



Spatial Dynamics of Traffic Delay and Man-hour Loss Along Major Corridors in Ilorin, Nigeria.

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Abstract

The ubiquitous traffic congestion and delays have led to colossal resource loss from travel time delays, increased fuel consumption and carbon emissions, and heat waves. The paper accounts for man-hour loss in three (3) selected major corridors-Tanke-University, Ilorin-Ajase Ipo, and Ilorin- Share corridors of the study area. The corridors were carefully evaluated and selected due to the pronounced traffic delays, traffic generators, and the absence of workable spatial walking theory. Mixed sampling methods were adopted, including a convenience sampling of commuters using unusual on-the-spot focus interview sessions by trained field assistants cum commuters. Using the Analysis of Variance (ANOVA), no significant differences in traffic characteristics were observed among the corridors. Consequently, the study recorded an average annual man-hour loss of 7.66 man-hours daily (116 days, 11 hours, 52 minutes, annually) per commuter across the three corridors, resulting from the complex interplay of congestion and delays. The paper, therefore, recommends policies that stifle reliance on automobile dependency, improve traffic management at road intersections, and create open penetrative campaigns through the diverse interest groups in the city to address prostitution in these corridors. Concerted intersectoral linkages must be initiated between the three tiers of government to increase road capacities.

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1.0 Introduction

The significance of urban transport vis-à-vis how it underpins urban growth and development has been dissected by scholars in the transport subdiscipline. From walking, cycling, and public transport (bus, metro, mass transit, paratransit/informal transport) to private transport (motorcycle and car), efficient road transport systems are not just pivotal to cities' functionality; they galvanise the economy (Brown, 2015). As Okoko (2018) puts it, transportation exerts the most pervasive influence on the city's economy, morphology, and social integration. Its demonstrative impact shows that land transport infrastructure is inextricably reliant on other land uses. It knits them together while ensuring a functional relationship. However, when transport control is limited, they spur the formation of sprawling cities due to the automobile dependency economy.

As much as all accounts have established the specific knowledge links between urban transportation and development, studies on its attendant ills regarding man-hour loss are scanty. There has been a gaping contradiction between what needs to be studied and what has been offered by on-hand scholarly works in urban transportation discourse. Despite the absence of an on-hand definition, Bako & Agunloye (2017) defined 'man-hour loss' as the excess or additional time spent in commuting that remains unaccounted for by a commuter. When commuters spend more than the usual time on a trip, their

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productivity at work reduces, and the general well-being of urban citizens and commuters suffers impingement (González et al., 2021).

Traffic congestion and man-hour loss are two distinct sides of the coin. In particular, cities experiencing tremendous rapid population growth exude manifold epiphenomena – traffic jams, slow and inefficient flow, long delays, and carbon emissions often a product of the complex interplay of citywide problems (Kutlimuratov et al., 2021). Startling statistics revealed that in 2016, traffic congestion cost the European region over €200 billion, equivalent to 1.4 per cent of her total GDP (European Commission, 2020). Similarly, in 2015, the United States recorded resource loss (time and travel time) to traffic congestion of \$ 160 billion, with staggering predictions that it will rise (Mondschein & Taylor, 2017). For instance, the figures in the Global South, particularly India, are not different. The cost is frightening as traffic delays were valued at \$11.4 billion yearly (Bari et al., 2022) – equivalent to over 30 per cent of Nigeria's annual budget (Federal Government of Nigeria, 2022). Aggregated views demonstrated that traffic congestion and delays are ubiquitous. However, its general understanding, estimation methods, and interpretation in man-hour loss terms remain uninvestigated.

New threats centred on man-hour loss now confront the continuous social integration of cities. Park et al. (2020) submitted that increased man-hours of idleness, particularly among young adults, increase the crystallised incidences of stress, suicidal ideation, fatigue, anxiety, and depression. Notably, protracted man-hour loss experience often alters daily diet, and life expectancy could be reduced through health-related conditions like hypertension and diabetes mellitus – (Wong et al., 2019). These coordinated threats are reinforced by the reciprocal relationship between places and placemaking that define and shape cities' traffic patterns. Noticeable accounts by Okoko (2018) averred that with a high population surge as the linchpin, the inevitable trinity of complementarity, intervening opportunity, and transferability underpins the reciprocal relationship shaping cities' morphology.

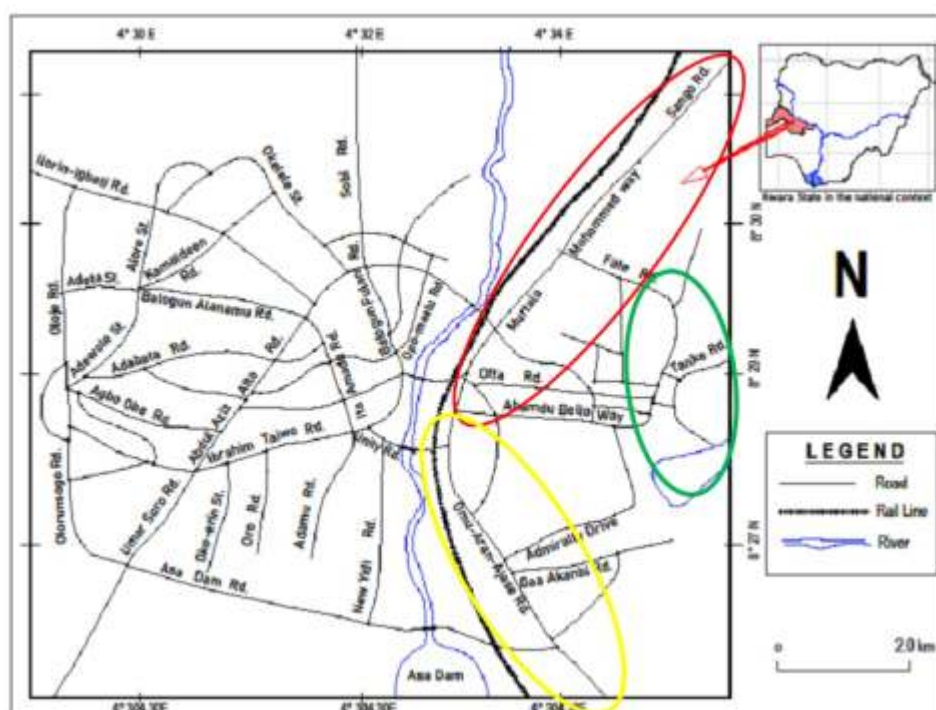
Crawford (2013) reported that adequate urban mobility was influenced by varied factors that straddle traffic management, pavement and road infrastructure quality, efficient public transport facilities, and services. As observed by —Kasmalkar & Suckale (2021), Omarov et al. (2022), and Harantová et al. (2022), most urban roads of the Global South are already in a hellacious state. Du et al. (2021) observed that urban centres have overloaded and overburdened transport systems; a slight change (natural or human-induced events) in traffic flow and condition can precipitate traffic congestion and delays. In alignment with Okoko (2018), previous studies demonstrated an *idée reçue* that most intra- and inter-city networks fall short of approved planning and engineering specifications. Consequently, prostitution of roads coupled with the absence of traffic control systems such as traffic signs, pavement markings, traffic signals, priority controls, and restraints make cities' spatial arrangement seemingly disordered while making man-hour loss deep-seated.

"Bako & Agunloyes (2017) study in Lagos, Nigeria, which is closely related to our intent, informed that commuters plying major corridors in Lagos State lost eight (8) hours a day, nearly 122 days in a year, on average. The tenets of this study were fortified by the absence of decisive literature and methods in understanding the Ilorin city's interpretation of man-hour loss, coupled with its pattern and causative factors that remain a work in progress. On the other hand, the arguments of hands-on unpublished reports are stultifying and remain poorly developed and ill-understood. Local understanding of major corridors in Ilorin presents a common peculiarity. The central land uses such as the University of Ilorin (along the *Tanke-University* corridor); University Teaching Hospital (UTH), Kwara State Polytechnic (*Share-Oja Oba* road); and the *Ilorin–Ajase-Ipo* road corridor traversing the Ilorin downtown area shape the traffic flow and pattern in the town, and a significant contributor to traffic delay and man-hour loss. While the first two corridors share similar land use characteristics determined by largely institutional land uses, the enormous commercial activities shape the congestion of the *Ilorin–Ajase-Ipo* corridor.

Consequently, these corridors were carefully evaluated and selected due to the pronounced traffic delays, traffic generators, and the absence of workable spatial walking theory. However, local understanding, anecdotal evidence, and personal observations embody knowledge gaps through specific

2.0 The Study Area

Ilorin operates a relatively well-developed intra-city public transportation, and the major roads (arterial roads) within the metropolis are in good condition. There are three modes of transiting from one place to another in the city, the most popular being the conventional taxi, privately-owned vehicle, and commercial motorcycle. Commercial tricycles' emergence has boosted the transiting fleet within the metropolis. The commuting cost is quite affordable in Ilorin, with movement from one place to another for as low as fifty naira, which is about 12 cents.



Source: Kwara State Ministry of Works and Transport, 2021.

Due to the peculiarity of the study, it adopted a mixed-method survey design approach that straddles exploratory, descriptive, and tinge analytical research methods. Based on personal observations and the absence of clear-sighted studies on traffic delay (man-hour loss) in Ilorin, three (3) distinct

corridors have been chosen as the ground zero of this study. In addition, these corridors (*Tanke-University* road corridor, otherwise known as Tunde Idiagbon Road; Share-Oja Oba road, and *Ilorin-Ajase-Ipo* road corridor) are tremendously witnessing changes in land uses and traffic patterns due to major trips attracting and generating land-use confederating along these routes. Primary and secondary data sources were utilised for this study. Data on socio-economic characteristics, traffic patterns, causes and periods of delays, and estimated man-hour loss were obtained through questionnaire administration, personal observations, and interview checklists. All these were sufficient for the instrumentation of primary data sources.

Similarly, general background, trip length, and standard travel time were sourced from secondary sources, dovetailing technical reports, journals, texts, and published and unpublished sources. The *Tanke-University*, Share-Oja-Oba road, and *Ilorin-Ajase-Ipo* corridors were the sampling frame. At the same time, the commuters found at the major termini and inside the dominant vehicles traversing these corridors represent the sampling elements. According to Bako & Agunloye (2017), different traffic volumes and average carrying capacities were designed with a distinct nuance for these corridors. However, motorcycles, tricycles, cars, trucks, commercial buses (mini & standard), bus rapid transit (BRT), vans, and tankers were the major vehicles plying these corridors. Correspondingly, their average traffic volumes were recorded for 12 hours (7 am – 7 pm) over three (3) days straddling weekends and workdays and were multiplied by the average carrying capacity of the dominant vehicles to give the sampling frame. We mathematically expressed the result for the three (3) corridors as follows:

Average Carrying Capacity (ACC) = Total Carrying Capacity (TCC) / Number of Vehicles Identified (NVI)

$$\text{Tanke-University Corridor (ACC)} = \frac{5+2+8+18+3+18+3+5+4+55}{8} = 13$$

NB: Cars, motorcycles, mini-bus, buses, vans, trucks, tricycles, and BRT buses were the forms of vehicles identified plying the corridor.

$$\text{Share-Oja-Oba Corridor (ACC)} = \frac{5+2+11+19+3+5+4+70+3}{9} = 14$$

NB: Cars, motorcycles, mini-bus, buses, vans, trucks, tricycles, BRT buses, and tankers were the forms of vehicles identified plying the corridor.

$$\text{Ilorin-Ajase-Ipo Corridor (ACC)} = \frac{1+5+2+9+16+5+4+3}{8} = 6$$

NB: Bicycles, cars, motorcycles, mini-bus, buses, vans/trucks, tricycles, BRT buses, and tankers were the vehicles identified plying the corridor.

Table 1: Analysis of Average Carrying Capacity of the Vehicles

Vehicle	Average Carrying Capacity		
	Tanke-University Corridor	Share-Oja-Oba Corridor	Ilorin-Ajase-Ipo Corridor
Bicycle	0	0	1
Car	5	5	5
Motorcycle	2	2	2
Mini-bus	8	11	9
Bus	18	19	16
Vans	3	3	-
Van/truck	5	5	5
Tricycle	4	4	4
Mass transit	55	70	0
Tanker	0	3	3
Total	100	122	45
Average Carrying capacity	13	14	6

Source: Authors' fieldwork, 2021 .

However, due to the exigency of the time and the peculiarity of these corridors, the volumetric survey carried out on Tanke-University road was done all through the five days of the week during the peak hours (7 - 10 am and 4 - 7 pm)- so observed. The average total traffic volume for the Tanke corridor stood at 9,762 daily during peak hours. That is because man-hour loss is only observed during peak hours. Multiplying the average carrying capacity (13) and average traffic volume (9,762) of the Tanke-University corridor amounted to 126,906 individuals plying the corridor daily during peak hours (Tables 1&2).

We applied the same recipe for the Share-Oja-Oba corridor, and an average total traffic volume of 1,720 daily during peak hours was recorded. That is so because of the major attracting and generating land uses, which are often hyperactive during the peak periods. The number of persons traversing this corridor stemmed from the multiplication of the average carrying capacity (14) and average traffic volume (1,720) of the Share-Oja-Oba corridor, which gives 24,080 persons. However, for the Ilorin-Ajase-Ipo Corridor, a 6-day survey was carried out, including a Saturday. That was because of the diverse land uses in the downtown area where this major corridor is accessed. The same mathematical formula was derived from calculating the sampling frame. The average carrying capacity (6) is multiplied by the average traffic volume (943) to give 5,658 persons.

Table 2: Sampling Frame Analysis

S/N	Corridor	Length of stretch Km/Minutes	Average Traffic Volume	ACC	Sampling frame	Sampling Size (10%)
1	<i>Tanke- University</i>	3.6/13Minutes	9,762	13	126,906	100
2	<i>Share-Oja-Oba</i>	8.2 km/18 minutes	1,720	14	24,080	100
3	<i>Ilorin-Ajase-Ipo</i>	4.7 km/15 minutes	943	6	5,658	98
Total			12,425		156,644	298

Source: Authors' fieldwork, 2021.

In agreement with the precision level of 95 per cent stipulated by Glenn's (1992) formula, the study adopted a 10 per cent sampling size, which amounts to 100,100 and 98 sampling sizes for the commuters of these major corridors (Table 2). Since the commuters of these major corridors primarily qualify to be sampled for the study, a purposive sampling method was adopted. Trained research assistants were strategically placed at the bus terminus and posed as co-passengers in public buses to clear-sightedly identify the commuters. Copies of the questionnaire administration, interview checklist, and personal observations were sufficient as the primary data collection techniques. Statistical Package for Social Scientists (SPSS) was used to analyse the data collected descriptively. Also, the significant difference between the traffic situation across the major routes was analysed using a one-way analysis of variance (ANOVA) within the Microsoft Excel environment.

4.0 Discussion of Findings

4.1 Socio-demography

Table 3 reveals the age structure of the commuters plying these major corridors. It shows that 81.0 per cent, 71.3 per cent, and 86.8 per cent of the respondents fell within the independent group who are naturally enterprising and possess the agile strength to pursue daily endeavours. Going by the age stratification that has reasons plying this road, it fortifies our personal beliefs regarding the importance of these corridors to socio-economic pursuits. Similarly, we observed close statistics between the gender distribution recorded on these corridors, as male and female distribution shows both genders take the liberty to ply the corridors for diverse reasons, such as business purposes, educational pursuits, and recreational reasons. It is instructive to note that perceived underpinning reasons for the employment status across these major corridors align with the findings recorded. For the Tanke-University and Share-

Oja-Oba roads, the majority of commuters plying these roads were students, those with formal employment like civil servants and private employees, and informal employment brought about by the indirect employment created by the positive interplays of student activities and workers of higher institution of learning which are the major trip attracting and generating land uses. Meanwhile, for the Ilorin-Ajase Ipo road, formal (civil servants and private employees) and informal activities (urban agricultural farming, petty trading) were the major activities the commuters plying these corridors engaged in, like the corridor, in particular, traversed the business district area of Ilorin, which by nature is the ground-zero for commercial activities in the city.

Table 3: Socio-demographic Features of the Ilorin Corridors

Socio-demography		Percent (%)	
	Tanke-University	Share-Oja-Oba	Ilorin-Ajase-Ipo
A. Age of the Respondents			
Less than 18 years	18.3	12.8	7.2
18 – 65 years	81.0	71.3	86.8
Above 65years	0.7	15.9	6.0
Total	100	100	100
B. Gender Distribution			
Male	58.0	42.1	41.7
Female	42.0	57.9	58.3
Total	100	100	100
C. Employment Status			
Formal	13.4	35.9	24.8
Informal	36.1	24.0	36.9
Retired	0.5	0.2	4.1
Apprentice	5.9	5.6	11.4
Student	44.1	34.3	22.8
Total	100	100	100
D. Educational Status			
No formal education	3.5	4.5	5.5
Primary	4.5	3.6	8.6
Secondary	35.6	10.7	42.4
Tertiary	56.4	81.2	43.5
Total	100	100	100

Source: Authors' fieldwork, 2021.

Futherrmore, Table 3 reveals the educational statuses of the commuters and shows that 92.0 percent, 91.9 percent, and 85.9 percent of commuters plying *Tanke-University*, *Share-Oja-Oba*, and *Ilorin-Ajase-Ipo* corridors were educated and could speak, write and understand the official language of the survey. They have sufficient knowledge and understanding of their communities. It further reinforces that attaining a certain level of education influences travel, which accounts for why these corridors were always busy and laden with hold-ups.

4.2 Traffic Characteristics of the Study Area

This section dissects the issues of optimal land use locations in urban spaces and how they influence traffic patterns. Land use characteristics of the Ilorin corridors present traffic delays that precipitate man-hour loss for commuters. That experience in the Ilorin metropolis is underpinned by the fundamental theories of Von Thunen, Walter Christaller, and Lösch (McCarty, 1955; Dacey, 1965; O'Kelly & Bryan, 1996; Agarwal, 2001), which enunciated that the demand pattern of land uses increases

when they are readily accessible. The findings of this study quadrate with these foundational theories of spatial interaction, as 72.9 per cent of the travel purposes were influenced by work and school. At the same time, other less demanding land uses like health care facilities, religious centres, and leisure places jointly influenced travel purposes by 21.5 per cent.

Emphases on the forward-thinking logic of Lefebvre (1991) demonstrate the limitless of urban spaces, as much as there is still a continuous interaction between everyday practice (working, playing, schooling) of urban residents and urban realities (land uses), which could either stretch cities spatially or compound traffic problems within a compact urban centre. Without blinking at the fact, major land uses like the University of Ilorin, Kwara Polytechnique, Immigration Service facilities, and diverse study centres confederating along these corridors and shaping their identities account for more than 50 per cent of the reasons commuters travel. Previous scholarships have established that cities with arrays of bustling and enterprising land uses have distinct proclivities to create larger GDPs supporting and advancing quality infrastructure.

Similarly, traffic problems experienced daily were a deep concern to many commuters plying these corridors. Traffic delays with no real intent accounted for 45% of the delays. These statistics were followed closely by road rage and poor driving habits, which accounted for 48.5 per cent of respondents' opinions. It shows that traffic delay is a function of traffic volume. The volume of vehicles traversing these corridors outstrips road capacity and design. Amplifying the forgoing demonstrates the underlying impacts of frontline and competing conditions like urbanisation, high population surge, and automobile dependency of urban citizens.

Similarly, many scholars have shown that cities' dominant public transport modes contribute immensely to traffic congestion and delays. The slews of motorcycle taxis (*Okada* in Nigeria) have been met with strident policies in more economically viable and boastful states like Lagos. Nevertheless, there have been concerns about adopting the same measures in other states due to the economic implications accompanying this policy. Brown (2015) argued that governments aiming to ban these motorcycle taxis risk being second-guessed by the income and employment opportunities that the operation and maintenance of these motorcycle taxis offer the informal sectors already drenched in poverty. Apart from the compelling reasons from the socio-economic point of view, such decisions are carefully vetted with the corridors of power relations residing in the city. Politicians and decision-makers seeking political relevance and advancement understand the political implications of such a decision, as it could mar their chances during the electioneering process.

However, broader debates are drawn on the fundamental disconnect between the number of lanes and the number of vehicles using them. Generally, within the tenets of spatial theories of walkability, two standard lanes will harbour up to 10,000 vehicles per day without traffic. Therefore, having four lanes imbued with traffic congestion indicates the need to redesign our intra-city networks to accommodate pedestrian walkways and bicycle networks that will galvanise the need to walk and reduce congestion. Consequently, shreds of evidence from Ilorin corridors are changing the global narrative that traffic congestion and man-hour loss are more triggered by poor road design than road capacity and emphasise the latent roles of comfortable walking and cycling. Interestingly, the absence of these walkways and bicycle networks energises the attitude of automobile dependency. Consequently, city growth is shaped by these new behaviours.

The need to assess the deep-seated dominant factors occasioning man-hour loss emanated from the daily unbearable traffic bottleneck experienced along the routes due to the rate at which vehicles keep increasing daily. Anecdotes from bystanders and analyses from Table 4 reveal that poor traffic control management (55.81), the presence of heavy-duty trucks (50.64), and road intersections (50.01) play a pivotal role in shaping the traffic pattern and precipitating delays. Using the mean and standard deviation analysis, the abovementioned factors accounted for the major factors precipitating man-hour loss along the corridors under investigation. As a commuter put it, 'the road intersections are the ground zero of traffic delays, motorists wait for ad interim for more than 30 minutes and do not get amber signal from the traffic warden.' That emblazoned that critical intersection along the corridors is devoid of working traffic signals; where present, the general impatience of drivers as observed through the 12-hour traffic count renders it

ineffective. Another accounting factor causing traffic delay and man-hour loss at road intersections, as adduced by Datta et al. (2020) and Omarov et al. (2022), is the U-turning of vehicles, mainly where manoeuvres are not restricted. Delays recorded in U-turning accounts straddle both lanes of traffic and can create as little as an average of 12 seconds of delay per vehicle (Omarov et al., 2022).

Table 4: Dominant Factors Responsible for Man-hour Loss

S/N	Dominant Factors Responsible for Man -hour Loss	Standard Deviation (SD)	Order Rank
1.	Poor traffic control management	55.81	
2.	Presence of heavy-duty trucks	50.64	
3.	Road intersection	50.01	
4.	Poor drainage system	49.64	
5.	Events along the road	49.00	
6.	Indiscriminate pedestrian crossing	47.23	
7.	Poor parking habit	45.94	
8.	Inadequate road capacity	45.08	
9.	Inadequate parking facility	43.94	
10.	poor road network	43.66	
Mid-rank SD		48.10	

Source: Author's Analysis 2022

Succeeding factors in Table 3 further show that poor drainage system and events along and covering part of the carriageway were the fourth and fifth most dominant factors that caused man-hour loss. For instance, Tanke-University Road records heavy gridlock from 1:30 pm to 3:00 pm on Fridays due to the weekly Jumat service engulfing half of the double carriageway accessing the central Mosque. This attitude remains unabated and routinised the presence of man-hour loss to a large extent. In another account, Cvetek et al. (2021) dubbed it non-current congestion stimulated by unpredictable or with a vestige of predictable traffic elements. That alone strengthens the aim of this research to predict the pattern of traffic incidences along these major routes. Correspondingly, the Share-Oja-Oba Road is witnessing serious events comprising informal activities and ongoing construction, limiting commuters' movement. These five factors represent the dominant factors accounting for man-hour loss in the Ilorin metropolis, as found to be above the mid-SD rank of 48.10. The commuters' most minor problems were poor parking habits, inadequate parking facilities, and insufficient road capacity, below the mid-SD rank.

4.3 Research Hypothesis

The research hypothesis for this study is stated as follows:

H₀: No significant difference exists between traffic characteristics across the three corridors.

H₁: There is a significant difference between traffic characteristics across the three corridors.

Analysis of variance (ANOVA) is a parametric test designed to draw a significant difference amongst data groups for homogeneity. Table 5 shows how one-way-ANOVA was instituted to discover the diversity in traffic situations between three (3) distinct locations. The data employed in the analysis were obtained for five days (4week days and one weekend). Comparison between the group means recorded an *F*-value of 44.56 at the significance level (*p*) of 0.00. That shows no significant difference between the traffic situations across the three (3) corridors under investigation at the degrees of freedom (2,12). The three (3) routes offer similar traffic situations and exude identical problems. This result is not far-fetched due to the similar traffic and land-use patterns along these major routes.

Table 5: ANOVA of Traffic Situations across the Three (3) Corridors in Ilorin Metropolis

Source of Variation	SS	df	MS	F	P-value
Between Groups	17438789.2	2	8719394.6	44.55715746	0.000
Within Groups	2348281.2	12	195690.1		
Total	19787070.4	14			

Source: Authors' Analysis 2022

As established in the general background, these areas are characterised by educational and commercial institutions, which have been a major trip attracting and generating land uses. Batches of observations already adduced that nearly 160,000 people commute to these corridors daily. That excludes the pedestrians that take over the road shoulders and further narrows the width of the carriageway meant for vehicular traffic. One way or another, they generate traffic delays that stimulate man-hour loss. This habit is self-evident due to the absence of pedestrian walkways and pedestrian-designated crossing points. We cannot discount that when congestion tiptoes the border of optimal capacity, slight changes in traffic volume could precipitate enormous significant delays that we currently witness in the study area. Given this, the null hypothesis is accepted, and the alternative hypothesis is rejected at significant levels of 0.05 and 0.01.

4.4 Estimation of Man-hour Loss

This study demonstrates the estimated man-hour loss due to traffic delays along the major routes under investigation. Table 6 shows that 5 percent, 38 per cent, and 53 per cent of the commuters lose 76.65 hours, 138.7 hours, and 229.95 hours annually on the Tanke-University corridor. That further translates into a minimum of 3 days, 4 hours, and 39 minutes; 5 days, 18 hours, 51 minutes; and 9 days, 13 hours, 56 minutes as man-hours lost annually by the 96percent of the commuters along the Tanke-University corridor. Similarly, the Share-Oja-Oba route has a minimum of 76.65 man-hours (3 days, 4 hours, and 39 minutes) being lost by 29 per cent of the commuters. At the same time, 36 per cent and 25 per cent lost 138.7 man-hours (5 days, 18 hours, 51 minutes) and 229.95 man-hours (9 days, 13 hours, 56 minutes), respectively. That shows a sharp variation in the traffic situation along the Tanke-University corridor, as most commuters lose a minimum of 5 days, as against the majority of the Tanke-University corridor commuters that lose over 9 days annually.

Meanwhile, the Ilorin-Ajase-Ipo commuters have the bulk of the commuters at 38.8 per cent, losing 76.65 man-hours annually. The inference from the previous presentation is that the Tanke-University route witnessed the most delays on average compared to the Share-Oja-Oba and Ilorin-Ajase-Ipo roads. Consequently, 7.66 daily man-hours were recorded on the major corridors, which amounted to losing 2,795.9 man-hours (116 days, 11 hours, 52 minutes) annually due to the complex interplays of congestion and delays. Losing nearly 117 days yearly (32 per cent of the year) smears some deep concerns. These concerns gravitate toward the health and economic lives of commuters. Man-hour loss triggers serious health challenges, increases commuters' stress, and impinges on their general well-being —(Wong et al., 2019).

Further, traffic congestion delays first responders in the health, risk, and disaster sectors, distorting emergency response time, and can horrendously threaten the lives of urban citizens (Han et al., 2020). Economically, Alexey (2020) and Cvetek et al. (2021) opined that direct costs in travel time delays and enormous fuel consumption could be recorded, while carbon emissions, a tinge of heatwaves recorded as an indirect cost(Kutlimuratov et al., 2021).

Table 6 : Estimation of Man-hour Loss Across the Major Corridors of Ilorin

Time Loss	<i>Tanke-University</i> Corridor			<i>Share-Oja-Oba</i>			<i>Ilorin-Ajase-Ipo</i> Corridor		
	Frequency	Percent	Average time loss (AVT) in a day (hours)	Frequency	Percent	Average time loss (AVT) in a day (hours)	Frequency	Percent	Average time loss (AVT) in a day (hours)
	(%)		(average time loss/60)		(%)	(average time loss/60)		(%)	(average time loss/60)
10-15 Minutes	5	5.0	0.21	29	29.0	0.21	38	38.8	0.21
16-30 Minutes	38	38.0	0.38	36	36.0	0.38	32	32.7	0.38
31-45 minutes	53	53.0	0.63	25	25.0	0.63	28	28.6	0.63
1 hour	3	3.0	1	10	10.0	1	0	0.0	0
2 hours	1	1.0	2	0	0.0	0	0	0.0	0
Total	100	100.0	4.22	100	100.0	2.22	98	100.0	1.22
			1540.3			810.3			445.3

Source: Authors' Analysis 2022

In addition, Pasha et al. (2021) adduced that noticeable physical impacts of these delays include increased traffic violations and spillovers of queues at opposite and adjacent intersections and interchanges. Moreover, the body of scholarly works established as a ground rule that leading congested cities in the world that often trigger man-hour loss are so because the traditional core areas are designed with narrow streets that serve as trenches of long queues. In sub-Saharan cities, it is worse because most of these cities are products of 'development before planning syndrome,' which has their vestiges traced to the primitive ages. These downtown areas are continuously flanked and imbued with informal activities that many city governments observe as an integral part of the city's economic fabric.

The absence of an operational masterplan in many African cities thwarts their optimal spatial arrangement, misleading these cities' spatial growth. In some cases where the criteria-based planning approach has been encouraged, they often get disconfirmed, as traditional cities are too complex, and the admissibility of this theory becomes the product of erroneous planning judgments. It further emphasises the fundamental role of city planning and the naturalism of cities. We cannot discount that without efficient transportation driving the master planning of cities made up of water, air, energy, and living things, collectively referred to as natural elements, the spatial arrangement would appear disarrayed. Therefore, leading-edge city policies must move cities to points of actuality rather than aspirations to which they currently belong.

5.0 Conclusion

The desire to find a safer, faster, and more reliable means of connecting places cannot be overemphasised. Like many before, this study has emblazoned the quintessence of spatial interaction and demonstrated the importance of commuters arriving at their destinations on time as one of the bountiful ways of maintaining a healthy life. A quantum of studies in the last decades have focused on the economic loss associated with traffic delays. In addition to the elusory nature of recent approaches, less attention to addressing traffic delay in man-hours terms remains limited. Therefore, this study has established that commuters spend nearly 117 days unaccounted for annually.

Similarly, road intersections, poor traffic control management, heavy-duty vehicles, and special events along the major corridors of Ilorin are competing and frontline conditions that precipitate man-hour loss and render it deep-seated. The study has established that there are usually no significant differences between the traffic situations of intra-city corridors of compact cities, as they all evinced identical land use patterns, characteristics, and problems. To adduce to the extant body of scholarly works, we can say that the gaping contradiction between road design and the number of vehicles using these roads renders congestion and man-hour loss deep-seated. By all standards, the corridors have the propensity to accommodate daily traffic. However, congestion and man-hour loss remain ingrained due to the absence of pedestrian walkways and bicycle lanes, integral parts of efficient design. The absence of the wide-ranging importance of technology in monitoring and controlling urban operations deserves greater attention. The use of big data (as in Seoul and Rio de Janeiro) in monitoring public transport is encouraged in many regions of the world.

Therefore, city managers, transport planners, and city administrators must embrace broader responsibilities, capable of engendering technologies that can shape societies in diverse ways and characterise the future of transportation to align with the new urban agenda. Nevertheless, urban citizens' expectations can be raised by the tenets of this study as it recommends (i) provision of mass transits and policies that stifle reliance on automobile dependency; (ii) provision of traffic signals to reduce conflicts at the intersections and interchanges that bring on delays; (iii) creating open penetrative campaigns through the diverse interest groups in the city to address prostitution of these corridors.

Concerted intersectoral linkages must be initiated between the three tiers of Government to increase the road capacities that give room for little or no marginal change. Additionally, through this research, major trips attracting and generating land uses, like the University of Ilorin, improve and widen their welfare schemes by introducing mass transit that can significantly reduce the proliferation of smaller vehicles on the road, particularly during peak hours. To further halt the man-hour loss recorded in a few years, ministries, departments, and agencies (MDA) connected to transport issues must realistically

develop the latest intelligent transportation systems (ITS) with proclivities of advancing traffic control and vehicular assignment operations.

Consequently, we hope this study will spur further practical and concrete results by establishing health-related wrinkles (Diabetes Mellitus, high blood pressure) associated with traffic delays. We hope the attendant study will fill the limitation gaps of this study by assessing the effect of man-hour loss on the genetic makeup of urban citizens vis-à-vis the cultural factors that shape gender responsibilities.

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