TRANSIT ORIENTED DEVELOPMENT (TOD) AS AN URBAN DESIGN CONCEPT FOR ENHANCED MOBILITY AND TOURISM IN LAGOS, NIGERIA

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ABSTRACT

One of the key factors in creating a resilient and intelligent urban environment is improved mobility for visitors, city inhabitants, the urban poor, and vulnerable groups. Mobility infrastructure and integrated transportation networks unite people, activities, buildings, and public space to create integrated urban place designs that are socially inclusive. The absence of efficient Transit Oriented Design (TOD) in Lagos' metropolitan area has left open areas and corridors vulnerable to criminal activity and occasionally utilized as disposal sites. The purpose of this article is to evaluate the existing TOD as a tool for urban planning that promotes increased tourism and mobility. Surulere was chosen for this research because of its advantageous position in the center of the city, as well as the notable natural features and public amenities that are common there. The study used a mix of both quantitative and qualitative investigation approaches, gathering data via the distribution of questionnaires, interviews with district residents (a total of 452 respondents), and the digitization and updating of high-resolution maps of the Surulere using Google Earth 2023 after the site visit. The field survey's analysis and result presentation show that 265 uncategorized respondents, or 58.2% of the sample, utilize the average commuter roads, which comprise the bulk of the mass transit network. The analysis finds that the state has natural rivers for ferry services in addition to a federal rail network that will be supplemented by the growing state rail network. The city's urban modifications have undergone a substantial and quick transformation. A framework of Public-Private Partnership (PPP) with substantial investments in aerial tramways is necessary for the growth of metro-tourism, given the interconnectedness of several commercial areas that necessitate high-capacity and alternative public transit networks.

Keywords: enhanced mobility, metropolis, urban design, tourism, TOD
1.0 INTRODUCTION

By enabling people to access essential services like health care, jobs, markets, education, and recreation, transportation plays a critical role in urban growth (Joshi, Bailey & Datta, 2021). Improved mobility for impoverished and vulnerable populations is a critical prerequisite for attaining the 2030 Sustainable Development Goals (Goal 11: Sustainable Cities and Communities), particularly in developing country cities (Razmjoo, Gandomi, Pazhoohesh, Mirjalili, & Rezaei, 2022). Urban areas that have integrated transportation modes have a greater potential to develop into hubs for business, industry, trade, tourism, education, and services (Ekhaese & Asinobi, 2023). Typically, as identified in Figure 1 below, communities that score highly on surveys gauging urban quality of life have excellent public transportation and non-motorized transportation networks (Razmjoo, et al., 2022). In Lagos, transportation is one of the most important problems. With assistance from the World Bank, the Lagos State government founded the Lagos Metropolitan Area Transport Authority (LAMATA) in 2003 (LAMATA, 2023).

Another significant event was the enactment of the Lagos Road Traffic Law in 2012, which appears to have more of an emphasis on managing and regulating vehicle traffic than it does on addressing systemic transportation issues. Numerous clauses in the statute depict Lagos as being under emergency control and that its residents strongly disagree with the institutions of government. It appears to represent a lot of the policies of the Lagos State administration (LAMATA, 2023). It appears that reducing the informal sector is the primary objective rather than empowering the locals. Although a significant portion of the populace relies

Figure 1. Showing the key indicators for TOD.
on the present unofficial public transportation system, it is also evident that many of the informal operators operate cars that are in poor condition and that security is a continuous concern. The system must undergo the required transition, and it must be inclusive. When something is prohibited, fresh options ought to be available. In light of this, one could question why the Lagos State government chose to invest in a light rail system that necessitates the evacuation of improvised buildings in addition to being intricately planned and expensive to construct, not to mention the high expense of operation and maintenance due to the severe tropical environment. In comparison, BRT systems are simple to set up, grow, and maintain. The problems of an African population that is growing at an accelerated rate, urban expansion, and inadequate basic services are faced by many cities which is similar to the situation in Lagos. Moreover, Lagos, the primary economic and cultural hub of the continent, is one of the fastest-growing cities in Africa, with a population of over 25 million now and projected to reach 25 million by 2030. As a result, livelihood activities are growing and diversifying even if there aren't many or any areas left for them. Many growth plans depend on the investment of foreign and popular interests due to the widespread lack of resources and knowledge deficiencies (Rukwaro, 2022). These plans should make cities more accessible and promise economic progress, but they disregard tourism and fail to appreciate the potential of public space and infrastructure to improve the livability of urban areas (Agboola, Alotaibi, Dodo, Abuhussain & Abuhussain, 2023).

The development of TOD infrastructure prioritizes growth, ecology, living, and justice as vital initiatives in addition to roadways. One way to approach urban planning and design that meets the demand for tourist regeneration in the Lagos metropolitan is through the spatial strategy. Lagos, home to 85% of the state's population, is the biggest metropolis in Nigeria, occupying the majority of Lagos State's 37% geographical area. The need for travel in Lagos in the future would be greatly impacted by these events. The demographic landscape of Lagos has evolved, and in the last fifteen years, the usage of motorcycles for intra-city transportation has grown dramatically, accounting for around half of all intra-city traffic incidents. Predicting the traffic situation in Lagos, where the typical commute to work takes over an hour, is likewise exceedingly challenging at the moment. Research has shown that cities with TOD inside an integrated system have a higher chance of developing into key centers for companies trading, educational institutions, and amenities. The Lagos State administration has undoubtedly initiated several significant infrastructure projects, including the implementation of a Bus Rapid Transit (BRT) system and the start of light rail network development. Nowadays, a lot of rules and regulations, such as the 2010 urban development requirements, depict Lagos as being under emergency control, and the purpose of the Lagos State government's policies does not appear to be to promote tourism. Lagos' reputation as a megacity has not been linked to increased tourism until the introduction of urban physiognomy reform, despite the city ranking third in the world with a projected population of 25 million in 2015. It spans the transit lanes between Surulere and Eti-Osa L.G.A. in Lagos State, Nigeria, using public design and public art as an urban feature. An efficient and cost-effective light rail and road-based transportation system development, as well as providing an alternative transit...
The motorable and transit environment is made economically viable and livable development with Lagos in order urban and physical characteristics which has a unique city identity and character, with flyovers, under bridges, accessible tourist-friendly transportation system, and public design and art in all parts of the mega-city. Figure 1’s essential metrics for evaluating an effective and sustainable TOD serve as the study's main focus. By taking into account the current infrastructure, the socioeconomic advantages, and the influence on the city, the research attempts to evaluate the current TOD as an urban design tool for improved and sustainable transportation, tourism, inclusive urban planning, and revitalization.

2.0 LITERATURE REVIEW

The most developed nations have tried and used TOD, and it could hold the key to solving many of the global megacities' future problems (Hussien, Gabr, & Zayed, 2023). Such operations have been initiated by numerous cities, and the evaluation and analysis of these initiatives point to strategies and tactics that are supportive of the wider adoption of urban regeneration in Sub-Saharan Africa while honoring the distinctiveness of each case and location as well as institutional and historical characteristics (Sheikh & Ameijde, 2022). Depending on the nation's stage of development, there are several ways to understand the idea of urban regeneration (Pozoukidou & Angelidou, 2022). Compact mixed-use development (TOD) is concentrated on transport routes, such as BRTS and metro rail. International experiences have shown that while transport systems support transit-oriented development (TOD), they are not as significant as enhancing accessibility and developing walkable neighborhoods (Yang, Li, Guo & Qian, 2023). Overall, urban regeneration may occur for the following three reasons: forced regrowth during a protracted period of abandoned land or extreme deterioration of living conditions in a neighborhood. When public and private investors search for vacant land for a significant development this is known as opportunistic regeneration. Future or preemptive urban redevelopment in places where the social and economic structure has broken down (Kaluarachchi, 2022). Redevelopment of cities has changed over time from being limited to the straightforward repair or rehabilitation of built-up land and outdated infrastructure to focusing on the restructuring of the urban fabric, the revitalization of the urban economy, or the image of the city while aiming to increase social interaction and equity, local population participation, and their social and professional integration into a multi-functional context (Kaluarachchi, 2022). Urban regeneration is becoming a fundamental component of national urban strategies in industrialized countries in the developed world but with varying designations depending on the participating nations. As urban areas serve as testing and implementation grounds for the tactics that are now necessary, it has emerged as a new activity in the city (Moko, 2022). For this reason, it is progressively putting sustainable development concepts into practice, which in theory calls for slowing down urban sprawl, fighting pollution, preventing risks to the public's health, and minimizing risks related to technology and the environment (Du, Zhang, & Mora, 2022).

2.2 Urban Regeneration and Tourism Development

Taking into account the complexity of urban dynamics is the goal of urban regeneration and tourist development (Xia, Semirumi, & Rezaei, 2023; Kaluarachchi, 2022). To do this, it is used
in conjunction with horizontal techniques that incorporate several core ideas. Given that it addresses issues unique to all urban components, it is location-specific (Rui & Othengrafen, 2023). However, its overall goal is to create a more uniform social environment by minimizing differences. It addresses both immediate societal demands and long-term sustainability needs, which attempt to anticipate future change, throughout a variety of periods (Sa & Choon-Yin, 2023). An excessive concentration of development instruments and resources in one place is the main cause of Lagos’s sluggish growth (Uduma-Olugu & Adesina, 2022). Local governments that should be at the forefront of development have been shut out of the process entirely. The rising decentralization of authority to local governments gives a road to gather vivid and disaggregated city data, initiate a locally led transport solution, and build a sustainable and inclusive transport system in Lagos State because it is used by several public and private parties, it has multiple dimensions. Contradictions must be resolved via discussion and goal prioritizing in urban redevelopment. The alignment of local strategy with national policy determines priorities. Urban regeneration tactics are used by TOD to improve one area of the city while also having good benefits elsewhere (Al-Kodmany, Xue & Sun, 2022).

2.3 Influence of Public Transport on Urban Revitalization

The future of Lagos's metropolitan shift in landscape attractiveness depends on public transit and the tourism boost frameworks in place now and in the years to come (Sheikh & Ameijde, 2022). Better economic conditions, resource and energy conservation, less traffic, less global warming, better air quality and health, vital emergency and disaster support, rising real estate values and development, mobility for small urban and rural communities, increased accessibility for people of all ages and circumstances, and lower health care costs all contribute to a higher standard of living (Ochia & Ochia, 2022; Georgiou, 2022). A range of travel options are provided by public transportation, including paratransit service, vanpooling, buses, and trolleybuses (Georgiou, 2022). Heavy, light, commuter, automated guided way transportation, inclined planes, cable cars, monorails, aerial tramways, and other permanent guideways including rails. Water taxis, passenger-only, and vehicle ferries. Numerous transportation networks run multiple service modalities. As a result of the advancement and use of 21st-century technology, passengers now discover that public transportation differs greatly from earlier transit networks (Klingmann, 2023). When stops are notified to passengers, getting on and off buses and trains is simple. The upcoming bus or train is announced to passengers by email or mobile phone via new information technology. On the websites of transit agencies, people plan their travels. These days, several commuter trains and buses are equipped with Wi-Fi, turning them into mobile internet cafés (Mitieka, Luke, Twinomurinzi & Mageto, 2023).

2.4 Inclusive Urban Planning through Transportation Networks

There are three physical modes of urban transportation: air, sea, and land (Hasselwander, Bigotte, Antunes & Sigua, 2022). Vehicles on land include buses, coaches, tricycles, bikes, motorbikes, pedestrians, and private vehicles. Surface rail, trams, metro lines, subways, and subterranean are all parts of the rail system in nations where urban planning has been done before construction begins (Razak, 2022). The
primary means of transportation within the cities are hovercrafts and ferries, which are found on the lagoons, streams, ports, and occasionally lakes that make up the interior waterways (Amamilo, Ajiboye & Adebayo, 2023; Samuel, 2023). The most common methods of airborne city transportation are overhead wires in hilly regions and helicopters. The contact between the land and the water is provided by the seaports and these are present in major ferry ports across the Lagos metropolis (Uduma-Olugu & Adesina, 2022). Figure 2 below shows the proposed rail network in which the first phase is presently been implemented this is done with its inherent setback and the approach adopted might not be sustainable in the future as some of the issues have not been solved (LAMATA, 2023).

The aforementioned modes of transportation as well as pedestrianization depend on several factors, including the purpose of the journey, the population’s size and makeup, the location and spatial distribution of their homes, the degree of technology advancement in the area, and the city (Mitieka, Luke, Twinomurinzi & Mageto, 2023; Kyriakopoulos, 2023). The level of technical progress of the populace and the society, the people's perception of the style of life they desire, the organizational structure of the city, as well as the amount of staff available for managing transportation, all have a significant impact on the type of transportation system that is employed (Olubanjo, Owolabi, Anthony, Oyebanji, Eniolawun & Badmus, 2023). The usage of transportation modes and systems is linked to challenges of one kind or another, regardless of the system that is chosen. Olubanjo et al opined that for transport experts and academics, managing these mobility difficulties is a...
monumental effort by everyone concerned especially the government and private stakeholders

3.0 THE STUDY AREA: SURULERE, LAGOS STATE

In Lagos State, Nigeria, Surulere is a residential neighborhood that was integrated with Lagos, the country's capital. One of the city's most inhabited districts, it is home to several landmarks and venues. This comprises a sizable stadium, sizable office buildings, shopping malls, a few shops, little green spaces, parks, cocktail lounges, and nightclubs. Surulere is a vibrant neighborhood of Lagos, situated in the southwest of the city, and has an area of 23 km² (9 square miles). Surulere is a 23 km² Local Government Area with residential and commercial properties situated on the mainland of Lagos, Nigeria's Lagos State (see Figures 3 a, b, c & 4). The National Theatre Iganmu, Leisure Mall, Teslim Balogun Stadium, Adeniran Ogunsanya Street, Ojuelegba, Nigerian Breweries, Jaekel House, National Arts Theatre, and Eko Bridge are some of the nearby attractions.
Figure 3 a, b, c. Map showing the study area, Surulere within Lagos.

Figure 4. Map showing the aerial imagery of the study area. Source: https://www.latlong.net/place/surulere-lagos-nigeria-4398.html.

Between latitude 6°29'28.02" N and longitude 3°21'6.22" E is where the Surulere core is situated (Figure 4). Surulere a district in Lago-Nigeria is located at latitude 6.500000 and longitude 3.350000. With GPS coordinates of 6° 30' 0.0000'' N and 3° 21' 0.0000'' E, Surulere, Lagos, Nigeria is situated in the Districts place category inside the nation of Nigeria. Surulere, located on bustling Ojuelegba Road, is a vibrant neighborhood with a mix of classy cocktail bars, throbbing clubs, and casual beer parlors. Along with mid-range fashion and home retailers on Ogunsanya Street and in the new Leisure Mall, the neighborhood is dotted with street food booths offering traditional meat, or suya. Modern dance performances, dramas, and foreign concerts are held in the National Theatre Iganmu. Surulere's boundaries are as follows: the Apapa-Oworonsoki Expressway to the west, Lawanson to the north, the Lagos-Badagry Expressway to the south, and the canal behind the national stadium to the east. The Lagos National Stadium, which can hold 60,000 spectators, was constructed there in 1972 for the All-Africa Games. Since 2002, the stadium has been let to deteriorate more and more. Ojuelegba is among the most well-liked locations in Surulere. It is recognized as one of the busiest spots in Lagos and is noted for its congested environment.

3.1 Methods

The mapping and identification of the pre-existing landmarks and nodes inside the chosen district served as the basis for the study's field survey, which included both qualitative and quantitative methodologies. The study area's green
infrastructure provisions may be comprehensively examined thanks to the use of quantitative research methods. Using secondary maps that were updated by a site visit and observations made during the field survey of the research area, the current site conditions were determined. Utilizing data from key respondent interviews and predetermined indices derived from the body of existing literature, a quantitative survey was conducted at various nodes to ascertain the primary needs of the residents of the chosen district (Surulere) as well as the respondent views and preferences given to the urban designer, transportation planning experts, and residents. The sample size is within the sampled frame of Surulere major streets and landmarks considering the traffic-prone areas, and nodes with major activities without neglecting the existing land use of the district. The primary source of data used for this study involves the use of onsite/physical assessment, taking of photographs, and detailed geospatial assessment of the maps. For the secondary source of data, literature relevant to the study was reviewed. While assessing the preexisting situation in the district, pictures were taken and drafted in Table 1 showing the major landmarks and predominant land uses and there. The existing land use infrastructure was categorized into; industrial areas, commercial centers (inclusive of the mixed-use building), sports complex (recreation), religious centers circulation and access roads landmarks (BRT terminal), open green spaces, administrative buildings, schools (educational) hospital (health), residential, others (uncategorized).

**Figure 5.** Existing major roads and canals.

**Figure 6.** Existing BRT corridors in Surulere.
As part of the assessment is the identification of major roads like the Lawanson-Ojuelegb road, Oshodi-Apapa expressway, Lagos-Badagry expressway, and waterways (canals) (Figure 5). The BRT terminals were also assessed for efficiency regarding their service noting the active, the inactive, and the few ones that are still undergoing construction and renovation (Figure 6). Surulere shares boundaries with seven major neighboring communities which are; Mushin, Oshodi-Isolo, Yaba, Ojuelegba, Apapa, Ajegunle, and Ajeromi-Ife lodun (see Figure 7). All these communities have direct or indirect influences on the urban development projects and infrastructure in Surulere and this study is tied to noting them as necessary references, recommendations, and for future studies.

Each of these places draws varying numbers of commuters, and their effects on the transportation network are unique. People's perceptions are also relative because data collected from various age groups and geographic locations will reveal people's current and future mobility and traffic-reduction needs, which will help relieve the strain on already overburdened infrastructure as a result of ongoing urbanization. To do a spatial analysis, the land areas of these characteristics were identified once they were digitalized on the photographs (Table 1).

![Figure 7. Map of Surulere showing boundaries and neighboring communities](image-url)
<table>
<thead>
<tr>
<th>Landmark of reference</th>
<th>Landmark</th>
<th>Easting</th>
<th>Northing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Industrial Area</td>
<td></td>
<td>3°21'27.56&quot;E</td>
<td>6°28'58.53&quot;N</td>
</tr>
<tr>
<td>(DUFIL Prima Foods Plc.)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Commercial Centres (Adeniran Ogunsanya Mall, Surulere)</td>
<td></td>
<td>3°21'23.75&quot;E</td>
<td>6°29'27.13&quot;N</td>
</tr>
<tr>
<td>Sports Complex</td>
<td></td>
<td>3°21'35.65&quot;E</td>
<td>6°29'55.04&quot;N</td>
</tr>
<tr>
<td>(Teslim Balogun Stadium)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Religious Centres (Surulere Central Mosque)</td>
<td></td>
<td>3°21'39.98&quot;E</td>
<td>6°30'42.56&quot;N</td>
</tr>
<tr>
<td>BRT</td>
<td></td>
<td>3°21'44.67&quot;E</td>
<td>6°29'54.22&quot;N</td>
</tr>
<tr>
<td>Terminal (Western Avenue)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ojuelegba Road</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Open Green Spaces (Connecting nodes at Shitta Roundabout Park)</td>
<td></td>
<td>3°21'30.66&quot;E</td>
<td>6°29'56.96&quot;N</td>
</tr>
<tr>
<td>Administrative Buildings (Surulere Post Office)</td>
<td></td>
<td>3°21'32.56&quot;E</td>
<td>6°30'11.96&quot;N</td>
</tr>
<tr>
<td>School (Stadium High School, Surulere)</td>
<td></td>
<td>3°21'52.57&quot;E</td>
<td>6°30'9.01&quot;N</td>
</tr>
</tbody>
</table>
4.0 RESULTS AND DISCUSSION

To alter the city's TOD, the Lagos State government created a ten-point development strategy as a strategic roadmap. Roads, transportation, energy and water supply, environment and physical planning, health, education, empowerment, food security, housing, and jobs are the 10 points of the agenda. Ninety percent of all people and commodities in the state are transported by road, which makes up the majority of the transport network. In addition to the state's growing state rail network, the state boasts natural rivers for ferry services and a federal rail network. An estimated 22–25 million trips per day are made in the Lagos megacity zone using all forms of transportation, including walking (LAMATA, 2023). Walk trips make up about 40% of all journeys in metropolitan Lagos. Lagos has one of the lowest road networks in the West African subregion, with 2.2 km of roads per 10,000 inhabitants, while having over 20 million passengers per day. By 2032, there will be between 40 and 42 million daily journeys required due to population growth and rising levels of living (LAMATA, 2023). The percentage distribution of respondents in the major areas of interest and according to Surulere's land usage is displayed in Tables 2, 3, and 4.

4.1 Results

Presentation of Respondents’ Demographic Characteristics

This section presents the respondents’ demographic data using frequency distribution tables.
Table 2. Percentage Distribution of Respondents by Age

<table>
<thead>
<tr>
<th>Age Distribution</th>
<th>Frequency</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>18-30</td>
<td>285</td>
<td>63</td>
</tr>
<tr>
<td>31-45</td>
<td>126</td>
<td>28</td>
</tr>
<tr>
<td>46-60</td>
<td>41</td>
<td>9</td>
</tr>
<tr>
<td>Total</td>
<td>452</td>
<td>100</td>
</tr>
</tbody>
</table>


Table 2 (above), reveals that 285, or 63% of respondents were between the ages 18-30 years of age, 126, or 28% of respondents were within the age bracket of 31-45 years, while 41, or 9% of respondents were within the age brackets of 46-60 years.

![Respondents by Age](image1)

![Respondents by Gender](image2)

Figure 8 & 9. Figure showing the cumulative respondents by Age and Gender

Table 3. Percentage Distribution of Respondents by Gender

<table>
<thead>
<tr>
<th>Gender Distribution</th>
<th>Frequency</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>327</td>
<td>72</td>
</tr>
<tr>
<td>Female</td>
<td>125</td>
<td>28</td>
</tr>
<tr>
<td>Total</td>
<td>452</td>
<td>100</td>
</tr>
</tbody>
</table>

This table’s (Table 3 above) results are not surprising since it shows that most young adults that are between 18- and 30 years of age responded to the questionnaire – this is the expected age bracket of the commuters, traders, and residents doing business or living along the major streets within the district. The table and figures show the distribution of the respondents by gender, 327(72%) of the respondents were male, while the remaining 125(28%) of them were...
female. This indicates that the majority of the respondents who attended the questionnaire and interviews were male. This shows that the dominant workforce of both skilled and unskilled labor is males. Figure showing the cumulative respondents by Age and Gender These are the workforces that require effective and functional TOD (see Figures 8 & 9).

Table 4. Percentage Distribution of Respondents by Land Use

<table>
<thead>
<tr>
<th>Physical Developments and Existing Land Use</th>
<th>Frequency</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Industrial Area (DUFIL Prima Foods Plc.)</td>
<td>25</td>
<td>5.5%</td>
</tr>
<tr>
<td>Commercial Centers (Inclusive of Mixed-use Building)</td>
<td>27</td>
<td>6.0%</td>
</tr>
<tr>
<td>Sports Complex (Recreation)</td>
<td>18</td>
<td>4.0%</td>
</tr>
<tr>
<td>Religious Centers</td>
<td>17</td>
<td>3.8%</td>
</tr>
<tr>
<td>Circulation and Access Roads Landmarks (BRT Terminal)</td>
<td>32</td>
<td>7.0%</td>
</tr>
<tr>
<td>Open Green Spaces</td>
<td>8</td>
<td>1.8%</td>
</tr>
<tr>
<td>Administrative Buildings</td>
<td>5</td>
<td>1.5%</td>
</tr>
<tr>
<td>School (Educational)</td>
<td>12</td>
<td>2.7%</td>
</tr>
<tr>
<td>Hospital (Health)</td>
<td>15</td>
<td>3.3%</td>
</tr>
<tr>
<td>Residential</td>
<td>28</td>
<td>6.2%</td>
</tr>
<tr>
<td>Others (Uncategorized)</td>
<td>265</td>
<td>58.2%</td>
</tr>
<tr>
<td></td>
<td>452</td>
<td>100</td>
</tr>
</tbody>
</table>


Table 4 above indicates that 25(5.5%) respondents were regular commuters around the industrial areas and, while 27(6%) respondents were captured at the commercial centers, 18(4%) at the sports centers. This table further reveals a quantum number of 265(58.2%) respondents were uncategorized since the survey sampling was done randomly the activities vary relatively and the demand for TOD and other alternative means of transportation also defers relatively to the perceptions of the respondents. Figure 10 shows the exponential increase in the need for TOD by looking at the projections in the order of the population density of the given land area. Information obtained from LAMATA regarding the proposed 22 km Mile 12 - CMS pilot Bus Rapid Transit (BRT) Lite scheme serves as the centerpiece for the organization’s reforms to bus services and is the first illustration of a thorough and coordinated strategy to enhance public transportation in the city and outside the state to SSA (LAMATA, 2023). It projects that there would be an average of 210,000 passengers daily in 2012 and 382,000 in 2017. An estimated 549,000 passengers daily are expected by 2030. In a week, it equates to 3,843,000 passengers every day. Nonetheless, this will have a significant impact on people’s mobility in the Surulere region given the requirement for alternate mass transit networks, which is also required to improve the district’s tourism potential.
4.1 Lagos Bus Rapid Transit System

The system uses 220 buses to move more than 200,000 passengers daily. In the last five years of operations, the BRT system has moved more than 400 million passengers. The overall objective of the Lagos BRT system is to improve mobility and transport affordability in the city of Lagos through regulatory reform and facilitation of person movement on major corridors through a combination of traffic management and implementation of a high quality, high-performance bus Rapid Transit System as also stated in the study conducted by Vergel-Tovar, & Landis, (2022) on bus rapid transit-the affordable transit megaproject alternative; ‘Megaprojects for Megacities’. The operation is guided by a set of regulations approved by the Lagos State House of Assembly (LAHA) and signed into law by the Government. Table 5 shows the projected capacity of the proposed TOD networks if fully implemented and this urban design concept of TOD will be performed creditably better than the existing BRT and transportation service in the State. This research reveals the complex role of mega-projects as change agents for socio-economic reforms, as signifiers of livability, and as planning frameworks to implement sustainable urbanism and tourism in the metropolis, while also creating a lifestyle infrastructure for residents and tourists. The proposed TOD is expected to increase the average passengers, trips and load factors, waiting and arrival time at the terminals and destination, and finally the speed, all these are expected to increase by at least 200%.

Table 5. Projected Capacity of the Proposed TOD Networks (Adapted, modified, and projected from [https://lamata.lagosstate.gov.ng/](https://lamata.lagosstate.gov.ng/), LAMATA, 2023)

<table>
<thead>
<tr>
<th>Existing BRT</th>
<th>Proposed TOD for Tourism Development</th>
</tr>
</thead>
<tbody>
<tr>
<td>Over 400 million passengers have been carried in the last five years</td>
<td>Over 800 million passengers to be carried in the next five years</td>
</tr>
<tr>
<td>The average daily ridership is 180,000 passengers</td>
<td>The average daily ridership to increase to 360,000 passengers</td>
</tr>
<tr>
<td>The average load factor of 800 passengers carried per bus daily</td>
<td>The average load factor of 1600 passengers carried per bus daily</td>
</tr>
<tr>
<td>The average daily trip per day is 5</td>
<td>The average daily trip per day is 10</td>
</tr>
<tr>
<td>The average waiting time is 15 minutes</td>
<td>The average waiting time is 7.5 minutes</td>
</tr>
<tr>
<td>The average speed is 30km/h</td>
<td>The average speed is 60km/h</td>
</tr>
</tbody>
</table>
4.2 Existing Dilapidating Transport Network System

When comparing the BRT system to other forms of transportation, the respondent's attitude is more favorable. Expectations were exceeded with the launch of the Mile 12 -TBS trial BRT Lite plan. Numerous users have been touched by the program, surpassing expectations in terms of patronage and placing a great deal of strain on the facilities. The daily average of 180,000 patrons over the week surpasses projected predictions by 200%. Second, travelers now see a 30% decrease in average prices and fare stability, a 40% reduction in travel time, a 35% reduction in average waiting time, and a decreased risk of robbery while using public transportation. Third, the program has drawn more users from groups who had previously avoided using public transportation, including younger people, middle-class people who own cars, the elderly, and people with limited mobility. Fourth, the program has generated over 1,000 direct jobs, primarily for recent graduates, and over 500,000 indirect jobs for residents of the state. Fifth, the program has shown that local operators are capable of managing profitable public transportation businesses. As a result, local banks, financiers, and automakers are very interested in working with the scheme to develop further BRT programs. Sixth, it has shown and validated public transportation's strategic importance in Lagos to the point that the state's anticipated investment in the subsector has increased fivefold. Preliminary data from this study indicates that the initiative has contributed to a decrease in the ambient concentration of harmful chemicals to human health along the corridor. Road transportation is the sole practical form of transportation in Surulere. Surulere’s road transport system is made up of a strong road network with auxiliary expressways running alongside it. A total of 8,305 kilometers of roads connect Surulere. The current network of road transportation is "gridded." State highways, major district roads, minor district roads, and expressways are all included. Tricycle operators, motorbike riders, privately owned public transit buses, and the BRT have all been made possible by the road transportation infrastructure.

4.3 Establishment Guidelines of Sustainable Tourism Development

This study compares the goals of the Lagos State Government with potential PPP projects that could increase tourism in the city, looking at mega-destinations and their master plans. The research shows that although each case study project focuses on one or more particular lifestyle areas, taken as a whole, the initiatives satisfy every lifestyle category listed in Lagos. It will also provide a variety of economic and educational possibilities for various demographic groups, along with initiatives to promote livability in the areas of urban design and environment, infrastructure and transit, social involvement, and safety. The research shows that, in terms of sustainable development standards, all of the open spaces and corridors provide plenty of options to improve Lagos's mobility by creating greenways for bicyclists and pedestrians that link to public transportation. Additionally, the projects show promise for creating urban synergies among various lifestyle domains when thoughtfully integrated as a sequence of urban layers. These synergies could have a positive impact on both proposed and existing neighborhoods, especially when expanded through an inclusive, participatory planning framework that could raise the socioeconomic demographic. With the thoughtful approach...
of TOD to resilience and urban design initiatives, together with non-motorized mobility motivated by the state of Lagos's fast urbanization and population increase, urban space is being sustainably revitalized for the development of tourism.

4.4 TOD Development Challenges

The transportation industry has a variety of difficulties, such as inadequate infrastructure, a lack of coordination among coordinating agencies, non-standard operations, incompetent management, and inadequate technological capabilities. Nonetheless, the analysis noted significant obstacles to TOD development. The Lagos Development Plan 2012-2015 has a statement that encapsulates the sector's issues. Since formal public transportation only accounts for 2.75 percent of daily mobility in Surulere, it is evident that these modes cannot satisfy the needs of the community. As a result, semi-formal and informal operators will continue to fill the void, including minibusses (danfos), motorcycles (okadas), and tricycles (keke). The city's high poverty rate and unemployment rates, rather than necessarily being a choice of job or grounded profession, are what drive the informal operators' need to close this mobility gap. Chaos in the traffic and unethical behavior among the informal operators have been caused by the young without jobs and other groups of people looking for a way to make ends meet entering the transportation industry. To fulfill the population's journey demand, the road infrastructure is woefully insufficient. In contrast, Surulere LGA has a high automotive density of 264 vehicles per kilometer of road or 8 autos per 100 persons. With only a few main corridors able to handle the majority of traffic, the network's efficiency is also poor. If connections are there at all, they are usually poorly planned and only offer limited access to the main network. A lot of tertiary highways serve as secondary ones. There aren't many signalized intersections, bus terminals are chaotic, and there aren't many bus stops with designated lanes aside from mass transit buses. Poor driving habits, carelessness on the part of public transportation staff, hazardous driving conditions, uneven roads, subpar street lighting, a lack of pedestrian facilities, and lax traffic enforcement all contribute to an alarmingly high accident rate, let alone environmental issues like vehicle emissions, improper waste oil disposal, and high traffic noise levels. Major social difficulties include forced evictions brought on by the growth of transportation infrastructure, high transportation prices, and the unreliability of the transportation system.

5.0 RECOMMENDATIONS

The present investigation acknowledges and suggests the necessity of an Integrated Multimodal Transport Plan (IMTP) system that enhances the interconnection of the metropolitan urban area and is sustainable. Following a thorough analysis of the supply and demand for Surulere's transportation infrastructure, the functional plan was created. The Surulere IMTP system will increase both people's and products' mobility. To accomplish sustainable growth in the area and to facilitate quick and easy traffic flow, especially for commuters, it also suggests methodically developing the transportation system. Cities with several commercial centers and multi-story buildings are unable to support mass transportation systems with extremely high capacities. Such cities cannot support very high-capacity networks and do not require them. All important routes should have suitable transit systems that can move
between 15,000 and 25,000 passengers per hour in each direction. An urban center like Lagos would remain the same with such measures in place. Systems like today’s bus rapid transit can meet this kind of demand. The plan’s elements include land use revision, a fundamental urban design rebuilding of Surulere, adoption of the decentralized development model in Lagos State, and improvements to roads, bus transit systems, public transportation access, bus terminals, and cableways;

a. To provide an efficient and economical rail- and road-based transportation system (including mass transport systems) well-integrated with the land use patterns to support balanced regional development;

b. To provide an accessible tourist-friendly transportation system and environment with public design and art;

c. To provide access to all parts of the region and discourage transit of passengers and goods through the core area of Surulere by making the peripheral expressways/bypasses motorable and thereby opening new areas for economic development;

d. To provide a suitable public transport system in Surulere to shift people from private transport to public transport, and to reduce vehicular air pollution.

This research illustrates how placemaking, sustainable urban planning, and social and economic changes combine to provide Lagos people with a whole new lifestyle option that they had not had before. Planning-wise, this entails building a sizable public infrastructure that promotes walkability and the active involvement of locals in leisure, cultural, entertainment, and sporting events. However, the investigation has also shown, that the projects do not use a mixed-income project model, which would enable low-income families to reside in a market-rate setting, although providing a wealth of public services. Furthermore, one of the initiatives calls for the relocation of migrant and low-income groups. The primary target audience for these model destinations is luxury visitors and rich residents, which may reinforce the existing socio-spatial divisions in the city, despite the government’s separate initiative that tries to provide affordable housing in other parts of the city. As a result, the megaprojects show Lagos's contradictory reaction to the logic of entrepreneurial neoliberalism: on the one hand, progressive initiatives to advance an egalitarian conception of urban livability; on the other hand, calculated attempts to utilize megaprojects as striking exhibitions in international trade shows.

6.0 CONCLUSION

A practical design was suggested after a thorough analysis of Surulere's transportation infrastructure's supply and demand. To improve Surulere's traffic flow for both people and goods by adding sporting facilities that periodically draw crowds of visitors. The goal of Lagos's sustainable development is to move traffic quickly, sustainably, and efficiently—especially for commuter traffic—through the integrated electric-powered Multimodal Transport Plan (IMTP) system. The primary element of a practical transportation strategy is the road network. Regional expressways, regional arterials, regional sub-arterials, regional collectors/distributors, and regional access roads are all included in the proposed hierarchical categorization. Since it is planned for these highway corridors to be expanded as a component of regional arterials, they ought to be
improved. For efficient traffic flow, Surulere's other connecting roads have to be renovated. The Apapa-Oshodi-Oworonsoki and Lagos-Badagry expressways should both have BRT corridors operational. To handle Surulere's swarming commuter population, more buses ought to be added to this route. To make access easier, organized minibusses have to be offered to travel via Surulere. Aerial tramways (also known as monocable, bicable, or tricable) are cable transport systems that use one or two vehicles to travel back and forth on a fixed track. A Public Private Partnership (PPP) with significant funding should be established for these systems. The cars are usually big and may hold anywhere from fifty to five hundred people at a time.

Similar levels of capacity and commercial speed may be reached by cable transport systems such as tramways or BHLS (buses with a high degree of service). However, because of the lengthy route, the sparse station count, and the considerable challenges involved in building inside the dense urban fabric of Lagos, cable transport systems are insufficient to serve as the backbone of an urban transport network in a sizable conurbation. Nonetheless, cable transport systems do provide an answer to needs that conventional transit systems (buses, tramways, and metro systems) are unable to adequately provide due to economic or technological limitations. Platforms may offer access to previously underserved regions due to impediments or level shifts. As a result, they can enhance existing transportation networks rather than replace them. These days, cable transport system development is still progressing slowly. This is especially due to factors including safety, property effect, legislation, and public acceptance.

One key topic to help with cable transport system implementation timelines involves land management.

**Abbreviations**

TOD: Transit Oriented Design  
IMTP: Multimodal Transport Plan  
PPP: Public-Private Partnership  
LAMATA: Lagos Metropolitan Area Transport Authority  
BRT: Bus Rapid Transit  
LGA: Local Government Area  
CMS: Church Mission Society  
SSA: Sub-Saharan Africa

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Dr Paul, and Dr Nnezi an Urban Designer and Landscape Architect respectively contributed to the work of this paper. Dr Oginni, as an expert in sustainability situated the work in this area and Arc Adesina worked on all the data, figures, tables, and captions alongside Dr Oginni in the preparation of the paper for publishing.
REFERENCE


to enhance the quality of life within the city’s neighborhoods. *Journal of Place Management and Development*, 16(1), 45-72. [https://doi.org/10.1108/JPMD-06-2021-0062](https://doi.org/10.1108/JPMD-06-2021-0062).


he research attempts to evaluate the current TOD as an urban design tool for improved and sustainable transportation, tourism, inclusive urban planning, and revitalization in Lagos, Nigeria.


