THE STUDY OF ROAD USERS AND THEIR CONFORMANCE TO THE SPECIFICATION

BY

ADEYINKA, AMINAH ABIDEMI

HND/23/STA/FT/0035

BEING A RESEARCH PROJECT SUBMITTED TO THE DEPARTMENT OF STATISTICS,

INSTITUTE OF APPLIED SCIENCES,

KWARA STATE POLYTECHNIC, ILORIN.

IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE AWARD OF HIGHER NATIONAL DIPLOMA (HND) IN STATISTICS

JULY, 2025

CERTIFICATION

I certify that this project was carried out by ADEYINKA, AMINAH ABIDEMI with matriculation number HND/23/STA/FT/0035 as meeting the requirement for the award of Higher National Diploma in the department of Statistics, Kwara State Polytechnic, Ilorin.

_____ _____

DR. OLARINOYE, S.B **Date**
Project Supervisor

_____ _____

MISS. AJIBOYE, R.A **Date**
Project Co-ordinator

_____ _____

MISS.ELEPO, T.A **Date**
Head of Department

_____ _____

External Supervisor **Date**

DEDICATION

This project is dedicated to Almighty God who has seen me through from the beginning to the end of the course. And to my lovely parents who has always been supportive.

ACKNOWLEDGMENTS

All thanks due to Almighty Allah, the owner and the creator of Universe for His divine protection and guidance throughout my life in school and this research project work.

First and foremost, I give thanks and I appreciate the efforts of my distinguished project supervisor, Dr Olarinoye who made sure I acquired all the necessary information and Knowledge during the course of this project work may Allah reward him abundantly.

My gratitude goes to my beloved parents Mr and Mrs Adeyinka I can't thank you enough for your parental advice and financial support since the beginning of this program, JAZAAAKUMLLAH KHAYR. I pray Allah (SWT) spare their lives and make them reap the fruit of their labour.

My special thanks and appreciation goes to my brother and siblings, who stood behind my back, in person of Ismail,Sodiq,Ibrahim,Taofikah and Aisha . Thank you all for the love and supports.

I want to say a very big thank you to my father,Thanks for everything you have been the best man on earth Jazakumullah

This acknowledgement will be incomplete if I fail to appreciate all my friends Blessing Adenike my sit partner Kaosarah Bisola Ayoola and my entire course mate in the department of STATISTICS 2025set. Thank you all. JAZAAKULLAH KHAYR. I pray Allah (SWT) guide and protect us till we reach the peak we're all eyeing.And thanks to everyone that support me In one way or the other during my journey in Sch I really appreciate you all and I am grateful for everything

Lastly, my sincere gratitude also goes to the Head of Statistics Department, in person of Miss Elepo T.A and all the lecturers of Statistics Department, Kwara State Polytechnic, Ilorin in person of Dr. (Mrs.) Aiyelabegan, A.B; Miss Ajiboye, R.A; Dr. Beki, D.O; Mr. Shafihi, F.G; Mr. Kuranga, J.O; Yusuf Saad; Mrs. Yusuf, G.A; Mrs. Abdulrahman; Mr Sulyman; and Mr Olarinoye, S.B for the good academic support given since the beginning of our program till point on time. I won't fail to appreciate DMLS-Rock Cyberworld located @Westend Market (+234 817365 1164) for the typeset of this project work.

ABSTRACT

The research work tends to examine the non-conformance of vehicles plying the roads. In the course of this a sample by observation was employed using sample size of One Hundred and Sixty four.

The analysis employed was the use of quality control tools (p-chart).

The result findings shows that the proportion of non-conformance vehicle plying the road are high with an average of ten vehicles in twenty sample which pose a risk to the road.

Keyword: (non-conformance, vehicles accidents,, chart, inspection)

TABLE OF CONTENTS

CHAPTER ONE

1.0 INTRODUCTION

Vehicle inspection is a procedure mandated by national or subnational government in many country, in which a vehicle is inspected to ensure that it conforms to regulations governing transfer of title to a vehicle. If required periodically, it is often termed periodic motor vehicle inspection: typical interval are every two year. When a vehicle passes inspection, often a sticker (inspection decal or inspection sticker) is placed on the vehicle's windshield or registration plate to simplify later controls, but in some countries, such as the Netherlands since 1994 it's no longer necessary. Inspection stations are places to drive inside to see if a vehicle passes inspection once a vehicle is due to inspection. Most US inspection decals/sticker display the month's number and the year.

In some jurisdictions, proof of inspection is required before a vehicle license or license plate can be issued or renewed. In others, once a vehicle passes inspection, an inspection decal is attached to the windshield or registration plate, and police can enforce the inspection law by seeing whether the vehicle displays an up-to-date decal.

There is some controversy over whether periodically inspecting motor vehicles is a cost-effective way to improve road traffic safety. Recent analysis of changes in safety inspection procedures in the

United State have cast renewed doubt on the effectiveness of these inspection.

ROUTINE INSPECTION FOR ROAD WORTHINESS

Vehicle inspection requirements

- Present vehicle at VIO's office (vehicle inspection officer's office)
- Pay the prescribed fee at MLA

The test may be a road test, visual test or with computer.

- The test shall focus on serviceability of the vehicle the chassis, Engine Electrical part transmission, Brake system and safety devices
- Inspection for road worthiness certificate is carried out and validity tag affixed to certificated vehicle.
- It is repeated every 6 months for commercial vehicles and annually for other vehicles older than 4 years from the date of manufacture, except those of exempted bodies/organizations.

VEHICLE CHECKLIST

Certain gadgets are expected to be carried in every vehicle at all times to meet the requirements of the law. These include:

1. Warning triangle (c-caution)
2. Fire extinguisher
3. Jack
4. Spare tyre

5. First aid kit
6. Wheel spanner
7. Water
8. Hydraulic
9. Transmission fluid

1.1 INQUIRY INTO VEHICLE ROADWORTHINESS

The Road Safety Committee of the Victorian parliament is conducting an inquiry into vehicle Roadworthiness. This is aimed at considering and making recommendation on the effectiveness of vehicle roadworthiness systems in reducing the incidence and severity of crashes.

This study is in response to a request by Victorian Automobile Chamber of Commerce (VACC) to assist in their submission, in responding to question 1 of the parliamentary committee's terms of reference

1. The extent to which vehicle roadworthiness is involved as a primary or contributing factor in crash causation.

The study focuses on roadworthiness for passenger vehicles and motorcycles, but does not include trucks (defined as good vehicles over 3.5 tonne GVM)

1.2 DEFINITION OF ROADWORTHINESS

To interpret the research on the effects of roadworthiness on crash and severity, it is helpful to have a clear definition of roadworthiness .

A roadworthy vehicle is one in which there exist no safety defects at a particular time, the RACQ Submission to the Travelsafe committee (1990) regards 'roadworthiness', as measured by the acquisition of a roadworthiness certificate, as an indication that the vehicle is safe to drive at the time that it was inspected.

The detection of defects, and judgment about what classifies as a defect, are very much relative concepts, rather than absolute ones. For example, vehicles vary from one make and model to another as regards their inherent primary safety and secondary safety performance, as well as their degradation with age. In one sense, a vehicle is roadworthy, the same vehicle could be roadworthy in one jurisdiction and not in another. Roadworthiness is not a constant attribute of the vehicle, either. A vehicle might be roadworthy today but not tomorrow if there is a failure of a component of the vehicle, for example, a signal lamp ceased to function. Defects may include some problems that are difficult to assess, such as a windscreen that distorts light.

1.3 METHOD

The work presented in this report comprises four main stages or activities. For each of these stags the central question to be addressed

relates to providing information in response to question 1 “The extent to which vehicle roadworthiness is involved as a primary or contributing factor in crash causation”

1.4 WHAT IS ROADWORTHINESS INSPECTION?

While importing a used vehicle, the main concern is to check whether or not the vehicle imported matches up with the safety standards of the country. To check the performance, tools of the vehicle, roadworthiness inspection is carried out. The certificate is given to vehicles, which passes certain predefined tests for roadworthiness. Roadworthiness is basically a term used to define a vehicle that meets the standard requirements for safe and sound driving on roads. The test also determines that vehicles have not been illegally modified.

Roadworthiness inspection not only determines whether or not the vehicle is working properly, but is also important for environmental reasons and to ensure fair competition in the transport sector. It is important to inspect the vehicle as fully maintained and safe vehicle is less likely to involve in a road accident. If any illegal modifications on vehicles are done, then it is not allowed to be imported or even allowed on the road.

During roadworthiness inspection, vehicles are checked for any mechanical and structural defects and any quality of repair. Inspection on vehicles is done by professional, working in highly reputed

organization. There are many organizations such as Japan Export Vehicle Inspection Centre (JEVIC), Japan Auto Appraisal Institute (JAAI), Intertek, Quality Inspection Services Japan (QISJ) and others that provide inspection on used vehicles before they are exported to different countries. On the basis of the quality of inspection and the level of accuracy these organization performs on used vehicles, these are appointed by several countries to carry out roadworthiness inspections prior to their shipment. For example QISJ has been approved by the Kenya Bureau of Standard (KEBS) for pre-shipment inspections on all vehicles shipped to Kenya.

To minimize the risk of unsafe and hazardous vehicles entering in the country, in some countries like Kenya, Uganda, Zambia, Tanzania it is necessary to carry out roadworthiness inspection prior to the shipment of the vehicle. The inspection on vehicles is done in accordance with the regulations of the country, where the vehicle is to be exported. But some of the common factors include age limitation, driving side, mechanical and technical inspection on the vehicle.

When a vehicle passes minimum safety standards, a certificate or roadworthiness is issued. Without inspection it is difficult to know completely whether the used vehicle is in proper condition and have all requirements from the safety perspective. Thus, getting the vehicle inspected before importation is beneficial as the inspection gives a

sense of satisfaction to used vehicle importers that the vehicle imported is safe to drive.

1.5 SIGNIFICANT OF STUDY

Transportation is the movement of the humans, animals and goods from one location to another. The need to examine the worthiness of the means of transportation e.g vehicle used on the road will go along way in saving life and the over all safety of the humans, animals and goods.

Every years there are cases of accidents cause as a result of the bad state of means of transportation, were several life were lost some are transit to disable, hence the need to examine the quality of the conformance to goods road worthiness of vehicle.

1.6 SCOPE OF THE STUDY

The researchwork covers all vehicle that are plying the road be commercial or private. The research work is not limited to local access road alone but the federal road also.

The roadworthiness conditions include the essential part of the cars/vehicle that are very importance in keeping the car/vehicle safe on the road.

1.7 LIMITATION OF STUDY

In the course of the study, some challenges were encounter such as access to good data, lack of database, lack of instrument to measure worthiness and the over-all constraints of time and resources.

1.8 AIM AND OBJECTIVES

The general aim of the research work is to examine the worthiness of which on the road

Objectives

- To examine quality of the vehicle
- To examine causes and effect of if out of control

CHAPTER TWO

LITERATURE REVIEW

2.0 INTRODUCTION

This section of the report reviews the research literature and reports on the effect of vehicle inspection systems on accident rates, the effect of vehicle defects on the incidence and severity of crashes, and the cause of crashes. The effect of ageing cars is then covered, followed by a short section on the contribution of vehicle defects to the severity of crashes and a review of the role of driver awareness in relation to roadworthiness.

2.1 THE EFFECT OF PERIODIC MOTOR VEHICLE INSPECTION (PMVI)

One method of determining the effect of roadworthiness on crash incidence is to examine the effect of periodic motor vehicle inspection (PMVI) programs on accident rates. The aim of PMVI is to eliminate defects from the vehicle fleet by inspecting all vehicles on a regular basis and ensuring that any detected defects are repaired before allowing the car to drive on public road. If periodic inspection does reduce defects in the vehicle fleet, then studies that demonstrate that PMVI reduces crash rates may indicate that a reduction in vehicle defects is reducing crash rates.

It is important to note that PMVI may have other effects which cause the differences observed, such as promoting the number of newer vehicles on the road which may improve the crash worthiness of the vehicle fleet.

PMVI studies have primarily comprised of:

i.) Comparative studies between jurisdictions that do and do not have PMVI programs.

ii.) 'Before and after' studies of jurisdictions that have not introduced PMVI programs.

iii.) Studies comparing the crash rates of vehicles that undergo PMVI with those vehicles that do not, within the same jurisdiction, and

iv.) Analyses of accident rates of inspected vehicles between periodic inspections.

2.1.1 ASSUMPTION OF EFFECTIVENESS OF PMVI

One problem in examining the effect of PMVI on accident rates is that studies measuring its effectiveness assume that PMVI is effective in detecting and repairing all defects that may at some stage contribute to an accident

An example of where this assumption may fail is demonstrated by Victorian rules relating to the detection of unroadworthytyres. Tyres could run for a maximum of 10% of their lifetime below the legal tread depth in Victoria, that is, for about four months in a three year tyre life. Thus, the probability of detection of this defect in a yearly inspection program would only be 33% (Youngman and Stolinski, 1994).

In addition, inspection may not detect all problems, in a study in Pennsylvania in 1975, a car with 12 implanted defects was inspected at 20 different inspection station (Carnegie-Mellon University, 1975, cited in Youngman and Stolinski, 1994). The average number of defects detected was four and the maximum was seven. One average, two non-existent defects were statistical significant difference in accident rates between states with biannual PMVI and states with annual PMVI. Crain (1981) has noted that'….Vehicle inspection programs do not have the expected effect of reducing accident rates'.

In addition, there were two unexpected findings of this study. The first was that there was a tendency for states with PMVI programs to have higher death rates than those without PMVI, although this was not a statistically significant difference. The second was that states that conduct random vehicle inspections were found to be those with the lowest accident rates.

Crain (1981) suggested two reason as to why PMVI programs may have failed to reduce crash rate. Firstly, additional resources devoted to vehicle maintenance as a result of periodic inspection may not improve the inherent safety characteristic of the vehicle. Alternatively, additional expenditure induced by periodic inspection requirements do make the vehicle safer, but this potential for improved safety is dissipated by adjustments in driver behavior.

The prevalence of road traffic accidents is on the rise, thus contributing to morbidity and mortality. Vehicular factors are responsible for 13% of road traffic crashes. 33% of vehicles are not compliant to road worthiness standards. Defects in vehicles commonly occur in the banking system, trafficator and lights, tires and wheels, steering systems and body. Vehicle road worthiness is important in ensuring that the vehicle in safe and is road worthy. This is a current global need as highlighted in the World decade for road safety action. It is important that commercial vehicles that transport passenger are road worthy, since these vehicles claim more deaths and disability after a road accident. This emphasizes the importance of routine vehicular checks in road safety. Also, the ever increasing in number of parks, transport operator, vehicles and passenger on the road has more than ever underscored the need for fitness to drive assessment and roadworthiness checks. This study aimed at road worthiness of long distance commercial vehicles to Benin City, Edo State. A descriptive

cross sectional study design was used, and data was collected from 315 commercial long-distance drivers and their vehicles. Study was done from January to October, 2013. Respondents were recruited using systematic random sampling technique. Study instrument included structured interviewer administered questionnaires (including an observational checklist). Data was analyzed using SPSS version 20 of the 315 respondents, 273 (86.6%) had vehicles that were aged 1-4 years while 42(13.4%) were aged 5-8 years. Over three quarters 245 (77.8%) of vehicles had a valid MOT road worthiness certificate in place. The statistically significant predictors of roadworthiness were vehicle age (years), having a valid Ministry of Health (MOT) roadworthiness certification in place and fitness of the driver. Only a tenth of the vehicles were road worthy. Thus, there is need to conduct annual vehicular checks and maintenance, including search for vehicular defects before departure. Enforce fitness to drive assessment especially before issuance of driver's license and the Ministry of Transport (MOT) roadworthiness certificate should be issued only to vehicles that are road worthy and defect free. (Skaforet'al 2018)

The National Highway Traffic Safety Administrations (NHTSA) guideline on state motor vehicle inspection programs recommends that states should maintain a vehicle safety inspection program to reduce the crash outcomes from the number of vehicles with existing or potential conditions. Some states have started to terminate the vehicle safety inspection program because of insufficient effectiveness measures, budget constraints, and modern safer automobiles. Despite the consensus that these periodic inspection programs improve vehicle condition and improve safety, research on the relationship between vehicle safety inspection programs and whether these programs reduce crash rates or crash severities. According to the 2011-2016 Fatality

Analyssis Reporting System (FARS) data, nearly 2.6% of fatal crashes or crash severities. According to the vehicle's pre-existing manufacturing defects NHTSA's vehicle complaint database incorporates more than 1.4 million complaint reports. These reports contain extended information on vehicle-related disruptions. Around 5% of these reports involve some level of injury or fatalities. This study used these two databases to determine the effectiveness of vehicle inspection regulation programs in different stat of the U.S. A statistical significance test was performed to determine the effectiveness of the vehicle safety inspection programs based on the state with and without safety inspection in place. This study concludes that there is a need for vehicle safety inspection to be continued for the reduction of vehicle complaints. (Das et'al 1971).

The general view about the routine vehicle inspection operation is to ensure that vehicles are road worthy and meet safety requirements. This is done to enhance safe and clean transport within urban centres since the nature and condition of vehicles on road can be associated with the efficiency of traffic system. This study examines the contributions of the routine vehicle inspection operations to the overall traffic system in Abuja, Nigeria. The study made use of secondary data collected from the records of the Directorates of Road Traffic Services (DRTS) respondents' perception on the contributions of vehicle inspection operation to transport system using questionnaire designed to elicit information to achieve the objective of the study. A total of 142 respondent who were commercial taxi and bus drivers in Abuja were randomly sampled for the study. The study employed simple descriptive statistics and a combination of correlation and factor analysis as techniques for data analysis. The correlation analysis showed that the variables for considerations have positive relationships with one another except reduction in accident rate. The result of the factor

loading identified increased safety level (80.2%) and reduction in the number of vehicles with poor parts (67.6%) as the most significant contributions of the routine vehicle inspection operations to the overall transport system in Abuja. It concludes that vehicle inspection operations have other significant contributions to transportation system of urban centres aside ensuring road worthiness of vehicles. (Gbadamosi&Aderigbo 2017).

Some mechanical systems, such as steering, brakes and suspension, critically affect the safety of the vehicle. These system are subject to wear through use and time, changing their status throughout the lifetime of a vehicle. It is therefore, essential to develop adequate components and procedures of inspection that ensure the correct operation of these systems. Moreover, the steering inspection must guarantee certain requirements, such as, being able to test any vehicle steering system and being low priced. In addition, one of the most important requirements for any inspection procedure and sensors to be employed. The current steering system that measures the steering angles is time consuming. The aim of this research is to introduce a steering system inspection based on forces measured by means of a dynamometer plate. The main features of the proposed system ensure minimum testing time, and simple operation and avoid manipulation of the vehicle. In addition, precise and objective limits for acceptance and rejection have been established. Therefore, the proposed procedure meets all the requirements for the periodic motor vehicle inspection (PMVI) (Pozueloet'al 2014)

Understanding and prioritizing crash contributing factors is important for improving traffic safety on the expressway. This paper aims to identify the possible contributory factors that were based on findings obtained from crash data at Senai-Desaru Expressway (SDE),

which is the main connector between the western and eastern part of Johor, Malaysia. Using reported accident data, the mishaps that had occurred along the 77.2km road were used to identify crash pattern and their possible related segment conditions. The average crash frequency and equivalent property damage only average crash frequency methods had been used to identify and rank accident-prone road segments as well as to propose for appropriate simple and inexpensive countermeasures. The result show that the dominat crash type along the road stretches of SDE had consisted of run-off-road collision and property damage only crashes. All types of accidents were more likely to occur during daytime. Out of the 154 segment, the 4 most accident-prone road segment had been determined and analyzed. The results obtained from the analyses suggest that accident types are necessary for identifying the possible causes of accidents and the appropriate strategies for countermeasures. Therefore, this accident analysis could be helpful to relevant authorities in reducing the number of road accidents and the level of accident severity along the SDE.

CHAPTER THREE

METHODOLOGY

3.0 INTRODUCTION

The chapter present the method employed in the cause of the analysis. This method include the method of the data collection and the analysis.

The method of data collection is a primary source which is through observation using simple random sample. The sample size is one hundred and sixty four.

The method of only use is the use of quality control using attribute control chart.

3.1 CONTROL CHART

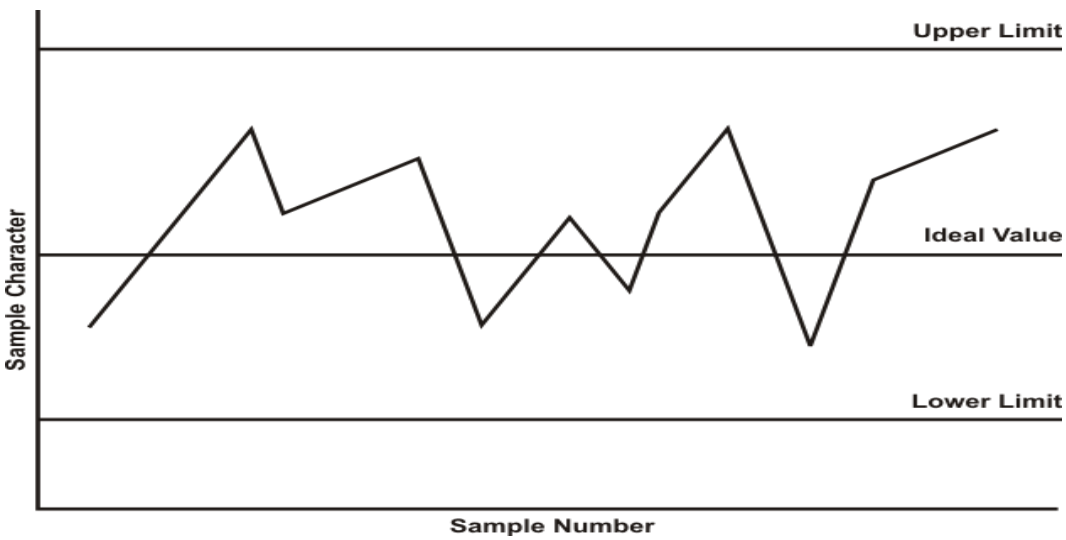
The control chart is a graph used to study how a process change over time. Data are plotted time order. A control chart always has a several line for the average, an upper line for the upper control limit and a lower line for the lower line for the lower control limit. These line are determined from historical data. By comparing current data to these lines, you can draw conclusions about whether the process variations is consistent (in control) or is unpredictable (out of control, affected by special causes of variation).Control charts for variable data are used in pairs. The top chart monitors the average or the centering of the distribution of data from the process. The bottom chart monitor the range, or the width of the distribution. If your data were shots in target practice, the average is where the shots are clustering, and the range is how tightly they are clustered. Control chart for attribute data are used singly.

When to use a control chart

- When controlling ongoing processes by finding and correcting problems as they occur.
- When predicting the expected range of outcome from a process.
- When determining whether a process is stable (in statistical control).
- When analyzing pattern of process variation from special causes (non-routine events) or common causes (built into the process)
- When determining whether your quality improvement project should aim to prevent specific problem or to make fundamental change to the process.

CONTROL CHART BASIS PROCEDURE

1. Choose the appropriate control chart for your data
2. Determine the appropriate time period for collecting and plotting data.
3. Collect data, construct your chart analyze the data.
4. Look for "out-of-control signals". On the control chart. When one is identified mark it on the chart and investigate the cause. Document how you investigated, what you learned, the cause and how it was corrected.



A typical control chart

It is also worth nothing at this stage that there is a close connection between control chart and hypothesis testing. If we formulate the hypotheses:

Ho: the process is in control

H_1: the process is not in control

Then a point lying with the upper and lower limits is telling us that we do not have the evidence to reject the null hypothesis and a point lying outside the upper and lower limit is telling us to reject the null hypothesis. From previous comments made you will realize that these statement are not an absolute truth but that are in indicative truth.

TYPES OF CONTROL CHARTS

The two major divisions of control chart result from the fact that there are two types of data variable and attribute data.

Whenever a record is made of an actual measured quality characteristics, such as a dimension expressed in thousandths of an inch, the quality is said to be expressed by variables. Variables are measureable characteristics such as a dimension, weight, purity, temperature, yield, tensile strength, flow rate angularity etc.

If a record shows only the number of articles conforming an falling to conform to specified requirements, the quality is said to be a record by attributes. Attributes are countable characteristics. For example, most visual examinations concern attributes. A shaft is either cracked or not; a bearing surface has an acceptable finish or it doesn't; a pump seal fails or it does not; scratches are present or not.

TYPES OF CONTROL CHARTS

Variable Charts

$\overline{X} - R$	Average and Range
$\overline{X} - R$	Median and Range
$\overline{X} - S$	Average and Standard Deviation
$X - R_m$	Individual and Moving Range

Attributes Charts

p	Fraction Nonconforming
np	Number of Nonconforming Units
c	Number of Nonconformities
u	Number of Nonconformities per unit

Requirements for using control charts

Before applying control chart techniques to any process or operation certain essential requirements must be satisfied. First, the people in decision-making positions should understand and support efforts to continually improve processes and quality through the use of statistical methods such as control charts. When this has been achieved, the following criteria must be satisfied for a business to really experience process improvement using control charts.

p Control Chart	p Fraction Nonconforming $\bar{p} = \frac{\sum d}{\sum n}$	$\bar{p}$	$UCLp = \bar{p} + 3\sqrt{\bar{p}(1-\bar{p})/n}$ $LCLp = \bar{p} - 3\sqrt{\bar{p}(1-\bar{p})/n}$
np Control Chart	npNo. of nonconforming unit $n\bar{p} = \left(\frac{\sum d}{\sum n}\right)(n)$	$n\bar{p}$	$UCLnp = n\bar{p} + 3\sqrt{n\bar{p}(1-\bar{p})}$ $LCLnp = n\bar{p} - 3\sqrt{n\bar{p}(1-\bar{p})}$
c Control Chart	cNo. of nonconformities $\bar{c} = \frac{\sum c}{k}$	$\bar{c}$	$UCLc = \bar{c} + 3\sqrt{\bar{c}}$ $LCLc = \bar{c} - 3\sqrt{\bar{c}}$
u Control Chart	uNo. of nonconformities/Insp. Unit $\bar{u} = \frac{\sum c}{\sum n}$	$\bar{u}$	$UCLu = \bar{u} + 3\sqrt{\bar{u}/n}$ $LCLu = \bar{u} - 3\sqrt{\bar{u}/n}$

CHAPTER FOUR

DATA PRESENTATION AND ANALYSIS

4.0 INTRODUCTION

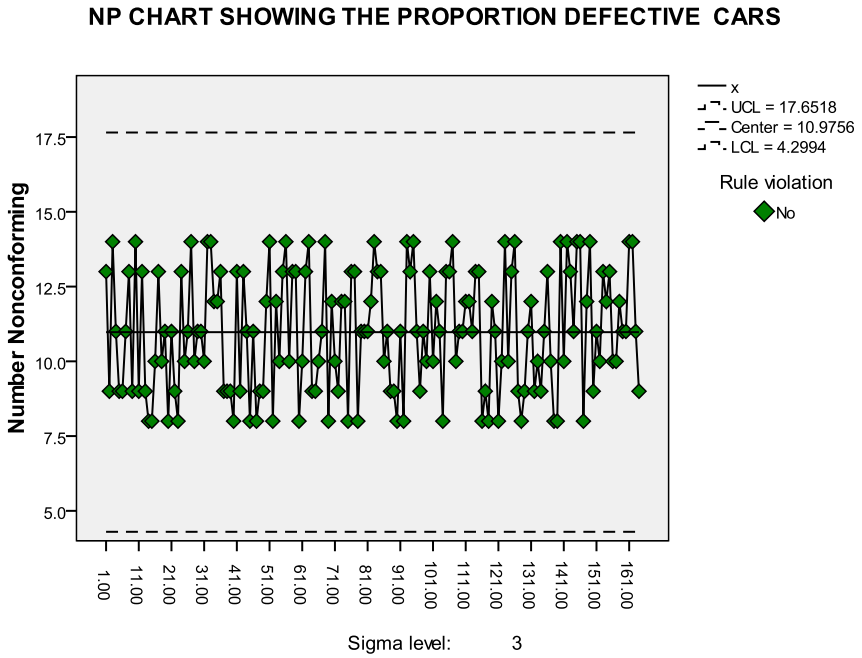
This chapter present the data and the analysis used in the research work. In the course of the work, a primary data was employed using observation method with a sample size of one hundred and sixty four. (See the appendix for the data)

The analysis was done using quality control tools (Attribte chart) P-chart for the measurement of the non-conformance of the vehicle inspection. This was done with the aid of software (SPSS). The output is as presented below

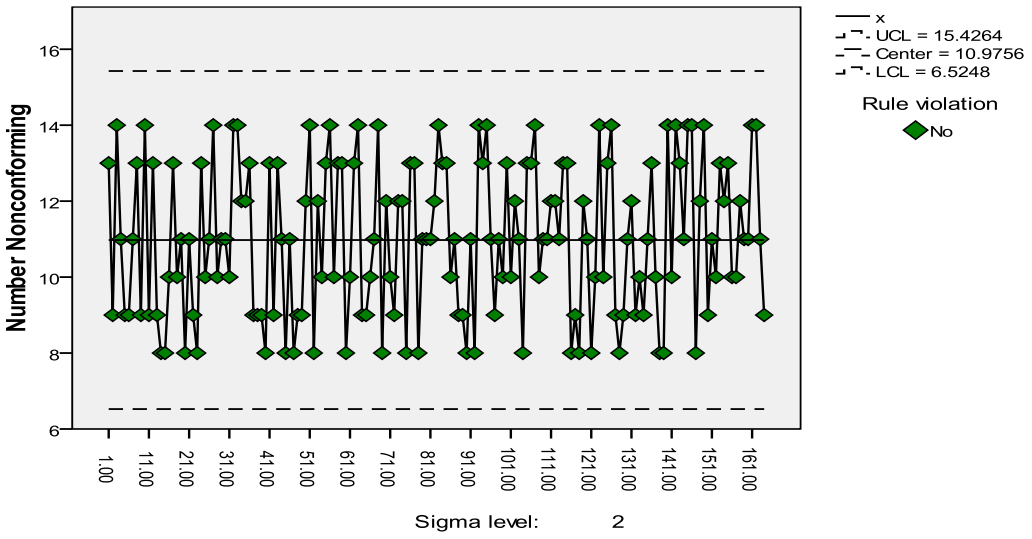
4.1 DATA ANALYSIS

Ho: Process in control

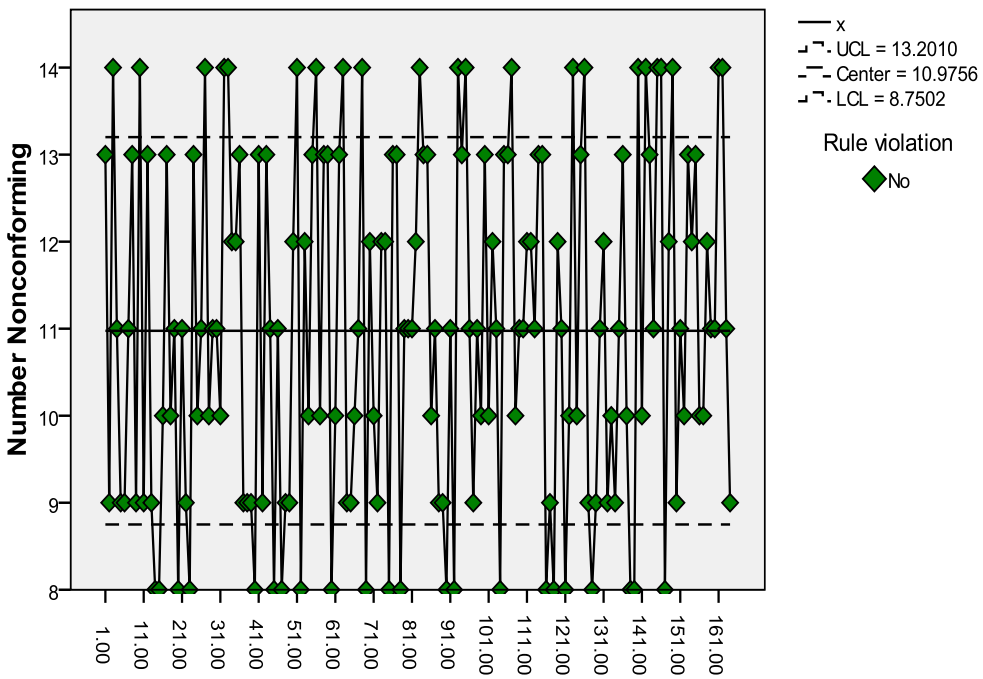
Hi: Process not in control



NP CHART SHOWING THE PROPORTION DEFECTIVE CARS



NP CHART SHOWING THE PROPORTION DEFECTIVE CARS



4.2 SUMMARY STATISTICS

Sigma Tolerance	CL	LC	UCL
δ	11	9	13
2δ	9	11	15
3δ	4	11	18

4.3 FINDINGS

The results obtained in the analysis shows that in an attempt to reduce the sigma (moving towards perfection) zero defect, the average defect the increase, while at 3δ the average was 4 (Non-conformance). This also affects the upper control limit.

CHAPTER FIVE

SUMMARY, FINDINGS, CONCLUSION AND RECOMMENDATION

5.0 SUMMARY

The research work examine the non-conformance of vehicle transportation system on the road. The need for this arise as a results of the various accidents happening on the road. The need to study the state of vehicle(s) and the number of such vehicles who are not road worthy is the reason for the research work. In the course of the study the following are the findings.

5.1 FINDINGS

The results obtained in the analysis using quality control tools (p-chart) shows that:

- The process/vehicle are not conformed to the road (sample)
- Moving toward 100% worthy of vehicles on the road the degree/values of non-conformance increases
- Most of the sample vehicles plying the road are one way or the other defective

5.2 CONCLUSION

Base on the outcome, there is the need for the following:

- 100% inspection for all vehicles
- The need to advice for the withdrawal of some vehicles from the road.

- Majority of the vehicles are not worthy to ply the road

5.3 RECOMMENDATION

The result obtain shows that proportion of non-conformed vehicles on the road hence, we therefore recommend as follows:

- The vehicle inspection officers should increase the orientation more on need for good state of vehicle
- Offender/non-conformed car/vehicles should be seize.
- The need for also good road.

REFERENCES

Asanda, S. (1992). Vehicle safety inspection system, Wheels '92 conference and workshop, 16-17 November, 1992: Sydney

Crain, W.N. (1981). Vehicle safety inspection: How effective? America enterprises institute for public policy research: Washington DC.

D. Garcia-Pozuelo, V. Diaz, M.J.L. Boada (2014). Improving vehicle safety.Ethiopian Journal of Environmental Studies and Management.

K.T. Gbadamosi, A.J. Adenigbo (2017). Contribution of vehicle inspection operation to traffic system.Ethiopian Journal of Environmental Studies and Management.

NordianaMashros, SittiAsmah Hassan, HaryatiYaacob, Moh'dShahrir Amin Ahmad Ismail Samat, Othman ChePuan, Norhidayah Abdul Hassan, Nor ZurairahettyMohdYunus and ZaitonHaron (2018). Road traffic accidents on Senai-Desaru expressway.MATEC Web of Conferences 250, 02002 (2018) SEPKA-ISEED 2018.

OkaforKingleyChinedu, Azuike Emmanuel C. &Omuemu Vivian O. (2018). Assessment of road worthiness of long distance commercial vehicles.International journal of Innovative Research & development.

Subasish Das, Sriniivas R. Geedipally, Karen Dixon, Xiaoduan Sun &Chaolun Ma (1981). Measures the effectiveness of vehicle inspection regulation.Journal of Transportation Research.

Youngman, J.H.R &Stolinsski, R.B. (1994).Compulsory periodic vehicle inspections.An RACV viewpoint. No CE 94/1, RACV.

APPENDIX

	SURVEY DATA ON VEHICLES PLYING THE ROAD							
SN	n	x	SN	n	x	SN	n	X
1	10	3	31	10	1	61	10	2
2	10	2	32	10	6	62	10	6
3	10	0	33	10	8	63	10	6
4	10	6	34	10	4	64	10	1
5	10	7	35	10	1	65	10	1
6	10	2	36	10	7	66	10	0
7	10	2	37	10	6	67	10	5
8	10	7	38	10	1	68	10	1
9	10	8	39	10	5	69	10	5
10	10	8	40	10	7	70	10	5
11	10	5	41	10	3	71	10	0
12	10	3	42	10	3	72	10	4
13	10	3	43	10	0	73	10	4
14	10	7	44	10	6	74	10	2
15	10	6	45	10	2	75	10	3
16	10	6	46	10	2	76	10	1
17	10	1	47	10	1	77	10	7
18	10	0	48	10	1	78	10	5
19	10	6	49	10	6	79	10	7
20	10	3	50	10	3	80	10	2
21	10	8	51	10	7	81	10	7
22	10	5	52	10	1	82	10	8
23	10	8	53	10	5	83	10	0
24	10	5	54	10	8	84	10	7
25	10	7	55	10	5	85	10	7
26	10	7	56	10	0	86	10	1
27	10	1	57	10	2	87	10	5
28	10	4	58	10	3	88	10	7
29	10	5	59	10	0	89	10	4
30	10	0	60	10	1	90	10	4