



## ASSESSMENT OF ENVIRONMENT TRAFFIC NOISE POLLUTION IN UWWIE LOCAL GOVERNMENT AREA OF DELTA STATE, NIGERIA.

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### ABSTRACT

The assessment of environmental traffic noise pollution in Uvwie local government area of Delta State, Nigeria was carried out using a well calibrated portable digital sound level meter (Model CEL-231). The sound level meter is an instrument used for measuring the exposure level of noise in the field. The measurement was done three times/day (Morning session 9am – 10am, afternoon session 1pm – 2pm and Evening session 4pm – 5pm) and readings were taken. The mean results measured from the studied area ranged from 74.61dB (A) in the evening to 76.92dB (A) in the afternoon with mean average of 76.66dB (A). The obtained mean values of traffic noise when compared with the permissible level for road traffic noise of 65 decibels dB (A) in commercial area during the Day time, it was observed that the obtained mean level results exceeded the permissible standard limit. These high values can be attributed to poor maintenance of the vehicles, indiscriminate usage of pressure horns and present of heavy duty truck that load petroleum product and cargo containers from the Warri refinery and Warri port (Nigeria Port Authority) respectively. This study revealed that immediate health implication may not be observed at the present level, but long term health effects are probable in the nearest future.

### Keywords

Traffic Noise, Traffic, assessment, Uvwie, Decibels, Sound level meter

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## 1.0 INTRODUCTION

Noise is an inevitable part of everyday life of man. (Slen and Jeremy, 2012; Anurage et al., 2013). Noise is present in every human activity, and when assessing its impact on man, it is usually classified either as occupational noise (i.e. noise at the place of work), or as environmental noise, which includes noise at the community, residential, or domestic land e.g. traffic, playgrounds, sports, music (Mangalekar, Jahav and Rant, 2012). Noise pollution can result from the activities of urbanization, civilization or industrialization which can affect physiological or psychological wellbeing of people and the environment negatively. Noise can be said to be unwanted sound or sound that is loud, unpleasant or unexpected to human and the environment (Singh & Davar, 2004). Traffic noise pollution has been of concern of late as a result of increase in vehicles, infrastructure, and population in Uvwie local government area of Delta State. Traffic noise pollution is a major challenge for town planners and environmentalists to overcome in the area. On a daily basis, people around these studied areas and environs especially those living around the road junctions are mainly affected by traffic noise pollution. Their exposure to high levels of traffic noise pollution can cause accidents, hearing loss, lack of concentration when driving, decrease human performance and action, stress on the nervous system, great annoyance, hypertension, heart problems, tiredness, headache, increase blood pressure etc. Noise is a major factor that should be considered in the design and construction of new transport systems, as well as when improvements are made to existing systems (Gobimath and Neelima, 2013; Abo-Qudais et al., 2007). These numerous problems emanating from traffic noise pollution have led the authors to investigate the level of traffic noise pollution in different road junctions in Uvwie Local Government Area of Delta State.

## 1.1 STUDY AREA

The Uvwie Local Government Area of Delta State, Nigeria has its headquarter in Effurun. It was carved out of the then Okpe Local Government Areas of Delta State on the 4<sup>th</sup> of December, 1996. The study area has latitudes of 5°00' and 6°30' North and longitudes of 5°00' and 6°45' East of Delta State. The indigenous inhabitants of the Uvwie Local Government Area are Urhobos speaking language, and their major occupation is farming and trading. The local government area plays host to companies like; Nigeria National Petroleum Corporation (NNPC), oil and gas services companies.



Fig. 1: Map of the study area

It is because of these companies that led to a massive in-flock of people to the area in order to seek for jobs, thus making the area over-populated. The commercial area is urban with an estimated population of 188,728 people (NPC, 2010). The climate of the study area is of the tropical equatorial climate with a mean annual temperature of 27.32°C, average relative humidity of about 60% - 80% and annual rainfall amount of 4,205mm. Generally, two major wind systems influence the climate of the area. These are the northeast trade wind blowing cold dry air from the Sahara and the southwest trade wind blowing cold moist air from the Atlantic. The southwest wind prevails almost throughout the year, from March – October, while the North-East trade wind is responsible for the cold dry period (Harmattan) which influences the area for four months (November – February). This brings about two seasons – the rainy season and the dry season respectively.

## 2.0 MATERIALS AND METHODS

The study was carried out using a well-calibrated portable digital sound level meter (Model CEL-231). The sound level meter is an instrument used for measuring the exposure level of noise in the field. The meter does not start from zero (0) as its minimum reading because a place cannot be 100% quiet with noise, the sound meter reading starts from 20 decibel (dB). The measurement was done three times/day

(Morning session 9am – 10am, afternoon session 1pm – 2pm and Evening session 4pm – 5pm) and readings were taken. The average reading was calculated and also the mean standard deviation was computed from the obtained results. This was done to determine the amount of noise generated in these busy junctions in the studied area. Noise Pollution (Regulation and Control Rules, 2000) which was given as:



**Table 1: Noise standards for Ambient Noise level**

Area Code	Category of area	Limits in dB(A)	
		Day time	Night time
A	Industrial	75	70
B	Commercial	65	55
C	Residential	55	45
D	Silence zone	50	40

### 3.0 RESULTS AND DISCUSSION

**Table 2: Mean results of all location in the study area**

S/No	LOCATION	No of Time	Mean Morning (9.00am) dB(A)	Mean Afternoon (1.00pm) dB(A)	Mean Evening (4.00pm) dB(A)	Average dB(A)
1	DSC ROUNDABOUT	4	75.95	73.42	73.35	74.24
2	P.T.I. JUNCTION	4	76.45	73.43	74.22	74.70
3	EFFURUN ROUNDABOUT	4	74.13	75.70	72.29	74.04
4	JAKPA JUNCTION	4	75.00	77.87	73.35	75.41
5	AIRPORT JUNCTION	4	74.07	76.98	73.35	74.80
6	ENERHEN JUNCTION	4	77.10	77.65	74.63	76.46
7	LINK ROAD JUNCTION	4	76.35	77.00	73.65	75.67
8	EKPAN ROUNDABOUT	4	77.25	77.40	73.63	76.09
9	NIGER CAT JUNCTION	4	78.12	75.80	74.93	76.28
10	EKPAN FLYOVER	4	81.70	81.75	75.83	79.76
11	NPA EXPRESSWAY	4	76.50	79.07	76.08	77.22
	<b>MEAN</b>		76.60	76.92	74.61	76.66

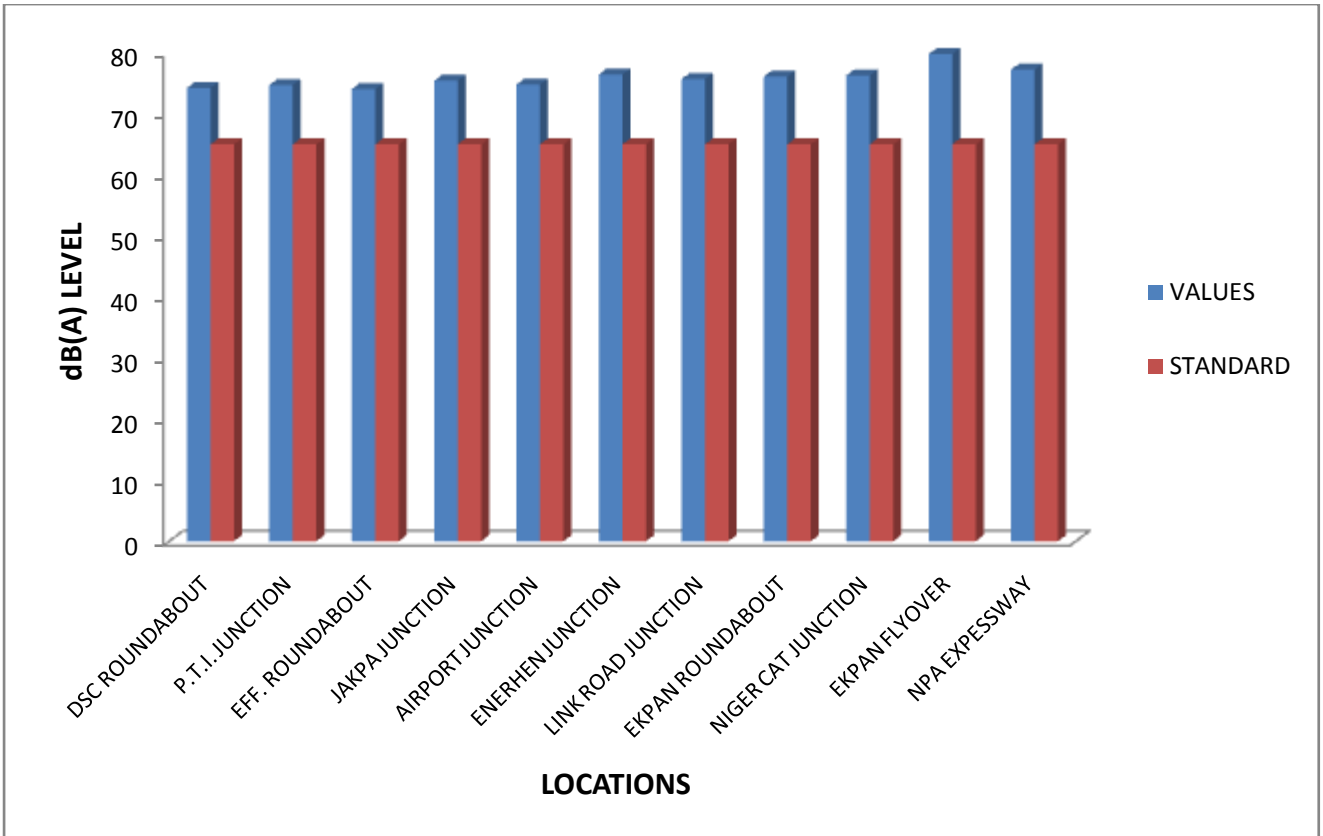


Fig. 2: Comparison of mean morning obtained values with standard in all the locations

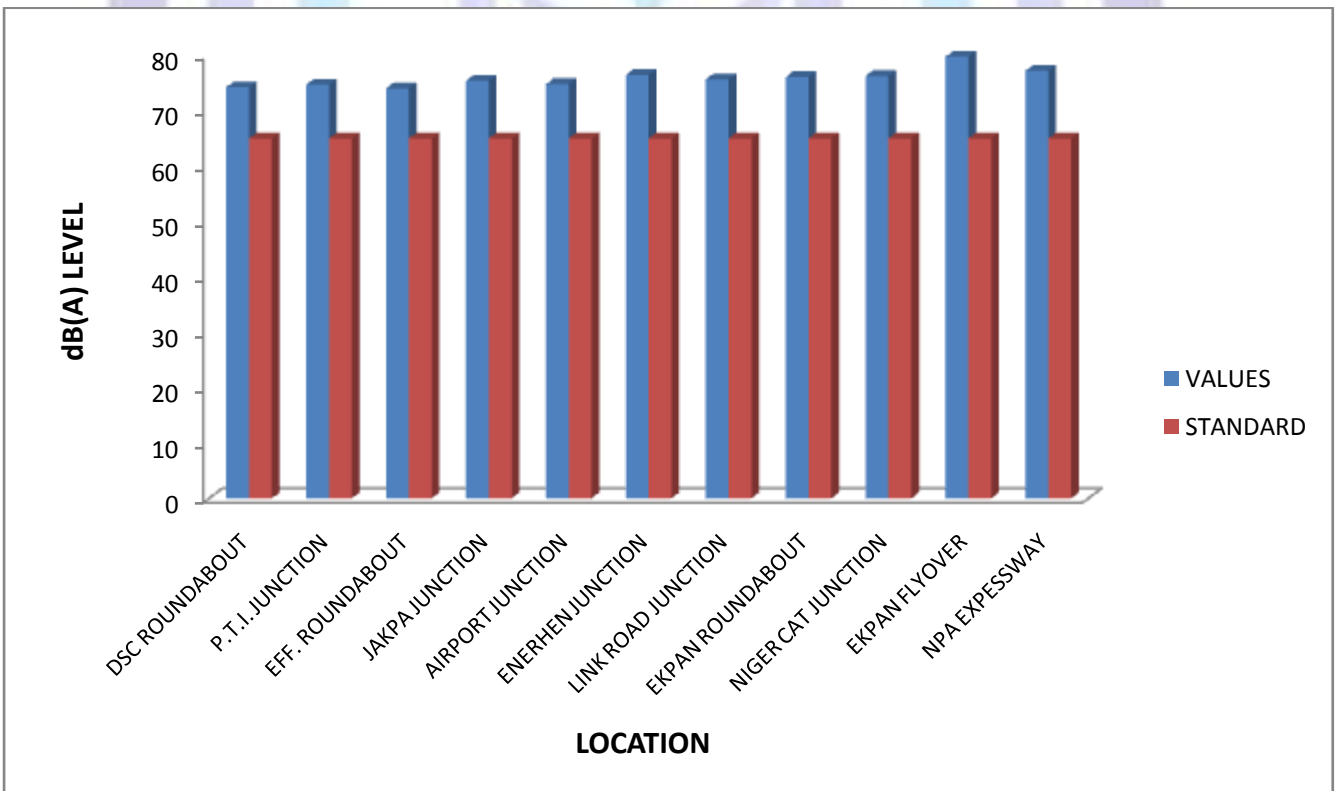


Fig. 3: Comparison of mean afternoon obtained values with standard in all the locations

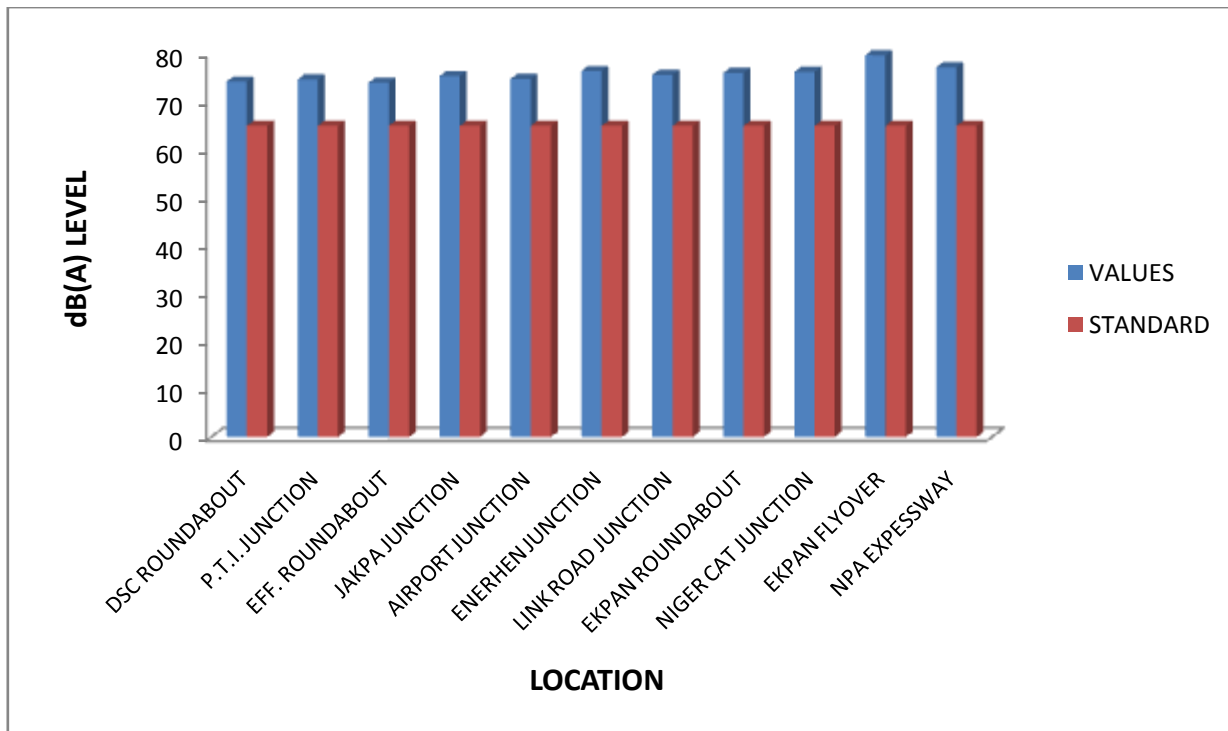


Fig. 4: Comparison of mean evening obtained values with standard in all the locations

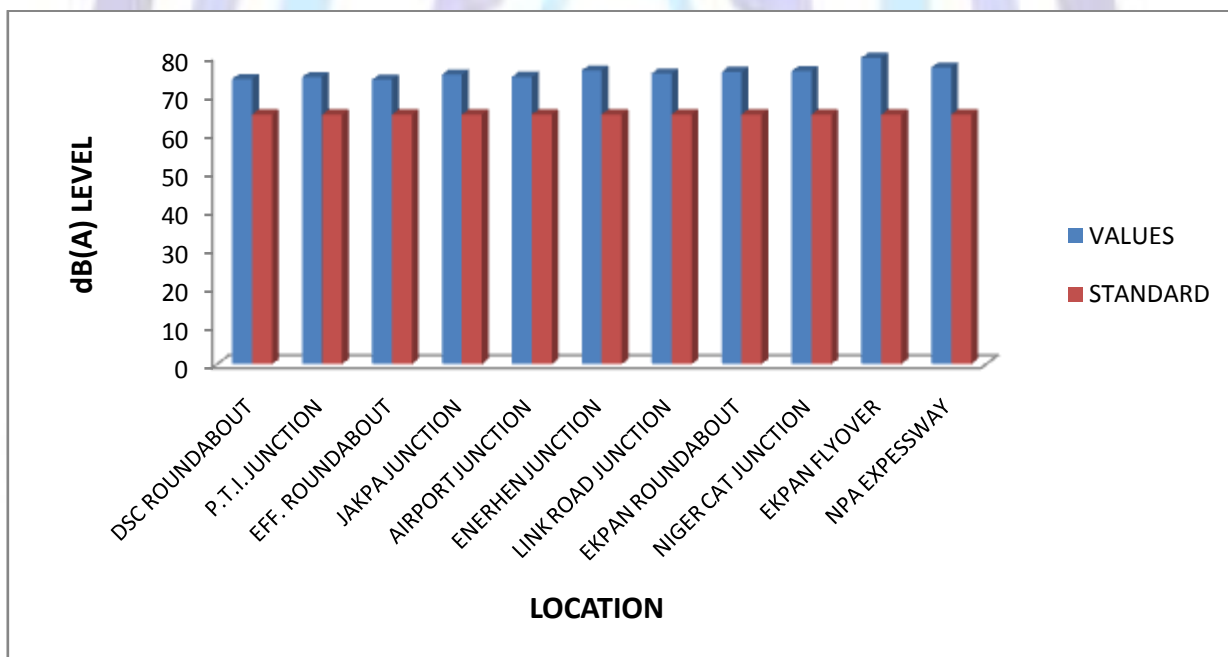


Fig. 5: Comparison of mean average values with standard in all the location

The results of traffic noise measured at various road junction location in Uvwie local government area of Delta State are as shown in Table 2. The mean results measured from the studied area ranged from 74.61dB (A) in the evening to 76.92dB (A) in the afternoon with mean average of 76.66dB (A). The source of noise measured is predominantly attributable to all kind motor vehicular traffic at the various road junction. The obtained mean values of traffic noise when compared with the permissible level for road traffic noise of 65 decibels dB (A) in commercial area during the Day time, it was observed that the obtained mean level results exceeded the permissible standard limit as shown in fig. 2-5. The obtained results have its highest values in the afternoon and along the highway express road of the studied area. These high values can be attributed to the present of heavy duty truck that load petroleum product cargo containers from the Warri refinery and Warri port (Nigeria Port Authority) respectively. The obtained mean values are lower than the values previously reported by Keerthana et al., (2013); Alimohammadi et al., (2013) when compared. The obtained mean values





are in agreement with the values of previous work reported by Anurag et al., (2013) in similar location and are high than the values reported by Krishna et al., (2007).

## 5.0 CONCLUSION

The obtained results of the environment noise pollution indicated that the mean values obtained from the road junction in Uvwie local government area of Delta State are higher than the permissible standard values in the commercial area and this can be attributed to the present of heavy duty truck that load petroleum product and cargo containers from the Warri refinery and Warri port (Nigeria Port Authority) respectively which apply the road, poor maintenance of the vehicles, indiscriminate usage of pressure horns. This variation of sound may effects on human health in severe ways such as, poor concentrations at work, stress, cardiovascular illness and many more. It is very essential to control noise at source, along the transmission path and at receiver's end by using the remedial measure. Though, immediate health implication may not be observed at the present level, but long term health effects are probable in the nearest future. We therefore, recommended as follows:

- Automobiles owner should maintain their automobiles properly.
- Government should plant trees and vegetation along the road
- Government should make laws to prohibit indiscriminate usage of pressure horns
- Road safety officers and VIO officers should ensure total compliance of existing traffic law by road users.
- There should be a regular monitoring of environment noise pollution level in our roads.
- Government should construct a separate road for heavy duty truck

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