sections based on three locations so chosen junctions, streets and roundabouts.

The three locations so chosen made up the sampling size and these are:

1. UNICAL Main-Gate roundabout and Etta AgborRoad.
2. Mary Slessor Road
3. IBB Way/Atimbo Roundabout.

#### 3.1.2 Technique of Data Analysis

For the quant table data obtained to be useful and to give solutions to the problems, descriptive analysis was used. This included classification of vehicles into bicycles, motorcycles, tipper and tankers and conversion was done using passengers car per unit(pal).

The descriptive statistics made use of tables, charts, simple percentages and the one way Analysis of variance (ANOVA) to determine the significant difference in spatial distribution of traffic congestion among traffic points used in the study.

A one way analysis of variance (ANOVA) was used to test this hypothesis on the influence of vehicular traffic problem on human health conditions.

This is given as:

$$TSS = BSS + WSS$$

TSS =Total sum of square (vehicular traffic problems)

BSS =Between sample square (of all vehicular traffic congestion).

WSS =Within sample square.

#### Data Presentation

Table 3.1 Frequency of vehicular movement at Etta-Agbor Roundabout

Days	Time	Direction	Bicycles	Motor-cycles and tricycle	Cars	Buses	Dynas	Tippers	Tankers	Total	Percentage
Mon	7-7:30am	Mary Slessor	1	161	1409	40	44	1	4	1515	12.43
	2-2:30pm		0	15	1358	65	24	0	7	1409	6.2
	6-6:30pm		2	13	1390	45	41	0	7	1498	6.14
	Total		3	44	4157	150	109	1	18	4422	18.13
Wedn	7-7:30am	Etta - Agbor	1	12	904	33	34	4	11	999	4.09

	2-2:30pm		1	19	1020	60	24	2	11	1137	4.66
	6-6:30pm		1	13	1114	59	29	8	7	1231	5.04
	Total		3	44	3038	152	87	14	29	3367	13.18
Friday	7-7:30am	UNICAL main-gate	0	4	742	21	19	0	4	790	3.24
	2-2:30pm		1	3	673	11	14	0	4	711	2.91
	6-6:30pm		1	3	678	11	14	0	4	711	2.9
	Total		2	9	9	52	54	4	8	2121	8.69
Mon	7-7:30am	Orok-Orok Roundabout	1	10	956	28	33	2	7	1037	4.25
	2-2:30pm		1	5	545	19	16	0	7	593	2.43
	6-6:30pm		1	8	572	29	24	4	7	645	2.64
	Total		3	23	2073	76	73	6	21	2275	9.33
	Grand Total		11	120	10233	430	323	25	76	11218	100

Source: Researchers Fieldwork: 2019

Table 3:1 shows the spatial distribution of traffic congestion at the Etta – Agbor roundabout it could be observed from the table that the highest unnumber of vehicles that cause congestion here are from the Unicalroundabout axis, that is 4422 (18.13%) were found to be from Mary Slessor Road.

The second road with the highest number of vehicular congestion around the roundabout are vehicles coming from

Etta – Agbor Junction with moving vehicle population at 3467 (13.81%) during the morning, after and evening rush hours.

The third road that cause congestion at the roundabout are vehicles coming from UnicalMaingate axis, however Orok – Orok Road has a total 2275 (9.33%). The highest category of vehicles found plying the junction are cars with a total of 11310(100%) out of a total of 24380.

Table 3.2 Frequency of vehicular movement at Watt Market roundabout

Days	Time	Direction	Bicy- cles	Motorcycles and tricycles	Cars	Buses	Dynas	Tippers	Tankers	Total	Percentage
Sat.	7-7:30am	Egerton Road	1	16	821	24	40	6	4	913	9.08
	2-2:30pm		0	7	537	10	11	0	7	572	5.69
	6-6:30pm		0	11	658	19	39	4	0	731	5.27
	Total		1	34	2016	54	90	10	11	2216	22.04
Wed.	7-7:30am	Nelson Mandela	1	7	950	53	66	10	4	1091	10.85
	2-2:30pm		1	14	865	43	61	24	4	1021	10.06
	6-6:30pm		0	18	831	28	14	14	0	905	9.00
	Total		2	39	2646	124	141	48	8	3008	29.92
Fri.	7-7:30am	Calabar Road	0	4	994	46	56	18	14	1132	11.26
	2-2:30pm		0	0	862	40	55	22	4	983	9.77
	6-6:30pm		1	4	670	19	24	16	0	734	7.31
	Total		1	8	2526	105	135	56	18	2849	28.34
Mon.	7-7:30am	Edibe- Edibe Road	2	4	741	24	49	10	7	837	8.32
	2-2:30pm		2	3	554	26	40	4	11	640	6.36
	6-6:30pm		1	4	453	29	11	0	4	502	4.10
	Total		5	11	1748	79	100	14	22	1979	19.68
	Grand Total		18	92	8936	362	466	128	56	10061	100

Source: Researchers Fieldwork: 2019

Table 3:2 shows the spatial distribution of traffic congestion in Watt Market roundabout. From the table it could be observed that the highest number of vehicle that causes congestion. They are from Egerton, from the period of 7-7:30am, 2-2:30pm and 6-6:30pm with a total of 2216 (22.05%) during these peak periods.

Nelson Mandela Road has the highest in ranking and which covers vehicles coming from Nelson Mandela and its environs has 3008 (29.92%).

The third road that causes congestion at the roundabout are vehicles coming from Calabar road at count of 2849 (28.34%).

Edibe–Edibe Road and its environs came last in this research work count and stood at 1979 (19.7%). The highest category of vehicles found plying their junction are cars 8936(88.9%) out of the total of 466 (4.6%) owing to the buyers who patronize for building materials and other consumables.

Table 3.3 frequency of vehicular movement at AtimboRoad

Days	Time	Direction	Bicy-cles	Motorcy-cles and tricycles	Cars	Buses	Dynas	Tippers	Tankers	Total	Percentage
Monday	7-7:30am	UNICAL Maingate	0	6	1043	65	44	0	4	1162	10.21
	2-2:30pm		1	14	928	50	38	4	7	1042	9.16
	6-6:30pm		0	8	742	40	33	0	0	823	7.29
	Total		1	28	2713	115	115	4	11	2987	26.26
Wednes-day	7-7:30am	NdidemUsan glso	0	41	953	75	44	0	0	1113	9.78
	2-2:30pm		0	13	788	89	45	8	4	947	8.32
	6-6:30pm		1	7	692	70	45	0	0	815	7.16
	Total		1	24	2433	234	134	8	4	2838	24.95
Friday	7-7:30am	I.B.B Road	1	5	903	58	36	6	7	1016	8.93
	2-2:30pm		1	9	825	58	33	6	4	936	8.22
	6-6:30pm		0	8	846	63	49	4	0	970	8.52
	Total		2	22	2574	179	118	16	11	2922	25.69
Saturday	7-7:30am	Atimbo Road	1	8	883	60	57	6	7	1016	8.32
	2-2:30pm		1	9	832	54	41	4	0	941	6.36
	6-6:30pm		0	6	553	59	50	2	0	670	4.10
	Total		2	23	2268	173	142	12	7	2627	19.68
Grand Total			6	97	9988	701	509	40	33	11374	100

Source: Researchers Fieldwork: 2019

Table 3:3 shows the spatial distribution of traffic congestion at Atimbo Road. It could be observed from the table that the highest number for vehicles that causes congestion there are from UNICAL Maingate that is of 2987(26.26%) vehicles were found plying the roundabout at the peak period of 7-7:30am, 2-2:30pm and 6-6:30pm, were found to come from that axis of the University of Calabar Maingate roundabout.

2922 vehicles whose percentage summation I.B.B Road and its environs. The third street with the most congestion are vehicles coming from Ndidem Isang Iso road, Atimbo and EdimOtop roads and converging at Ndidem Isang Iso Road 2838 (24.95%) count.

The least of all the four are vehicles coming from Atimbo road with a total of 2627(23.09%) from the total number of

vehicles. It was also observed that cars are with a total of 9988 (87.59%) that ply the junction out of a total of 22069.

### 3.1.3 Test of Hypothesis

There is no significant difference in the spatial distribution of traffic congestion among the points used in the study.

A one way analysis of variance was adopted to test the hypothesis; the result is presented in the table below. One way analysis (ANOVA) is a way to test the quality of 3 or more means at one time by using variances.

### .3.1.4 Total Variation

The total variation (not variance) is comprised of the sun of squares of the difference of each mean with the grand mean.

$$SS(T) = \sum (X - \bar{X}_{Gm})^2$$

### 3.1.5 Between Group Variation

The between group variation is denoted by  $S^2_b$

$$SS(B) = \sum n (\bar{X} - \bar{X}_{Gm})^2$$

While the within the group is denoted as;

$$df = N - K$$

The variance due to the difference with in individual sample is denoted  $MS(w)$  for mean square within groups. This is the within group variation divided by its degree of freedom. It is also denoted by  $S^2_w$  it is the weighted average of the variance (weighted with the degrees of freedom).

$$SS(W) = \sum df \cdot S^2$$

### 3.1.6 F-Statistics

Recall that an F-variable is the ratio of 2 independent chi-square variables divided by their respective degrees of freedom.

F test statistic is found by dividing the between group variance by the within group variance as shown in Table 3.4.

$$F = \frac{S^2_b}{S^2_w}$$

Table 3.4: Model of analysis of variances

Square of Variances	SS	DF	MS	F
Between Sample Square (BSS)	SS (B)	K - 1	$\frac{SS(B)}{K - 1}$	$\frac{MS(B)}{MS(W)}$
Within Sample Square (WSS)	SS (W)	N - K	$\frac{SS(W)}{N - K}$	
Total	SS(w) + SS(B)	N - 1		

Notice that each mean square is just the sum of squares divided by its degree of freedom and the F value is the ratio of the mean square.

Table 3.5: Summary table of analysis

Square of Variances	SS	DF	MS	F
Between Group (BSS)	7478.6	149	50.19	1.03
Within Group (WSS)	2176.8	300	7.25	
Total	9655.4	449		

Significant  $P > 0.05$

$$df = 300 \text{ and } 449$$

$$F = 3.21$$

The result in Table 3.5 shows that the calculated F-value of 1.59 was found to be smaller than the critical F-value of 3.478 needed for significance at 0.05 alpha level of significance with 449 and 300 degree of freedom. This result implies that there is no significant difference in spatial distribution of traffic congestion that contribute to health hazards among the three areas used in the study.

Table 3.6: Frequency distribution of transportation

Responses	Frequency	Percentage
Motorcycles	15	10
Cars	90	60
Buses	45	30
Total	150	100

Source: Researcher's Field Work, 2019

Table 3.6 shows that 60% of the respondents which is the highest claim that cars are the major means of transportation. 30% of the respondents identified buses as the second major means of transportation while 10% went for motorcycles and tricycles.

### 3.1.7 Spatial Distribution of Traffic Congestion

Table 3.7: Area of high traffic congestion

Responses	Frequency	Percentage
Etta-Agbor	84	56
Mary Slessor	10	6.6
Watt Market	56	37.4
Total	150	100

Source: Researcher's Field Work, 2019

Table 3.7 shows the spatial distribution of traffic at Etta-Agbor that spawns into UNICAL Maingate with 56% while that of Watt Market that extended to Calabar Road and 11-11 Roundabout being the second highest and standing at 37.4% and coming last is the Mary Slessor Roundabout having 6.6%. This shows that traffic congestion is mostly experienced along UNICAL Main gate.

### 3.1.8 Traffic problems, causes and their implications on human health

Table 3.8: Vehicular traffic problems experienced in the area

Responses	Frequency	Percentage
Air pollution	84	56
Traffic congestion	35	23.4
Accidents	31	20.6
Total	150	100

Source: Researcher's Field Work, 2019

From the Table 3.8, it shows that most significant vehicular traffic problem experienced is air pollution (56%) as a result of traffic built up (23.4%) that at least causes minimal accidents at 20.6%.

Table 3.9: Causes of traffic problems in the area

Responses	Frequency	Percentage
Narrow road	10	6.7
Street trading	30	20
Increased car ownership	60	40
Inadequacy of alternative roads	40	26.6
Failure of motorists to obey traffic rules	10	6.7
Total	150	100

Source: Researcher’s Field Work, 2019

From the Table 3.9, 46.7% of respondents claimed that the causes of traffic problems to be due to increased car ownership, street trading and the inadequacy of alternative tallied and are causative factors. Moreso, narrow roads and the failure of motorists to obey traffic rules tallied at 6.7% respectively.

Table 3.10: Implication of traffic congestion

Responses	Frequency	Percentage
Delay to work or business	80	53.4
Reduction in productivity growth	52	34.6
Death of the sick being taken to hospital	18	12
Others	0	0
Total	150	100

Source: Researcher’s Field Work, 2019

Table 3.10 shows that 52% of the respondents are faced with delay to work or their business areas, while 34.7% were of the opinion that traffic congestion leads to reduction in productivity growth. 12% of the respondents identified the problem of people dying along the way when rushed to the hospital for medicare. The rest fell on others who opined that there are unexplainable problems caused by traffic congestion in any area.

Table 3.11: Health implication of vehicular traffic

Responses	Frequency	Percentage
Lung cancer	40	26.7
Chronic respiratory diseases	90	60
Accidents	20	13.3
Total	150	100

Source: Researcher’s Field Work, 2019

Table 3.11 shows that 60% of the respondents are identified with chronic respiratory diseases as one of the major health implications of vehicular traffic. 26.7% claims that lung cancer due to the inhaling of carbon dioxide (fumes) from slow moving vehicles is another health implication of vehicular traffic. The rest 13.4% were of the opinion that vehicular traffic, resulted in accidents leading to injury or death.

Table 3.12: Environmental/health complications of vehicular traffic

Responses	Frequency	Percentage
Air pollution	81	54
Noise pollution	41	27.3
Environmental deterioration	18	12
Destruction of aesthetics of city’s beauty	10	6.7
Others	0	0
Total	150	100

Source: Researcher’s Field Work, 2019

Table 3.12 shows that 54% of the respondents identified air pollution as a major problem when held up in traffic. This problem was closely followed by noise pollution (41%), environmental deterioration (18%), 10% went to the destruction of aesthetics that are stationed close to all these roads from fumes emitting from slow moving cars and the abandoning of broken-down vehicles on the roads.

#### IV. CONCLUSION

The government should ban of street trading and wrong road usage (81%), Nigerians should be made to be aware (13.3%), periodic road markings/signs should be reviewed (6%) and that poorly maintained diesel engine vehicles should be banned from the use of roads (26.7%).

There should be regulations and restriction on motor cycle not to ply some major road to reduce road accidents.

All vehicles should comply strictly to road signs and other regulations to reduce unnecessary congestion and traffic jams.

#### Summary of Findings

- There is massive failure of motorists to obey traffic rules,
- High rate of illegal street trading,
- There are few and inadequacy of alternative routes,
- Insufficient presence of regulators and control of checkpoints by law enforcement officers near and/or at junctions.
- Inadequate transportation infrastructure, services and technology.
- Large number of vehicles has been introduced into the streets of Calabar with no official upgrading of the existing infrastructure.
- Air pollution and various forms of heart diseases and reduction in marginal labour productivity as a result of carbon emission.
- Traffic congestion cases pollution which invariably affects human, plants and animals.

#### V. RECOMMENDATIONS

- Government should ensure that there is strict compliance to regulations on traffic rules.
- Street trading should be ban.

- Alternative exit roots should be constructed to reduce the level of vehicular congestion.
- Road and other taskforce officers should ensure they present in their duty post.
- government should ensure that roads, and other traffic regulatory signs are present where it is Necessary.
- Levy should be placed on any vehicle that smokes high fumes into the air. This will help to coup unnecessary emissions.

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