DETERMINANTS OF TRAFFIC CONGESTION IN GOMBE METROPOLIS, NORTH-EAST, NIGERIA

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Abstract

This study aims at providing information on the prevailing determinant of traffic congestion. A structured questionnaire was randomly distributed to 354 drivers who are conversant with the study area were requested to weight the variables that identify factors responsible traffic congestion in accordance with 4 – point Likert Scale. Relative Factor Index

Keywords:
Congestion, Metropolis, North-East, Gombe, Determinants, Traffic.

(RFI) across their responses was computed The result

INTRODUCTION

Transport system is wanted to facilitate a greater choice of the peripheral areas Odeleye and Oni (2007). Most socio-financial activities are concentrated in the middle of city with the aim to be noticeable by commuters which also creates many urban mobility problems, such as increasing automobile usage and trips to the central business districts, this in turn ends in excessive demand for parking, environmental trouble which include pollution, and in-capabilities to deal with those problems effects in congestion (Cameron and Krynauw,2003)

Traffic congestion takes place ordinarily when a town's road is not able to accommodate the

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revels human factor, technical land use and physical factors are obstructing efficient road traffic flow hence the need for improvement in terminal facilities, landuse relocation, and Participation of road users in future road design.

quantity of traffic that uses. Underneath such circumstances every vehicle impairs the quality of others. it's currently a typical feature of most urban centers of African country and most importantly city, Ibadan, Port Harcourt, Enugu etc. that central business Unit as the industrial nerve centers in most cities, having the foremost issues (Aderamo, 1998).

This study agued the prevailing information in understanding on traffic because it paves the manner for additional investigation, the matter of congestion therefore highlight befittingly the generic characteristics and peculiarities of this development within the urban centers. the answer to minimizing traffic congestion in Gombe maybe lies in correct transportation designing and management, in as much as transportation is regarded a vital subject right in any society. (Whitelegg, 2006). Once this part is omitted or neglected, any adopted resolution strategy could seemingly miss the target (Uwadiegwu, 2013).

The Study Area

Gombe state is centrally located in the Northeast region of the country (figure: 1.1), The study area is the administrative capital of Gombe State, located between latitude $10°08'43"N$ to $10^{0}25'13"N$, and longitude $11°01'19"E$ to $11^{0}18'55"E$ with general land use of 3216.0 ha (62%), as Residential, Recreation covered 117 ha (2%), 13%, is Industrial landuse Commercial landuse lastly 3.0%, public and semi-public landuses 19%. as seen in figure1.3
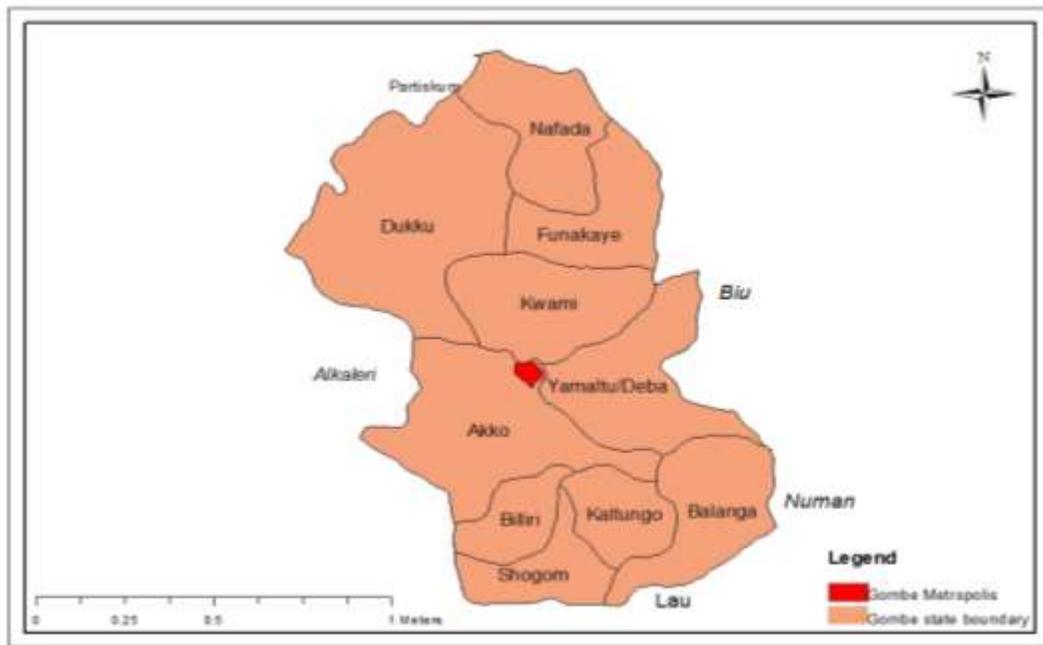
Figure 1.2: Gombe state Showing Gombe Metropolis
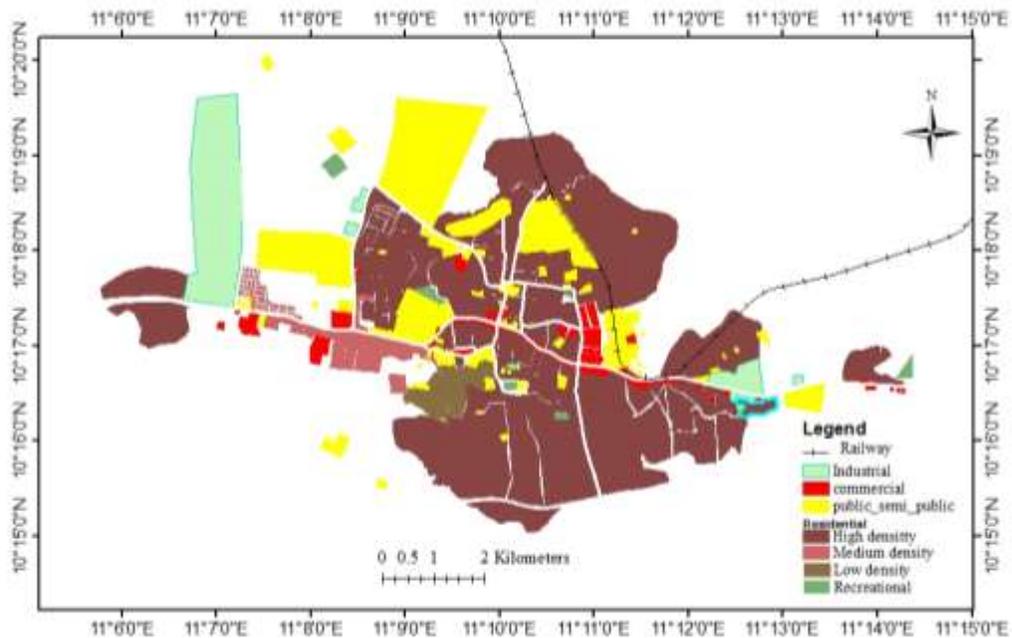 Source: Gombe State Urban Development Board (2003)

Figure1. 3: Land Use Map of Gombe Metropolis
 Source: Gombe State Urban Development Board (2003) updated by the author

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Method of Data Collection

A questionaire-based survey was carried out in order to have a full understanding of Commuter's perception on determinants of traffic congestion in Gombe urban area a structured questionaire was distributed to drivers at motor parks and congested roads. The structured questionaire contains a scale of 1 to 4 where, 4 is predominant, 3 is relevant, 2 is Somehow relevant, 1 is unimportant, to record and measure the level of response of a respondent in terms of numbers.

Simple Random Sampling was employed to select the sample from the intra city driver's that registered with NURTW having population size of 860. In determining adequate sample size, Macorr on line sample size calculator was used allowing for 95% level of confidence and confidence interval of 0.04, the sample size of 354 was obtained based on the total population of registered commercial drivers in Gombe.

Expressed as a percentage of the aggregate of the respondent's potential or maximum scores on all the five variables which explain a factor. In statistical term

$$RFI = \frac{\sum_{i=1}^{n} ei}{\sum_{i=1}^{n} Ei} \times 100/1$$

Relative Factor Index for traffic congestion variables, N is the number of variables, i for measuring value of the 4 variable, ei the actual score by the respondents on each variable, and Ei represents the maximum or potential score for each variable. Relative Factor Index (RFI) was computed for respondents across the five variables that explain a factor. The computation was based on the assumption that a respondents score on the variables taken together, constitute empirically derived variables based on his experience. The RFI then represents the aggregate of the respondent's real score, The higher the RFI score, the higher the relative importance of the variable, which will also mean a high percentage contribution.

Note: the minimum score for a respondent is 25% while the maximum is 100%. Therefore, for a variable to be accepted, it must have scored at least 25 percent.

RESULT AND DISCUSSION

Relative Factor Index (RFI): yielded variable loadings which point out the relevant determinants was used to establish what was responsible for traffic congestion was summarized in table 4.1.

Technical

So many road sides parking owning to absence of parking areas with RFI index of 28.8 % for the most part contributed to traffic chaos. At cross and jeka-da-fari roads, the road side walks have been converted to show stands of products and so narrowing the road right-of-way and within the absence of pedestrian walkways, there is persistent traffic congestion. Another technical issue relates to the ugly habit of attaching canopies before of outlets and stores which project almost to the drainage line thus reducing spaces for vehicular parking. Customers then resort to on street parking that hinder traffic flow, lack of effective transport planning was perceived by the majority of the drivers as the main cause of road transport issues in Gombe. This is because there has been a continuous change in the leadership of transport management institutions in the state, which leads to lack of policy continuity. The two different causes of road transport seemed to be important are 46.3% and 41.5% of the personnel, and poor financing of road development respectively

Human

Every vehicle driver seems to be in a very hurry and in and of itself impatient and intolerant that result in traffic bottlenecks. From the information analysis, Vehicle drivers are impatient and intolerant at 30%. Drivers who are home thought may likely to be deficient in adequate good-natured route way behavior to enable them observe traffic sign. This ends up in high incidence of violation of traffic rules and laws, and so possible to decline traffic wardens. Secondly absence of traffic wardens ranks 28.1%. The problem of inadequate traffic wardens and even the few existing ones seem to compromise ethics and so ignore careless parking of

vehicles on busy road; the traffic wardens typically seem overwhelmed by the chaotic traffic scenario.

Landuse
Main Market is additionally a significant traffic generator. Similarly, these things situations have attracted such a big number of hawkers, vendors, road side trading furthermore various stores and outlets lined up along the road, so making favorable condition for traffic hold up with 27.8% of RFI.

Physical
Traffic volumetric count shows that on the typical, there were 2900 vehicles per hour. along Sabon Layi which is the major route which passed through Gombe such a link road is sure to be traffic busy throughout the day, inadequate design capacity of which leads to the road inability to accommodate the volume of traffic and the existence of the many cross junctions which are major conflict points having 27.4% and 25.7% of the RFI respectively.

Vehicle
With the recent embargo on operation of motorcycles together with the business ones (Achaba) in the neighboring states, which lead to operation of tricycles referred to as Keke-Napep with 33.1% from the table 3.3, the traffic nuisance meant to be eradicated by ban motorcycle in neighboring states is still being perpetrated by Keke-Napep, and addition of the many motorcycle riders who have migrated to the Gombe, constitutes about 28.1%. All these add to traffic congestion

Table4.1 Identification of RFI

COURSES OF TRAFFIC CONGESTION	VERY IMPORTANT		UN-IMPORTANT		RELEVANT		PRE-DOMINANT		RFI	on %
PHYSICAL FACTOR	1	%	2	%	3	%	4	%	RFI	%
Design capacity of the are	52	21.1	196	29.8	225	18.8	448	30	194	27.4

	1	%	2	%	3	%	4	%	RFI	%
inadequate for the current traffic										
The roads are dilapidated and pot holed	66	26.8	186	28.3	342	28.5	256	17.2	174	25.1
Inadequate number of distributors and collectors	89	38.2	176	26.7	324	27	208	13.9	182	25.8
So many cross junctions which cause traffic bottleneck	39	15.9	100	15.2	309	25.7	580	38.9	153	21.7
TOTAL	246	100	658	100	1200	100	1492	100	703	100
LAND USE FACTOR	1	%	2	%	3	%	4	%	RFI	%
Close to city center	64	23.3	126	17.4	237	25.7	476	36.2	150	21.7
It is a zone of different land -uses	63	22.8	186	25.5	252	28.4	388	26.2	213	30.7
So many itinerant hawkers, vendors and road side trading	70	25.5	190	26.1	279	30.3	316	21.4	193	27.8
Presence of a market	78	28.4	226	31	152	16.5	300	20.2	135	19.8
TOTAL	275	100	728	100	921	100	1480	100	691	100
HUMAN FACTOR	1	%	2	%	3	%	4	%	RFI	%

Vehicle drivers are impatient and intolerant	101	25.6	148	19.3	288	28.8	264	28	227	38.3
Road users disregard traffic regulations	81	20.5	274	32.8	195	19.5	216	23	100	16.8
So many uneducated and unlicensed drivers	117	26.6	184	24.0	210	21.0	232	24.7	100	16.8
Absence of traffic wardens	96	24.3	160	20.9	306	30.7	230	24.4	167	28.1
TOTAL TECHNICAL FACTORS	395 1	100 %	766 2	100 %	999 3	100 %	942 4	100 %	594 RFI	100 %
Serviced by one of the major bus routes	123	31.5	200	29.7	159	16.4	244	19.4	162	24.1
So many road side parking due to absence of parking spaces	86	22	110	16.3	318	32.8	432	34.3	194	28.8
So many poorly maintained vehicles on the road	79	20.2	186	27.6	372	38.4	164	13.0	150	22.3

So many abandoned unserviceable vehicles along the road sides	103	26.3	178	26.4	120	12.4	420	33.3	167	24.8
TOTAL	391	100	674	100	969	100	1260	100	673	100
MODE OF TRANSPORT	1	%	2	%	3	%	4	%	RFI	%
So many Motorcycle	52	16.1	182	25	204	19.4	504	42.7	136	28.1
So many Keke Nepep	151	46.7	92	12	309	28.9	148	12.5	149	30.7
So many Personal Cars	46	14.3	150	20	363	24.6	380	32.3	100	20.6
So many of heavy trucks	74	22.9	322	43	195	18.1	148	12.5	100	20.6
TOTAL	323	100	746	100	1071	100	1180	100	482	100

CONCLUSION AND RECOMMENDATION

Even though significant government funding has been injected into the transport system through unfortunately the huge spending has not yielded the desired results. Hence the is important to involve road users in the project design phase (Bouladon, G. 1967). winding up this study reveals that traffic congestion is as result of behavior of the drivers which is visible in side parking traffic volume and violation of traffic rules within the metropolis, Parking control such as prohibition on-street forces drivers to cover great distance in search of parking lots with vacancy So as to prevent the traffic congestion.

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