

# Wayfinding of Daily Commuters in Ferry Terminals: Case Study of Five Cowries Terminal, Lagos Nigeria

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## ABSTRACT

There is a great demand for better transportation systems, which also applies to ferry terminals. Though ferry service is typically one of the least preferred modes of transportation if it is the only option for travellers to reach their destination, appropriate and functional ports are required, particularly in Lagos, Nigeria. Respondents (commuters) were reached in this study using a series of interviews and questionnaires to evaluate their experience with navigation within two ferry ports. This study examined the design, building, and operation of ferry terminals in user accessibility. The research used a case study technique and interviews to assess the accessibility compliance of an existing ferry terminal in Lagos State, Nigeria. The case study included facility observation and evaluation, and the discussions focused on 18 'facilities operators and passengers' on their experiences with linked facilities. The study's findings indicated a lack of compliance with accessibility in exterior and interior surroundings. As a result, there is a significant level of restriction on the use of the facilities for all aspects of water transport, including building approach, waiting, boarding, and disembarking spaces. Existing facilities are insufficiently accessible and fall short of the criteria required to guarantee that all users may utilize them without discrimination or segregation. Through the adoption and use of universal design and wayfinding principles, ferry terminal structures and facilities must be accessible to successfully enable all users to attain genuine mobility in barrier-free surroundings that enhance user comfort. Those approached included everyday commuters, the elderly, adolescents, and first-time users. Initial studies indicate that adequate ferry terminal planning and design can enhance navigation experiences within a ferry terminal, making ferry services more effective and efficient.

Keywords: wayfinding, accessibility, passengers, user comfort, transportation

## I. INTRODUCTION

Ferry terminals serve as interchange points for road and maritime transport, playing an important role in providing a faster, lower-cost alternative to bridges or tunnels connecting points separated in coastal cities with a great portion of access to rivers, lakes, and canals; ferries also help to remove large numbers of commuters from roads, reducing peak hour congestion in densely populated areas where high frequency Ferry services are operational. Given the wide range of user demands and skills, accessibility has become critical in providing inclusive settings for people of all ages, sizes, talents, and disabilities. The necessity of having a dependable public transportation system is critical, especially for low-income households who may struggle to afford owning own automobiles, and the situation may deteriorate if the transit infrastructure is inadequate (Ng, 2019). Careful design for public transportation contributed to greater economic and social progress by boosting mobility, accessibility, and lowering transportation costs. Lower transportation costs may boost transportation efficiency (Park, Seo, & Ha, 2019), if better transportation infrastructure is available. Commuters' experiences with space(s) are determined by how they travel and position themselves inside the space of a terminal building. A commuter's daily travel patterns had a significant impact on his or her behavior and navigation method. As a result, whether it is on land, ocean, or air transportation, the capacity to find one's way plays a significant role in achieving a healthy pattern of travel (Zomer et al., 2019). The known design principles of wayfinding may be used to accomplish good space planning within a structure are;

A distinct identity to be produced in a carefully selected specific site in order to differentiate that region from others; and

1. To serve as a landmark in providing the ability to mentally map routes and orientation,
2. In creating direct and easy pathways
3. In creating spaces with strong visual characteristics
4. In avoiding too many diversion and route options
5. In providing maps or guides,

6. In creating signage at junctions to assist decision making, and finally
7. In creating direct approach design to visualize final destination. According to Foltz (1998), the physical design, colors, signage, display boards, and numbering and writing will be stored in one's memory in the form of a mental map that will later be useful for navigating between areas (Foltz, 1998).

## 1.2 Area of Study



Fig 1: Map of Waterways route in Lagos (Source: LASWA website)

The qualitative research approach used in this study to assess the 'compliance of Ferry terminals in Lagos, Nigeria to requirements for accessibility' is a case study (consisting of observation and evaluation of the facilities) and interviews. The Lagos State Ferry Services Corporation (LSFSC) or Lagos Ferry Services Company (also known as Lagferry) is a ferry service operator in Lagos State. It was formed in 1983. Lagferry collaborates with the Lagos State Waterways Authority (LASWA), the National Inland Waterways Authority (NIWA), and the Nigeria Marine Administration and Safety Agency (NIMASA). Other private ferry operators, in addition to Lagferry, employ contemporary ferry boats to provide commercial transportation services between Ikorodu, Lagos Island, Apapa, and Victoria Island. The Lagos State Waterways Authority (LASWA), a new regulatory agency established in 2008 to oversee the maintenance of waterways with a mission that included water transportation, is responsible for monitoring and

ensuring that operators comply with the policies of former Governor Babatunde Raji Fashola's government, as well as other regulations.

## II. LITERATURE REVIEW

### Wayfinding

The physicality of the built environment has an impact on the amount of navigational skill, and a traveler in a ferry port is not immune. The familiarity of the route and the overall physical arrangement of the location or places shape a person's experience. As a result, physical appearances such as landmarks, signposts, signboards, direction signs, and paths may influence a person's decision-making when navigating or experiencing buildings (Xia, Arrowsmith, Jackson, & Cartwright, 2008). Finding a destination in a new area can be challenging at times, thus smart decision making is required. As a result, repetitive training is required while travelling within a building to aid and develop wayfinding abilities (Hölscher, Büchner,

Meilinger, & Strube, 2009). The quality of wayfinding is regarded good when one can easily travel inside areas based on the context and cues of the investigated building. In this scenario of enhanced navigation abilities, the physical qualities of a building, signs, and display boards may assist commuters within a building (Shiwakoti, Wang, Jiang, & Wang, 2019). It is critical to understand the layouts of a building, such as the route, routes, walkways, and landmarks, allotted space, building typology, and the ability to recognize the overall architectural features.

#### Imageability

Imageability is a measure of how quickly a physical thing, word, or situation can elicit a distinct mental image in the mind of everyone who sees it. The imageability and visual play an essential part in assisting building users in navigating and understanding the flow of a building (Hölscher, Meilinger, Vrachliotis, Brösamle, & Knauff, 2006). By incorporating Kevin A. Lynch's (1960) theory of the crucial image of a city into a ferry terminal, there are five dominant physical elements (paths, edges, districts, nodes, and landmarks) that designers can implement to assist a commuter in understanding his surrounding environment, orienting themselves inside the terminal, and assigning the meaning the space can give to them (Lynch, 1960). Through the frequency of navigational experience of the same structure, these five components might assist establish the imageability (by mental mapping) of the ferry port. The commuter's navigation experiences within the building were connected with mental mapping of the building (Foltz, 1998, Lokuge et al., 1996).

As a result, in order for a ferry terminal building to enable smooth navigation for its commuters, the general architecture of a ferry terminal should be carefully and correctly designed in order to facilitate the movement of the passenger, particularly during peak hours or seasons. There are various elements to consider while constructing a space of a ferry terminal building that might impact ferry commuters' navigation experiences:

- The spatial layout and organization of the building: The organization of the spaces and the layout of a ferry terminal are very crucial and important as it should be easily accessed and identified, especially the internal circulation, and also to avoid overcrowding so that commuters can find their way to their final destinations. The structuring of spatial layouts

may have an impact on the efficiency of space as well as passengers' capacity to navigate (Hillier, 2009).

- Actual information and direction; and the provision of real-time information, such as departure and arrival announcements, are critical, as is information on the position and direction within the ferry terminal building. A display board can convey this information in real time. It is critical for a designer to choose the most strategic position for display boards.
- Visual assistance: A visual guide is one of the most significant imageability features for assisting a commuter's navigation and wayfinding in a ferry terminal. Signage, floor and layout maps, landmarks, and colors, for example, should be easily recognized, identified, and located.

### III. METHODOLOGY

The mixed-method research strategy was employed throughout this investigation, which includes direct survey or on-site observations, circulating questionnaires, and interviews. During the data gathering process, 40 respondents from each ferry port were approached at random to complete questionnaires. Respondents were essentially asked to score the amount of wayfinding efficiency of the architectural aspects of the current terminal buildings, which included general layout and space design. It includes the imageability of the structure through the color of the walls, signs, and display boards, as well as any dominating qualities such as landmarks that may impact the navigational behavior and experiences of ferry passengers' traversing spaces when they are within the ferry terminals. The qualitative research approach used in this study to assess the 'compliance of Ferry terminals in Lagos, Nigeria, to requirements for Accessibility and Wayfinding is a case study (consisting of observation and assessment of the facilities) and interviews that utilized a similar strategy. The research analyzed many case locations, which necessitated personal visits to existing Ferry terminals for observation and documenting of existing characteristics utilizing drawings and pictures of current Ferry terminals. Interviews with operators and commuters were also done, which contributed in the building's evaluation, planning, and design.



A. Case Study: Five Cowries Terminal (LASWA Terminal)



Figure 1: Exterior view of the terminal building from the waterfront (image source: www.travelwaka.com)

The Five Cowries Terminal, located in Lagos, is a cutting-edge, multifunctional terminal for the twenty-first century. MTN Nigeria, Nigeria's largest telecommunications network, developed the facility and gave it to the Lagos State Government. MTN held a lavish event to activate the five Cowries terminals on August 30, 2018. The Five Cowries Terminal also serves as the

headquarters of the Lagos State Waterways Authority (LASWA). The luxurious port has a jetty, restaurant, bar, administrative buildings, ticketing offices, a waiting space, bathrooms, and an ATM Gallery. The station also has a multi-level parking garage that can accommodate over 800 automobiles.



Figure 2: Satellite image of LASWA Terminal (image source: Google Maps)

The vehicle park is inside the terminal. It was built to promote people to use the waterways

and decongest the Lagos roads, as well as to attract investors to invest in the Lagos waterways. The

new terminal will make it easier to move people

and goods by water in Lagos State, Nigeria.



Figure 3: Exterior view of the jetty and ferries (image source: [www.travelwaka.com](http://www.travelwaka.com))



Figure 4: Waiting area (image source: [www.travelwaka.com](http://www.travelwaka.com))





Figure 5: Jetty berth (image source: [www.travelwaka.com](http://www.travelwaka.com))



Figure 6: Exterior view of the terminal building (image source: [www.travelwaka.com](http://www.travelwaka.com))



Figure 7: Ticketing counter (image source: livinspace.net)

#### Facilities Present:

- Office Spaces: The Terminal also acts as the LASWA headquarters (Lagos State waterways Authority). It provides well-furnished ultra-modern office spaces, board rooms, conference rooms, and so on.
- Jetty: The ultra-modern terminal has a jetty that can handle a variety of vessels.
- Restrooms: It has a male and female restroom, as well as handicapped access.
- Artwork: It also features a section dedicated to artworks.
- Ticketing: There is a ticketing arena where you may purchase tickets. It offers a spacious multi-purpose waiting space for Arrivals and Departures.
- Restaurant: It also includes a restaurant with views of the Lagos Lagoon where you may eat local and continental cuisine.

## IV. RESULTS AND DISCUSSIONS

### 4.1 Commuter navigation in existing ferry ports

The majority of commuters (respondents) who traveled from both sides of Lagos state (the mainland, i.e. Falomo, or the island side, i.e. Lekki, Ikoyi) rated the wayfinding experiences at both terminals as good, and the majority of them were satisfied with the existing wayfinding tools at both terminals. Since they have been using the terminals for a long time, they have developed a mental mapping skill that allows them to readily recognize the roads, walls, and general building plan designs. The circumstances were different from the previous time they met at the boat ports. Because of their previous encounters with LASWA ferry terminals; this set of responders finds it straightforward to maneuver through the terminal structures. From this category, 70% of commuters use the LASWA

ferry services for everyday commuting to work, while the remaining 30% use the ferry services exclusively for special events like as vacationing, sightseeing, or shopping. According to the research, the majority (67.5 percent) of commuters rely on available signs, floor maps, visible conspicuous landmarks, or any other visual features that may be utilized to support their navigating inside ferry terminals. These existing physical appearances combination functioned as visual assistance, allowing commuters to communicate with their surroundings by converting those recognized pictures into a mental mapping, so boosting their decision making for navigation (Foltz, 1998).

### 4.2 The impact of physical appearances and visual advice on commuters' navigation experiences

The physical looks and visual assistance at a ferry terminal are among the essential aspects that may impact passengers' decision-making. According to 5% of respondents, they just require one visual cue based on the physical appearances offered by the building to move about freely inside the structure. Some other responders, on the other hand, will need to combine several visual guiding resources, such as information boards, signage, building plan and floor maps, and landmarks, to move about. According to the information acquired, the majority of commuters rely on information boards and signage to help them make their way through the ferry terminal facilities. However, 50% of respondents stated that the signage is difficult to distinguish from the surrounding color and mood, particularly at the Ikorodu Ferry Terminal. However, they acknowledged the signage at LASWA ferry terminal as impressive, with a strong color combination that stands out from its background.

Figure 8 depicts the usage of symbols, pictures and smaller wordings on a clean white backdrop on a dark backboard for signage at LASWA Ferry

Terminal. The signage is more noticeable and easy to find.



Figure 8: Water route signage (image source: livinspaces.net)

When it comes to the design of a route and walkways, it is critical to provide adequate visual direction for ferry riders. Based on direct on-site observation, the LASWA Ferry Terminal, which has not been improved in a long time, has a very straight and easy arrangement for commuters to reach the departure gates. Figure 3 depicts the concrete roadway given for commuters, which is simply divided by planter boxes, concrete walls, and hand railing. It is adequate for creating boundaries and establishing routes, but its perforated properties that mix in with the surroundings may be bothersome, especially to first-timers. In addition to information boards, signs, and outward looks, respondents identified the landmarks they generally associate with in order to construct their sense of navigation success rates.

## V. CONCLUSION

The findings reveal that the capacity to build a good wayfinding within ferry terminals differs amongst people. The physical looks of a structure and pictures of a ferry terminal are both significant in establishing favorable wayfinding. Generally, commuters will have a greater chance of having favorable navigation experiences if they use the same route over and over again, developing a mental map of the location. The combination of physical building appearances and additional visual advice, such as an information board, signs, building plan and floor map, and landmarks, will produce the best outcomes in wayfinding. As an

example, signs with easy-to-understand iconography, basic straightforward phrasing, and good color separation would undoubtedly aid in the creation of better, legible signage for commuters, particularly the elderly, youngsters, and first-time users (such as tourists who just came to visit Lagos). As a result, for a ferry terminal building to provide easy navigation and enhance the wayfinding of their commuters while using the main terminal, the overall design of a ferry terminal layout should be carefully and properly planned in order to assist the movement of travellers to reach their final routes, particularly during peak hours or seasons.

### Design Recommendations

Given the state's disability legislation, known as the "Lagos state special people's law 2011," which became enforceable in 2016, it is expected that the state government will begin with a complete retrofit of existing ferry terminals in the state to ensure comply with international best practices and accessibility standards. Architects and other designers, as well as 'Design and Build Contractors,' should begin to prioritize wayfinding and accessibility as one of the essential needs that must be met in every ferry terminal design. Rather of treating easy wayfinding and accessibility as an afterthought to the building, there should be a deliberate design approach to attaining wayfinding from the original planning and design stage through construction completion and planned maintenance to provide appropriate service for all types of customers.



In order to ensure compliance, government accessibility regulations should be strictly enforced. Planning authorities and government institutions in charge of building design approval and construction supervision should monitor and enforce the incorporation of accessible design elements such as curb ramps, signage, railings, dedicated pedestrian and vehicular paths, and other design infrastructure in new Ferry terminals or retrofitting already constructed or existing terminals with all necessary requirements for ease of use by the people regardless of age.

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