Asian Journal of
Science, Technology, Engineering, and Art

e-ISSN: 3025-4507
p-ISSN: 3025-5287
Index: Harvard, Boston, Sydney University, Dimensions, Lens, Scilit, Semantic, Google, etc

https://doi.org/10.58578/AJSTEA.v3i2.5164

The Role of Environmental Awareness in Shaping Residents' Trip Lengths in Ogun State: A Sustainable Transportation Perspective

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Article Info:

Submitted:	Revised:	Accepted:	Published:
Feb 12, 2025	Feb 24, 2025	Mar 9, 2025	Mar 14, 2025

Abstract

This study examines the role of environmental awareness in shaping residents' trip lengths in Ogun State, focusing on sustainable transportation perspectives. The research investigates intra-urban variations in trip lengths across different spatial structures: traditional, transitional, and suburban zones. Utilizing a descriptive and analytical approach, data were collected through surveys targeting 362 residents. Based on the findings, Females generated more trips (58.4% of total trips). Residents aged 30-44 made the most trips (average daily: 234.7). Individuals with ND/HND qualifications made the most trips (1,331 weekly). Households earning ₦60,000 - ₦120,000 made the highest number of trips (1,341 weekly). The findings reveal that about 44.1% of the residents in traditional zones predominantly undertake shorter trips (5.1-10 km), while about 23.6% of the respondents in suburban zones show a higher frequency of longer trips (above 20 km). Factors influencing travel behavior include

socioeconomic characteristics, modal preferences, and environmental awareness. The study underscores the necessity for tailored urban planning and transportation policies that consider the unique attributes of each zone to promote sustainable travel behaviors.

Keywords: Environmental Awareness, Socioeconomic Characteristics, Modal Preferences, Intra-Urban Variations, Suburban Zones

INTRODUCTION

Trip generation is a widely used technique for forecasting travel demand by estimating the number of trips originating from or heading to specific traffic analysis zones (Gehrke and Welch, 2017). It is closely linked to the social and economic characteristics of households. Within the context of traffic analysis zones, terms like "producing" or "generating" trips are employed, highlighting how zones serve as destinations or attractors (Muili, 2013). The focus of attractor analysis is mainly on non-residential land uses (Zahnow, 2018). This methodology helps researchers pinpoint trip origins and destinations, facilitating the documentation of resident travel and the identification of travel patterns.

Trip distribution involves examining zonal interactions to create origin-destination tables that show where trips occur (Zahnow, 2018). This process matches the origins and destinations of travelers, producing a "trip table" or matrix that indicates the number of trips between each origin and destination (Iroham, *et.al*, 2020). This concept is vital for understanding the directional trends of residents' travel. Route assignment is the next step, which involves selecting routes (or paths) between origins and destinations within a transportation network (Bliemer, *et. a*l., 2017). To assess facility needs, understanding the volume of travelers on each route and link within the network is essential for evaluating costs and benefits. A route is defined as a series of links that connect an origin to a destination (Sodiya, 2020). Thus, conducting traffic (or trip) assignment is crucial. For instance, in a network that includes highways and transit systems with planned expansions, recognizing existing traffic delay patterns is important (Bliemer, *et.al*, 2017). This information is crucial for evaluating the current transportation system's condition and is key for planning improvements, optimizing routes, and managing traffic efficiently. Travel patterns emerge from the activities individuals engage in at different times, and

understanding these patterns requires a comprehensive approach. According to (Holmes *et al.*, 2021), research on travel patterns seeks to understand how travelers' values, norms, attitudes, and constraints shape observed behaviors. Traveler values include motivational, cognitive, situational, and dispositional factors that affect human behavior (Laesser, *et.al*, 2019). Analyzing travel patterns primarily involves modeling and studying travel demand, utilizing theories and analytical methods from various scientific disciplines. This includes examining time allocation for travel and activities, exploring these aspects across different time contexts and life stages, as well as organizing and utilizing space across various social levels, such as individuals, households, communities, and other formal and informal groups (Khan, *et. al.*, 2017). Based the research the following are the research objectives; To analyze the Intra-Urban variation in Trip Length among Residents, to investigate the Relationship between Trip Length and Frequency among Residents across Different Spatial Structures in Ogun State, and to Analyze Modal Preferences across Different Spatial Structures

Previous studies

Numerous studies examining the connection between urban form and travel behavior have faced criticism for not adequately considering the role of residential self-selection. As discussed by (Handy, *et. al.*, 2005), the key question remains whether urban form characteristics influence travel behavior or if individuals choose their residential neighborhoods based on their travel preferences. Recent literature indicates that the relationship between urban form and travel behavior may be influenced by both attitudes and demographic factors (Cao, *et.al.*, 2009). (Bohte, *et. al.*, 2009) further emphasize that attitudinal factors are just as significant as socio-economic characteristics in shaping travel behavior.

A clearer understanding of residential self-selection can enhance sustainable spatial planning policies while also addressing housing supply issues. Naess (2009) argues that while households may self-select their neighborhoods, this does not negate the influence of urban structure on travel behavior; rather, the urban structure facilitates self-selection. Naess also suggests that it is possible to encourage car-dependent households to adopt walking and cycling habits (Næss, 2006 - 2012). Factors such as activity participation, the location of activities, travel mode choices, and route selections contribute to higher motorized travel rates among residents in outer areas compared to those living in the inner

city, regardless of self-selection into particular neighborhoods (Naess, 2009), (Cao *et. al.*, 2010). This aligns with an activity-based theory of urban travel demand rather than solely utility-based models. Ha et al. (2020) note that personal travel patterns are shaped by various factors including income, age, household size, travel distance, and mode of transportation. The impact of residential location on personal mobility is significant, although the exact nature of this impact is not entirely clear (Engle, *et. al.*, 2020). Researchers have explored the spatial positioning of residences in relation to the city center or central business district (CBD) in both meso (citywide) and macro-level (regional) travel analyses. Common travel metrics include trip frequency, distance traveled, mode share, and transport-related energy consumption. Generally, homes located further from the city center—such as in suburbs or outlying areas—are linked to longer travel distances, increased car dependency, and higher transport energy usage. The relationship between residential location and the number of trips taken is typically found to be insignificant.

Several studies, including those by (Nwachukwu, *et.al*, 2019), (Iroham *et. al.*, 2020), (Gwanshak, et.al, 2020), and (Holmes, *et. al.*, 2021), support this finding. (Grobe, *et.al*, 2019) conducted an extensive household travel survey in the Copenhagen metropolitan area, focusing on how residential location relative to downtown affects travel patterns. Their quantitative analysis reveals that weekday travel distances vary significantly among individuals based on their distance from the city center, with city center and inner-city residents traveling shorter distances by car compared to those living farther away. Furthermore, city center residents are more likely to use active transportation (walking or cycling) for activities within a 20km radius, whereas suburban and exurban residents generally walk or cycle for activities within 5km of their homes. Weekend leisure trip distances tend to increase with greater distance from the urban center, even after controlling for socio-economic factors, likely due to the concentration of entertainment venues and employment opportunities in the city center (Hu, *et. al.*, 2018).

Theoretical Framework

The theoretical framework in this context involves defining and articulating the concepts, theories, and models that underpin the specific research or investigation. Various concepts and theories have been applied by scholars to study residents' travel patterns, some of which are included in this study.

Ullman's Theory of Spatial Interaction: - This theory, proposed by Edward Ullman in 1956, addresses the relationship between demand and supply that drives movement and influences residents' travel patterns across different locations (Castells, 2020). Ullman identified three key concepts that facilitate interaction: complementarities, transferability, and intervening opportunities (Ren, *et. al.*, 2020).

i. **Concept of Complementarity: -** Complementarity is essential for understanding interactions between two distinct locations, where the demand in one area aligns with the supply in another (Jacobides, *et. al.*, 2018). This interaction is often motivated by comparative advantages regarding resource availability, goods, and services. Areas typically specialize in producing goods or services where they hold a competitive edge over others (Ren *et al.,* 2020). The dynamics of supply and demand foster movement and interaction among various areas or settlements, both within and outside the local government being studied. In this context, complementarities refer to the spatial differences and the presence of supply and demand across various locations, encouraging interactions between distant places. Essentially, complementarity arises when a supply exists in one area and there is a corresponding demand in another (Kassam, *et. al.*, 2021). This concept is particularly relevant to the flow of goods and materials between locations, with road transportation playing a critical role in facilitating this interaction, resulting in traffic patterns influenced by spatial interaction levels, flow, and time. Understanding complementarities is vital as spatial phenomena are often unevenly distributed, necessitating travel to access services or facilities.

ii. **Concept of Intervening Opportunity: -**Intervening opportunity refers to the emergence of alternative areas that serve as intermediate points for the demand or supply of goods and services between two distinct locations (Kassam, *et. al.*, 2021). The presence of intervening opportunities significantly affects the degree of interaction between these places, introducing constraints that can limit interaction even when complementarities exist (Ren, *et.al*, 2020). Essentially, intervening opportunities explain why one location might be favored over another for patronage. This concept is closely tied to the idea of minimizing distance, where preferences lean towards nearer locations rather than farther ones. The influence of intervening opportunities is evident in movement patterns, acting as a filter that affects the flow of people. Practically, intervening opportunities create

conditions that guide decision-making in movement and patronage, adding a nuanced layer to the overall flow patterns between different locations.

iii. **Concept of Transferability: -**Transferability concerns the movement of goods and services within specific areas, assessed in terms of time and cost (Castells, 2020). When the time and cost associated with transporting a commodity over a distance are prohibitively high, the level of interaction is likely to decrease significantly, even in the presence of strong complementarities and intervening opportunities (Grobe, *et. al.*, 2019). Consequently, there is often a tendency to substitute goods that are costly or difficult to transport. However, this challenge can change with advancements in transportation, which may enhance interactions between areas. Transferability relates to how easily demands between two complementary places can be satisfied, measured in terms of real transfer and time costs. Although primarily applicable to the flow of goods, transferability can also inform spatial interactions. For example, individuals might be willing to travel shorter distances for low-value goods but are more likely to travel greater distances for high-value items (Kassam, *et. al.*, 2021). The concentration of high-value goods and services in urban areas contributes to traffic patterns. This theory explains the reasons behind interactions in geographical spaces, encompassing the movement of both people and goods for various activities (Ren, *et. al.*, 2020). Understanding transferability is crucial for analyzing residents' movements from their homes to other locations and the associated travel patterns (Ha, *et. al.*, 2020). The theory examines the factors necessitating movement as well as the barriers such as costs, transportation modes, and accessibility. Given that this research focuses on residents' mobility, this theory is particularly relevant as residents of Ota travel for various reasons, including seeking opportunities, visiting friends and family, shopping, and attending religious services.

Study Area

Ogun State is situated in southwestern Nigeria, spanning latitudes 6°N to 8°N and longitudes 3°E to 5°E. It shares its western border with the Republic of Benin, while Ondo State lies to the east. To the north, it is bordered by Oyo State, and to the south, by Lagos State and the Atlantic Ocean (see Figure 1). The state encompasses an area of approximately 16,762 square kilometers, which accounts for about 1.81% of Nigeria's total

land area of around 923,768 square kilometers (Akanni, 2000). The geology of Ogun State consists of both sedimentary and basement complex rocks. According to Akanni (2000), approximately 1,200 km² of the state is made up of sedimentary formations, while about 400 km² consists of basement complex rocks from the pre-Cambrian era. The state features two primary relief regions: the first includes creeks and lagoons in the southeastern part, with altitudes ranging from 0 to 40 meters above sea level. The second region consists of undulating coastal plain and lowland areas, where elevation increases from about 30 meters to 250 meters above sea level as one moves northward. This plain is interrupted by sandstone crests, particularly in the western section of the state. The landscape is dotted with rock outcrops, especially around the state capital, Abeokuta. The entire region is drained by several coastal rivers, including the Ogun, Yewa, and Shasha rivers, which flow from Oyo State through the densely vegetated western part of Ogun. Additionally, numerous small rivers and streams flow perennially through the swampy southeastern terrain.

Figure 1: Map of Ogun State

METHODOLOGY

Opoku et al. (2016) define research methodology as the overall approach a researcher takes to conduct a study, which influences the selection of specific tools. It emphasizes the steps

involved in the research process and the objective procedures that need to be explored. Thus, research methodology encompasses the procedures or systematic steps followed when conducting research. This chapter outlines the research design, types and sources of data, instruments for data collection, methods of data gathering, and data analysis techniques that will be employed in the study. The methodology aims to ensure a structured collection, analysis, and interpretation of relevant data regarding residents' travel patterns in the study area.

Research Design

This study employs both descriptive and analytical approaches, with an emphasis on an inferential method. The inferential approach, often referred to as survey research, involves studying a sample of the population to determine its characteristics, allowing researchers to infer that the broader population shares these characteristics. The primary instrument for data collection was a questionnaire, which consists of a series of questions organized in a specific order on a form or set of forms.

Types and Sources of Data

Primary data served as the main source for this study. This type of data is obtained from original sources and constitutes the majority of the information needed for the research.

Sampling Frame

The study area had a population of 163,783, according to the 2006 census. The average household size in urban areas was found to be four persons per household (Opoko and Oluwatayo, 2014). Sango Ota comprises fifty-three localities distributed across various spatial structures, as detailed in Table 3.2. Twelve localities along major traffic corridors were purposefully selected using a purposive sampling technique, as outlined in Table 3.3. The number of residential buildings in these selected localities was counted to establish the sampling frame for the study. To gather this information, the total number of houses in the selected localities was captured and counted using Google Earth images from 2022. The selected areas were zoomed in on Google Earth to provide clearer imagery for counting. To prevent double counting, hard copies of the images were printed, with marked counts of the houses. Assuming there is at least one household per house, it was determined that the selected localities contained 3,578 households, which served as the sampling frame for the study.

RESULTS AND DISCUSSION

Spatial Distribution Pattern of activities that Influence the Residents' Travel Behaviour

1. Gender of Respondents and Travel Behaviour

Information presented on Figure 1 shows the gender of respondents and their trip frequency. It was found that daily trip distribution between male and female was 1,569 and 2,203 respectively. This could be interpreted that female generated more trips than their male counterpart in the study area. While male made 1,569 trips, female generated 2,203 trips, representing 58.4% of the total trips generated. Furthermore, findings on the average daily trip shows that male made 224.1 and female generated 314.7 trips in a day. However, information on average daily person trip indicates that a male generated 1.9 trips per day, while a female respondent made 2.7 trips daily. The implication of the findings was that female generates trips more than their male counterpart. This might be attributed to the notion that shopping for family needs was the duty of female folk.

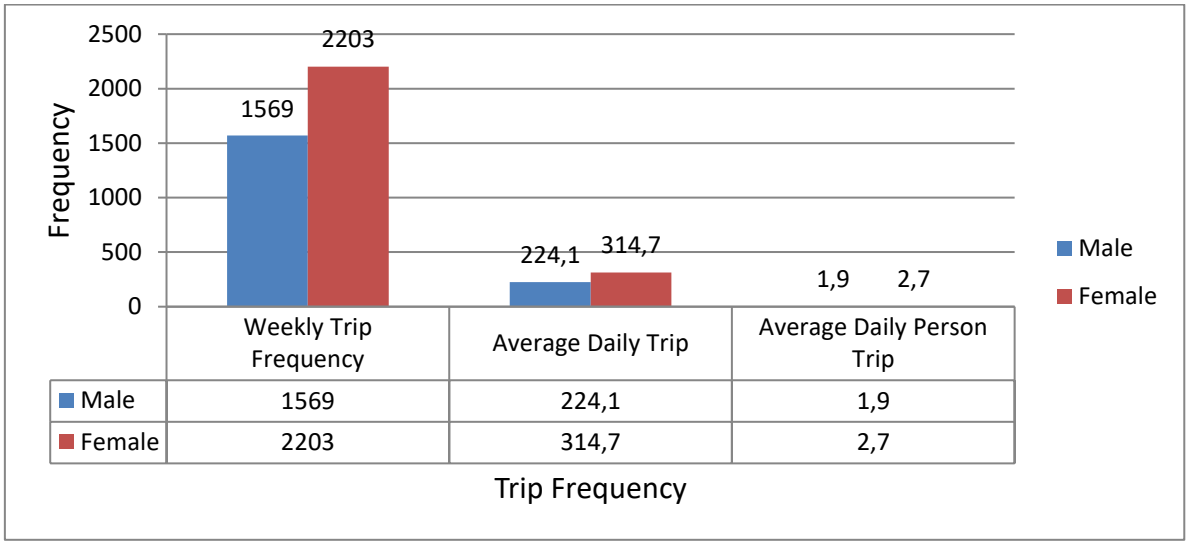

Figure 2: Residents' Gender and Travel Behaviour

Source: Author's Field Survey (2023)

2. Age of Respondents and Travel Behaviour

Findings on the age group and trip behaviour of the respondents reveal that, residents between age brackets 30 – 44 years generated more trips compared to other age groups surveyed. The average daily trip made by this age group was 234.7, while an individual within this age group generated 2.0 trips in a day. In order of magnitude, age

group of between 5 – 59 years came second. The residents within this age range generated 1,643 trips in a week, with the average daily trip of 188.9 and average daily person trip of 1.6. While residents within age group 18 – 29 years occupies third position with 567 trips per week and average daily trip of 81, whereas residents within the age bracket of Above 74 years accounts for the least. The residents within the age range made 240 trips per week, with average daily trips of 34.3 and average daily person trip of 0.3 as presented on Table 1.

Table 1: Age Group and Residents' Travel Behaviour

Age Group (years)	Weekly Trip Frequency	Average Daily Trip	Average Daily Person Trip
18 – 29	567	81	0.7
30-44	1,643	234.7	2.0
45-59	1,322	188.9	1.6
Above 74	240	34.3	0.3

Source: Author's Field Survey (2023)

3. Educational Status of Respondents and Travel Behaviour

The analysis of residents' educational status and their travel behaviour shows that most trips were generated by respondents with ND/HND educational qualifications. Residents in this category made 1,331 trips in a week, with average daily trip of 190.1 and 1.6 average daily person trip. As observed in the Table 4.29, residents with first degree ranked second. It was noted that respondents with the educational status generated 969 trips weekly. Their average daily trip was 138.4 trips and average daily person trip was 1.2 trips. Residents with secondary educational qualification occupy third position in terms of frequency of trip generation. This category of residents made 554 trips in a week, with average daily trip of 79.1 and average daily person trip of 0.7. The residents with postgraduate academic attainment ranked fourth. The total trip generated by the residents was 546 trips per week. While their average daily trip was 78 and average daily person trip was 0.7. Residents with the primary school certificate had least trip generation. The total trips generated by this resident was 372, having average daily trip of 53.1 and average daily person trip of 0.5. It could be inferred from the findings that daily person trips increase with the level of education. However, the trend changed between residents with first degree and postgraduate educational status.

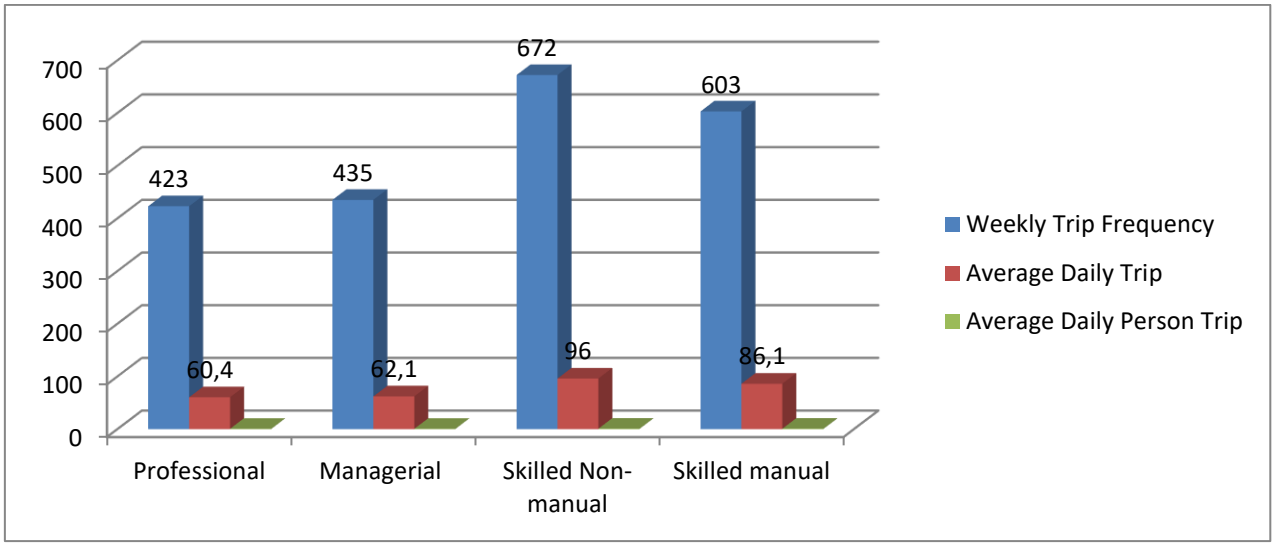

Figure 3: Educational Status and Residents' Travel Behaviour

Source: Author's Field Survey (2023)

4. Occupation of Respondents and Travel Behaviour

Figure 4 shows findings on residents' occupation and travel behaviour. It was found that respondents that engaged in unskilled manual job made more trips than others. The proportion of trips generated by residents in this category represents 19.1% of the total trips. Further analysis reveals average daily trip of 103 and average daily person trip. Next in rank were respondents that engaged in skilled non-manual occupation. Residents in this group made 672 trips in a week. Their average daily trip amounted to 96, with average daily person trip of 0.8. This was followed by respondents that engaged in skilled manual job. The total weekly trip generation of these respondents was 603. While their average daily trip was 86.1, it was observed that their average daily person trip was 0.7. The weekly trip generation of the unemployed and retired respondents happened to be the least. While respondents that were unemployed made 277 trips in a week, those that were retired generated 102 trips per week. Their respective average daily trip was 39.6 and 14.6 trips. However, while unemployed respondents generated average daily person trip of 0.3, those that were retired made 0.1 average daily person trips.

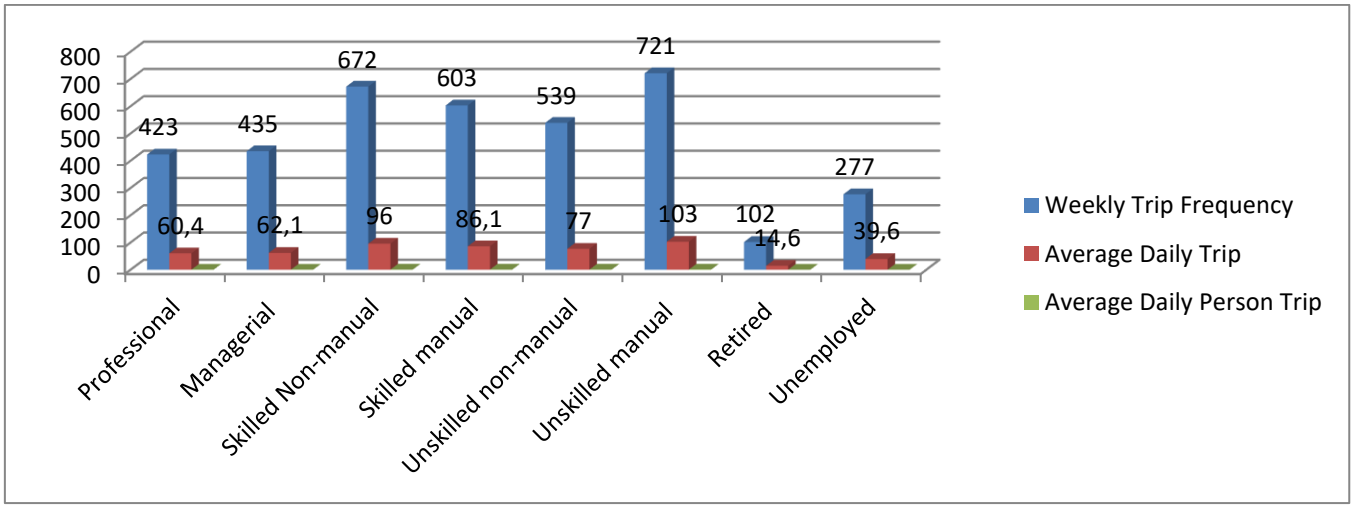

Figure 4: Occupation and Residents' Travel Behaviour Source: Author's Field Survey (2023)

5. Monthly Income of Respondents and Travel Behaviour

Findings on average monthly income of the respondents and travel behaviour show a pattern of relationship. The results reveal inverse relationship between income and trip frequency was presented on Figure 4.5. Except for respondents within the income group of "less than ₦60,000" the trip frequency decreases with the increase in residents' income. However, the weekly household trip was highest among household that earned ₦60,000 - ₦120,000 per month. The weekly trips of the household were 1,341 in a week. Their average daily trip was 191.6 trips, whereas average daily person trip was 1.6. The least trip frequency was made by respondents that earned income that was above ₦400,000 in a month. The residents in this category generated 103 trips per week. Their average daily trips were estimated to be 14.7 trips, while daily person trip was 0.1.

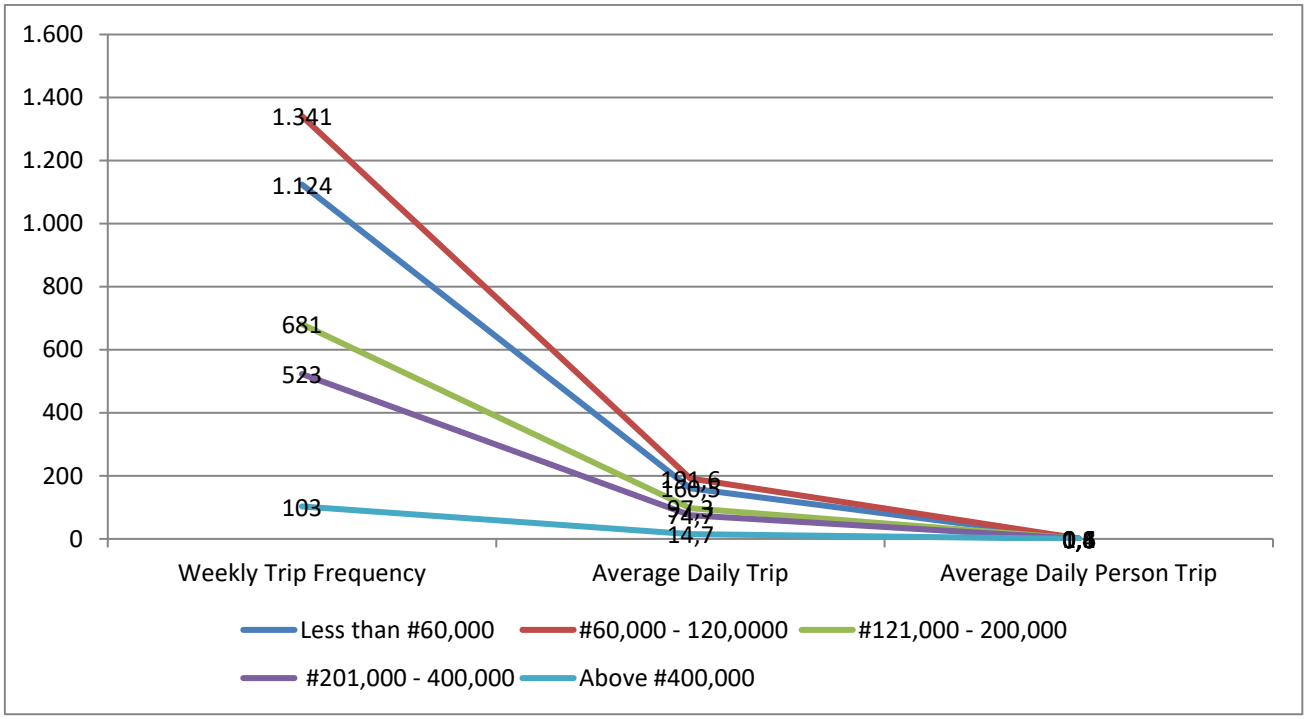

Figure 5: Average Monthly Income and Travel Behaviour of Residents

Source: Author's Field Survey (2023)

6. Vehicle Ownership and of Respondents and Travel Behaviour

Information obtained from analysis of vehicle ownership and residents' travel behaviour shows that residents with vehicle generated more trips than their counterparts without vehicles (Figure 6). Over 50% of the trips were made by vehicle owners. It was observed that daily average trip generated by vehicle owners was 318.6, while daily average person trip of 2.6 was made per day. However, respondents without a vehicle made total trips of 1,542. It was noted that daily average trip for this group was 220.3 and daily average person trip estimated was 1.9.

Figure 7 shows a pattern of relationship between motorcycle ownership and travel behaviour of the residents. The analysis reveals that respondents with motorcycle generated more trips than their counterparts without motorcycle. About 60% of the trips generated in a week were made by respondents that owned motorcycle either one or more. The daily average trip was estimated 353, with average daily person trip of 3.0. It could be inferred that residents that own motorcycle have higher likelihood of generating more trips, compare to those that do not have.

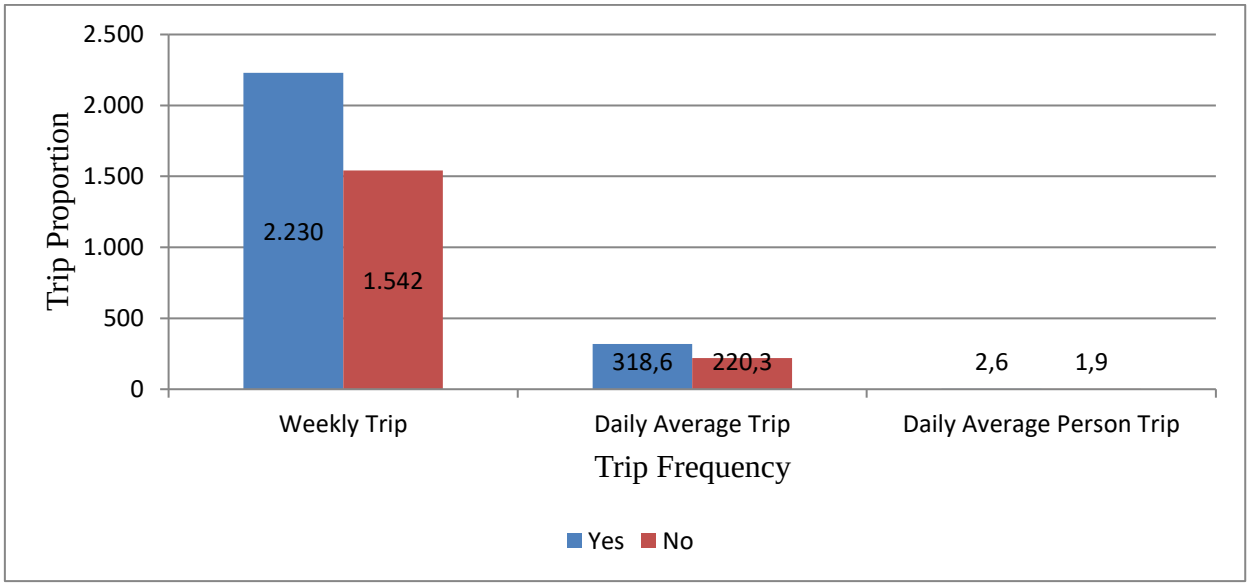

Figure 6: Vehicle Ownership and Residents' Travel Behaviour: Source: Author's Field Survey (2023)

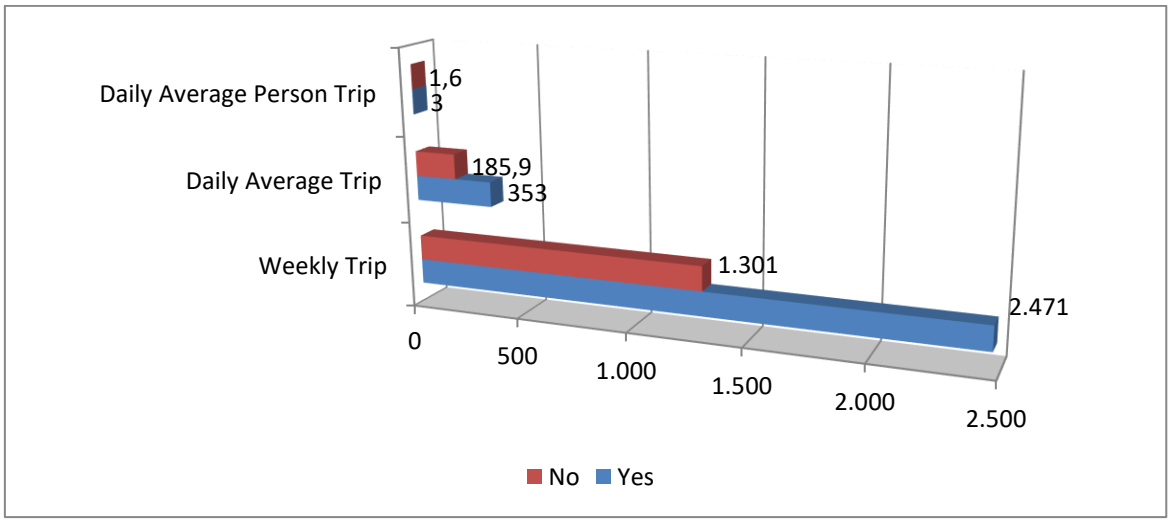

Figure 7: Motorcycle Ownership and Residents' Travel Behaviour: Source: Author's Field Survey (2023)

Intra-Urban Variation in Residents Trip Frequency

Information presented on Table 1 shows the residents' trip frequency in each day of the week and spatial structures. The seven-day travel diary of 362 residents surveyed in the study area generated a total of 3,772 trips. Over forty percent (41.3%) of the trips were generated by the residents in the traditional zone. While 27.7% of the trips were made by residents in Transitional zone, about one third (31%) were generated by the residents in

sub-urban spatial structure. The study shows that an average of 222 trips were generated by residents in the traditional area, a daily average of 149 trips were made by residents in transitional zone, while 167 trips were generated by residents in sub-urban area. Furthermore, average daily trip per household was 10.6, 10.3 and 10.4 in the traditional, transitional zone and sub-urban zones respectively. The average daily trip per person in traditional area was 4.3. While respective average daily trip per person in transitional zone and sub-urban zones was 2.9 and 0.3. From the foregoing, it implies that respondents from traditional zone generated more trips than those in transitional and sub-urban zones. In the same vein, individual in traditional area made more daily trip than individual respondents from other zones. The reasons behind the higher trip generation in the traditional zone compared to Transitional and sub-urban zones could be rooted in several factors. The traditional zone might have a higher concentration of commercial and retail activities, leading to increased movement for shopping or market purposes. Additionally, it might host more public amenities, resulting in higher mobility for activities such as religious events or cultural gatherings. The area might also have a higher population density, contributing to increased travel needs. The implications of these results are significant for urban planning and transportation management. Understanding the differential trip generation across Spatial Structures was crucial for designing transportation infrastructure, allocating resources for public amenities, and implementing zoning regulations. Policymakers and urban planners can use this information to tailor transportation strategies, optimize public services, and develop efficient land-use plans that cater to the diverse travel patterns in different spatial structures.

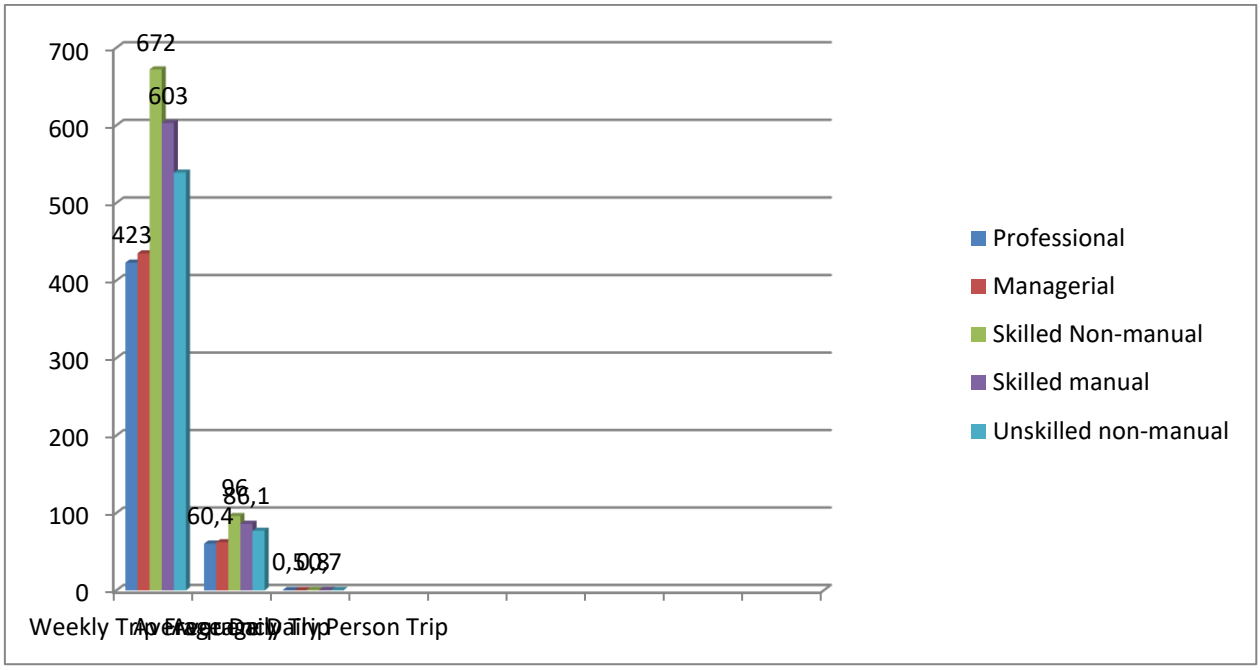

Figure 8: Spatial Structure Trip Frequency and Days of Week Source: Author's Field Survey (2023)

Intra-Urban Variation in Residents' Trip Purpose

The analysis of intra-urban trip purposes across different spatial structures reveals intriguing patterns in residents' travel behaviour. Primarily, the predominant trip purpose across all zones was for work-related activities, indicating that a significant portion of residents commute to their workplaces. This pattern persists consistently across traditional, Transitional and sub-urban zones, albeit with slight variations in percentages. Interestingly, the second-

highest trip purpose varies across these zones, shedding light on the distinct socio-cultural dynamics within each area. In the sub-urban zone, trips to educational facilities emerge as the second most frequent, indicating a higher concentration of school-going children in this area compared to the others. Conversely, in the traditional core and transitional zones, trips for market or shopping activities take precedence as the second most common, reflecting the local lifestyle and the centrality of commerce in these areas.

Moreover, the data showcases notable differences in the least generated trip purposes among the zones. Recreational trips hold the position of the least generated trips in the traditional core and transitional zones, suggesting that leisure activities might be less

prioritized or accessible within these areas. Conversely, trips to religious activities are the least made in the sub-urban zone, potentially indicating varied levels of religious engagements or commitments among residents in this zone. This variance in trip purposes between zones reflects the multifaceted nature of urban life and the diverse needs and priorities of residents across different residential areas. It also underscores the influence of local culture, infrastructure availability, and socio-economic factors on residents' travel behaviour within these zones.

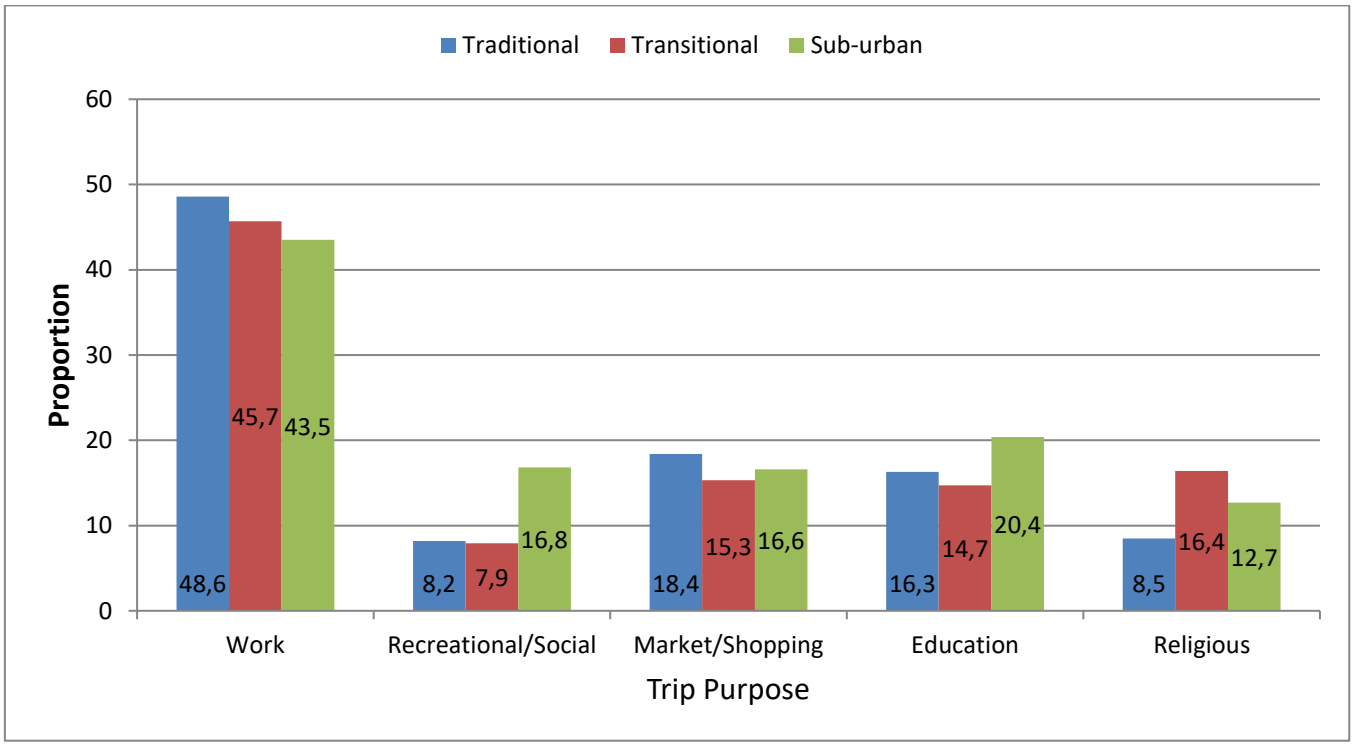

Figure 9: Intra-Urban Variation in Residents' Trip Purpose Source: Author's Field Work (2023)

Intra-Urban Variation in Residents' Trip Length

Findings on intra-urban variation in trip length of residents are as shown in Table 1. It was found that the predominant trip length in traditional zone was between 5.1 and 10 km. It constitutes 44.1% of the total trips embarked on by the residents in the area. The least (3.0%) distance covered by the residents was trip length that was above 20 km. The reason for this outcome might be attributed to the fact that the zone was probably dominated by children and elderly who could not travel long distances. It was discovered that trip frequency decreases with trip lengths in the traditional zone. The same trend was

observed in Transitional zone, where the trip length of 5.1 to 10 km accounts for the majority (57.1%). Findings on trip length from sub-urban zone are quite different from the other two zones. The highest trip frequency was trip length that was above 20 km. It constitutes 23.6% of the total trips generated in the area. The trip frequency was observed to increase with trip length in sub-urban zone.

Table 2: Trip Length by Spatial Structures

Spatial Structure	< 1 km (%)	1-5 km (%)	5.1-10 km (%)	10.1-15 km (%)	15.1-20 km (%)	Above 20 km (%)	Total (%)
Traditional	4.0	23.5	44.1	15.7	9.8	3.0	100
Transitional Zone	12.0	2.9	57.1	8.6	11.4	8.0	100
Sub-urban	10.8	12.2	14.8	16.1	22.5	23.6	100

Intra-Urban Variation in Residents' Modal Choice

The results of modal choice of residents show that motorcycle constitutes the highest (31.4%) mode in traditional area, whereas, car usage has the least percentage (7.8%). However, in transitional zone tricycle and motorcycle accounts for 28.6% each. This implies that these modes were mostly used by the respondents in the area. As observed from the table car usage was next in proportion to tricycle and motorcycle with 22.9%. Walking represents least (6.1%) modal choice in the area. The most frequently used mode in sub-urban zone was car. It has percentage contribution of 54.3% in the area.

Table 3: Modal Choice by Spatial Structures

Spatial Structure	Bus/Taxi (%)	Tricycle (%)	Motorcycle (%)	Car (%)	Walking (%)	Total (%)
Traditional	7 (13.7)	13 (25.5)	16 (31.4)	4 (7.8)	11 (21.6)	51 (100
Transitional Zone	4 (11.4)	10 (28.6)	10 (28.6)	8 (22.9)	3 (8.6)	35 (100
Sub-urban	5 (15.2)	3 (9.1)	5 (15.2)	18 (54.3)	2 (6.1)	33 (100

Source: Author's Field Work (2023)

CONCLUSION

The analysis of trip lengths among residents in Ogun State demonstrates significant intra-urban variations influenced by spatial structures and socioeconomic factors. In traditional zones, the predominance of short trips can be attributed to demographic factors, including a larger proportion of children and elderly individuals. Conversely, suburban zones exhibit a trend of longer trips, reflecting greater access to employment opportunities and essential services. The findings highlight the relationship between trip frequency and modal choices, with motorcycle usage being prevalent in traditional and transitional zones, while car usage dominates in suburban areas.

The analysis indicates significant intra-urban variations in trip lengths among residents in Ogun State. Based on Trip Length Distribution for the traditional zones, predominantly short trips (44.1% between 5.1-10 km). Majority (57.1%) of Transitional Zones trips are also in the 5.1-10 km range. While about 23.6% of trips exceed 20 km for suburban zones

Based on Trip Frequency, average daily trips per person were highest in traditional zones (4.3), followed by transitional (2.9) and suburban zones (0.3). Likewise for Modal Preferences, motorcycle usage is highest in traditional zones (31.4%), while car usage is dominant in suburban areas (54.3%). These results highlight the importance of understanding unique travel patterns shaped by environmental awareness and socioeconomic factors.

Recommendations

1. Urban planners should consider the unique characteristics of each spatial structure when designing transportation infrastructure. This includes enhancing public transportation options in suburban areas where longer trips are more common.
2. Initiatives aimed at increasing environmental awareness among residents should be prioritized. Educational campaigns can encourage the adoption of sustainable travel practices, such as walking and cycling, particularly in traditional and transitional zones.
3. Developing reliable and efficient public transport systems can reduce reliance on personal vehicles, especially in suburban areas. This will help alleviate traffic congestion and reduce environmental impacts.

4. Offering incentives for residents who choose sustainable modes of transport, such as discounts on public transportation fares or subsidies for bicycle purchases, can encourage a shift in travel behavior.

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