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**ANALYSIS OF VEHICULAR TRAFFIC COUNTS AND ACCIDENTS
OCCURRENCES ON SELECTED MAJOR ROADS IN MINNA, METROPOLIS
OF NIGER STATE NIGERIA**

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ABSTRACT

The study Examine the vehicular traffic counts across the days of the week on the selected major roads in Minna metropolis for establishing the level of flows and accidents occurrences. The method adopted for the study was the employment, training and distribution of thirty (30) students of SSS3 of Zarmai Model secondary school to serve as a team of research assistants for vehicular counting so as to obtain accurate and reliable results manually. This was due to the unavailability of digital traffic counting devices. The five (5) major roads had (6) students each stationed at the Roundabouts of the major roads to count and record the various types of assigned vehicles, one (1) student each was assigned to the five(5) major roads to record the road traffic accidents and Black spots locations along the roads .The 5 selected vehicles are; Cars Buses, Trucks tricycles and motorcycles The traffic count was restricted to days (Mondays-Sunday), and conducted at three different time epochs (7am-10am 12pm - 2pm, 4pm-6pm), for a duration of one week, after which the percentages of the recorded counts was computed and documented. The results from the five (5) major roads traffic counts within the period of (7am-10am, 12pm-2pm, 4pm-6pm) reveals tricycles, accounted for 2,704 (28.13%), motorcycles, 2,589 (26.27%), Cars 2,480 (25.80%), Buses 1,374 (14.30%), and Truck 443 (4.63%), with a total of 34 road traffic accidents recorded, out of which 60 people were involved , 25 injured , no death recorded, 28 black spots were identified to be of more risks with the highest roads crashes recorded between 7am-10am. ANOVA t-test was carried to determine the difference between road traffic accident and vehicular traffic count. Among the recommendations are; comprehensive weekly researches should be done in all Local Government Headquarters to compare the crashes records from FRSC, VIO, Police and other traffic agencies; Driving and vision test to be conducted on monthly bases to ascertain the effectiveness and sight viewing of the drivers; Traffic warders and other roads traffic enforcement agents should be position in all locations throughout the days of the week to arrest and charge the offenders.

Keywords: Vehicular counts, Traffic, Crashes, Casualties, Accident and Black spots



INTRODUCTION

Nigeria loses about 80 billion naira annually to road traffic accidents of all subjects that are involved in road traffic accidents in the country, 29.1 percent suffer disability and 13.5 percent are unable to return to work (Labinjo et al, 2010, Atubi, 2012). Road traffic crashes cost most countries 3% of their gross domestic product (UN Global Status Report on Road Safety, 2015). Atubi (2015) averred that road traffic accidents have physical, social, emotional and economic implications. The effect of speed on causing traffic related crashes, injuries and deaths has been documented in many settings (Aderamo, 2012). In fact, the over 20% reduction in traffic crashes and deaths in Brazil has been partly attributed to speed limits which have been posted on many roads since 1998 (Afolabi, 2017).

Urban traffic management is an important aspect of transportation planning that attracts the attention of transport experts and governments in both developed and developing countries in the world (Ajala, 2011). Preliminary investigations revealed that there is a gradual increase in the volume of automobile that plies the road networks within the study area. It is one of the major causative factors of the traffic gridlock frequently experienced by road users (Ajayi *et al.*, 2015). Therefore, the need to analyze the current traffic situation of the selected roads within the study area will serve as a base map for providing probable solutions to the menace of road traffic crashes. Traffic crashes has been one of major issues that most metropolises are facing. In order to mitigate this, many measures have been taken. It is believed that the identification of vehicular traffic count is the first step for such efforts as an essential guidance for selecting appropriate measures (Rao and Rao, 2012). Traffic count is a count of vehicular or pedestrian traffic, which is conducted along a particular road, path, or intersection which is commonly undertaken either automatically (with the installation of a temporary or permanent electronic traffic recording device), or manually by observers who visually count and record traffic on a hand-held electronic device or tally sheet (FHWA, June 2013)



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Traffic counts can be used by local councils to identify which routes are used most, and to either improve that road or provide an alternative if there is an excessive amount of traffic. Also, some geography fieldwork involves a traffic count which provide the source data used to calculate the Annual Average Daily Traffic (AADT), commonly used as indicator to represent traffic volume and for comparing two or more roads, and can also be used alongside other methods to find out where the central business district (CBD) of a settlement is located, these include used in speed limit enforcement efforts, highlighting peak speeding periods to optimise speed camera use and educational efforts (Denney and Charlie, 2015), traffic recorders, was introduced in 1937, operated off a strip laid across the street, and used a six volt battery. Each hour it printed off a paper strip with the total for that hour (Ryus et al., 2014). A newer type of temporary sensor consists of a metal detector and data recorder in a single package, adhered to the pavement in the center of a driving lane, unlike the pneumatic tube detector which cannot differentiate between lanes (Atagi, 2017). Most applications of manual counts require small samples of data at any given location. Manual counts are sometimes used when the effort and expense of automated equipment are not justified. Manual counts are necessary when automatic equipment is not available. Manual counts are typically used for periods of less than a day. Normal intervals for a manual count are 5, 10 or 15 minutes. Traffic counts during a Monday morning rush hour and a Friday evening rush hour may show exceptionally high volumes and are not normally used in analysis; therefore, counts are usually conducted on a Tuesday, Wednesday, or Thursday.

Agoki (1992) indicates that RTAs causation factors may be traced to the road users, vehicles or the road environment; and in Kenya the proportion is 80% traceable to road users, 6% to vehicle and 14% to road environment. In Nairobi County the contribution by road user factors is as high as 94% and an analysis of road traffic accident characteristics revealed four major groupings of factors influencing RTAs namely; pedestrian factors; land use factors; road layout factors, vehicular factors and traffic control device factors (Agoki,



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1992). These variables are also to be considered in our study. Technical reports by the National Transport and Safety Authority recommends road safety be made an integral component in urban planning. Many stakeholders outline the importance of urban traffic planning for road safety and enforcement of traffic rules and regulations. The studied went further in addressing the missing link where all the road safety stakeholders are involved in formulating road safety programs and interventions in order to reduce the scale of RTAs in Nairobi County.

Kim et al. (1995) utilized a log-linear model to explain the role of driver behaviors in the causal sequence that led to more severe injuries. They showed that behaviors of alcohol use and lack of seat belt use greatly increased the odds of more severe crashes and injuries. This was also employed by Akomolafe (2007) when he utilized the Artificial Neural Network using Multilayer to predict likelihood of accident happening at a particular location between the first 40 kilometers along Lagos-Ibadan Express road. Therefore, there is need to investigate the current traffic situation and road traffic crashes within the selected roads in the study.

STUDY AREA

Minna, lies between Latitude $9^{\circ} 36' 54.86''$ N, Longitude $6^{\circ} 32' 51.94''$, and Global Positioning System (GPS) coordinates Latitude 9. 6152, Longitude 6.5478, UTM Easting 230, 673.62, Universal Transverse Mercator, (UTM) Northing 1, 060, 329.98, UTM is plane coordinate grid system named for the map projection on which it is based. Degree-Minutes-Seconds (DMS) Latitude $9^{\circ} 35' 0.7980''$ N, DMS Longitude $6^{\circ} 32' 46.7376''$ E. It lies on the valley bed i.e. low land bordered to east by Paida mountain spreading east ward toward Maitumbi and northwards towards Maikunkele village to west, and southwards are highlands with all areas essentially savannah with its rich soil capable of sustaining agricultural activities Minna (Bosso and Chanchaga LGAs) share borders with the following



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Local Government Areas; Shiroro LGA to the North, Wushishi LGA to the West, Gbako LGA to the South-West, Katcha LGA to the South-East and Paikoro LGA to the East.

In April 1, 1976, Niger state was created out of the former Northern western state, and Minna became the capital of the new state. With this decision to make Minna a state capital, its role changed from that of the divisional headquarter to that of the state capital. It becomes the seat of the Government of Niger State from where the major decisions influencing the lives of the entire people within the whole state would be made. In effect, Minna has been transformed from a relatively passive divisional headquarter into a vigorous and dynamic state capital, which is not only has to provide service for the indigenes of Minna and the few immigrants prior to the state creation, but also for a much larger and mixed population in the town. This development would in no doubt have many planning implications. Possible areas of effects on planning as a result of the changing role of Minna would include need for land for government offices and residential uses. Need for housing, community services, medical welfare, recreational facilities and utilities etc, would be affected. But at this stage of Minna's development, the most important elements that would have greater planning implication are the need to allocate adequate land for government offices and residential, commercial uses, therefore the space that would be occupied by the offices that would accommodate all the people employed to serve the government would tell much not only on the size of the total future land requirement for the urban area, but also on how the total land must be allocated to various uses within the administrative city. As an administrative centre, Minna has consequently become an importance economic centre where people from the different part of the state would come to seek for employment and earn better living.

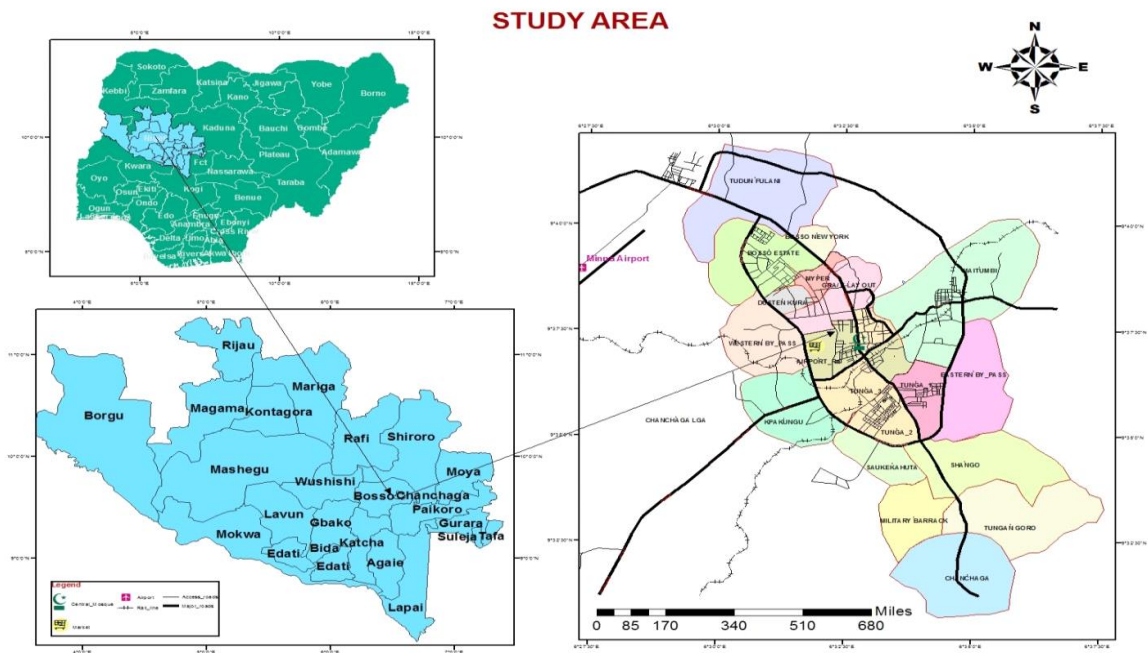


Figure 1: Map Showing Nigeria, Niger State, and Minna Metropolis
(Source: Niger State Ministry of Land Survey and Town Planning)

METHODOLOGY

The study used Primary sources of data. The primary data came from a comprehensive traffic census conducted by a team of research assistants in the city to establish the volume and composition of vehicular traffic flows in the city. The study procedure adopted for the selection of five (5) Major roads in the entire Minna Metropolis for vehicular road traffic count was based on the historical vehicular traffic flows volume, they include; Bosso-Mobile road, Bosso-Maikunkele, Book Roundabout-Mobile, Mobile-Bosso road, Kpakungu-Gidan kwano road, and Kpakungu-City gate . Thirty (30) students of SSS3 of Zarmai Model secondary school were selected, trained and distributed to serve as a team of research assistants for vehicular counting. This was due to the unavailability of digital traffic counting devices. The five (5) major roads had five (5) students each stationed at the roundabouts of the major roads to count and record the various types of assigned vehicles ,



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while one(1) student each was assigned to the five (5) major roads to record accidents and Black spots locations along the roads .The five (5) selected motorcycles recorded are, Cars, Buses, Trucks tricycles and motorcycles The traffic count was restricted to days (Mondays, Tuesday, Wednesdays Thursday Fridays, Saturdays and Sunday), and conducted at three (3) different time epochs (7am-10am, 12pm-2pm, 4pm-6pm), for a duration of one week, after which the percentages of the recorded counts was computed and documented.

DATA PRESENTATION AND ANALYSIS

.Tables 1; reveals the volume of vehicular traffic counts distributions for Mondays, Tuesday, Wednesdays, Thursday, Fridays, Saturdays and Sunday, with the epoch period of 7am-10am, 12pm-2pm, and 4pm-6pm. This periods usually witnessed an increase in the volume of vehicular flows that plies the five (5) major routes per days of the week, and the number of accidents occurrences. The major roads are; Mobile-Bosso, Bosso- Maikunkele, Book roundabout-Mobil, Kpakungu-Gidankwano, and Kpakungu-Citygate. The traffic count was conducted, computed and documented from the selected roads based on the long historical records obtained from the responses of the residents of the study area.

Table 1: results analysis of the combined five (5) major roads within the period of 7am-10 am, reveals total traffic count during the seven hours traffic survey conducted by the researcher showed a remarkable preponderance of motorcycle traffic. Of the total traffic volume of 9590 recorded, tricycles, accounted for 2704 (28.13%), motorcycles, 2589 (26.27%), Cars 2480 (25.80%, Buses 1374 (14.30%), and Truck 43 (4.63%). From table 1, it can be observed that the major routes in Minna that has high volume of vehicular traffic flow is Kpakungu-Gidan-Kwano, which accounted for about 5075 (22.22%)



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Table 1: Distribution of vehicular traffic counts on major routes between (700pm-10.00pm)

Vehicle Type	Days (7.00am-10.00am)							Total	
	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday		
Motor Cycle	473	376	396	352	423	315	254	2589	NO
	28.10	26.00	27.00	26.00	26.00	29.00	25.48	26.7	%
Car	419	377	400	347	357	301	279	2480	NO
	25.00	26.01	28.00	25.00	22.00	27.71	27.98	25.8	%
Bus	290	260	168	238	182	124	112	1374	NO
	17.23	18.00	12.00	17.00	11.00	11.41	11.23	14.3	%
Truck	64	77	74	68	72	49	39	443	NO
	3.80	5.30	5.00	5.00	4.00	4.52	3.91	4.62	%
Tricycle	437	363	401	334	559	297	313	2704	NO
	26.00	25.00	28.00	24.00	35.00	27.36	31.39	28.1	%
Total	1683	1453	1439	1339	1593	1086	997	9590	NO

Source: Field Work survey, 2021

Table 2: analysis of the combined five (5) major roads within the period of 4pm-600pm , reveals total traffic count during the three (3) hours traffic survey conducted by the researcher showed a remarkable in traffic volume during this periods. Of the total traffic volume of 5850 recorded, Cars and Tricycles accounted for 1862 (31.83%), 1678 (28.68%) respectively, while Motorcycles 1384 (23.66%), Buses accounted for 714 (12.21) and Truck has the lowest of the traffic volume accounted for 285 (4.87%). From table 3, it can be observed that during these period, there were less Buses and truck plying the major selected routes in Minna Metropolis, as compared to others motor vehicles



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Table 2: Distribution of Vehicular Traffic Counts on major Routes between 1200pm-200pm

Vehicle type	(1200pm-200pm)							Total	
	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday		
Motor Cycle	266	234	279	221	340	294	246	384	NO
	28.24	27.40	29.68	25.93	28.91	30.69	27.80	3.66	%
Car	266	260	280	262	320	284	288	1862	NO
	28.24	30.44	29.79	30.75	27.21	29.65	32.54	31.83	%
Bus	118	105	106	110	129	125	121	714	NO
	12.53	12.29	11.28	12.91	10.97	13.05	13.67	12.21	%
Truck	41	33	39	40	46	40	36	285	NO
	4.35	3.86	4.15	4.69	3.91	4.18	4.07	48.7	%
Tricycle	251	222	236	219	314	215	194	1678	NO
	26.65	26.10	25.11	25.70	28.99	22.44	21.92	28.68	%
Total	942	8124	940	852	1149	958	885	5850	NO
	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	%

Source: Field Work survey, 2021

Table 3: analysis of the combined five (5) major roads within the period of 1200pm-200 pm reveals total traffic count during the three (3) hours traffic survey conducted by the researcher showed a remarkable less in traffic volume during this periods. Of the total traffic volume of 7098 recorded, motorcycle, accounted for 2187 (30.81%), Cars 1973 (27.79%), Tricycle 1747 (24.61%, Buses 903 (12.72%), and Truck has the lowest of the traffic volume accounted for 288(4.06%). From table 2, it can be observed that during these period, there were less Buses and truck plying the major selected routes in Minna Metropolis, as compared to others motor vehicles.



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Table 3: Distribution of Vehicular Traffic Counts Per Days of the Weeks between (400pm-600pm)

Vehicle Type	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday	Total
Motor-cycle	218 24.60	188 25.00	191 24.24	211 26.38	200 20.94	199 26.46	186 25.97	1393 24.62
Car	260 29.35	212 28.19	219 27.79	246 30.75	282 29.52	202 26.86	179 25.00	1600 28.32
Bus	118 13.32	105 13.96	113 14.34	110 13.75	129 13.50	106 14.09	123 17.17	804 14.23
Truck	41 4.63	33 4.39	34 4.31	33 4.13	46 4.81	40 5.31	35 4.88	262 4.63
Tricycle	249 28.10	214 28.46	231 29.31	200 25	298 31.20	205 20.26	193 26.95	1590 28.14
Total	886 100.00	752 100.00	788 100.00	800 100.00	955 100.00	752 100.00	716 100.00	5649 100.0

Source: Field Work survey, 2021

Table 4 is the analysis of the combined five (5) major roads within the period of 4pm-600pm. It revealed that total traffic count during the three (3) hours traffic survey, showed a remarkable in traffic volume during this periods. Of the total traffic volume of 5649 recorded, Cars and Tricycles accounted for 1600(28.32%), 1590 (28.14%) respectively, while Motorcycles 1393 (24.62%), Buses accounted for 804 (14.23) and Truck has the lowest of the traffic volume accounted for 262 (4.62%). From table 3, it can be observed that during these period, there were less Buses and truck plying the major selected routes in Minna Metropolis, as compared to others motor vehicles.

Table 4, shows the vehicular traffic counts distributions per week, number of traffic crashes recorded, numbers of people involved, number of people injured, killed, and the numbers of Blackspots along the five (5) major routes. The distributions revealed statically, that about 22,838 of different categories of vehicles were recorded plying the routes at the epoch period selected of (7am-10am, 12pm-2pm and 4pm-6pm) respectively. The category of these vehicles; are Motorcycles, cars, buses, truck and tricycles. Out of which, Bosso-Mobile had



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4250 vehicular counts, Bosso-Maikunkele recorded the least vehicular traffic flows counts of 4057, Book Roundabout-Mobile recorded the highest of 5073 vehicular counts, Kpakungu-Gidan kwano recorded 4401 vehicles, and Kpakungu-City gate recorded 5057 vehicles. The distributions according to the numbers of crashes, a total of 34 traffic crashes were recorded with Kpakungu-Gidan kwano recording the highest of 11 crashes, while Kpakungu-City gate, recording the least crashes of 3 respectively. A total of 60 people were involved in the road traffic crashes along the routes, with Bosso-Maikunkele and Kpakungu-Gidan kwano routes having the highest of 16 people involved in the crashes respectively, while Kpakungu-City gate, recording the least of only 6 people involved in the crash. For the numbers of people injured, a total of 25 people were recorded, out of which Kpakungu-Gidan kwano, recorded the highest of 8 people with various degree of injuries, while Kpakungu-City gate, recorded the least of 2 people with injuries, however, no death were recorded at the spot of the crash during the field work. Furthermore, from the From (Table 4), about 28 Black spots were recorded along the routes during the research work, out of which BossoMobile had 10 Blackspots as the highest, while Kpakungu-Gidan kwano had none, the reasons for these was that, Kpakungu-Gidan kwano has no double lane, and lack of U-turns.

The scenario that was responsible for the casualties was as result of over speeding, lane driving violation, and also partly caused by road users themselves since they have developed attitude of gross impatience and disobedience to traffic rules. Summarily, the major causes of traffic crashes on this route include: narrow road width, bad road pavement, indiscriminate parking of cars by the road corridors, lack of traffic light, reckless driving and commercial viability of the axis (adjacent land use) (Okagbue et al., 2015).

Finally the analyses of the results of the vehicular counts were based on days of the week and time of the hours selected for the 5 major roads, and the reasons for selecting the time



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period was due to the fact that traffic gradually attain its peak in the morning around 7am-10am, being a rush hour for both students and workers to get to their schools and work places respectively, and in the afternoon around 2pm-4pm when most offices and schools closes for the day.

Table 4: Distribution of Vehicular Traffic Counts, causalities and numbers black spots on major Routes

Major Roads	Number of Vehicular Traffic counts per week	%	No. of Traffic crashes recorded	No. of people involved	No. of people injured	No. of people killed	No. of Black spots along the route	Total
Bosso-Mobile	4250	18.61	6	13	7	0	10	36
Bosso-Maikunkele	4057	17.77	9	16	5	0	8	38
Book Roundabout-Mobile	5057	22.15	5	9	3	0	4	21
Kpakungu-Gidan kwano	5075	22.22	11	16	8	0	0	35
Kpakungu-City gate	4401	19.27	3	6	2	0	6	17
Total	22,838	100.00	34	60	25	0	28	147

Source: Field Work survey, 2021

Table 5 shows the total number of vehicular traffic counts per week, Traffic crashes recorded, number of people involved, people injured, number of people killed, and number Black spots along the route. The analysis from the field surveyed reveals a total of 34 various kinds of accidents crashes occurrences were recorded across the study. Kpakungu-Gidan kwano has the highest number of accidents crashes of 11 crases, with no death recorded. The road of the city concentrating greatest route and is the most heavily trafficked route accounting for over 22.22% (5075), Book Roundabout-Mobile 22.15% (5057). Kpakungu-



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City gate 19.27% (4401), Bosso-Mobile 18.61% (4250) and Bosso- Maikunkele 17.77% (4057) of the total vehicular traffic volume field counts.

Table 5: Vehicular Traffic counts and number of Road Traffic Accident

Road	Road Traffic Accident	Vehicular Traffic Count
Bosso- Mobil	6	4250
Bosso-Maikunkele	9	4057
BookRound About-Mobil	5	5057
Kpakungu-Gidan –Kwano	11	5075
Kpakungu –City Gate	3	4401
Total	34	22,840

Sources: Fieldwork survey, 2021

ANOVA Statistical Testing

Table 6: The difference between road traffic accident and vehicular traffic count has calculated P-value of 1.64000 and critical F-value of 5.987378 in a test of two-tailed at 0.05 significant levels. This exposes the fact that road traffic accident and vehicular traffic counts do not differ significantly. This implies that vehicular traffic accident is a product of vehicular traffic flow on the road of a particular city or urban area.

Table 6: ANOVA Test Explaining the difference between road traffic accident and vehicular traffic count

<i>Source of Variation</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>P-value</i>	<i>F crit.</i>
Between Groups	43068481	43068481	340.0416	1.64E-06	5.987378
Within Groups	759939	126656.5			
Total	43828420				

Table 7: Vehicular road traffic accident across the days of the week has calculated P-value of 1.64000 and critical F-value of 2.75871 in a test of two-tailed at 0.05 Significant Levels (S.L). This expresses the fact that there is no statistically significant difference in vehicular road traffic accident across the days of the week. It implies that road traffic accident is the



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same in the various days of the week. This supports the previous prediction that actually there is no difference in the number of vehicles that have accident across the days of the week.

Table 7: ANOVA Test Explaining the Difference in Vehicular Road Traffic Accident across the Days of the Week

<i>Source of Variation</i>	<i>SS</i>	<i>ddf</i>	<i>MS</i>	<i>F</i>	<i>P-value</i>	<i>F crit</i>
Between Groups	3.533333	4	0.883333	1.086066	0.384715905	2.75871
Within Groups	20.33333	25	0.813333			
Total	23.86667	29				

Table 8: Vehicular traffic counts across hours of the day has calculated P-value of 0.268796 and critical F-value of 5.192167773 in a test of two-tailed at 0.05 Significant Levels (S.L). This expresses the fact that there is no statistically significant difference in vehicular traffic counts across hours of the day. It means there is no severe variation in the movement of vehicles in different hours of the day. This support the earlier speculation that vehicular traffic is the same across the various hours of the day.

Table 8: ANOVA Test Explaining difference in vehicular traffic counts across hours of the day.

<i>Source of Variation</i>	<i>SS</i>	<i>df</i>	<i>MS</i>	<i>F</i>	<i>P-value</i>	<i>F crit</i>
Between Groups	5	4	1.25	1.785714	0.268796	5.1921677
Within Groups	3.5	5	7			
Total	8.5	9				

CONCLUSIONS AND RECOMMENDATION

Conclusions

The study has explored the importance and the need for a redressing traffic volume survey on major road in Minna (Bosso-Mobile road, Bosso-Maikunkele, Book Roundabout-



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Mobile-Bosso road, Kpakungu-Gidan kwano road, and Kpakungu-City gate) , Interestingly, the study through its major findings revealed that Kpakungu-Gidan kwano, indicates that Car vehicle type is perhaps the most dominant traffic on Minna roads resulting from the failing government and private sector investment in the conventional public transport system in conjunction with a weak policy and poor intermodal system. Also, this study revealed no statistically significant variation in the traffic flow, and thus confirms that the observed variation results from a poor physical condition along the road corridors as well as rush-to-avoid-longer travel time and unnecessary cost along traffic routes. The nature of maintenance in Niger have remained major challenges that have encouraged never-ending quagmires of the road traffic across the Minna metropolis and surrounding, due to the obvious neglect of a traffic volume survey and the total decline in the provision and maintenance of basic infrastructural facilities such as traffic management devices vis-à-vis control, monitoring and priority devices; road lightning; night visibility mechanism; road geometry and layout; road signs and signals etc. which this study noted as agents for a high-quality physical condition of road networks that confirmed causing clustered nature of traffic bottlenecks on the roads.

Recommendation

Based on these findings, the study recommends a total redress of traffic volume survey and road transport planning along road corridors; installation of automated traffic count devices including permanent count devices and videotaping devices along major traffic corridors; periodic maintenance of road networks with quality facilities, installation of modern (automated and manual) traffic management devices along road corridors; prompt road improvement and expansion with right geometry and layout as well as the establishment of quality traffic database. In addition, research units should be embraced for efficient, safe, and quality road transport system in Nigeria and countries with similar traffic issues.



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VIO (Vehicles Inspection Office), should be equipped with modern devices that would enable daily vehicular counts results to be process and stored, so as to determine the statistics numbers of vehicles on each routes per day. The data would assist the road maintenance and rehabilitation.

Comprehensive weekly researches should be done in all Local Government Headquarters to compare the crashes records from FRSC, VIO, Police and other traffic agencies; Driving and vision test to be conducted on monthly bases to ascertain the effectiveness and sight viewing of the drivers; Traffic warders and other roads traffic enforcement agents should be position in all locations throughout the days of the week to arrest and charge the offenders.

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Major Roads	Number of Vehicular Traffic counts per week	%	No. of Traffic crashes recorded	No. of people involved	No. of people injured	No. of people killed	No. of Black spots along the route	Total
Bosso-Mobile	4250	18.61	6	13	7	0	10	36
Bosso-Maikunkele	4057	17.77	9	16	5	0	8	38
Book Roundabout-Mobile	5057	22.15	5	9	3	0	4	21