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An Opinion Survey on Traffic Congestion along the Federal University of Technology Akure Main Route during Peak Periods

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Abstract

Traffic congestion makes the transportation system sub-optimally functional and it simultaneously contributes to economic stagnation. Hence, urban traffic congestion has resulted in a high loss of labour productivity as well as a loss of several man-hours. Therefore, this study seeks to assess the performance of the FUTA junction - FUTA south gate route during rush hour periods, as well as examine the factors contributing to traffic congestion along the route to assess the impact on the road users, identify strategies to improve traffic flow along the route. The research employed a quantitative approach using a structured questionnaire administered purposively to a sample size of 384. Descriptive analysis was conducted using frequency distribution charts,

mean, and standard deviation. Findings revealed that the performance of the route is relatively very poor considering the high dissatisfaction of the road users. The factors contributing to traffic congestion along the route were identified as the need for road expansion, roadside market, illegal parking, and lack of efficient mass transport. The study equally identified that the major impact on users is stress, noise pollution, air pollution, and adverse effect on business activities. The study hence recommended the expansion of road pavement for the route, and the provision of efficient public mass transportation.

Keywords: *FUTA, Peak period, Road Expansion, Rush Hour, Traffic Congestion.*

1.0 Introduction

The issue of road traffic congestion is a common problem in most urban cities around the world. This can largely be attributed to the frequent rural-urban drift which leads to overcrowding. Onyeneke (2018) supports this statement that rapid urbanization, economic activities, and commercialization are leading factors contributing to traffic congestion in Nigeria. In addition, the existence of poorly planned road networks is a major source of concern, especially in developing countries like Nigeria. More so, the growth rate of vehicle ownership

in Nigeria is far greater than the provision rate of transportation facilities which consequently results in traffic congestion (Raheem *et al*, 2015). Although there is no widely accepted definition for traffic congestion, it is regarded as a situation in which the demand for road space is more than the supply (OEAC, 2007). Similarly, Ajayi, *et al* (2017) describes traffic congestion as a restriction to the movement of people and freight. Urban traffic congestion according to Shekhar and Saharka (n.d) and Sougata, (2017) involves the presence of high

vehicular queues, restricted movement, and increased travel times.

Rukunga (2002), categorized the causes of urban traffic congestion as recurring which is attributed to peak commuting periods at critical locations, and nonrecurring which is caused by spontaneous occurrences. Igbinosun and Izevbizua (2020) identified factors such as poor road maintenance culture, inconsistent national road policy, and unstable regulations as disruptions to free traffic flow. Poor driving habits, poor road network, inadequate road capacity, and lack of parking facilities have been identified by a study conducted by Joseph and Anderson, (2012), as the greatest causes of traffic congestion in Nigeria. Given these, just like other urban cities, the causes of traffic congestion in Akure are not different from those identified. Furthermore, Akinse *et al.* (2016) in their study discovered that an average of 93.75% of buildings have encroached into the right of way limits along the FUTA road. Hence the call for redesign and reconstruction.

According to EIU (2013), socio-economic costs such as environmental degradation, delays, decreasing productivity, wasted energy, and diminished standard of living arises from traffic congestion in Nigeria. Hence, it is imperative to find lasting solutions to this social menace.

1.1 Statement of the problem
Generally, the lack of organisation in the construction and maintenance of the various road networks and the absence of a reliable national road policy, unbalanced regulation, and application of road standards are some of the characteristics of Nigerian roads (Igbinosun and Izevbizua, 2020). Traffic congestion according to Weyusia (2006) generally makes the transportation system sub-optimally functional and it simultaneously

contributes to economic stagnation. Nigeria, as the most populated country in Africa unfortunately cannot make substantial provisions around road networking, and transportation infrastructure especially in urban cities to ease traffic congestion. Thus, due to urban traffic congestion, the loss of labour productivity is high, as well as the loss of several man-hours (Onyeneke, 2018). Specifically, the route from the FUTA junction to FUTA south gate in the study area constantly experiences gridlock between the hours of 7 am - 9 am, and 3 pm - 6 pm which are rush hours, and traffic congestion along the route has led to students' coming late for classes, missing classes, university staff resuming late for work, among others, as well as fatigue which has a negative effect on productivity. This was justified by the authors' personal experiences, field observations, and negative comments from the majority of road users.

1.2 Objectives of the study
i.   To assess the performance of the FUTA junction - FUTA south gate route during the rush hour period
ii.   To examine the factors contributing to traffic congestion along the route and to assess the impact on the road users
iii.   To identify strategies to improve traffic flow along the route

1.3 Significance of the research
The impact of urban traffic congestion is consequential on productivity, as well as social-economic activities. Hence, the free flow of urban traffic provides an efficient and convenient means of moving people and goods (Rukunga, 2002). Mututantri *et al.* (2015) in their study suggested the expansion of road widths, lanes, and walkway shoulders to meet the anticipated traffic demands and pedestrian requirements

of the near future. This solution according to Ruben and Renan (2013) would reduce travel time, increase fuel efficiency, and reduce vehicular wear and tear. On this note, the road design expansion along the FUTA junction – FUTA south gate proposed by the authors, among other results, findings and recommendations would go a long way in tackling traffic congestion along the route. This would consequently improve socio-economic activities, increase road users' satisfaction, boost worker productivity, and eliminate loss of productive man-hours due to traffic congestion.

2.0 Review of related studies

Several studies exist in the literature regarding the issues of traffic congestion in Nigeria and specifically around the study area. Related studies such as Ibili and Owolabi, (2019); Fadairo (2013); Laoye *et al.*, (2016); Ogunyemi *et al.,* (2021); Oyedepo *et al.,* (2019); and Ogundare and Ogunbodede (2014) were conducted in Akure city focusing on traffic congestion. However, none of these studies considered the FUTA junction – FUTA Southgate route as shown in Table 1.

Table 1: Review of related studies

S/No	Reference	Objectives	Methodology	Major findings
1	Ogundare and Ogunbodede (2014)	to describe intra-urban transport circulation in Akure metropolis with its attendant traffic congestion situation and problems.	Field observation	The major cause of traffic congestion in the Central Business District of Akure is parking problems
2	Fadairo (2013)	An investigation into traffic congestion along Federal University of Technology Akure Road / Oja-Oba Road	Survey	The most prevalent causes of traffic congestion are poor driving habits, weather conditions, absence of traffic lights and/wardens, roadside parking, among others
3	Ibili and Owolabi (2019)	Investigation of traffic noise in Ondo town	Calculation of Road Traffic Noise (CoRTN)	Findings revealed that the equivalent noise level exceeded the World Health Organisation (WHO) and Federal Highway Administration (FHWA) limits
4	Laoye *et al*. (2016)	Examination of the Indices of traffic congestion on major roads in Akure	Traffic volume data during peak periods	The study predicted increased traffic volume along the route based on 10 years forecast
5	Ogunyemi *et al*. (2021)	Explored the impact of traffic congestion on road users	Questionnaire survey	Traffic congestion significantly affects productivity

3.0 Material and methods

The study deploys the use of a structured questionnaire

administered to the university community (comprising university workers, and students), the University's host community, and commercial motorists. This study population was selected because they constitute the majority of road users along the route. These respondents consented to participation in the survey if their identity would be anonymous. Hence, the authors ensured the anonymity of the respondents which increased the willingness of participants. The structured questionnaire had 3 major sections. The first section acquired demographic information from the respondents, while the second and third sections asked questions regarding the performance of the FUTA junction - FUTA south gate route during rush hour periods and the impact of traffic congestion on the road users respectively. The questionnaire components were adapted from the studies of Awoyemi *et al.* (2012) and Popoola *et al.* (2013). The Authors employed the use of a 5-point Likert scale (Very high – 5; High – 4; Medium – 3; Low – 2; and Very low – 1) and (Strongly Agree – 5; Agree – 4; Medium – 3; Disagree – 2; and Strongly Disagree – 1) to record the respondents' opinions on issues. Using Cochran's formula for sample size, a sample size of 386 was calculated as shown below. Previous studies such as Yusuf and Diugwu (2021); Mobayo *et al.* (2021) also adopted this approach. approach.

$$n_0 = \frac{Z^2 pq}{e^2}$$

Where　　　e = the desired level of precision (i.e. the margin of error),

p = the (estimated) proportion of the population

which has the attribute in question,

q = 1 – p.

Thus

$$n_0 = \frac{1.96^2 (0.5 * 0.5)}{0.05^2}$$

n_0 = 384

Thus, a total number of 384 questionnaires was distributed purposively to respondents. This sampling technique was selected because it gives the opportunity of selecting the respondents that the authors feel would provide accurate and correct information.

A total number of 254 questionnaires were returned, but 235 were valid responses (representing a 72.5% success rate) for data analysis. The data analysis was conducted using descriptive analysis with the aid of frequency distribution charts, with mean, and standard deviation.

4.0 Results and Discussions

4.1 Demographics of the respondents

Findings show that 147 (62.6%) males and 88 (37.4%) females participated in this survey. The age distribution of respondents. 80% of the respondents' ages fall within the age range of 18-39, while 20% of the respondents are 40 years and above. By category, findings also show that 24% of the respondent were University staff as shown in Figure 1. A total of 29% of the respondents were students, 35% belong to the University host community category, and 12% are commercial motorists.
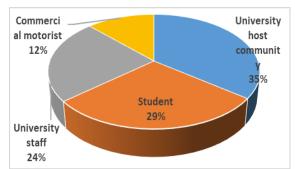
Figure 1: Category of respondents

Regarding the medium of transportation, 49% of the respondents use public transport, 41% use their vehicle, and 10% use motor-cycle as shown in Figure 2.
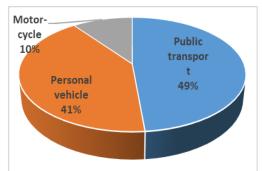

Figure 2: Medium of transportation.

Hence, the demographic features of the respondents validate their participation in the survey in providing valid responses to issues raised. The descriptive statistics also indicate that the respondents are regular commuters of the route..

4.2 Assessing the performance of the FUTA junction - FUTA south gate route during the rush hour period

The first objective of this study seeks to assess the performance of the FUTA junction - FUTA south gate route during a rush hour period. The rush hour period is the gridlock experienced between the hours of 7 am - 9 am and 3 pm - 6 pm along the route. Figure 3 shows that the majority (76.2%) of the respondents frequently ply the FUTA junction – FUTA south gate route for work, academics, and business

activities. This is in contrast to the study of Awoyemi *et al.* (2012) where peak hours of traffic congestion in the Akure metropolis are between 8 – 10 am and 2 – 5 pm. Figure 4 shows that 85.5% of the respondents strongly agreed that the rate of traffic congestion is usually higher during rush hour periods (7 am - 9 am, and 3 pm - 6 pm) along the FUTA junction – FUTA south gate route. In addition, Figure 5 shows that the frequency of gridlock occurrences along the route is relatively high.
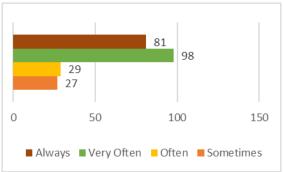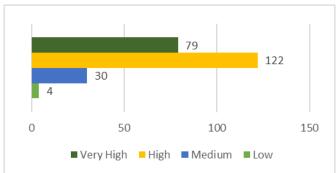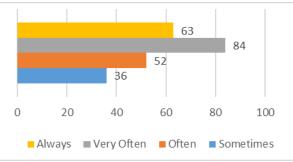

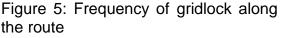Figure 3: Frequency of plying the route

Figure 4: Nature of traffic congestion

Figure 5: Frequency of gridlock along the route

This result is an indication of the heavy gridlock usually experienced

by commuters along the FUTA junction – FUTA south gate route. The majority of the respondents ply the route and a very small percentage of them (14.5%) believed that the traffic congestion along the route is medium or low. This high congestion is mostly attributed to the rush hour periods when students and University workers are resuming work in the morning and leaving in the afternoon.

4.3 The factors contributing to traffic congestion along the route

The study, through the opinions of respondents, seeks to identify factors affecting the free flow of traffic along the route to assess the impact of rush hour

traffic congestion on road users. Findings presented in Table 2 show that the factors contributing to traffic congestion along the route are; the need for road expansion, roadside market, illegal parking, and lack of efficient mass transport with mean values of 4.42, 4.13, 4.08, and 4.01 respectively. This is quite similar to the findings of Awoyemi *et al.* (2012); Popoola et al. (2013); and Ajayi *et al.* (2017) which identified traffic holdup, road narrowness, bad roads, and scarcity of vehicles as the major issues. Similarly, Uwadiegwu (2014) categorized these factors into physical, technical land use, and human error.
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Table 2: Factors causing traffic congestion along the FUTA junction - FUTA south gate route

S/No	Causes of traffic congestion	Strongly Disagree	Disagree	No Opinion	Agree	Strongly Agree	Mean Value	Std Dev.
1	Need for road expansion	-	1	26	81	127	4.42	0.70
2	Roadside market	6	11	27	94	97	4.13	0.96
3	Illegal Parking	4	22	19	96	94	4.08	1.00
4	Lack of efficient mass transport	6	11	32	111	75	4.01	0.93
5	Absence of traffic officers	4	28	33	88	82	3.92	1.05
6	Bad road (potholes)	34	27	45	95	34	3.29	1.26
7	Irresponsible Driving	23	62	34	70	46	3.23	1.30
8	Faulty vehicles	40	64	73	49	9	2.67	1.10
9	Road traffic accident	48	60	84	42	1	2.52	1.02

Source: Authors' Field Survey, 2021

Table 3: Direct impact of traffic congestion on the road users along the FUTA junction – FUTA south gate route

S/No	Impact of traffic congestion	Strongly Disagree	Disagree	No Opinion	Agree	Strongly Agree	Mean Value	Std. Dev.
1	Stress	1		26	87	121	4.40	0.70
2	Noise pollution	-	4	33	73	125	4.36	0.78
3	Air pollution	-	9	35	100	91	4.16	0.81
4	Pedestrians	4	17	48	75	91	3.99	1.02
5	Work productivity	3	14	48	93	77	3.97	0.94
6	Business activities	4	9	73	78	71	3.86	0.95
7	Quality of life	3	27	55	73	76	3.82	1.05
8	Lateness to class	-	11	117	50	57	3.65	0.90
9	Missing classes	8	14	108	48	57	3.56	1.03
10	Road traffic accidents	54	63	70	31	17	2.55	1.19

N=235
Source: Authors' Field Survey, 2021

The direct impact of the rush hour traffic congestion according to respondents has led to stress, noise pollution, air pollution, pedestrians, and adversely affected business activities along the route over time. These and more are shown in Table 3. Additionally, findings revealed that the commuters were mostly delayed by 30 minutes – 1 hour (with a mean value of 4.06) due to rush hour traffic congestion. Asides from time wastage, the study of Popoola *et al.* (2013) identified the inability to predict travel time, fuel consumption, and emergency vehicles as other effects of traffic congestion.

4.4. Strategies to improve traffic flow along the route
Respondents were requested on a Likert scale of 1 – 5 (strongly disagree – strongly agree) to rate identified possible solutions to the problem of traffic congestion along the FUTA junction - FUTA south gate route.

Findings in Table 4 thus show that expansion of road pavement, provision of efficient public mass transport, and sanction for illegal parking with mean values of 4.50, 4.49, and 4.23 respectively as the most recommended solutions to the problem. These findings are similar to those presented by Popoola *et al.* (2013). Contrarily, Li and Gao, (2014) proposed the two-way road lane needs to be reallocated to play the best role in managing congestion. This is because the two-way road flows are always unbalanced in opposite directions during the morning and evening rush hour.
However, the University host community category does not entirely agree with the prohibition of the roadside market which is mostly due to their direct benefits. In addition, Table 5 shows that commercial motorists with a mean value of 2.62 do not support that illegal parking should be sanctioned. Again, this is because they

are the category usually involved in illegal parking as they pick – drop – pick passengers along the route. Furthermore, students and University staff with mean values of 4.61 and 4.59 respectively strongly agreed efficient public mass transport should be provided as they stand to benefit the most.

Table 4: Strategies to improve traffic flow along the FUTA junction – FUTA south gate route

S/No	Strategies to improve traffic flow	Strongly Disagree	Disagree	No Opinion	Agree	Strongly Agree	Mean Value	Std. Dev.
1	Expansion of road pavement	-	-	21	75	139	4.50	0.65
2	Provision of efficient public mass transport	-	-	18	84	133	4.49	0.63
3	Sanction for illegal parking	3	11	27	82	112	4.23	0.92
4	Road maintenance	3	15	30	67	120	4.22	0.98
5	Provision of parking spaces	3	11	33	92	96	4.14	0.91
6	The constant presence of traffic officers	3	19	24	84	105	4.14	0.98
7	Prohibition on the roadside market	18	58	40	59	60	3.36	1.30

N=235
Source: Authors' Field Survey, 2021

Table 5: Variation among respondents' categories

Category		Expansion of road pavement	Provision of parking spaces	Sanction for Illegal parking	Road maintenance	The constant presence of traffic officers	Prohibition on the roadside market	Provision of efficient public mass transport
University staff (N=56)	Mean	4.55	4.54	4.61	4.45	4.48	3.89	4.59
	S.D	.502	.503	.493	.630	.603	1.171	.496
Student (N=67)	Mean	4.57	4.46	4.67	4.72	4.37	4.21	4.61
	S.D	.633	.611	.533	.486	.775	.789	.549
University host community (N=83)	Mean	4.51	4.04	4.18	4.12	4.27	2.16	4.41
	S.D	.612	.740	.683	.903	.842	.862	.606
Commercial motorist (N=29)	Mean	4.24	2.90	2.62	2.90	2.62	3.83	4.24
	Std. Dev.	.988	1.345	1.049	1.345	1.049	1.037	.988

N=235
Source: Authors' Field Survey, 2021

5.0 Conclusion

The identified problem of this study was the frequent gridlock along the FUTA junction – FUTA south gate route due to rush hour traffic. The performance of the route is regarded as very poor based on the study's assessment of respondents' opinions. Furthermore, the severity of the direct impact of this traffic congestion on road users is relatively high. Road users have suffered from stress, noise pollution, air pollution, and adversely affected business activities due to traffic congestion. The major limitation of this study is the potential bias due to the sampling technique employed. Other sampling techniques or methodologies could be explored to investigate the traffic conditions along the route.

6.0 Recommendations

In line with the identified research problem, as well as the opinions from different categories of respondents, the following recommendations were drawn from the findings and previous studies such as (Laoye *et al.*, (2016) and Ogundare and Ogunbodede, (2014));
i.   Expansion of road pavement for the FUTA junction – FUTA south gate route.
ii.   Provision of efficient public mass transportation along the FUTA junction – FUTA south gate route.
iii.   Sanction for illegal parking.
iv.   The constant presence of traffic officers ensures ease of flow of traffic and arrests traffic violators.
v.   Off-peak vehicle usage should be introduced and enforced to reduce the frequency of vehicles on the roads.
vi.   Efficient road maintenance

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