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Development at the Urban Fringes: Analysing Intra-urban Mobility in Peri-urban Communities of Ado-Ekiti, Nigeria

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ABSTRACT

Urbanization is a characteristic of rapidly growing cities, which will, in turn, generate peri-urban areas. Extensive urbanization has occurred in Ado-Ekiti, the capital city of Ekiti State in Nigeria, resulting in the establishment of peri-urban settlements. Transport behavior in intra-urban areas of these settlements is the subject of this paper, and concerns, opportunities, and implications of transport dynamics for socio-economic activity are discussed. The study deconstructs how poor infrastructure, informal transport, and spatial inequality organize mobility and urban integration. The findings present lessons in sustainable planning to optimize accessibility and connectivity in peri-urban Ado-Ekiti.

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Introduction

Urban expansion typifies developing cities, which are fast changing the surrounding zones into peri-urban areas. These areas are transitional zones, which act as a buffer between urban and rural land uses, infrastructure, and socio-economic activities. They often face a myriad of challenges revolving around governance, service provision, and mobility [1]. Conspicuously, rapid urban expansion towards peri-urban areas can be ascribed to the contributions of population explosion, rural-urban migration, and a rising demand for housing and land [2]. In Nigeria, urban expansion has pushed the city outwards, forming new settlements that provide a huge challenge for planning and also which drive calls for new transit systems [3-4]. Albeit, poor infrastructure development in these peri-urban areas now presents a challenge, especially in the transport sector, where bad road networks and inefficient public transportation systems create hurdles for actual intra-urban mobility [5]. Ado-Ekiti, the capital of Ekiti State, is one of the fasturbanizing cities in the last two decades, which has recorded peri-urban expansions towards places like Iworoko, Ilawe, Ijan, and Odo-Ado [6]. The areas within Ado feel a good number of them who move into the city center to work, school, seek healthcare or pursue local economic endeavors each day. Yet there are other challenges impacting mobility within these zones-the most conspicuous among which are inadequate road infrastructure, poor public transport, and very high transport charges [7]. The complete lack of proper structured, reliable transport forces the population to use informal means of transport in the guise of motorcycles (okadas) and minibuses (danfos), which are very unregulated, very unsafe, and overly costly [8]. While such informal transport is critical in ensuring connectivity, it is also a big contributor to accident rates concern for pollution to the environment, and traffic congestion.

Despite being critical to urban expansion, the peri-urban areas continue to suffer from inferior transportation infrastructure and poor mobility planning [9]. Studies say peri-urban communities in Nigeria usually encounter serious transport difficulties due to a combination of factors including deterioration of existing road conditions, absence of organized public transport systems, and poor government policies on transport management [10-11]. Ado-Ekiti peri-urban settlement residents face daily mobility constraints, especially during peak hours, when the demand for transport is more than the supply [12]. Seasonal flooding, which renders many unpaved roads impassable during the rainy season, exacerbates these difficulties [13]. Poor transport infrastructure enhances low productivity in the economy, extends traveling time, and constrains access to essential services such as health care and education [14]. The lack of integration between urban and peri-urban transport systems further decreases economic interactions that enhance trade and commerce between the urban core and the periphery (Bello, [15]. Those challenges in mobility have a spiraling chain of socio-economic implications on peri-urban people. Sub-standard transport services hit the urban poor hardest as they highly depend on cheaper public transport means to connect with jobs and other essential services [16]. In particular, women and school children experience worse mobility challenges due to security issues and high fares. The lack of transport options for residents of peri-urban areas makes it difficult for them to trade agriculture, since many of them are engaged in small scale farming, which requires access to urban markets aided by transport systems [17]. A full comprehension of intra-urban transport patterns in peri-urban Ado-Ekiti is needed to provide a foundation for the pristine development of policy interventions that align urban transport safe in other resource optimization, as well as incorporate more desirable considerations [18].

The research aims to investigate intra-urban mobility in peri-urban Ado-Ekiti by addressing several questions to realize these goals. The objectives of this study are to; notice the dominant modes of transportation used by the residents, analyze the main challenges facing intra-urban mobility, and evaluate the socio-economic implications of an inefficient transportation system. In addition, the study will present policy recommendations and possible interventions useful in enhancing mobility and access into and within peri-urban Ado-Ekiti. These mobility patterns are important in sustainable urban planning and further inclusion of urban growth. The research objectives are oriented to providing a better understanding of the intra-urban mobility challenges that's facing the peri-urban populace in Ado-Ekiti; first, to know the transport pattern in peri-urban settlements and assess their efficiency; second, to identify the major issues preventing such areas in accomplishing potential effective intra-urban mobility; third, to investigate the implications in the areas of economics, education, and healthcare accessibility arising from low mobility of the peri-urban populace; and lastly, to provide recommendations toward a better transport infrastructure capable of providing better mobility with the integration of peri-urban areas into the much wider urban transport system of Ado-Ekiti. Urgent are needed for urban planning policy interventions aimed within peri-urban areas, since using this approach provides an analytical tool for understanding urban mobility dynamics: an efficient and reliable urban transport system is a conduit for economic prosperity and equity and environmental sustainability. To sustain the development of these peri-urban communities, these mobility limitations must be addressed, as the city of Ado-Ekiti expands. This study provides empirical evidence on the intra-urban mobility status in peri-urban Ado-Ekiti to contribute sound advice to policymakers, urban planners, and transport stakeholders.

Literature Review

Conceptualizing Urban Expansion and Peri-Urban Development
It is an unquestionable reality that urban expansion is an ongoing process, constantly reshaping the spatial, economic, and social structures of cities worldwide. Urbanisation occurs when urban populations multiply and cities grow beyond their originally specified administrative boundaries, thereby fulfilling therewith the demand for housing, infrastructures, and economic activities. Urban expansion, according to UN-Habitat, is a fundamental aspect of modern cities, a fact which is particularly true of cities in the developing world: there, population growth outstrips the development of urban infrastructure (2021). The peri-urban zone may be seen as an area of transitory character, much sharper when the rural population is closely linked to that of the cities. Peri-urban areas act as an interface between the city centre and the rural hinterlands regarding urban development and are places for quite important changes in land use, demographic and infrastructural transformations that challenge urban planners [9]. In growth, peri-urban settlements provide a wider room for the relocation of urban migrants, many searching for less expensive housing and better opportunities for jobs outside the equally crowded city core [6]. However, this growth is mostly unplanned and results in inadequate physical infrastructure, poor service delivery, and environmental degradation. Urban sprawl mainly causes peri-urban development, unregulated and even unmapped urban spread over rural lands surrounding a city. Urban sprawl consists of low-density development, more dependency on private cars for travel, and encroachment of farm land onto residential and commercial use [2]. In contrast to planned urban growth, peri-urban growth is uncontrolled, and it is characterized by unplanned settlement plans, poor public amenities, and low access to basic services

such as transport, water, and electricity (Olaide et al., 2021) [7]. Lack of stringent land-use planning policy in most developing nations has compounded peri-urbanization challenges, resulting in inefficient resource use and governmental complexities (Akinyemi & Olatunji, 2022) [9].

The lack of peri-urban planning most frequently results in land-use conflict, between agricultural and urban residential use in the majority of cases [6]. states that land competition between peri-urban developers and rural farmers is one of the primary challenges of peri-urban settlements. The conflict not only deters food production but also results in tenure insecurity, poor people's displacement, and wasteful use of land. Loss of forest and pollution are two of the most harmful effects of unchecked peri-urban growth. Such synergistic effects are hard to attain in sustainable development and complicate long-term urban governance.

Urban Expansion and Peri-Urbanization in Ado-Ekiti

Ado-Ekiti, the capital city of Ekiti state, is among the fastest-developing towns in southwest Nigeria. The town has become very populous in recent two decades via rural-urban migration, expanded education, and infrastructural development. Economic diversification, the increase in the number of students from the tertiary institution, and deliberate urban renewal attempts by the government have all facilitated the fast development of Ado-Ekiti, as opined by Expansion of the city over its boundary has led to the establishment of peri-urban areas such as Iworoko, Ilawe, Ijan, and Odo-Ado, which have been involved in the total development of the city. While becoming more important, peri-urban towns of Ado-Ekiti are plagued by poor.

infrastructure and effective urban planning that act as mobility bottlenecks. Peri-urban villages along the city central business district roads, argue, are normally in pathetic states with narrowed eroded road surfaces impassable during rainy weather. This absence of central infrastructure has therefore produced transport inefficiencies which have been affecting the social and economic standards of living of members in the peri-urban homes. Second, dependency on informal transport modes like the motorcycle taxi (okadas) and the mini bus (danfos) has been accompanied by additional mobility issues where such transport vehicles have been unsafe, disorganized, and costly.

With increasing urbanization, transport demand increases, while official public transport serves most of the peri-urban settlements inadequately. In Ado-Ekiti, poor investment in the transport infrastructure aggravated the transport crisis in the peri-urban settlements, while their inhabitants are unable to access the economic opportunities, health facilities, and schools. Disorganized roads and untrustworthy transport services raised the cost of travel, imposed economic burdens on poor households.

Moreover, the absence of urban land-use planning has led to the uncoordinated development of residential, commercial, and industrial areas in peri-urban [7]. This fragmented development pattern has contributed to inefficient transport routes, traffic congestion, and the proliferation of informal settlements [20]. Without effective policy interventions, these issues will continue to hinder the sustainable growth of Ado-Ekiti's peri-urban zones.

The urbanization and peri-urban mobility issues in Ado-Ekiti need top-down planning interventions for effective development. The issues are addressed through special policies for the upgrade of road infrastructure, access to cheap and effective public transport, and

firm adherence to land-use planning for systematic urban expansion. By mere inaction, peri-urban areas will be locked out, limiting them from contributing positively to the wider urban economy.

The foregoing has shown the essential pillars of peri-urban and urban expansion, and how these cast their influence upon intra-urban mobility in Ado-Ekiti. That which comes after is on theoretical frameworks on which intra-urban mobility within the peri-urban environment depends.

Theoretical Framework for Understanding Peri-Urban Mobility
Peri-urban mobility is an area that requires a robust theoretical foundation to be able to respond to the determinants of mobility patterns, transportation issues, and socio-economic effects of mobility limitation. Various theories provide explanations regarding the complexities of urbanization and transport in peri-urban areas [19]. These theories help in understanding the relationship between urban centers and their peripheral settlements, particularly how transport infrastructure influences economic activities and social interactions [20]. The Central Place Theory, the Urban Transport Theory, and the Accessibility Theory provide a structured method of analyzing peri-urban mobility in Ado-Ekiti [21].

Central Place Theory and Peri-Urban Mobility

Central Place Theory, developed by Walter Christaller in 1933, is utilized to describe the location of cities spatially by defining how settlements exist hierarchically. City centers, which was hypothesized, provide rural and peri-urban hinterlands with basic commodities and services, and control the movement of people seeking employment, trade, and social facilities [22]. The peri-urban towns such as Iworoko, Ilawe, Ijan, and Odo-Ado in Ado-Ekiti are dependent on the urban center for services and are perceived as having high intra-urban transport concentration. They look up to the urban center Ado-Ekiti for social and economic purposes, and mobility through commuting takes the central place of daily life in the peri-urban towns.

Despite this dependence, inefficient transport systems hinder the mobility flow, and inefficiencies generated therein constrain economic interaction. Inefficient transport systems have been found to lengthen travel time, raise the cost of transport, and lower access to basic services, thereby widening urban inequalities. The lack of organized transport infrastructure in the peri-urban Ado-Ekiti forces citizens to use informal transport modes such as motorcycles (okadas) and minibuses (danfos) that are insecure and unstable. It therefore makes peri-urban residents poorly connected to economic and social activities and diminishes the overall quality of living [23].

Whereas Central Place Theory informs us about what precisely peri-urban settlements rely on in the urban locations, it never speaks of transport infrastructure lack in constraining mobility. The Urban Transport Theory is thus relevant in bridging the gap of such mobility lacks because it speaks to the very role of transport systems in defining urban growth [24].

Urban Transport Theory and Peri-Urban Mobility

Urban Transport Theory is employed to explain the interaction between transport infrastructure, economic growth, and the land use in the urban environment. As per the theory, greater transport infrastructure is at the forefront of facilitating accessible transport in cities and other locations trigger economic growth and urbanization. Dealing transport infrastructure, however, triggers congestion, more work trips, as well as accessibility restrictions, mainly in the peri-urban fringe.

Peri-urban transportation in Ado-Ekiti is not organized as individuals are using the services of danfos and okadas since no public transport system is established. The transport medium is predominantly unreliable, expensive, and insecure, thus exposing travelers to risks and preventing them from reaching urban benefits. Peri-urban urban road conditions have been shown to be substandard and the unpaved and ungraded roads subject vehicles to additional travel time and maintenance expenses and constitute an investment barrier to the areas.

Urban Transport Theory is also applied in determining the social exclusion dimension of transport, in which poor transport is utilized in excluding people's communities, mainly low-income urban dwellers, from active engagement in city life. There is limited transport affordability and public transport accessibility that constrains mobility in Ado-Ekiti, and peri-urban residents cannot access the central city to work, for business, education, and health care. It has been established by studies that limited connectivity by transport is one of the main causes of economic marginalization, whereby commuting to the place of work within the central city is not feasible. It is a problem that has to be addressed through transport infrastructure development and integration of peri-urban settlements into formal transit networks [25].

Accessibility Theory and Peri-Urban Mobility

Accessibility Theory, established on the basis of urban and transport studies, highlights that mobility should not be understood in relation to transport infrastructure or in relation to becoming accessible to opportunity and service as soon as possible. A good transport system has been achieved, as per the theory, if it provides citizens with timely, low-cost, and secure access to work, markets, healthcare, and education.

It is greatly limited by inadequate transport connectivity, uncontrolled land use, and poverty in peri-urban Ado-Ekiti. Facts are so numerous to the point that individuals living in such peri-urban areas such as Iworoko and Odo-Ado find it challenging to access generic services due to unreliable and costly transport. For example, studies have shown that peri-urban children are faced with challenges in accessing schools due to increased distances and poor public transport infrastructure, hence poor school attendance levels. Similarly, the limited number of health facilities in the areas increases the risk of medical emergencies since the inhabitants are likely to be delayed when they present themselves for treatment at the city center hospital.

The accessibility theory further highlights the cost of limited mobility. The data has substantiated that where transportation systems fail to offer fair access, peri-urban dwellers have higher costs of living and lower economic output. In Ado-Ekiti, costly transport charges and poor public transportation service limit access to employment by poor households and further increases socio-economic disparities. It has been established by research that upgrading transport connections in the peri-urban area can induce improved productivity, improved business activity, and improved economic connection with the central city [26].

Determinants of Intra-Urban Mobility in Peri-Urban Areas

The operation of intra-urban mobility in peri-urban areas is influenced by a range of infrastructural, economic, social, and environmental determinants. They determine the mode and type of travel between and within peri-urban settlements and how individuals travel to work, school, health care, and other basic services. For mobility at Ado-Ekiti, peri-urban mobility is constrained by inadequate infrastructure, poor transport facilities,

costly travel, and poor policy interventions that cumulatively lead to inefficiencies in transport.

Transportation Infrastructure and Road Conditions

The quality and access to transport infrastructure are crucial variables in ascertaining intra-urban mobility within peri-urban areas. Adequate constructed and well-upkept road networks provide free flow of traffic, reduce travel time, and lower transportation costs. In the majority of peri-urban settlements, however, roads are poorly kept due to poor planning, lack of proper maintenance, and impact of adverse weather condition.

In peri-urban Ado-Ekiti, the roads are predominantly unpaved and subject to season flooding, with very high commuting difficulty, particularly in the wet seas. There is no adequate drainage infrastructure to make matters worse, leading to road deterioration and potholes that are slowing down traffic and increasing vehicle maintenance. Additionally, the absence of pedestrian lanes and minibuses and motorcycle lanes results in unorganized traffic, which further reduces transport efficiency.

Availability and Affordability of Transport Services

Affordability and accessibility of transportation services are major facilitators of mobility in peri-urban areas. Lacking well-organized public transport systems, the majority of residents utilize informal modes of transport such as motorcycles (okadas), minibuses (danfos), and tricycles (kekes). While the services are informal and accessible, they are characterized by high fares, irregular costs, and insecurity. In Ado-Ekiti, transportation costs are a serious expense for impoverished households. Higher fuel prices, coupled with the absence of fare controls, often render transportation costs volatile and prohibitive. The majority of commuters walk long distances due to the cost of daily commuting, further reducing their access to economic and social opportunities. Besides, as there is no formalized transport system, the operators determine routes and schedules arbitrarily, hence the services are irregular and unreliable.

Settlement Patterns and Land-Use Structure

The land use and spatial configuration of peri-urban areas impact mobility behavior. Although well-structured cities develop in a methodical pattern, peri-urban communities develop non-systematically and in bits, which brings decentralized shopping and commercial areas, residential areas, and service patterns. It is a chaotic model of development that does not provide the foundation for good transport facilities and mass transportation.

Urbanization was uncontrolled and fast in peri-urban Ado-Ekiti, and residential land extended outward from major economic centers, increasing the pressure on long-distance commuting. Peri-urban residents congregate far from good roads, and they must resort to inefficient modes of transport or walk for a long distance just to be in a position to travel on major. The absence of mixed land-use planning where residential, commercial, and industrial uses are mixed also increases mobility issues by increasing travel distances and traffic.

Socio-Economic Factors Influencing Mobility

Socio-economic characteristics such as income levels, labor status, and household size have a significant impact on transport modes and mobility behavior in peri-urban areas. Poorer households tend to have greater mobility limitations because of the high price of transport services, and therefore they are forced to use more

effective but lower-cost modes, for example, cycling or walking. On the other hand, wealthier residents have superior access to personal vehicles, which allow them to escape the troubles of public and informal.

In Ado-Ekiti, employment in labor also affects trends in mobility. Some peri-urban residents are employed in the city center with daily long-distance travel. However, due to poor transport services, workers mostly face delays and high fares, affecting their productivity and financial. Women, children, and the elderly have other mobility limitations due to safety needs, lack of accessible transport modes, and socio-cultural restrictions on their mobility.

Government Policies and Institutional Interventions

The impact of state policies and institutional organization on peri-urban mobility cannot be overstated. Effective transport planning requires interagency coordination among government agencies, urban planners, and transport operators to yield sustainable and equitable mobility. However, in the majority of developing countries, including Nigeria, peri-urban areas are susceptible to policy neglect, resulting in inadequate transport infrastructure and inadequate investment in public transport. In Ado-Ekiti, the lack of an urban transport plan has been one of the factors contributing to inefficiency in transportation, and individuals have had to adapt to utilizing informal transport modes. While government policies such as road widening programs and urban regeneration have been implemented, they do not seem to address the very needs of peri-urban zones. Its failure to establish proper traffic control and enforcement systems continues to exacerbate mobility issues to cause congestion, accidents, and ineffective transport operations.

Environmental and Climatic Constraints

Physical attributes such as topography, climatic characteristics, and climatic change characterize mobility behavior in the peri-urban areas. The lack of drainage system and poor road cover in the locality make commuting extremely challenging on wet days, and floods and dilapidation of roads lead to extensive disruption of transport services. The rise in temperature and air pollution emanating from inadequately serviced vehicles also exposed passengers to health risk.

Peri-urban Ado-Ekiti seasonal flooding is apt to destroy roads and restrict access to critical services, forcing individuals to use longer routes that increase travel time and increase transportation. Secondly, the environmental impacts of informal transport systems like noise pollution and increased carbon emissions raise long-term sustainability concerns.

Challenges of Intra-Urban Mobility in Peri-Urban Ado-Ekiti

The peri-urban towns of Ado-Ekiti face greatly curtailed intra-urban movement due to some interconnected constraints. These span inadequate transport infrastructure through economic as well as social constraints to effective intra-urban travel of residents. It is critical to tackle such problems for improvement in accessibility, economic efficiency, and urban cohesion.

Poor Road Infrastructure and Maintenance

Road infrastructure is perhaps the most significant mobility limitation in peri-urban Ado-Ekiti. Except for some good roads, such as the Ikere-Ekiti road and that leading to the FEDPOTH, others are unsealed, narrow, and of poor quality. It is established in literature that the absence of permanent road surfaces is the

reason for the frequent potholes and undulations, which are a mobility hindrance. Seasonal flooding encourages extensive wear and tear of the roads, whereas poor drainage causes erosion and temporary washouts. Aside from inadequate road expansion, this is responsible for the high degree of congestion. Peri-urban Ado-Ekiti most roads were originally designed to handle small amounts of traffic and not in a condition to be able to handle greater volumes of drivers and Travel time delay is thus incurred, fuel efficiency is interfered with, and economic cost to the average commuter is heightened.

Dependence on Informal Transport Services

As a result of the lack of an orderly and well-planned public transport system, the majority of peri-urban Ado-Ekiti residents depend on informal transport services such as motorcycle taxis (okadas), minibuses (danfos), and tricycles. Although the informal transport services offer mobility, they are not well regulated, hence their prices fluctuate and the journey is unsafe.

Okada operators have a tendency toward reckless driving since there is not strict enforcement of traffic regulations, which contributes to the high rates of accidents. As explain, over 70% of intra-urban trips in Ado-Ekiti peri-urban areas are by informal modes of transport, but their reliability remains inconsistent because of the poor condition of roads and restrictions in the span of operational time. The absence of an organized transport system thus has the residents often stuck, particularly during the night or peak hours.

High Transportation Costs and Economic Barriers

Peri-urban Ado-Ekiti transport fare is a pertinent matter, particularly for the low-income residents who use daily trips to the city center for work and other activities. Rising fuel costs, maintenance, and occasional fare hikes by informal transporters have been a financial strain on the locals. The extravagant cost of mobility forces some of the inhabitants to travel long distances on foot, which is time-consuming and energetically exhausting. Also, the price of transport constitutes a large proportion of domestic expenditure, reducing disposable income available for expenditure on food, health, and education asserts that accessible and affordable transport is a critical component in urban expansion, and in the absence of government intervention on fare control, transport fares within peri-urban Ado-Ekiti will continue to rise.

Inadequate Public Transport Infrastructure

The other major issue is the absence of a well-structured public transport system that can effectively serve peri-urban communities. In big Nigerian cities such as Lagos and Abuja, the government has authorized transport services; nevertheless, there is no well-structured transit system in Ado-Ekiti. The disorganized nature of the transport system renders the scheduling unreliable, routes less effective, and has no designated transport stations.

Public transport infrastructure, such as specialized bus stops, terminals, and transport centers, is scarcely available in peri-urban areas. As a result, commuters wait for hours or walk long distances to access available transport services, worsening mobility issues.

Traffic Congestion and Road Safety Issues

Traffic congestion has been a flourishing encounter in peri-urban Ado-Ekiti, especially along main roads connecting peri-urban settlements and the city center. In addition to poor road conditions and narrowness, an increase in traffic volume has also led to bottlenecks to frequently arise. Further, the absence of

proper traffic management systems, such as proper traffic lights, pedestrians' crossing locations, and enforcing officers, aggravates congestion.

There are also safety concerns. There are mostly reported accidents on peri-urban roads resulting from reckless driving, speeding, and traffic law breaches. There is a deficiency of pedestrian infrastructure such as walkways and pedestrian bridges, subjecting school children, the elderly, and the disabled to accidents.

Seasonal Mobility Challenges

Seasonal disruptions add to the misery of the peri-urban population in Ado-Ekiti because of the mobility limitations. In the rainy season, a majority of the not-tarred roads turn into watery gullies which are impassable and this disrupts the transport business and as a result fares are increased. According Transport investment and subsequently higher expense have been affected, while local changings of climate elicit city car transportation infrastructure development through moving different urbanization processes. Environmental hazards increase maintenance costs for the transport operators, which then transfer the additional costs to the passengers by the way of fare hikes after the vehicles are damaged in floods.

In the dry season, the air pollution due to dust from unpaved roads poses as a significant health risk and over time gives rise to respiratory diseases and eye infections, particularly to bikers and pedestrians. The implications of the health problems caused by dust in the long run are significant with consequences which need specific measures of controlling dust as well as constructing roads to be paved so that people will have a high level of mobility according.

Lack of Government Policies and Institutional Support

Even though huge changes in the cityscape of Ado-Ekiti are being made, government policies and transport infrastructure paybacks in middle of Ekiti to peri-urban outskirts is still very inferior. The mobility problems of the peri-urban inhabitants do not receive much adequate solutions through transport planning properly which is a matter of concern. Most of the time, infrastructure projects are privileging the Hominsoro Junction and other central facilities while steering clear of peri-urban areas, thereby leaving urban residents commuting nightmares in the area.

Besides the fact that there are institutions with non-existing schemes and the uncoordination of transport regulatory agencies, the inefficiency of the transportation services and the absence of a timetable and fixed routes lead to corruption in the transporters' financing. Need for addressing the direct, comprehensive intervention of policy and the supply of infrastructure that come with the report is the only way to combat the high mobility reproductive issues that peri-urban Ado-Ekiti will still face, influencing urban growth and economic development.

Methodology

This paper was carried out with a mixed-method research design of combination the qualitative approach with the quantitative one between and used to examine the intra-urban mobility in peri-urban Ado-Ekiti. Descriptive research design is adopted by the incredible researcher to evaluate transportation modes, commuting patterns, and mobility challenges.

Study Area

The research done in some peri-urban localities of Ado-Ekiti,

where Iworoko, Ilawe, Ijan, Odo-Ado belong, among others, are included. These localities have seen a tremendous transformation in terms of growth; still, there is traffic congestion due to the inadequate infrastructural facilities in the areas.

Findings

The composition of the data is brought into several head themes such as the socio-demographic characteristic, a transport loan, commuting habits, road infrastructure, cost of transport, mobility problems, transport reliability, seasonal variations, safety concerns, the issue of gender-based mobility.

The combination of descriptive statistics, inferential analysis, and qualitative insights is done to explain in details the intra-urban mobility issues in the study area. The reported data addresses the barriers of the peri-urban plot in Ado-Ekiti, showing evidence supporting the future policy recommendations.

Socio-Demographic Characteristics

The survey covered 150 participants across different age groups, income levels, and occupations to ensure a diverse representation of peri-urban commuters in Ado-Ekiti.

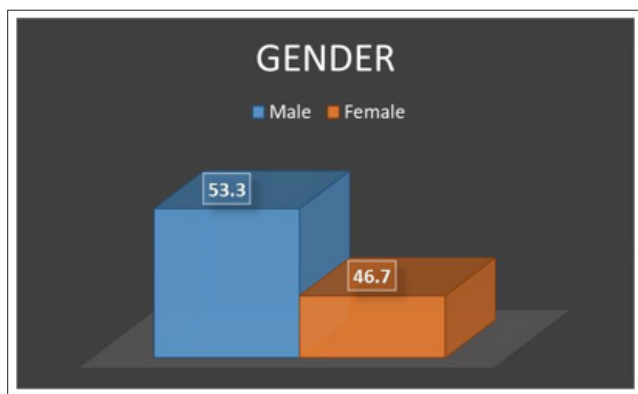


Figure 1: Gender: Level Field Survey, 2025

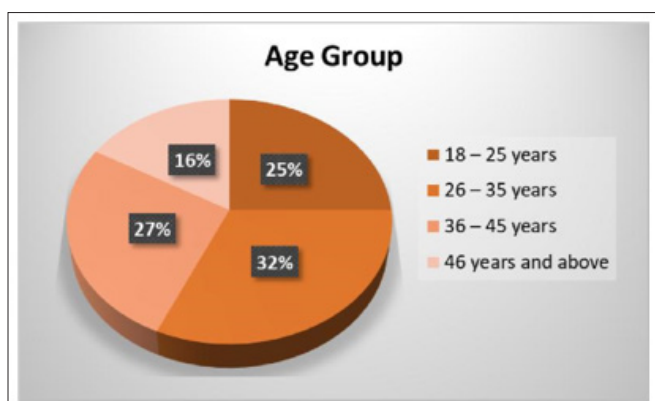


Figure 2: Socio-Demographic Characteristics: Age Group

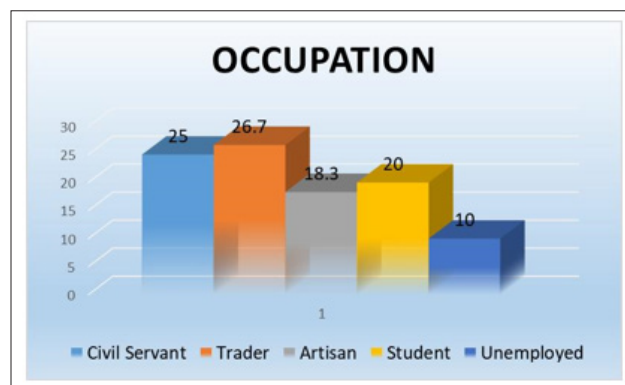


Figure 3: Socio-Demographic Characteristics: Occupation

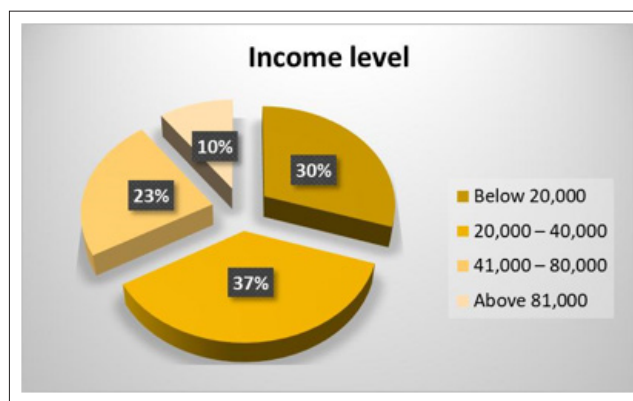


Figure 4: Socio-Demographic Characteristics: Income Level

Observations

- Majority (53.3%) were male, while 46.7% were female.
- The dominant age group was 26 – 35 years (31.7%), followed by 36 – 45 years (26.7%).
- Low-income earners (earning below ₦40,000) made up 66.7%, indicating that mobility affordability is a major issue.

Transport Modes and Commuting Patterns

The survey assessed daily commuting habits and transport choices among peri-urban residents.

Table 1: Commonly Used Transport Modes: Field Survey, 2025

Transport Mode	Frequency
Motorcycle (Okada)	50%
Tricycle (KekeNapep)	26.7%
Minibus (Danfo)	13.3%

Observations

- Motorcycles (Okada) are the most used transport mode (40%) due to affordability and ability to navigate bad roads.
- Tricycles (Keke Napep) account for 30% of transport use, especially in areas with better road networks.
- Only 6.7% use private cars, reinforcing the dependency on informal transport modes.

4.4 Road Infrastructure and Mobility Constraints

Poor road conditions are a major factor limiting efficient mobility in peri-urban Ado-Ekiti.

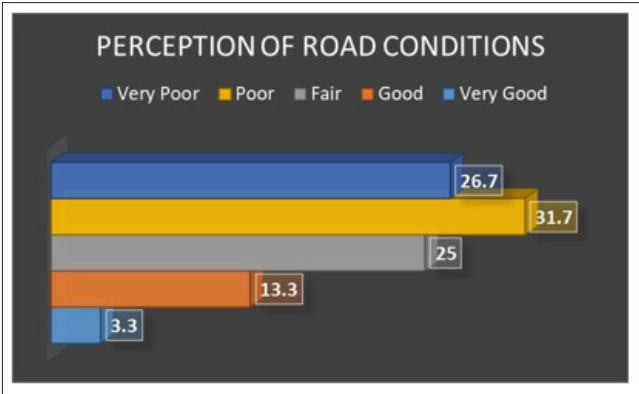


Figure 5: Perception of Road Conditions: Field Survey, 2025

Observations

- 58.4% rated road conditions as poor or very poor, highlighting the lack of proper infrastructure maintenance.
- Seasonal flooding worsens road usability, particularly in communities without proper drainage.

Commuting Patterns and Travel Time

Table 2: Average Daily Commuting Time: Field Survey, 2025

Travel Duration	Frequency (%)
Less than 30 minutes	13.3%
30-60 minutes	43.3%
1-2 hours	30%
More than 2 hours	13.3%

Observations

- 43.3% of respondents spend between 30-60 minutes commuting daily, reflecting moderate mobility constraints.
- 30% of respondents spend 1-2 hours commuting, highlighting inefficiencies in the transport system.
- Long commuting times (over 2 hours) are particularly reported in Afao-Ekiti and Odo-Ado, where road connectivity is poor.

Transport Reliability and Safety

Table 3: Perception of Transport Reliability: Field Survey, 2025

Reliability Level	Frequency
Very Reliable	10%
Reliable	26.7%
Unreliable	40%
Very Unreliable	23.3%

Observations

- 73.3% find transport services unreliable or very unreliable.
- Delays, vehicle breakdowns, and unpredictable fare hikes were major complaints.

Table 4: Perception of Seasonal Variations in Mobility: Field Survey, 2025

Seasonal Variations in Mobility

Season	< 30 mins (%)	30-60 mins (%)	1-2 hours (%)	>2 hours (%)
Dry Season	5%	46.7%	36.7%	11.7%
Rainy Season	1.7%	30%	40%	28.3%

Observations

- Commuting time increases during the rainy season due to road flooding and poor drainage.

Seasonal Variations in Mobility

Table 5: Impact of Rainy Season on Mobility: Field Survey, 2025

Effect of Rainy Season	Frequency (%)
Increased Travel Time	45.0
Higher Transport Costs	26.7
Reduced Transport Availability	18.3
No Change	10.0

Observations

- Travel time increases for 45% during the rainy season due to poor road conditions.
- 26.7% reported increased fares, particularly for motorcycles and tricycles.

Table 6: Safety Concerns in Mobility: Field Survey, 2025

Safety Concerns in Mobility

Transport Mode	Very Safe (%)	Safe (%)	Unsafe (%)	Very Unsafe (%)
Motorcycle (Okada)	6.7%	26.7%	40%	26.7%
Tricycle (KekeNapep)	13.3%	40%	30%	16.7%
Minibus (Danfo)	16.7%	46.7%	20%	16.7%

Observations

- 66.7% of respondents consider motorcycles unsafe, mainly due to reckless riding.

Adoption of Technology in Transportation

Technology adoption remains low, with only 10% using ride-hailing apps.

Table 7: Technology Usage for Transport: Field Survey, 2025

Technology	Frequency
Ride-hailing apps	10.0
Google Maps	20.0
Mobile Payment	15.0
No Technology Use	55.0

Observations

- 55% do not use any technology for transportation.
- Cash payments dominate transport transactions, limiting digital integration.

Conclusion

The research work has actually revealed that the inside-urban transit in the peri-urban area of Ado-Ekiti has been negatively affected by the lack of proper transport infrastructure, the transportation system not being formal nor being regulated and the fact that there exist differences in the socio-economic characteristics of the population in terms of mobility. The preponderance of the two-wheelers (Okada) and tricycles (Keke Napep) as a first priority transportation medium is indicative of the nonexistence of a public transport system with a plan. In addition to this, the research results express the notion that the mobility issues are strongly felt in the low-earning income class of people, mainly due to the high transportation costs, crime, and lack of proper roads and accessibility infrastructure. Besides, the mobility situation is made even worse by the seasonal factors like flooding and erosion, whereas the dim prospects of a smooth ride through technology-led transport solutions hinder the effectiveness of service. The way to make in-town transport that is both green and rapid by private cars is to make wise investments in road infrastructure, have laws that request transporters to obey them, try to enhance safety for all modes of transport, and introduce innovative technologies that will make mobility easier than ever.

Recommendation

Those policy documents made by Mr. Perfect in the town called Peri-urban Ado-Ekiti for help intra-urban mobility are based on five key areas: road infrastructure development, spatial transportation regularization and regulating the services, safety and security measures, accessibility and inclusivity in transport, and technological integration in smart mobility. Adaptation and expansion of the roadway network through the suburb is one of the key factors in ensuring time and space efficiency in transportation. Installation of adequate drainage systems and their subsequent maintenance will help remove the road destruction caused by floods and erosion, which often disrupt mobility. Constructing dedicated lanes for motorcycles and tricycles will play a major role in maintaining traffic flow, safety and avoiding conflicts between users of different transport modes. Moreover, road rehabilitation programs will be instigated to step up the quality of the already functional roads, especially floodplain areas that are connected to mobility constraints through poor roads.

Formalization and regulation of transport services is a way to attract the business to the peri-urban area, so that the efficacy and safety in peri-urban Ado-Ekiti are much improved. The establishment of a formalized public transportation, government-subsidized buses, for instance, would work towards the alleviation of which informal transport mode use as a better means of transportation. Imposing standardized fare rules is able to prevent unfair pricing of motorcycle and tricycle drivers due to competition, which has consequently made the mode of transportation expensive. With the implementation of licensing and training programs, the quality of service and road safety are aimed at being improved. Moreover, through a system of transport cooperatives, some informal transport enterprises can be transformed into structured and reliable services in order to give the commuter a pleasant experience and to reduce the magnitude of the safety risks.

To better address the issues that are involved in the lack of safety and security related to non-formal modes of transport, especially with motorcycles and tricycles, safety and security enhancements are necessary. The re-implementation of road safety regulations that are stricter is necessary to minimize accidents and thus, ensure the overall improvement of the transport conditions. One of the

transport safety measures that should be adopted to empower the commuters is a system that can monitor traffic. For example, the use of a CCTV camera system and a digital platform for the reporting of crimes are the tools that can be effectively used. The engagement and welcoming attitudes of all the people of the peri-urban Ado-Ekiti will lead to equal movement towards the neighborhoods. The provision of wheelchair-accessible public transportation would give disabled people a new lease of life while the government's financial help to the needy and students in the city would mean equal accessibility to mobility services. One of the most important decisions that should be made is not about equality, but about the emphasis on gender-sensitive transport policies associating gender-sensitive with its eligibility as a transport policy student. Through these measures, the system will be inclusive and fair thus commuter needs being taken care of in a good way.

The problem of the underdeveloped transportation system in a peri-urban area in Ado-Ekiti can be solved with recent technological trends and smart mobility solutions. Adoption of digital payment systems in the transport sector will definitely speed up the fare collection process thereby encouraging less reliance on cash transactions. Persuading the leading ride-hailing platforms like Bolt and Uber to offer their services to the peri-urban areas through the support of the government is a viable way to expand urban mobility. The use of Geographic Information Systems (GIS) and smart mobility data combined with transport planning and route optimization will boost the efficiency of traffic and bring a win-win situation. Moreover, the introduction of digital mapping tools such as Google Maps in transport systems will lead to improvement in navigation and a decrease in trip time.

After implementing these inspirations, the local authorities of peri-urban Ado-Ekiti will face notable challenges in framing their urban planning strategies that focus on the areas of transport, management, and socio-economic development. Being able to transport goods and people from one place to another effortlessly and practically is a factor that feeds growth and profits for local businesses. More importantly, having a green transportation system would pull down the social distances while increasing the equality among the low-income people as well as those with disabilities. Transporter safety measures, inter alia regulatory enforcement, would assist in bringing order on the streets and help eliminate problems such as shady pricing and imprudent driving. As a final point, environmental management, especially in curbing road degradation brought about by the rainy season, will not just allow for urban resilience but miscellaneous transport sustainability become more enhanced.

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