IOSR Journal Of Humanities And Social Science (IOSR-JHSS)
Volume 19, Issue 5, Ver. VI (May. 2014), PP 79-98
e-ISSN: 2279-0837, p-ISSN: 2279-0845.
www.iosrjournals.org

Is Speed Bumps Installation Panacea For Road Traffic Crash Prevention? An Evaluation of Selected Major Routes in Ondo, Southwestern Nigeria

Richard Paul Chukwugozi,
Federal Road Safety Corps, Akure, Nigeria

Abstract: *The study examines the effect of speed bump installations along the selected major routes in Ondo and adopted three methods of investigation i.e. conducting Focus Group Discussions (FGDs), use of Questionnaire and referencing the FRSC Monthly RTCs Report/Quarterly Traffic Count Data.*
The findings reveal that road traffic crash trend changed negatively in the selected routes after the speed bumps installation except in Akure-Ado route which might be owing to traffic diverting to alternative route where speed bumps are not installed. The findings also reveal that the majority of the participants do not support the speed bumps installation because of its negative implication in terms of damage to vehicle, human health as a result of impact and exposure of road users to criminal activities and a decline in traffic volume along the selected routes after the speed bumps installation except in Akure-Owo route which might be owing to either the cost implication of fuelling vehicles if the alternative route is used or there was no alternative route. People whose residences are in proximity to highways are in the habit of indiscriminately erecting bumps without recourse to specifications posed danger to both vehicles and road users. The fact that prevalent violations on these selected routes are speed dependant, it is suggested that the decisions agreed on in a communiqué issued on the 2nd Stakeholders' forum on speed limiting device enforcement in Nigeria held in Abuja on Wednesday 04 September 2013 should be given strong political backing to achieve the goal of tackling speed factor.
Keywords: *Speed, crash, bumps and installation*

I. Introduction

Any road meant for public use and connecting two major cities or otherwise important destinations is referred to as a highway (Wikipedia, 2013). According to Oguara (2010), roads represent the major areas of investment in transportation and are the most dominant travel mode accounting for over 90% of passenger and goods transport in Nigeria. A road is supposed to provide dependable pathways for moving people and goods from one place to another without being death trap for the motoring public. Major modern highways that connect cities in populous developed and developing countries usually incorporate features intended to enhance the road's capacity, efficiency, and safety to various degrees. Such features include a reduction in the number of locations for user access, the use of dual carriageways with two or more lanes on each carriageway, and grade-separated junctions with other roads and modes of transport.

In contrary, road traffic environment in Nigeria is scarcely provided with these inevitable and paramount components enumerated above. Rather, several kilometres of roads are characterised by bushy road environment; pot-holes; black-spots; poor visibility due to lack of street light at night. Traffic signs as well as traffic lights are not adequately available. Often time, pedestrians, cyclists and motorists compete jealously, especially in the urban centres, for right of way along highways. This is as a result of the poor planning structure of the roads (Odeleye, 13th ICICT Workshop).

In the early days of road network development in Nigeria, vehicular traffic was sparingly distributed across the available road network. Growth in urbanization and in the number of vehicles has lead to increased traffic congestion in urban centers and increase in traffic crashes on road networks, which were never designed for the volumes and types of traffic that they are now to carry. There is also competition between different classes of road users coupled with poor road maintenance, bad and inadequate provision of road infrastructure. All these have contributed to the serious road safety problems in developing countries like Nigeria (Oyedepo & Makinde, 2010).

Out of the four main modes of transportation, the one that puts people at the greatest risk of injury per kilometers travelled is road transportation (WHO, 2004) and the problem in road safety transcends the transport sector. The upward trend in vehicular traffic gave rise to increasing carnage on Nigerian roads. It is sad that the high mortality rate in Nigeria today is ascribable largely to such carnage, which surpasses deaths arising from ill-health, homicide, natural disasters or accidental circumstances (including industrial accident, fire outbreak and drowning). The morbidity and mortality burden in developing countries is rising due to a

combination of factors, including rapid motorisation, poor road and traffic infrastructure as well as the behaviour of road users (Nantulya and Reich, 2002).

There are several underlying factors responsible for increasing road traffic crashes (RTCs) in Nigeria. Hunan factor constitutes about 90% of RTCs. Out of this percentage drivers' action or inactions accounts for about 80% (FRSC, 2013b). According to FRSC (2013a), speed is one of the human factors behind crashes in which excessive speeding is defined as exceeding the speed limit while inappropriate speed is defined as driving at a speed unsuitable for the prevailing road and traffic conditions. Excess and inappropriate speeds are responsible for a high proportion of the mortality and morbidity that result from road crashes. In some low and middle income countries, speed is estimated to be the main contributory factor in about 50 percent of all crashes.

The issue of speed has been identified by WHO as a key risk factor in road traffic injuries, influencing both the risk of a crash as well as the severity of the injuries that result from crashes. The relationship between speed and injury severity is particularly critical for vulnerable road users such as pedestrians and cyclists. Higher driving speeds increase the risk and severity of crashes. This risk is particularly high for vulnerable users, including pedestrians and cyclists, who are present in large numbers in urban areas. When the impact speed in a collision is 30 km/h, a pedestrian's likelihood of being fatally injured is approximately 10%; at 50 km/h, it jumps to over 75% (Ashton, 1981).

The perception of speeding on highways is probably the most persistent problem facing all and sundry and people whose residences are in proximity to highways perceive vehicles are being driven at high speeds and conclude that the speeds would decrease if speed bumps were installed. Speed bumps are installations of raised pavement on roads or parking lots intended to slow vehicular traffic and tend to exhibit inconsistent design parameters from one installation and another. They are generally three to six inches in height and one to three feet in length across the roadway or driving area which are intended to reduce vehicle speeds up to 5 miles per hour (8 km/hr) and not recommended for public roads. As more and more speed bumps are installed, the question of the legality of this measure is becoming irrelevant.

Speed bump installations in Nigeria especially Ondo State emanated from the need to bring the vulnerable road users especially pedestrians out of the vulnerability mode. Hence, the extracts below culled from the daily newspapers further explain better the genesis of speed bump installations in the State. The papers read thus:

"Ondo youths protest killings by drivers"

"For the second day running, hundreds of youths blocked the Iju/Itaogbolu-Ado Ekiti Express-way, protesting the alleged killing of three persons, including two youths and an aged woman, by hit-and-run drivers within three days. The irate youths, who dug a trench across the expressway, vowed to remain on the road until speed guide, in form of bumps, are made on the road by relevant government agencies."

"The Vanguard" Newspaper, November 14, 2013.

"Villagers block highway to protest youth's death in Ondo"

"Villagers at Ogbese, a suburb of Akure Ondo State yesterday stormed the highways to protest the killing of a youth in the ever busy Akure-Owo Expressway by a commercial bus driver. Commuters and other motorists were stranded for several hours due to the traffic gridlock caused by the protesters. The deceased was crushed to death by a commercial bus when he was trying to cross to the other side of the road."

"The Sun news Online", August 15, 2013.

"Trailer kills teenager in Ondo community, youths go on rampage"

"There was heavy traffic yesterday, along Owo-Akungba Road linking the South West and the Federal Capital Territory as youth of Oba, Akoko community erected several barricades on the highway in protest of a 14-year-old teenage youth killed by a trailer. In protest, the irate youth made bonfires on the roads within the town and chanted war songs, while calling on relevant authorities to construct speed breakers along the highway to prevent recurrence."

"The Dailypost Nigeria online newspaper", January 6, 2014.

In many instances, speed bumps were installed instantaneously without considering the characteristics of vehicles plying the highways, neither the nature of the road environment nor safety of other road users. The speed bump installations are in most cases carried out due to yearning of people whose residences are in proximity to the highways regardless of laws guiding the construction of highways. Therefore, this study evaluated the effect of speed bumps installation along the selected major routes in Ondo.

II. Objective Of The Study

This study is to evaluate the effect of speed bump installations along the selected major routes in Ondo, Southwestern Nigeria

Specific objectives:

- To analyse the crash rate before and after specific sections of the selected routes were installed with speed bumps,
- To determine the acceptable level of the speed bump installations among the road users plying those routes and,
- To compare the traffic volume along the selected major routes before and after the installations.

III. Research Questions

- Does the speed bumps installation bring about change in the crash trend along the selected major routes?
- What is the extent to which the speed bump installations are acceptable among the categories of road users?
- Has the vehicular traffic pattern change along the selected routes since the installation of the speed bumps?

Fig.1: Categories of vehicle negotiating the speed bumps along Ikare-Owo Route

Fig.2: Categories of vehicle negotiating the speed bumps along Akure-Owo Route

IV. Rearch Setting And Methodology

The study area is Ondo State which was created out of former Ondo Province of Former Western State in 1976. It is bounded by Kwara and Kogi State in the North, Edo State to the East, Delta State to the South East, Osun and Ogun States to the West and the Bight of Benin of the Atlantic Ocean to the South. Agriculture is the main stay of the economy of the people and they produce both cash and food crops. The state is primarily inhabited by the Yoruba people with a tradition of living in towns. The landmass of the State is 14,606 square km with a population of 3,441,024 (NPC, 2006). There are 12 major routes which connected the State to other parts of the country. The strategically selected major routes are the Akure-Owo, Akure-Ado and Ikare-Owo due to the installation of speed bumps along these routes in recent time.

The study was largely exploratory and limited to the evaluation of three (3) selected routes in Ondo. The routes assessed were those with bumps installation. It involved different categories of road users excluding children (minor) plying the routes. The specific locations used for the study are Oba-Akoko in Ikare – Owo, Ogbese in Akure-Owo and Iju in Akure-Ado routes. Traders, Transport workers and other people were also interviewed and their views/suggestions may provide useful ideas for intervention.

To make the study an-all inclusive one, three methods of investigation were used. This becomes imperative because not all of the research population were literate, and some of the issues demanded a different approach. The methods used are Focal Group Discussions (FGDs), questionnaire and Monthly RTCs Report/ Quarterly Traffic Count Data.

100 questionnaires were distributed randomly among the road users plying the selected routes in Ondo comprising drivers (Private and Commercial), passengers, pedestrians, traffic officers, and other users of the roads. Participation of respondents are voluntary and consent was given before the instruments were applied. Two (2) FGDs each of traders, transport workers and other road users who have one way or the other ply these selected routes and their views were thought to be paramount in evaluating the effect of speed bumps installation on the motoring public. Responses from the FGDs were reported verbatim to complement the quantitative data generated from cross sectional survey. A simple percentage Statistical analysis was employed as well as a content analysis of the Focal Group Discussions.

V. Results And Discussion

The results of the study are presented below and grouped according to the research questions.

Question one

Does the speed bumps installation bring about change in the crash trend along the selected major routes?

To make adequate evaluation of the selected routes in terms of RTCs and fatality, a comparative analysis of the RTC Report for 3/6 months before and after the dates of the speed bumps installation were employed.

KEY

DOT – Dangerous Overtaking
LOC – Loss of Control
SPV – Speed Limit Violation
OBS – Road Obstruction
BC – Bicycle
MC – Motorcycle
TC - Tricycle
SUV – Seat Belt Use Violation
m - male
f - female
c - children
DAD - Driving under Alcohol/Drug Influence
UPD – Use of Phone while Driving
BRD – Bad Road
DGD – Dangerous Driving
WOV – Wrongful Overtaking
P/UP – Pick Up
TRL – Trailer
TRK – Truck
R.P – Reference Point
TYV – Tyre Violation
PWR- Poor Weather
FTQ - Fatigue
COMACE- Corps Marshal & Chief Executive
BFL – Brake Failure
RTV – Route Violation

Date of speed bumps installation at Ogbese along Akure-Owo: 15th August 2013

Akure-Owo Route

Date	Time (hrs)	Probable Cause	No of Person(s) injured			No of Person(s) killed			Categories of Vehicles Involved								
			m	f	c	m	f	c	BC	MC	TC	CAR	SUV	P/UP	BUS	TRK	TRL
23-3-2013	1401	BFL	0	0	0	1	0	0	0	1	0	0	0	0	0	1	0
24-3-2013	1035	DOT,LOC	1	2	0	0	0	0	0	0	0	1	0	1	0	0	0
30-3-2013	1547	DOT	2	4	0	0	0	0	0	0	0	2	0	0	0	0	0
22-4-2013	0315	SLEEPING	1	1	0	1	0	0	0	0	0	0	0	0	1	0	0
26-4-2013	1424	WOV	2	3	0	0	0	0	0	0	0	1	0	0	1	1	0
2-5-13	1330	DGD	3	0	0	0	0	0	0	1	0	0	0	0	0	1	0
10-5-13	1130	DOT	5	2	1	0	0	0	0	0	0	1	0	0	0	1	1
17-5-13	1010	DOT,LOC	3	0	0	0	0	0	0	0	0	1	0	0	0	0	1
27-5-13	1340	DOT	0	0	0	5	0	0	0	0	0	1	0	0	0	1	0
30-5-13	1150	DOT	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0
6-6-13	1635	BFL	0	0	0	0	0	0	0	0	0	1	0	0	1	1	0
15-6-13	1548	SPV,LOC	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0
20-6-13	1505	LOC	2	0	0	0	0	0	0	0	0	0	1	0	1	0	0
26-6-13	0520	TYV	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0
8-7-13	1023	FTQ,PWR	0	0	0	0	0	0	0	0	0	1	0	0	1	1	0
22-7-13	2315	DGD	1	0	0	3	0	0	0	0	0	1	0	0	1	0	0
28-7-13	1020	RTV,LOC	1	2	1	0	0	0	0	0	0	2	0	0	0	0	0
14-8-13	0935	LOC	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
15-8-13	R.P	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
16-8-13	1845	DGD	5	0	0	0	0	0	0	0	0	0	0	0	0	1	0
2-9-13	1445	DOT,LOC	7	5	3	0	0	0	0	0	0	1	0	1	1	0	0
2-10-13	1100	DAD,LOC	2	0	0	0	0	0	0	2	0	1	0	0	0	0	0
19-10-13	2000	SPV,DGD	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0
26-10-13	1930	SPV	1	0	0	1	0	0	0	0	0	1	0	0	0	0	0
14-11-13	1840	SPV,DOT	4	1	1	0	0	0	0	0	0	2	0	0	1	0	0
20-11-13	1332	DOT,LOC	0	2	0	1	1	0	0	0	0	1	0	0	0	0	1
1-12-13	1705	DGD	5	0	0	0	0	0	0	3	0	2	0	0	0	0	0
8-12-13	1500	DGD	0	0	0	2	1	0	0	2	0	0	0	0	0	0	0
25-12-13	1117	DOT,LOC	2	1	1	0	0	0	0	0	0	1	0	0	1	0	1
25-12-13	1424	SPV,DGD	0	0	0	1	0	0	0	0	0	1	0	0	1	0	0
27-12-13	1430	SPV,LOC	1	3	3	0	0	0	0	1	0	0	0	0	1	0	0

29-12-13	1300	DOT,LOC	5	6	3	0	0	0	0	0	0	3	0	0	0	0	0
1-1-14	0925	SPV,LOC	3	1	1	0	0	0	0	0	0	1	0	0	0	0	0
1-1-14	1520	SPV	1	0	2	1	0	0	0	0	0	1	0	0	0	0	0
2-1-14	0910	SPV	2	2	0	0	0	0	0	0	0	2	0	0	0	0	0
7-1-14	1011	DGD	1	1	0	0	0	0	0	0	0	2	0	0	0	0	0
11-1-14	1405	BRD	0	1	1	0	0	0	0	1	0	0	0	0	0	0	0
13-1-14	1750	SPV,LOC	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0
13-1-14	2155	SPV,DOT	1	0	0	1	0	0	0	0	1	0	0	0	1	0	0
15-1-14	0835	SPV,DOT	1	1	0	0	0	0	0	1	0	1	0	0	0	0	0
23-1-14	0633	OBS	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0
28-1-14	1425	SPV,DOT	10	6	0	0	0	0	0	0	0	0	0	1	2	0	0
1-2-14	1740	SPV,LOC	4	1	0	0	0	0	0	0	0	1	0	0	0	0	0
2-2-14	1010	SPV,DOT	1	0	0	0	0	0	0	0	0	3	0	0	0	0	0
5-2-14	1133	UPD,LOC	2	0	0	0	0	0	0	0	0	2	1	0	0	0	0
20-2-14	2110	UPD,LOC	2	0	0	0	0	0	0	0	0	0	0	0	0	0	1
12-3-14	1544	SPV	2	1	0	0	0	0	0	0	0	0	1	0	0	0	1

Table 1.1: RTC Data recorded along Akure-Owo Route six (6) months before and after 15th August 2013

The total RTCs that occurred six months before the speed bumps installation amounted to 18 while the RTCs that occurred six months after summed up to 28. There was 55.5% increase in RTCs six months after the speed bumps installation. Truck/Trailer accounted for 10 of 18 (55.5%) RTCs six months before speed bumps installation and 6 of 28 (21.4%) RTCs six months after speed bumps installation. This revealed that RTCs resulting from Truck/Trailer decline by 34.1% six months after the installation. Truck/Trailer alone caused 7 of 12 (58%) fatalities before speed bumps installation and 2 of 10 (20%) fatalities after speed bumps installation.

Period	No of Person(s) injured			No of Person(s) killed			Categories of Vehicles Involved								
R.F :15th August 2013	m	f	c	m	f	c	BC	MC	TC	CAR	SUV	P/UP	BUS	TRK	TRL
6 months Before	22	14	2	12	0	0	0	2	0	14	1	1	7	8	3
6 months After	63	32	15	8	2	0	0	8	1	27	2	2	9	2	4
Total	85	46	17	20	2	0	0	10	1	41	3	3	16	10	7

Table 1.2: Analysis of People/Categories of Vehicle involved in RTCs along Akure-Owo Route

Severity Index of RTCs six months before the speed bumps installation is determined as follows;
Number of RTCs = 18
Number of Death = 12
Number of Injured = 22+14+2 = 38
Casualty figure = 12+38 = 50

Fatality Rate = $\text{Number of Death} / \text{Number of RTCs}$

$= 12/18$

Casualty Rate = $\text{Casualty figure} / \text{Number of RTCs}$

$= 50/18$

`Severity Index = $\text{Fatality Rate} / \text{Casuality Rate}$

$= 12/18 \,/ 50/18$

$= 12/50$

Severity Index (A) = 0.24

Severity Index of RTCs six months after the speed bumps installation is determined as follows;
Number of RTCs = 28
Number of Death = 10
Number of Injured = 63+32+15 = 110
Casualty figure = 10+110 = 120

Fatality Rate = $\text{Number of Death} / \text{Number of RTCs}$

$= 10/28$

Casualty Rate = $\text{Casualty figure} / \text{Number of RTCs}$

$$= {}^{120}/_{28}$$

Severity Index = $^{\text{Fatality Rate}}/_{\text{Casuality Rate}}$

$$= {}^{10/28}/_{120/28}$$

$$= {}^{10}/_{120}$$

Severity Index (B) = 0.083

The Severity Index of RTCs six months before the Speed Bumps Installation is higher than six months after i.e. A>B.

Cause of RTC	Frequency Before	Frequency After	Total	Percent (%)
BFN	2	-	**2**	2.98
DOT	6	9	**15**	22.38
LOC	5	11	**16**	22.85
Sleeping	1	-	**1**	1.49
WOV	1	-	**1**	1.49
DGD	2	6	**8**	11.94
SPV	1	15	**16**	22.85
TYV	1	-	**1**	1.49
DAD	-	1	**1**	1.49
UPD	-	2	**2**	2.98
BRD	-	1	**1**	1.49
OBS	-	1	**1**	1.49
FTQ	1	-	**1**	1.49
PWR	1	-	**1**	1.49

Table 1.3: Analysis of the RTC causal factors along Akure-Owo Route

DOT**,** LOC and SPV accounted for 68% of total causal factors (violations) along Akure-Owo Route from 15th February 2013 to 15th February 2014 and the offences are inter-related as over speeding could make the control of the vehicle get out of hand. The result almost corroborated with the COMACE's statement during the second stakeholders' forum in Abuja that speed violation accounted for about 65 per cent of causative factors of road crashes and fatalities within the last seven months of 2013.

Date of speed bumps installation at Iju along Akure-Ado Route: 14th November 2013

Akure-Ado Route

Date	Time (hrs)	Probable Cause	No of Person(s) injured			No of Person(s) killed			Categories of Vehicles Involved								
			m	f	c	m	f	c	BC	MC	TC	CAR	SUV	P/UP	BUS	TRK	TRL
24-8-13	1645	DOT	9	3	0	0	0	0	0	1	0	0	0	0	1	0	1
13-9-13	1844	DOT	1	0	0	1	0	0	0	1	0	1	0	0	0	0	0
14-11-13	R.P																
7-2-14	0650	SPV.LOC	0	1	0	0	0	0	0	0	0	2	0	0	0	0	0

Table 1.4: RTC Data recorded along Akure-Ado Route three (3) months before and after 14th November 2014

The total RTCs that occurred three months before the speed bumps installation amounted to 2 while the RTC(s) that occurred three months after was only one. The observed sharp drop in road crash on this route might be as a result of traffic diverting to alternative route where speed bumps are not installed. There was 50.0% reduction in RTCs three months after the speed bumps installation. Truck/Trailer accounted for 1 of 3 (33.3%) RTCs three months before speed bumps installation while no RTC was caused by Truck/Trailer three months after. This revealed that RTCs resulting from Truck/Trailer decline by 33.3% three months after the installation.

Period	No of Person(s) injured			No of Person(s) killed			Categories of Vehicles Involved								
R.P : 14th November 2013	m	f	c	m	f	c	BC	MC	TC	CAR	SUV	P/UP	BUS	TRK	TRL
3 months Before	10	3	0	1	0	0	0	2	0	1	0	0	1	0	1
3 months After	0	1	0	0	0	0	0	0	0	2	0	0	0	0	0
Total	10	4	0	1	0	0	0	2	0	3	0	0	1	0	1

Table 1.5: Analysis of People/Categories of Vehicle involved in RTCs along Akure-Ado Route

Severity Index of RTCs three months before the speed bumps installation is determined as follows;
Number of RTCs = 2
Number of Death = 1
Number of Injured = 10+3+0 = 13
Casualty figure = 1+13 = 14
Fatality Rate = $^{\text{Number of Death}}/_{\text{Number of RTCs}}$

$= {}^{1}/_{2}$

Casualty Rate = $^{\text{Casualty figure}}/_{\text{Number of RTCs}}$

$= {}^{14}/_{2}$

`Severity Index = $^{\text{Fatality Rate}}/_{\text{Casuality Rate}}$

$= 1/2 \; /14/2$

$= {}^{1}/_{14}$

Severity Index (C) = 0.071
Severity Index of RTCs three months after the speed bumps installation is determined as follows;
Number of RTCs = 1
Number of Death = 0
Number of Injured = 0+1+0 = 1
Casualty figure = 0+1 = 1
Fatality Rate = $^{\text{Number of Death}}/_{\text{Number of RTCs}}$

$= {}^{0}/_{1}$

Casualty Rate = $^{\text{Casualty figure}}/_{\text{Number of RTCs}}$

$= {}^{1}/_{1}$

Severity Index = $^{\text{Fatality Rate}}/_{\text{Casuality Rate}}$

$= 0/1 \; /1/1$

$= {}^{0}/_{1}$

Severity Index (D) = 0

The Severity Index of RTCs three months before the Speed Bumps Installation is higher than six months after i.e. C>D.

Cause of RTC	Frequency Before	Frequency After	Total
DOT	2	-	**2**
LOC	-	1	**1**
SPV	-	1	**1**

Table 1.6: Analysis of the RTC causal factors along Akure-Ado Route

DOT**,** LOC and SPV are causal factors (violations) along Akure-Ado Route from 14th August 2013 to 14th February 2014.

Date of speed bumps installation at Oba along Ikare-Owo Route: 6th January 2014

Ikare-Owo Route

Date	Time (hrs)	Probable Cause	No of Person(s) injured			No of Person(s) killed			Categories of Vehicles Involved								
			m	f	c	m	f	c	BC	MC	TC	CAR	SUV	P/UP	BUS	TRK	TRL
2-11-13	2215	SPV.DGD	3	2	0	0	0	0	0	0	0	1	0	0	1	0	0
5-01-14	1115	BLF.LOC	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0
6-01-14	R.P		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7-02-14	1215	BFL.LOC	0	0	0	0	0	0	0	0	0	2	0	0	0	1	0
1-03-14	1050	MDV.LOC	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0
12-4-14	0642	DOT.SPV	2	1	0	2	2	0	0	0	0	1	0	0	1	1	0

Table 1.7: RTC Data recorded along Ikare-Owo Route three (3) months before and after 6th January 2014

The total RTCs that occurred three months before the speed bumps installation amounted to two (2) while the RTC(s) that occurred three months after was three (3) in number. There was 50.0% increase in RTCs three months after the speed bumps installation. Truck/Trailer accounted for 1 of 2 (50.0%) RTCs three (3) before speed bumps installation while RTC caused by Truck/Trailer three months after accounted for 2 of 3 (66.7%) RTCs. This indicated that RTCs resulting from Truck/Trailer rise by 16.7% three months after the installation. Truck/Trailer caused the only one fatality which occurred three months before speed bumps installation and the only four fatalities that occurred three months after speed bumps installation.

Period	No of Person(s) injured			No of Person(s) killed			Categories of Vehicles Involved								
R.P :6th January 2014	m	f	c	m	f	c	BC	MC	TC	CAR	SUV	P/UP	BUS	TRK	TRL
3 months Before	3	2	0	1	0	0	0	0	0	1	0	0	1	1	0
3 months After	2	1	0	2	2	0	0	0	0	4	0	0	2	2	0
Total	5	3	0	3	2	0	0	0	0	5	0	0	3	3	0

Table 1.8: Analysis of People/Categories of Vehicle involved in RTCs along Ikare-Owo Route

Severity Index of RTCs three months before the speed bumps installation is determined as follows;
Number of RTCs = 2
Number of Death = 1
Number of Injured = 3+2+0 = 5
Casualty figure = 5+1 = 6

Fatality Rate = $\text{Number of Death} / \text{Number of RTCs}$

$= 1/2$

Casualty Rate = $\text{Casualty figure} / \text{Number of RTCs}$

$= 6/2$

`Severity Index = $\text{Fatality Rate} / \text{Casuality Rate}$

$= 1/2 \ / 6/2$

$= 1/6$

Severity Index (E) = 0.166

Severity Index of RTCs three months after the speed bumps installation is determined as follows;
Number of RTCs = 3
Number of Death = 4
Number of Injured = 2+1+0 = 3
Casualty figure = 3+4 = 7

Fatality Rate = $\text{Number of Death} / \text{Number of RTCs}$

$= 4/3$

Casualty Rate = $\text{Casualty figure} / \text{Number of RTCs}$

$= 7/3$

`Severity Index = $\text{Fatality Rate} / \text{Casuality Rate}$

$= 4/3 \ / 7/3$

$= 4/7$

Severity Index (F) = 0.571

The Severity Index of RTCs three months before the Speed Bumps Installation is lower than three months after i.e. E<F.

Cause of RTC	Frequency Before	Frequency After	Total
DOT	-	1	**1**
LOC	1	2	**3**
SPV	1	1	**2**
MDV	-	1	**1**
BFL	1	1	**2**
DGD	1	-	**1**

Table 1.9: Analysis of the RTC causal factors along Ikare-Owo Route

DOT**,** LOC and SPV accounted for 60% of total causal factors (violations) along Ikare-Owo Route from 6th October 2013 to 6th April 2014.The report within this period also indicates that DOT and LOC which are directly linked to speeding were equally risk factors. Summed together, excessive speeding remains the biggest obstacle to the Corps 2014 Goals of cutting down crashes by 15 per cent and fatalities by 25 per cent.

Question two

What is the extent to which the speed bump installations are acceptable among the categories of road users?

Table2.1: Distribution of Questionnaire along the major routes

Selected Routes	Lengths of Road (Km)	Questionnaire
Akure-Owo	23	40
Akure-Ado	43	30
Ikare- Owo	30	30
Total	**96**	**100**

Table 2.2: Respondents' Usage of the road

Item	Measurement	Frequency	Percent (%)
How often do you ply this route?	Always	58	58
	Occasionally	38	38
	Rarely	4	4

Table 2.3: Perception of Respondents towards the Speed Bumps Installation

	Item	Measurement	Frequency	Percent (%)
a	Do you feel comfortable when you observed that speed bumps have been constructed along this route?	Yes	42	42
		No	58	58
b	What do you suggest was the reason for the construction?	Incessant killing of pedestrians	15	15
		To reduce vehicular speed	33	33
		Crash reduction/prevention	22	22
		I don't know	30	30
c	Has the construction meet up with the purpose?	Yes	22	22
		No	48	48
		I don't know	30	30
d	Do you support the intervention?	Yes	37	37
		No	63	63

The purpose of the speed bumps installation

The installation of the speed bumps can be as a result of many f actors. Most of the participants at the focus group discussions, however, cited that vehicular speed as the main factor responsible for the erection. As one trader in one of the interviews submits,

The reason for the construction of speed bumps is to reduce the over-speeding of motor passing the road which automatically reduce the rate of accidents on our road

A participant in one of the focus groups also asserted:

This is to reduce speed along the highway when approaching busy area like markets, schools etc

These responses are typical of the respondents. Although vehicular speed is considered as the prime factor, other factors mentioned are crash reduction/prevention, which is also reflected in the aforementioned response, and spate incessant killing of pedestrians. From the survey conducted along the selected routes, 22% of participants opined that the construction met up with the purpose but with emerging issues.

Implication of the erection on road transportation

With reference to the public perception on the impact of the speed bumps erection on road transportation in Ondo, more than half of the respondents stressed that the bumps suddenly cause tear and wear of vehicles. Responses such as

Its implication on total time spent on the journey apart. It in the long run causes deterioration (at rates more than normal) of the vehicle mechanically which invariably translates to high maintenance cost, attest to this.

Focus groups discussions among significant others in the environment confirm the negative implications of the installation.

Erection of bumps on the highway cannot stop accident; hence it can truly lead to more accident. Just imagine what happen in a situation where a strange driver enter with high speed into bumps that had just been erected

(FGD with Transport Workers)

It must be noted that erection of bumps do waste time and cause more havoc to the road users. I felt mad when my relative had a miscarriage along Akure-Ado road at Ita-ogbolu bump erection

(FGD with Other Road Users)

These corroborate with the statement of Dr. Acquaye at a road safety awards for drivers held recently in Ghana:

Some of the bumps were too sharp and high and were the cause of frequent tyre punctures and damage to shock absorbers could be the cause of low back pains and neck pains reported at the hospitals.

It was reported that Dr. Acquaye brought a polythene bag full of bolts, knots and rivets picked at one of the bumps sites close to the Regional Hospital in Ghana to prove the damage which such bumps caused to vehicles.

From a study conducted by Omidiji & Ibitoye (2010), it was stated that some criminals used stones, tyre rims and wood laced with nails to stop vehicles by setting them on roads as traps to deflate the tyres that ran over them thereby unleash terror on the helpless victims. This provides a temporal machinery to perpetrate crime unlike speed bumps installation which is permanently position to aid criminality unknowingly as posited by one of the FGDs.

Speed bumps erection brings time delay and if care is not taken armed robbers will molest commuters along the road side.

(FGD with Other Road Users)

The findings from the survey reveal that the erection has negative implication in terms of damage to vehicle, human health as a result of impact and exposure of road users to criminal activities.

Acceptable Level of the Intervention

The finding from the study showed that 63% of the respondents do not support the intervention, which was evident in a statement made during the FGD session by one of the participants as follows:

The speed bumps erection is not vehicle-friendly and causes back and neck pains of vehicle occupants

(FGD with Other Road Users)

It was observed that the 37% of those that supported the erection are mainly traders who ply their trade in the built up areas (crash prone) and have witnessed some incidents in the areas. Be that it may, other road users' perception on the issue need to be taken into cognisance for critical analysis and necessary recommendations.

Question 3

Has the vehicular traffic pattern change along the selected routes since the installation of the speed bumps?

To determine the change in the vehicular traffic pattern along the selected major routes in Ondo, Quarterly Traffic Count Data before and after the installation dates of the speed bumps were compared.

- **AKURE-OWO ROUTE**
- **Date of Speed Bumps Installation:** 15th August 2013
- 2nd & 3rd Quarter Traffic Count Data of year 2013 were considered

2ND QUARTER 2013 TRAFFIC COUNT COLLATION

SECTOR: RS11.2 AKURE
ROUTE: AKURE-OWO
COUNTING POINT: FEDERAL GOVERNMENT GIRLS' COLLEGE
WEATHER: RAINING

DIRECTION INDICATORS FROM: AKURE TO: OWO

TIME INTERVAL	BC	MC	TC	CAR (P)	P/UP	TXI	OMNI BUS	LUX	LOR/TRUCK	TRL	TANKER	OTHER	TOTAL
0600-0700	0	28	0	43	21	31	47	2	22	13	21	0	228
0700-0800	1	35	0	47	27	39	51	1	30	19	27	0	277
0800-0900	0	48	0	53	33	40	61	0	35	23	29	0	322
0900-1000	0	36	0	64	37	37	78	1	47	30	32	0	362
1000-1100	0	34	1	73	31	35	88	0	43	33	37	0	375
1100-1200	0	41	1	89	29	38	92	0	37	38	35	1	401
1200-1300	0	30	0	91	28	11	108	1	24	40	39	0	372
1300-1400	0	27	4	106	18	15	111	0	26	39	27	0	373
1400-1500	0	17	0	117	25	34	126	0	31	35	28	0	413
1500-1600	1	21	6	102	27	22	131	0	39	27	40	0	416
1600-1700	0	22	0	131	21	20	105	2	40	21	43	0	405
1700-1800	0	34	0	139	27	33	118	0	42	30	37	0	460
TOTAL	2	373	12	1055	324	355	1116	7	416	348	395	1	4404

DIRECTION INDICATORS FROM: OWO TO: AKURE

TIME INTERVAL	BC	MC	TC	CAR (P)	P/UP	TXI	OMNI BUS	LUX	LOR/TRUCK	TRL	TANKER	OTHER	TOTAL
0600-0700	0	28	0	87	11	39	50	1	27	18	17	0	278
0700-0800	0	32	0	93	15	40	55	0	30	21	20	0	306
0800-0900	0	22	1	92	12	47	61	0	31	29	21	0	316
0900-1000	1	31	1	85	27	49	66	0	15	32	22	0	329
1000-1100	0	15	3	72	24	37	87	0	25	30	23	12	328
1100-1200	3	23	0	62	28	22	98	10	13	28	20	0	307
1200-1300	0	21	2	63	24	21	105	15	12	25	19	5	312
1300-1400	0	25	0	75	2	17	111	0	10	26	21	10	297
1400-1500	0	26	5	70	11	30	87	0	15	22	27	3	296
1500-1600	1	19	0	78	15	28	54	16	23	27	30	0	291
1600-1700	0	25	2	92	25	25	67	1	37	31	33	2	340
1700-1800	0	23	1	63	29	18	71	1	36	35	32	0	309
TOTAL	5	290	15	932	223	373	912	44	274	324	285	32	3709

3RD QUARTER 2013 Traffic Count Collation

SECTOR: RS11.2 AKURE
ROUTE: AKURE-OWO
COUNTING POINT: FEDERAL GOVERNMENT GIRLS' COLLEGE
WEATHER: RAINING

DIRECTION INDICATORS FROM: AKURE TO: OWO

TIME INTERVAL	BC	MC	TC	CAR (P)	P/UP	TXI	OMNI BUS	LUX	LOR/TRUCK	TRL	TANKER	OTHER	TOTAL
0600-0700	0	40	2	250	20	100	50	5	10	3	0	0	480
0700-0800	0	45	0	200	29	150	65	7	5	5	0	0	506
0800-0900	4	40	2	100	10	92	71	4	21	9	34	3	390
0900-1000	7	20	0	95	43	142	122	2	35	12	15	15	508
1000-1100	1	35	5	127	78	113	77	1	43	0	33	23	536
1100-1200	3	20	0	160	67	134	89	0	34	2	45	32	586
1200-1300	5	22	0	120	55	145	54	4	24	0	38	33	500
1300-1400	3	45	4	150	45	197	34	1	31	15	24	46	595
1400-1500	0	30	0	162	93	78	87	0	23	0	37	24	534
1500-1600	3	40	0	234	32	134	80	5	43	1	28	17	617
1600-1700	2	50	1	168	78	110	126	2	21	20	23	35	636
1700-1800	0	35	0	123	12	32	41	0	2	2	21	0	268
TOTAL	28	422	14	1889	562	1427	896	31	292	69	298	228	6156

DIRECTION INDICATORS FROM: OWO TO: AKURE

TIME INTERVAL	BC	MC	TC	CAR (P)	P/UP	TXI	OMNI BUS	LUX	LOR/TRUCK	TRL	TANKER	OTHER	TOTAL
0600-0700	0	40	0	250	19	69	10	0	10	12	20	0	430
0700-0800	0	59	0	300	27	71	39	1	13	0	19	15	544
0800-0900	3	29	6	79	12	71	56	2	13	0	35	0	306
0900-1000	1	35	0	70	56	92	82	3	36	10	33	3	421
1000-1100	4	20	0	140	55	76	114	0	51	0	42	25	527
1100-1200	0	15	4	150	56	81	61	0	21	0	39	7	434
1200-1300	6	25	0	134	45	76	76	2	43	20	42	3	472
1300-1400	1	30	0	114	65	134	23	3	23	0	34	10	437
1400-1500	2	27	8	156	72	45	59	2	45	0	31	9	456
1500-1600	4	45	0	190	45	124	65	2	34	13	55	15	592
1600-1700	1	47	0	156	23	76	79	0	17	0	41	9	449
1700-1800	0	37	3	112	9	25	23	3	7	16	17	0	252
TOTAL	22	409	21	1851	484	940	687	18	313	71	408	96	5320

	2nd Quarter			3rd Quarter		
Vehicle	**Akr/Owo**	**Owo/Akr**	**Total**	**Akr/Owo**	**Owo/Akr**	**Total**
BC	2	5	**7**	28	22	**50**
MC	373	290	**663**	422	409	**831**
TC	12	15	**27**	14	21	**35**
Car	1055	932	**1987**	1889	1851	**3740**
P/UP	324	223	**547**	562	484	**1046**
Taxi	355	373	**728**	1427	940	**2367**
Omni Bus	1116	912	**2028**	896	687	**1583**
Luxury	7	44	**51**	31	18	**49**
Lor/Truck	416	274	**690**	292	313	**605**
Trailer	348	324	**672**	69	71	**140**
Tanker	395	285	**680**	298	408	**706**
Other	1	32	**33**	228	96	**324**
Total	**4404**	**3709**	**8113**	**6156**	**5320**	**11476**

Total traffic counted bi-directionally during the 2013 Second Quarter Traffic Count (before the speed bumps were installed) = 8113
Total hour spent = 12
Average vehicular traffic per hour =
$$total\ vehicular\ traffic\ counted\ bi-directionally\ /Total\ hour\ spent$$

Average vehicular traffic per hour = $8113/12$

= 676 vehicles per hour

Total traffic counted bi-directionally during the 2013 Third Quarter Traffic Count (after the speed bumps were installed) = 11476

Total hour spent = 12

Average vehicular traffic per hour =

$$total\ vehicular\ traffic\ counted\ bi-directionally\ /Total\ hour\ spent$$

Average vehicular traffic per hour = $11476/12$

= 956 vehicles per hour

% Δ in vehicular traffic pattern = $(11476-8113)/8113 \times 100\%$

$$= 3363/8113 \times 100\%$$

= 41.45%

There was 45% increase in traffic volume when the 2013 Second Quarter Traffic Count Data (before the speed bumps installation) and Third Quarter Traffic Count Data (after the speed bumps installation) collated with respect to Akure-Owo route were compared. The increase might be owing to either the cost implication of fuelling vehicles if the motorists took alternative route or there was no alternative route.

Comparing analytically the data obtained from the Traffic Counted during the 2013 Second and Third Quarter in respect of heavy goods vehicle as follows;

Total heavy good vehicle for the 2013 Second Quarter Traffic Count = 2,042

Total heavy good vehicle for the 2013 Third Quarter Traffic Count = 1,451

% Δ in vehicular traffic pattern = $(1451-2042)/2042 \times 100\%$

$$= -591/2042 \times 100\%$$

= -28.94%

There was 28.94% decline in heavy good vehicle that ply the route for the periods under review. This might be owing to hostile nature of the communities along the route especially when crash involving drivers of heavy goods vehicle occurred. The peak period in the 2013 Second and Third Quarter Traffic Count fell in the evening which might have increase the probability of pedestrians (such as children) involving in road traffic crashes in those communities along the route since majority of them were already back from school.

- **AKURE-ADO ROUTE**
- **Date of Speed Bumps Installation:** 15th November 2013
- 3rd & 4th Quarter Traffic Count Data of year, 2013 were considered

3RD QUARTER 2013 TRAFFIC COUNT COLLATION

SECTOR: RS11.2 AKURE
ROUTE: AKURE-ADO
COUNTING POINT: 100M FROM ADO GARAGE
WEATHER: RAINING

DIRECTION INDICATORS FROM: AKURE TO: ADO

TIME INTERVAL	BC	MC	TC	CAR (P)	P/UP	TXI	OMNI BUS	LUX	LOR/TRUCK	TRL	TANKER	OTHER	TOTAL
0600-0700	0	12	0	50	5	50	15	0	5	0	5	0	142
0700-0800	0	5	0	65	12	69	19	0	9	0	10	0	189
0800-0900	2	30	2	110	15	95	77	6	25	5	30	3	400
0900-1000	5	15	0	100	45	145	125	5	40	0	19	10	509
1000-1100	7	17	0	130	80	120	80	0	40	0	35	25	534
1100-1200	3	20	0	165	70	138	90	0	34	9	47	35	611
1200-1300	1	10	10	130	60	150	60	5	25	0	40	40	531
1300-1400	4	15	0	152	47	200	40	2	30	7	27	15	539
1400-1500	3	20	0	163	98	80	90	0	27	0	40	10	531
1500-1600	4	15	0	230	37	137	85	6	45	0	31	5	595
1600-1700	0	30	3	170	80	115	130	3	27	4	29	42	633
1700-1800	0	35	0	130	20	39	120	0	4	0	25	10	383
TOTAL	29	224	15	1595	569	1338	931	27	311	25	338	195	5597

DIRECTION INDICATORS FROM: ADO TO: AKURE

TIME INTERVAL	BC	MC	TC	CAR (P)	P/UP	TXI	OMNI BUS	LUX	LOR/TRUCK	TRL	TANKER	OTHER	TOTAL
0600-0700	0	25	0	100	15		50	5	15	5	12	0	307
0700-0800	0	39	8	120	13	80	65	1	21	0	11	10	360
0800-0900	3	20	0	85	17	72	60	4	15	10	35	0	324
0900-1000	4	11	0	75	60	97	87	7	45	0	25	235	436
1000-1100	0	10	2	150	65	80	117	4	47	0	40	0	515
1100-1200	0	25	0	140	60	85	65	3	20	9	50	10	467
1200-1300	0	5	0	120	50	80	50	4	40	0	45	20	414
1300-1400	1	17	12	158	69	140	30	4	20	0	28	19	498
1400-1500	4	19	0	170	75	50	60	1	29	7	42	5	462
1500-1600	2	10	0	195	50	125	50	2	40	0	35	37	546
1600-1700	0	35	10	157	30	80	115	1	20	12	32	40	532
1700-1800	2	40	0	120	15	30	105	1	10	0	29	0	352
TOTAL	16	256	32	1590	519	994	854	37	322	43	384	166	5213

4TH QUARTER 2013 TRAFFIC COUNT COLLATION

SECTOR: RS11.2 AKURE
ROUTE: AKURE-ADO
COUNTING POINT:
WEATHER: HARMATTAN
DATE: 16TH DEC., 2013

DIRECTION INDICATORS FROM: AKURE TO: ADO

TIME INTERVAL	BC	MC	TC	CAR (P)	P/UP	TXI	OMNI BUS	LUX	LOR/TRUCK	TRL/TANKER	OTHER	TOTAL
0600-0700	0	45	0	115	111	140	20	0	9	12	0	452
0700-0800	0	65	0	105	102	125	65	0	10	15	0	487
0800-0900	0	55	1	120	56	11	47	0	30	27	4	351
0900-1000	1	28	0	145	91	127	108	0	35	20	6	561
1000-1100	0	25	0	100	84	117	30	1	25	18	9	409
1100-1200	0	24	2	95	60	102	45	0	10	19	2	359
1200-1300	1	47	0	80	65	100	50	0	17	21	1	382
1300-1400	0	35	0	75	80	103	51	1	8	25	3	381
1400-1500	0	33	4	55	74	90	47	0	20	20	5	348
1500-1600	1	50	0	105	30	85	29	0	36	27	0	363
1600-1700	2	20	3	68	35	95	30	1	27	16	4	301
1700-1800	0	25	0	70	40	97	47	0	30	19	0	328
TOTAL	5	452	10	1133	828	1192	569	3	257	239	34	4722

DIRECTION INDICATORS FROM: ADO TO: AKURE

TIME INTERVAL	BC	MC	TC	CAR (P)	P/UP	TXI	OMNI BUS	LUX	LOR/TRUCK	TRL/TANKER	OTHER	TOTAL
0600-0700	0	50	0	120	102	130	10	0	0	0	0	412
0700-0800	0	70	0	115	115	140	15	0	0	0	0	455
0800-0900	0	65	2	125	100	102	65	0	10	16	9	494
0900-1000	0	65	0	130	50	105	11	0	15	39	10	425
1000-1100	1	50	0	110	80	117	40	0	20	35	0	453
1100-1200	0	40	3	80	65	120	45	0	30	9	0	392
1200-1300	1	20	0	79	50	135	50	0	35	25	6	401
1300-1400	0	27	0	57	27	140	52	0	26	20	0	349
1400-1500	2	25	4	100	55	145	49	0	10	22	0	412
1500-1600	0	40	0	75	10	90	20	0	15	30	3	283
1600-1700	4	45	0	60	20	100	35	0	17	11	1	293
1700-1800	0	25	0	75	30	50	50	0	12	13	0	255
TOTAL	8	522	9	1126	704	1374	442	0	190	220	29	4624

	3rd Quarter			4th Quarter		
Vehicle	**Akr/Ado**	**Ado/Akr**	**Total**	**Akr/Ado**	**Ado/Akr**	**Total**
BC	29	16	**45**	5	8	**13**
MC	224	256	**480**	452	522	**974**
TC	15	32	**47**	10	9	**19**
Car	1595	1590	**3185**	1133	1126	**2259**
P/UP	569	519	**1088**	828	704	**1532**
Taxi	1338	994	**2332**	1192	1374	**2566**
Omni Bus	931	854	**1785**	569	442	**1011**
Luxury	27	37	**64**	3	0	**3**
Lor/Truck	311	322	**633**	257	190	**447**
Trailer/Tanker	25/338	43/384	**68/722**	239	220	**459**
Other	195	166	**361**	34	29	**63**
Total	**5597**	**5213**	**10810**	**4722**	**4624**	**9346**

Total traffic counted bi-directionally during the 2013 Third Quarter Traffic Count (before the speed bumps were installed) = 10810
Total hour spent = 12

Average vehicular traffic per hour =

$$total\ vehicular\ traffic\ counted\ bi-directionally\ /_{Total\ hour\ spent}$$

Average vehicular traffic per hour = $10810/_{12}$

= 901 vehicles per hour

Total traffic counted bi-directionally during the 2013 Fourth Quarter Traffic Count (after the speed bumps were installed) = 9346

Total hour spent = 12

Average vehicular traffic per hour =

$$total\ vehicular\ traffic\ counted\ bi-directionally\ /_{Total\ hour\ spent}$$

Average vehicular traffic per hour = $9346/_{12}$

= 779 vehicles per hour

% Δ in traffic pattern = $(9346-10810)/_{10810} \times 100\%$

$$= -1464/_{10810} \times 100\%$$

= -13.54%

There was 13.54% decline in traffic volume when the 2013 Third Quarter Traffic Count Data (before the speed bumps installation) and Fourth Quarter Traffic Count Data (after the speed bumps installation) collated with respect to Akure-Ado route were compared. The decrease might be owing to motorists' alternative route of getting to their various destinations. The peak period in the 2013 Third and Fourth Quarter Traffic Count Data fell in the evening which might be owing to traders returning from markets where their produce are sold.

- **IKARE-OWO ROUTE**
- **Date of Speed Bumps Installation:** 6th January 2014
- 2013 4th Quarter Traffic Count Data and 2014 1st Quarter Traffic Count Data were considered

4TH QUARTER 2013 TRAFFIC COUNT COLLATION

SECTOR: RS11.2 AKURE
ROUTE: IKARE-OWO
COUNTING POINT:
WEATHER:
DATE: 17th December 2013

DIRECTION INDICATORS FROM: IKARE TO: OWO

TIME INTERVAL	BC	MC	TC	CAR (P)	P/UP	TXI	OMNI BUS	LUX	LOR/TRUCK	TRL/TANKER	OTHER	TOTAL
0600-0700	0	45	0	41	42	11	44	1	15	22	10	231
0700-0800	0	40	0	52	28	4	53	0	26	7	13	223
0800-0900	0	45	2	57	33	0	29	2	14	9	16	207
0900-1000	0	34		48	37	9	45	0	6	11	18	208
1000-1100	2	33	0	52	42	21	52	0	9	12	21	244
1100-1200	0	31	0	55	52	8	45	1	14	13	23	242
1200-1300	4	27	0	75	33	30	23	0	12	9	12	225
1300-1400	0	21	0	94	28	0	45	0	35	6	8	237
1400-1500	1	43	0	84	32	12	24	0	16	5	11	228
1500-1600	0	46	0	69	32	27	43	0	9	6	9	261
1600-1700	0	34	0	72	46	21	31	0	5	4	6	219
1700-1800	0	42	0	58	29	9	35	0	15	3	2	193
TOTAL	7	441	2	757	454	152	469	4	176	107	149	2718

DIRECTION INDICATORS FROM: OWO **TO: IKARE**

TIME INTERVAL	BC	MC	TC	CAR (P)	P/UP	TXI	OMNI BUS	LUX	LOR/TRUCK	TRL/TANKER	OTHER	TOTAL
0600-0700	0	58	0	63	45	10	40	8	19	6	16	265
0700-0800	0	33	0	60	48	21	20	3	22	8	4	219
0800-0900	0	35	0	33	27	13	29	5	4	5	7	160
0900-1000	0	50	0	55	29	35	42	9	18	11	3	252
1000-1100	0	31	0	45	8	23	43	4	6	1	13	174
1100-1200	0	60	0	62	37	11	36	8	16	3	21	254
1200-1300	0	35	0	43	15	9	25	12	7	15	4	165
1300-1400	0	53	0	40	11	14	23	16	12	8	6	183
1400-1500	0	35	0	50	15	7	36	11	4	5	3	166
1500-1600	0	43	0	56	30	12	40	8	3	8	4	204
1600-1700	0	36	0	50	18	17	34	0	7	11	2	175
1700-1800	0	45	0	54	24	20	38	13	14	4	3	215
TOTAL	0	514	0	613	307	192	406	97	132	85	86	2432

1st QUARTER 2014 TRAFFIC COUNT COLLATION

SECTOR: RS11.2 AKURE
ROUTE: IKARE-OWO
COUNTING POINT:
WEATHER:
DATE:

DIRECTION INDICATORS FROM: OWO **TO: IKARE**

TIME INTERVAL	BC	MC	TC	CAR (P)	P/UP	TXI	OMNI BUS	LUX	LOR/TRUCK	TRL/TANKER	OTHER	TOTAL
0600-0700	0	21	0	11	3	19	11	0	18	12	3	98
0700-0800	0	37	0	29	4	26	29	3	21	18	0	167
0800-0900	1	41	1	36	18	29	19	6	11	28	4	193
0900-1000	0	39	0	41	3	22	31	3	28	31	6	204
1000-1100	0	23	0	32	6	36	38	0	31	11	0	177
1100-1200	0	29	0	18	16	11	21	8	18	26	3	151
1200-1300	0	26	0	23	12	19	34	4	26	17	7	168
1300-1400	0	31	0	18	9	28	41	2	21	36	3	189
1400-1500	0	48	1	36	18	16	28	0	1716	-	179	167
1500-1600	0	36	0	28	11	29	19	1	12	14	2	152
1600-1700	0	28	0	19	21	26	27	4	21	11	0	158
1700-1800	0	37	0	26	18	16	21	0	18	21	0	157
TOTAL	1	396	2	317	139	277	319	31	242	241	28	1993

DIRECTION INDICATORS FROM: OWO **TO: IKARE**

TIME INTERVAL	BC	MC	TC	CAR (P)	P/UP	TXI	OMNI BUS	LUX	LOR/TRUCK	TRL/TANKER	OTHER	TOTAL
0600-0700	0	16	0	42	11	34	18	2	16	21	2	161
0700-0800	0	40	0	36	3	32	19	4	10	29	0	172
0800-0900	0	46	1	37	6	13	30	7	11	20	3	174
0900-1000	0	39	0	33	3	36	29	4	14	12	3	173
1000-1100	0	46	0	48	11	17	22	0	10	9	2	165
1100-1200	1	17	0	33	7	19	19	3	12	13	0	124
1200-1300	0	16	0	48	3	32	27	3	8	26	3	165
1300-1400	0	26	0	33	2	39	39	1	13	29	2	183
1400-1500	0	30	1	36	0	36	34	0	13	17	0	167
1500-1600	0	46	0	40	1	47	31	2	21	16	1	204
1600-1700	0	48	0	22	4	33	37	6	11	9	4	174
1700-1800	0	36	0	33	1	39	33	2	19	17	1	180
TOTAL	1	402	2	440	52	377	338	34	157	218	21	2042

	2013 4th Quarter			2014 1st Quarter		
Vehicle	**Ikare/Owo**	**Owo/Ikare**	**Total**	**Ikare/Owo**	**Owo/Ikare**	**Total**
BC	7	0	**7**	1	1	**2**
MC	441	514	**955**	396	402	**798**
TC	2	0	**2**	2	2	**4**
Car	757	613	**1370**	317	440	**757**
P/UP	454	307	**761**	139	52	**191**
Taxi	152	192	**344**	277	377	**654**
Omni Bus	469	406	**875**	319	338	**657**
Luxury	4	97	**101**	31	34	**65**
Lor/Truck	176	132	**308**	242	157	**399**
Trailer/Tanker	107	85	**192**	241	218	**459**
Other	149	86	**235**	28	21	**49**
Total	**2718**	**2432**	**5150**	**1993**	**2042**	**4035**

Total traffic counted bi-directionally during the 2013 Fourth Quarter Traffic Count (before the speed bumps were installed) = 5150

Total hour spent = 12
Average vehicular traffic per hour =
$$total\ vehicular\ traffic\ counted\ bi-directionally\ /_{Total\ hour\ spent}$$

Average vehicular traffic per hour = $5150/_{12}$

= 429 vehicles per hour
Total traffic counted bi-directionally during the 2014 First Quarter Traffic Count (after the speed bumps were installed) = 4035
Total hour spent = 12
Average vehicular traffic per hour =
$$total\ vehicular\ traffic\ counted\ bi-directionally\ /_{Total\ hour\ spent}$$

Average vehicular traffic per hour = $4035/_{12}$

= 336 vehicles per hour
% Δ in traffic pattern = $(4035-5150)/_{5150} \times 100\%$

$$= -1\ 115/_{5150} \times 100\%$$

= -21.65%

There was 21.65% decline in traffic volume when the 2013 Fourth Quarter Traffic Count Data (before the speed bumps installation) and 2014 First Quarter Traffic Count Data (after the speed bumps installation) collated with respect to Ikare-Owo route were compared. The decrease might be owing to motorists' alternative routes of getting to their various destinations. The peak period in the 2013 Fourth Quarter Traffic Count was in the morning (0600hrs – 0700hrs) considering the route bi-directionally.

In the 2014 First Quarter Traffic Count, two (2) peak periods were recorded along the route since the highest number of traffic counted bi-directionally was 204. The peak period of Ikare-Owo was considered as the total traffic counted was less than that of Owo-Ikare. Therefore the period fell in the morning and reduces pedestrians (especially children) vulnerability as might have gone to schools in the areas close to the highway.

VI. Conclusion

Effective traffic management in Nigeria is threatened not only by inadequacy of traffic engineering measures, but also by the poor road culture of the people. This does not allow many drivers and other road users to take note of existing measures; hence the obvious flagrant disregard of the safety measures. The Driving School Standardization Programme (DSSP) and the National Drivers' Training Manual developed by the FRSC under its Training, Standards and Certification arm were designed to address the preponderance of human errors leading to avoidable road mishaps in Nigeria. The Corps emphasizes that all driving schools in the country either owned by government or private individuals conform to the stipulated guidelines and specifications for the benefit of all (FRSC Report,2010). But how much are the procedures adhered to?

Pedestrians (mostly children) also contribute to road traffic crashes by not observing road traffic rules and regulations. Some pedestrians walk or run across the road without looking and ensuring the road is safe to do so while others do not wear reflective clothes at night so that drivers could easily see them. These behaviours contribute to road traffic crashes (FRSC, 2013b). Road safety education is said to be a potent tool for the prevention of RTCs and bringing in road safety curriculum into the normal school programme to inculcate them with road safety culture in a tender age, but "how much is it welcomed" becomes very significant.

This group of road users (i.e. pedestrians) is the primary purpose while speed bumps are installed in some locations. The erection of speed bumps without recourse to specifications posed danger to both vehicles and road users. As observed, people who are residence close to the highway are in the habit of indiscriminately erecting bumps without recourse to the concerned agency. These practices greatly undermine government's

efforts at ensuring sanity on the roads. They do not take the interest of the society into account and there is the need for some level of control and regulation.

WHO and the Global Road Safety Partnership in the publication-Speed Management: a Road Safety Manual for Decisions Makers and Practitioners, 2008 recommended that speed limit should be introduced in every country as part of the global strategy to cut down road fatalities and according to COMACE, the Corps major challenge is enforcing traffic laws on over speeding without any bias or exceptions especially as it affects executive recklessness.

But insufficient database is the bane of traffic management in the country and poor political will hampered robust traffic data collation which would have aided the country in the overall safety and security. It is regrettable that comprehensive collaborative efforts of the FRSC with institutions towards enhancement of a safer traffic environment are paid deaf ear to or not embraced fully. Rather, road safety issues are approached unilaterally in different quarters. Hence, the continual deplorable trends of road traffic crashes in Nigeria.

VII. Recommendations

Certain challenges militating against the maintenance of safety on the selected routes have been sufficiently identified above. To mitigate these challenges, the following recommendations are hereby suggested:

It is strongly advised that the recommendations being presented after the conduct of road safety audits should be accepted and followed to the letter and the implementation of the International Road Assessment Programme (iRAP) tools should be pursued with vigour as it assists in the identification of highest risk highways and enable the Ministry of Works to establish a targeted programme of interventions.

It is strongly recommended that close monitoring of the driving schools should be conducted at all time as it ensures proper driver training which would guaranteed crash free roads in Nigeria.

Pedestrians involved in RTCs are mostly children; it is recommended that adequate road safety knowledge should be imparted to them at the early stage to raise their consciousness level through full implementation of road safety education in the school curriculum by the school administrators.

It is also recommended that the Federal Roads Committee on Surveillance and Action against Road Abuse should be alive to its responsibility of prosecuting any person caught abusing the roads.

There should be strict enforcement of traffic laws on every traffic offender without care whose ox is gored i.e. there should be no exception to the compliance of the law and in the case of crash, the financial responsibilities/burdens of injured victims should be transferred to the driver/rider that caused it.

The fact that prevalent violations on these selected routes are speed dependant, it is also suggested that the decisions agreed on in a communiqué issued on the 2nd Stakeholders' forum on speed limiting device enforcement in Nigeria held in Abuja on Wednesday 04 September 2013 should be given strong political backing to achieve the goal of tackling speed factor.

With credible database, accountability is ensured as traffic infractions recorded are traced to the offenders. Emphasis must be placed on data control and is achievable only and only if it is fully institutionalized through strong political will.

A stronger multi-sectoral collaboration on road safety should be encouraged amongst agencies and other Non-Governmental Organisations as safety on the roads is everybody's business.

Acknowledgement

I give thanks to the Almighty God for the inspiration and also my lovely wife, Mrs Taiye Elizabeth Richard for giving the moral supports. I must sincerely thank my Colleagues, YE Ojo; Fadumo and Ayanleke for assisting in the data gathering. Without forgetting the staff of the PRS Department in RS11.2 Ondo Sector Command for making vital information readily available and the entire Command for creating the enabling environment.

References

[1]. Ashton, S.J (1981). Pedestrian injuries: The influence of vehicle Design in H.C. Foot et al (ed.) Road Safety Research and Practice. Praeger,1981.
[2]. FRSC (2013a). FRSC and the Speed Burden. Retrieved April 10, 2014 from http://www.nigeriaintel.com/2013/09/21/frsc-and-the-speed-burden/
[3]. FRSC. 2013b. Nigeria Highway Code (3rd edition).Abuja: Detailworks Publication. August 2013.
[4]. FRSC Report. 2010. Why we have road crashes. Retrieved April 13, 2014 from http://frsc.gov.ng/rtc2011.pdf, pp.64
[5]. Nantulya, V.M. and M.R. Reich, 2002. The neglected epidemic: Road traffic injuries in developing countries. Br. Med. J., 324: 1139-1141
[6]. Odeleye, J.A. Improved Road Traffic Environment for Better Child Safety in Nigeria. 13th ICTCT Workshop Pedestrians and Road Design Proceedings
[7]. Oguara, T. M. (2010), a Management Model for Road Infrastructure Maintenance. Book of proceedings, 19th engineering assembly, Council for the Regulation of Engineering in Nigeria.

[8]. Omidiji, A.A. and Ibitoye, S.A.2010. Crime and Road Traffic Crashes Prevention in Public Transportation System in Nigeria: The Case Study of Kwara, Kogi and Ekiti States 24th ARRB Conference – Building on 50 years of road and transport research, Melbourne, Australia 2010
[9]. Omidiji, A.A.2010. Observational Studies of Road Traffic Engineering Measures on Federal Capital Territory Roads in Abuja, Nigeria. Proceedings of the 20th Canadian Multidisciplinary Road Safety Conference, Niagara Falls, Ontario, June 6-9, 2010
[10]. Oyedepo, O.J. and Makinde, O.O.2010. Accident Prediction Models for Akure-Ondo Carriageway, Ondo State Southwest Nigeria; Using Multiple Linear Regressions. An International Multi-Disciplinary Journal, Ethiopia Vol. 4 (2) April, 2010 (Pp. 30-49)
[11]. Wikipedia.2013. Highway. Retrieved February 26, 2014 from http://en.wikipedia.org/w/index.php?title=Highway&oldid=589207744
[12]. WHO. 2004. World Report on Road Traffic Injury Prevention. World Health Organization: Geneva, Switzerland.