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1.0 Introduction and Project Overview

Lagos State is the economic and financial capital of Nigeria, with a population of about 20 million people. Lagos State has the highest population density in the country, is the most populated city in Africa and ranks 7th in the world.

Lagos is the economic nerve centre of Nigeria. She plays host to headquarters of financial institutions, multinational corporations, government parastatals, international institutions, embassies, among others. The metropolitan area contains the largest manufacturing and service sector and contributes about 45% of the skilled manpower.

The city is located close to the ocean and is surrounded by water bodies (Lagoon). It is crossed by water currents, creeks and subject to flooding. The central business district (CBD) is located on an Island (Lagos Island) with three bridges connecting it to the mainland and other bridges connecting to neighbouring Islands.

Transportation within Lagos metropolis is however a major problem. It is essentially road based. High population coupled with lack of adequate infrastructural expansion to cope with the increasing population has resulted in heavy traffic congestion within the city. Travelling within Lagos takes double and sometime triple the normal time. This is not only an economic loss in terms of productive man-hour spent in traffic hold up, it also makes the cost of doing business in Lagos highly prohibitive thus giving Lagos a bad image as an investment unfriendly city. Experts have identified high traffic volume, lack of proper planning and projection, recklessness on the part drivers, weak and inadequate infrastructure as some of the reasons for this congestion. High road accident with attendant loss of life is also a major concern in addition to noise and environmental pollution.

1.1 Overview of Urban Road Network and Transportation in Lagos Metropolis

The predominant public transport mode in Lagos is road transportation with a bus fleet of about 75,000 units, mostly consisting of Danfos and Molues. The current trend shows very high increase in the use of low capacity vehicles (minibus or danfo) and decrease in other types of buses. Lagos roads are congested with one of the highest vehicle density in the world (222 vehicles per kilometres). Major roads, distributor, and collector roads cover about 650 kilometres. Most part of the Lagos road network is in poor condition and all these make road transport highly inefficient within Lagos metropolis.

Buses are individually owned, rented to drivers on a daily basis and are loosely organised into routes, and associations (drivers and owners associations). Many of the buses operate off their licensed routes due to poor licensing and traffic regulatory environment.

The services offered by the buses are of poor quality, insecure, inefficient, unsafe, and expensive and have resulted in huge loss of lives, properties, businesses etc. They are largely fragmented and unorganized. An average commuter wants to get to his or her destination without any problem, however, the bad attitude of bus conductors and drivers make this service unattractive. Lagos residents only tolerate these services in the absence of a better alternative. The bus drivers are also responsible for a large percentage of traffic congestions on the Lagos roads due to bad driving habit and lack of respect for traffic laws and regulation. Most of the buses are obsolete, lacks good maintenance and are subject to frequent breakdowns. These have often resulted in accidents that have claimed so many lives in Lagos.

It is important to note that major PT corridors plagued with diverse transport and traffic problems resulting in traffic congestion and delays as well as accidents and environmental pollution due to the following factors:

- Inadequate off street parking provision;
- Uncoordinated junction control mechanisms;
- Poor driver behaviour;
- In-effective enforcement regime to curb indiscipline among drivers;
- Few signalized junctions and manual control of most is restricted to daylight hours;
- Flooding of the carriage-way resulting from poor drainage infrastructures especially in rainy season;

- Use of the road space for other purposes is common with the major junctions, and interchanges hampered in their function by their use as unofficial bus stops, and encroachment by street trading and semi-official market activities;
- Street trading;
- Poor bus service delivery due to fragmented bus service;
- Lack of pedestrian walkway;
- High level of operational indiscipline;
- Lack of major fleet operators;
- Unauthorized parks and garages along the corridor;
- Deplorable bus conditions, which are generally unsafe and uncomfortable;
- Hawking and other commercial activities on the highway;
- Reduction in road capacity by encroachment;
- Indiscriminate bus parking and congestion;
- Poor traffic enforcement regime;
- Lack of Traffic Systems Management (TSM) measures – vertical signs and lane markings.

Figure 1.1: On-street loading by Danfo Operators & Traffic Congestion at Idumota

Figure 1.2: On-street loading by Danfo Operators & Traffic Congestion at Ogudu

Figure 1.3: On-street loading by Danfo Operators & Traffic Congestion at Ikeja

1.2 Overview of Public Transportation (PT) in Lagos

Road transportation is the predominant mode of transport within Lagos and also there are skeletal water transportation services linking Marina, Apapa with Ikorodu, Ajah and many other communities along the Badagry and Porto Novo Creeks. There is also skeletal rail service being offered by the Nigerian Rail Corporation from Ijoko to the Terminus at Iddo.

With the roads being the major modes of transportation, Lagos has a very high car density due to its high motorization which is 11 times the national average. Commuters experience huge traffic congestion especially in the mornings as traffic movement tends to be towards the CBDs (Ikeja, Lagos Island, Victoria Island, Lekki, etc. This is reversed in the evenings, with the congestion seen in the other direction - away from the islands.

Road infrastructures are over-stretched and though there has been a lot of road improvement – construction of new roads, rehabilitation of existing roads, dualization of roads – within the past 16 years, the demand to use the roads far outstrips the supply and thus there is severe traffic. The huge financial resources necessary to continue a road-development based approach is however not feasible.

The bus operation in Lagos is divided into two (2) categories namely; the formal and informal operators. The formal bus operators comprises of the Lagos BRT, LAGBUS and Bus Franchise Scheme which operates High Occupancy Vehicles (HOV) that are comfortable and convenient to passengers. The formal sector enjoys a certain degree of regulation and coordination with trained and experience drivers and bus attendants. While the informal bus operators have a large fleet of mini-buses popularly referred to as Danfo, estimated at over 55,000 and are largely old, rickety and ramshackle and do not provide any sort of comfortable or reliable service to commuters. There is no effective routing system, and variable fares are the norm with these set of operators. These operators are not traceable in any way and there have been instances where these buses have been used for kidnapping and assaulting commuters.

On the infrastructure front, bus stops have not been formalized and are largely improperly located and sized. A lot of the bus stops do not have lay-bys so buses have to pick up and drop off passengers while impeding the free flow of traffic. A lot of the junctions are traffic black-spots as there is a huge pedestrian-vehicular interactions and commercial activities at junctions. Other issues at junctions include poor junction geometry, commercial activities at junctions, bus parks at junctions and lack of proper rod maintenance culture.

1.3 Project Description

The Lagos State Government (LASG) in line with the vision of His Excellency, Mr. Akinwunmi Ambode is undertaking a Bus Reform Project with the aim of Systematically restructuring the existing PT bus operations in Lagos through the introduction of a modern, safe, convenient, fuel efficient, environmental friendly and air conditioned buses to replace the existing old, dilapidated and rickety danfos from major roads in Lagos.

The Lagos Bus Reform project will commence with Phase 1A and Phase 1B which would be simultaneously implemented in 2017. The Phase 1A (Ikeja Transport Hub) will cover places such as Ikeja, Oshodi, Abule-Egba, Ojota, Maryland, etc.; and while the Phase 1B (Lagos Island Hub) will focus on places such as Lagos Island, Victoria Island, Ikoyi, Ajah, Epe, Costain, Oyingbo, Yaba, Obalende, etc.

The essential components / features of the Lagos Bus Reform Project to be at par with other developed world's standards would include:

- The Bus – The reform buses would be brand new buses fully air-conditioned, comfortable and custom-built to cater for all routes while offering the best transit service to passengers.
- Route Licensing – Routes would be allocated to qualified Bus Operating Companies (BOS) for effective implementation of the bus reform project operational / logistics efficiency.
- Operating Companies – This includes the involvement and certification of professional public transport service providers to operate the buses according to the approved LOS to ensure implementation of operational standards.
- Training – appropriate training for drivers and bus attendants to ensure that the safety of life and properties, as well as promote and strengthen driver-passenger relationship etiquettes. Drivers and bus attendants would be adequately certified after the completion of the training programme. Drivers and attendants' bio-data would be duly taken before they could be allowed to drive the buses..
- Drivers & Bus Attendants – Drivers and attendants would be well trained and certified to work in a respectable and sane manner using well-tailored uniforms and identity badges for easy identification to the entire public.
- Ticketing - Electronic ticketing would be put in place to ensure fast boarding of passengers and quick movement of queues which will in turn reduce waiting time at boarding points.

- **Intelligent Transport Service (ITS)** – ITS, which stands as an important technology for proper journey planning and awareness, will be implemented to provide passengers with updates from time to time along all the bus routes in Lagos.
- **Infrastructure** – The infrastructures needed for smooth running of the buses will be provided which includes the bus shelters, terminals and depots. The buses would be garaged at the depots rather than the unregulated parking method. These infrastructures would be provided at various strategic points along the routes.
- **Passenger Insurance** - Passenger insurance plans would be put in place to strengthen safety and confidence in the bus reform scheme, thus promoting frequent patronage by passengers.

1.4 Project Objectives

The objectives of the Lagos Bus Reform project include the following:

- Provide comfortable and reliable bus services,
- Improve public transportation connections in Lagos,
- Reduce traffic congestion and environmental pollution attributed to Danfos and
- Improve safety and security of the commuting public; thereby enhancing the quality of life and travel experience of the commuting public in Lagos.

1.5 Terms of Reference (ToR)

Our scope of work covers activities necessary to accomplish the stated objectives of this assignment. The project Terms of Reference (ToR) include:

- Identify the critical route network in Lagos for Bus Reform;
- Data Collection: Manual Classified Counts (MCC), Journey Time & Delay Studies, Fare Surveys, Parking Surveys, Transport Demand, etc.
- Determine passenger transport demand of each of the major routes;
- Establish infrastructural requirements i.e. bus way, stations, terminals, depot, JIW etc.;
- Determine type of buses that would be suitable in terms of capacity, quantity, brand, etc.;
- Design operational framework;
- Determine appropriate private sector participation strategy;
- Establish appropriate intuitional / regulatory framework for the effective management of the project.;

1.6 Draft Project Implementation Report

Planet Projects Limited (PPL) deployed her team of Transport Planners and Traffic Engineers to carry out extensive studies (Basically Bus Park Survey (BPS) and Manual Classified Count (MCC)) at all the strategic locations for Ikeja and Lagos Island Hubs. We hereby present the Draft Project Implementation Report which is divided into fourteen chapters namely:

- Introduction and Project Overview;
- Lagos Bus Reform Zones;
- Traffic Survey Methodology;
- Traffic Data Analysis;
- Passenger Demand Estimation and Projection;
- Bus Requirements;
- Infrastructure Requirements

- Bus Master Plan;
- Intelligent Transport System(ITS);
- Institutional and Regulatory Framework;
- Information, Education and Consultation;
- Work Programme and
- Conclusion.

2.0 Current Lagos Bus Transport System

Lagos, like many other cities in developing countries, is expanding rapidly and having only strictly limited resources, has suffered serious deficiency in urban services. Public transport, in particular, is far from adequate and unable to cope with the very heavy and increasing demands placed on it due to several factors ranging from weak institution and regulatory framework, poor service delivery, operations inadequacies, ownership structure, poor bus quality, absence of modern public transport infrastructure, poor finance regime, etc. As a result, services are severely overcrowded, uncomfortable, expensive, unsafe, unreliable, and passengers have to endure excessive journey times and long periods of waiting time.

2.1 Institutional, Regulatory and Legal Framework

In Lagos, there is a multiplicity of government agencies that plays various roles in regulating and enforcing different aspects of public transportation. These agencies include the following:

- Ministry of Transportation (MOT);
- Lagos Metropolitan Area Transport Authority (LAMATA);
- Lagos Traffic Management Agency (LASTMA)
- Federal Road Safety Corps (FRSC);
- Nigerian Police Traffic Division;
- Etc.

A review of the roles and functions shows that these agencies do not necessarily co-ordinate on policies and as such there is no effective sectorial management, leading to Poor traffic management & enforcement regime, non-implementation of Transport Master Plan (TMP), and no concentrated efforts at resolving a lot of the issues plaguing the transport sector.

2.2 Major Bus Routes

Lagos is characterized by the mass movement of people with diverse journey patterns. Whereas movement to and from Lagos Island used to dominate the peak hours, the growth of the city has resulted in a polycentric pattern with a complexity of movement that is both radial and orbital and everything in between.

Bus routes in Lagos connect major residential areas to the CBDs (Ikeja, Lagos Island, Victoria Island, etc.). The routes can be regarded as primary corridors connected by several feeders (secondary routes) providing access to other minor residential, commercial districts of Lagos. The routes are characterized by huge traffic volumes, traffic congestion and delays, accidents, pollution, etc. Table 2.1 shows major primary and secondary public transport routes in Lagos.

Table 2.1: Major Primary and Secondary Routes in Lagos

Primary Route	Secondary Route
1. Ajah – CMS	1. Akin Adesola Road
2. Ikorodu – CMS	2. Ahmadu Bello Way
3. Berger – Obalende	3. Herbert Macaulay Road
4. Abule Egba – CMS	4. Lawanson Road
5. Okokomaiko – CMS	5. Idimu-Egbe Road
6. Apapa – Oshodi Express	6. Ikotun Idimu Road
7. Oworo – Oshodi Express	7. Mobolaji Bank Anthony Road
8. Iyana-Iba Road	8. Allen – Opebi Road
	9. Kudirat Abiola Road
	10. Obafemi Awolowo Road
	11. Lateef Jakande Road
	12. Iju Road
	13. Ekoro Road
	14. Ipaja Road
	15. TOS Benson Road

Lagos bus route network is consisted of individual routes planned in isolation rather than as part of a co-ordinate network, thus underachieving in two key characteristics of an efficient bus network, namely minimizing passenger interchange and maximizing operational efficiencies.

The urban bus network in Lagos consists of routes planned in isolation, which largely responds to commercial opportunity, rather than as part of a coordinated bus network. This is usually unsatisfactory for meeting the requirements of a significant proportion of travelers. Poor route planning may result in poor route coverage, an excessive requirement for between routes, and irregular frequencies. Worse still, the urban bus system in Lagos has been predominately managed by the informal sector. This has made the operations of the urban bus system in Lagos to be disorderly, duplicative and inefficient. Figure 2.1 shows major primary and secondary routes in Lagos. Similarly, figures 2.2 – 2.5 contain some major bus corridors in Lagos.

Figure 2.2: Idumota, Lagos Island

Figure 2.3: Ketu along Ikorodu Road

Figure 2.4: Oshodi – Abule Egba Corridor

Figure 2.5: Iyana Ipaja – Akowonjo Corridor

2.3 Type of Vehicles and Operational Structure

2.3.1 Informal Sector

Public Transport operations in Lagos have largely been driven by the informal sector. Buses, tricycles, okadas, etc., are individually owned, rented to drivers on a daily basis and are loosely organized into routes, and associations (drivers and owners associations). The informal sector is characterized by Old, rickety and dilapidated buses and tricycles; and are largely owned by individual operators. The services are largely fragmented, uncoordinated, unregulated, unreliable, unsafe, uncomfortable and expensive with fare changing indiscriminately.

The informal sector is highly unorganised and this has contributed to the poor image of transportation in the city. There is generally poor quality of service delivery and unmaintained buses. The Buses which ply different route to convey commuters to their various destinations are mainly used “second hand” vehicles. The fare regime is not regulated; fares can be increased at will depending (at bus driver’s discretion) on a number of individual factors ranging from excess demand over supply especially during the peak periods, unfavourable weather condition, poor road condition to non-availability of buses during festive periods. These poorly maintained worn out buses are generally not environmental friendly as they are highly responsible for noise and air pollution in Lagos. These pollutants are hazardous and dangerous to human health.

The services offered by the minibuses (danfos), motorcycles and motorcycles are of poor quality, insecure, inefficient, unsafe, and expensive and have resulted in huge loss of lives, properties, businesses etc. An average commuter wants to get to his or her destination without any problem, however, the bad attitude of bus conductors and drivers make this service unattractive. Lagos residents only tolerate these services in the absence of a better alternative.

Also, public transport drivers are responsible for a large percentage of traffic congestions on the Lagos roads due to bad driving habit and lack of respect for traffic laws and regulation as well as other road users. Most of

the buses and kabukabu are obsolete, lacks good maintenance and are subject to frequent breakdowns. These have often resulted in accidents that have claimed so many lives in Lagos.

Generally, the service provided by the informal sector operators is haphazard, not comfortable with little regard for safety of commuters and absolute disregard for traffic rules and regulations. Figure 2.6 shows typical bus types used by the informal bus operators.

Figure 2.6: Typical Bus Types Used for Informal Bus Operations

2.3.2 Formal Sector

Unlike the informal sector, the activities and operations of the formal sector is well defined, coordinated and highly regulated. The formal sector is characterized by the use of modern high-occupancy-vehicles (HOV), regulated fare regime, service level agreement (SLA), ticketing regime, route franchising, etc. The buses are in good condition and are generally affordable, comfortable, secure and safe.

In recent time, the Lagos State Government, working through the Lagos Metropolitan Area Transport Authority (LAMATA) introduced the Bus Rapid Transit (BRT) Lite. The BRT system for Lagos is envisioned as a high quality, low cost public transportation system operating on specialized infrastructure with adequate incentives to offer affordable mobility, sustainable urban environment and better quality of life to urban population, especially the poor.

The current Lagos BRT corridor runs along Ikorodu Road, from CMS (Lagos Island) to Mile 12, a total distance of 22km. The Lagos BRT has witnessed an extension of additional 14km from Mile 12 to Ikorodu Roundabout. The BRT Scheme though was initially designed for only 100 high occupancy vehicles (HOV), but the fleet has grown

to about 400 buses (fully air conditioned). Similarly, daily ridership has increased tremendously to about 220,000 passengers.

Apart from the BRT, other formal bus services include the LAGBUS (and buses running under her franchise) and the Iyana-Ipaja – Maryland Bus Franchise Scheme (BFS).

Figure 2.7: Typical Bus Types Used for Formal Bus Operations

2.4 Infrastructures

Poor condition of the road network and the public transport infrastructures coupled with a near-complete absence of Traffic System Management (TSM) measures, severely affects the quality of the transport system in Lagos.

Public transportation system, are usually characterized by a service that is efficient, reliable, accessible and affordable. However, the overall performance (in terms of operational efficiency) of PT (especially bus operations) is largely dependent on having well planned infrastructures to support the operation. Typical infrastructure required for a sustainable PT include layby, bus shelters, bus depot, bus flags, terminals, good road pavement, and traffic system management (TSM) measures.

2.4.1 Bus Shelters / Terminals

Bus shelters and terminals are essential modern infrastructural element of public transport for effective and efficient optimization of bus operations. One of the major banes of bus operations in Lagos is the absence of modern public transport infrastructure to complement bus operations. However, in a situation where they are being provided, they are usually improperly sited and hence, results operational inefficiency.

An inventory of public transport infrastructure was performed with the aim of investigating their current condition. Over eight hundred (800) bus stops were visited during the exercise. Also, some of the existing bus stops visited have bus shelters, but are grossly inefficient operationally in terms of demand, design capacity, and construction inadequacies.

The following are the major infrastructural deficiency of the current bus operations in Lagos:

- Non formalization of bus stops;
- Poorly situated bus stops (too close to junctions, intersections, etc.);
- Capacity deficiency of bus stops as buses were observed loading on the road carriageways);
- Absence of laybys so disembarking and boarding of passenger take place on the carriageways;
- Poorly sited bus shelter;
- No consideration for level boarding;

Figure 2.8 shows locations of existing bus stops in Lagos. Similarly, a picture galleria of bus stop location with their current condition is contained in Appendix II.

Figure 2.9: One of the existing Bus Shelters at Cement Bus Stop

Figure 2.10: Iyana Ipaja Bus Shelter - *Misuse of PT Infrastructure*

Figure 2.11: Poorly situated Bus Shelter at Stadium Bus Stop

Figure 2.12: Poorly situated Bus Shelter at Charity Bus Stop

2.4.2 Bus Parks

Transport activity typically focuses around terminal points known as bus parks which are transport hubs from where danfo /bus services typically commence or terminate their route. An initial review of data collected on Lagos Travel Demand Model (2009) revealed that there are more than 50 bus parks in Lagos. However, the number of bus parks in Lagos is on the rise (currently increased to over 60 bus parks) as a result of increased demand for public transport due to population explosion in recent times.

Major bus parks typically serve as interchange point where passenger transfers between routes. The major bus parks serve more than 20 different bus routes with several hundred buses in each park at any given time. These major bus parks are commonly found within the strategic transport hubs and these include:

- CMS Bus Park;
- Idumota Bus Park;
- Apongbo Bus Park;
- Oshodi Bus Park;
- Obalende Bus Park;
- Ikeja Bus Park;
- Yaba Bus Park;
- Ojodu Berger Bus Park;
- Ojuelegba Bus Park;
- Oyingbo Bus Park;
- Ikorodu Bus Park;
- Mile 2 Bus Park;
- Etc.

These parks are neither marked with signs nor properly planned resulting in haphazard arrangements. Due to inadequate space within the parks, buses are noticeably parked on road sections which, along with illegal street trading, this situation is further exacerbated by local street markets in a manner that encroach upon the right of way.

An inventory of bus parks was performed with the aim of investigating their current condition. Over sixty (60) bus parks were visited during the exercise. The following are the major challenges affecting the effectiveness of the bus park operations in Lagos:

- Lacks basic passenger and infrastructural facilities such as terminal building, waiting area, loading bay, convenience, parking lot, etc.;
- Encroachment of carriageway due to space limitation;
- Hawking /trading activities that possess health danger to passengers;
- Ponding;
- Unhygienic surrounding; and
- Not properly managed and an aberration to the Lagos Mega City landscape.

Figure 2.13 shows locations of existing bus parks in Lagos. Similarly, a picture galleria of bus parks location with their current condition is contained in Appendix III.

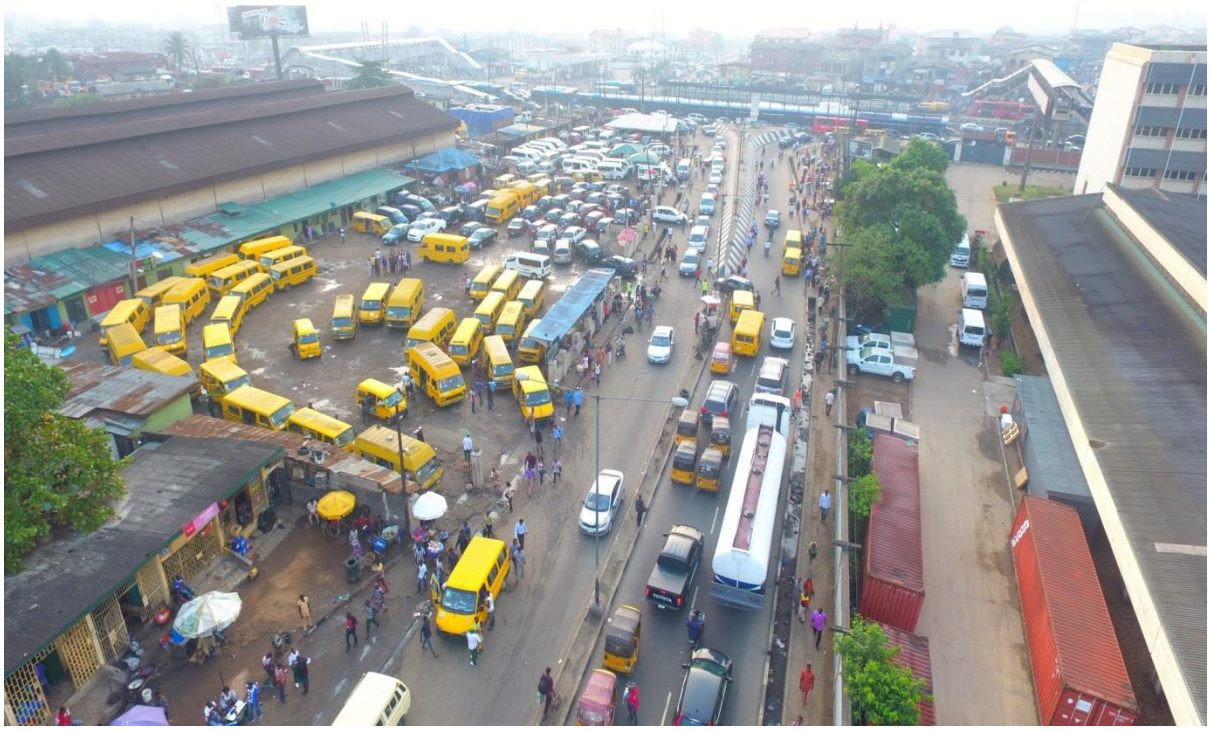


Figure 2.14: Ojota Bus Park

Figure 2.15: Biode Intercity Bus Park, Ojota

Figure 2.16: Berger Bus Park

Figure 2.17: Idumota Bus Park

Figure 2.18: Iyana Ipaja Bus Park

Figure 2.19: Ikeja Bus Park

2.4.3 TBS Bus Terminal

As part of the initiative of the current administration to improve PT system in Lagos, the TBS Bus Terminal has been upgraded to meet the best international standards in terms of demand and other basic passengers' requirements. The terminal has provision for parking for bus retention as well as adequate waiting areas for passengers. It also has provision for parking for other vehicles.

Figure 2.20: TBS BUS Terminal

3.0 Our Approach and Methodology

All major mega cities around the world rely on quality public transport to keep their citizens moving and their economies working while also mitigating the negative environmental impacts of rapid motorization. These mega cities increasingly upgrade or even transform their public transport systems to better serve the needs of their population. Depending on approach and level of details during the planning process, some of these efforts would be more successful than others. Bus reform successes include; the celebrated success of the TransMilenio bus rapid transit (BRT) system in Bogota, Colombia, and the bus rapid transit (BRT) system in Curitiba, Brazil. It will therefore be important to learn from the benefits and shortcomings of various approaches that have been taken by these different mega cities.

3.1 Critical Success factors in Public Transport

For a public transport scheme to be successful, there are four main issues to be addressed. These include:

Planning, Institutional, Regulatory and Legal Framework: These include the planning of the public transport system, setting up of an appropriate institution to guide the public transport systems, setting up of regulatory institutions/agency and providing legal framework to back up the entire scheme. This function is usually performed by the public sector.

Infrastructures: The infrastructure required for efficient and effective transportation system has to be available for a sustainable public transport system. These include laybyes, shelters, terminal, depot, maintenance infrastructures, etc. Infrastructure provision being a fixed asset is usually provided by the public sector.

Transportation Services: such as Bus, Rail, and Ferry operation have to be appropriately designed to meet the traffic demand. The service usually has to be efficient, reliable, and affordable to enjoy public acceptability and patronage. The service is typically the responsibility of the private sector.

Finance / Private Sector Participation Strategy: A very good financial model and business case have to be developed to determine the revenue, cost, and risk involved in the bus operation. The financial model would provide information necessary to determine the overall financial viability of the bus operation and whether subsidy would be required to make the scheme financially viable. Appropriate fare regime required to make the scheme sustainable would also be established with the aid of the model. In addition, the model would be used as a tool to decide on the appropriate Private Sector Participation (PSP) strategy to be adopted.

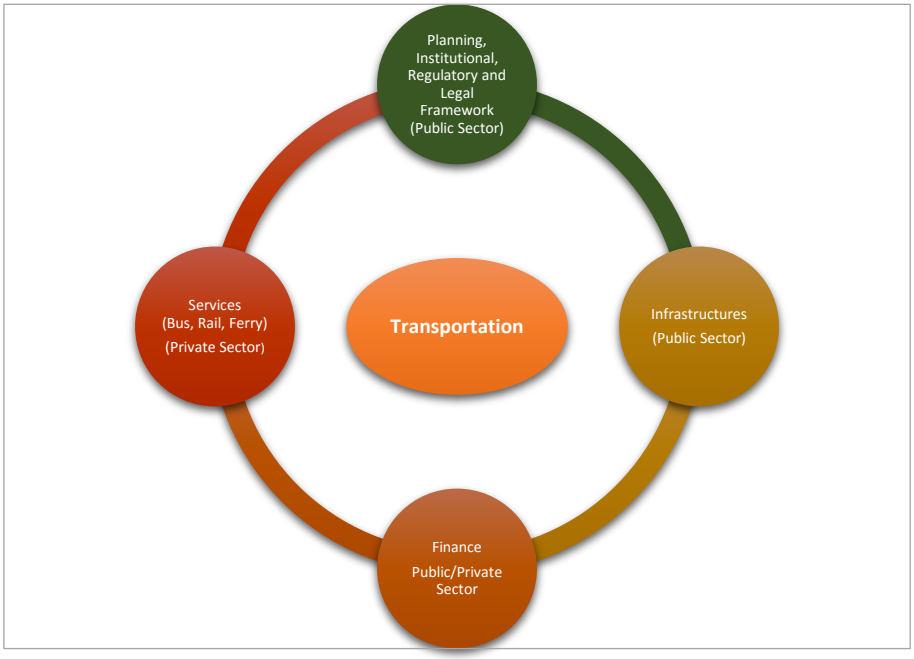


Figure 3.1: Critical Success Factors in Public Transport

3.2 Our Approach and Methods

Our global approach and methods follows a systematic and painstaking assessment of the objectives and ToR of the Lagos Bus Reform Project. The present transport system is largely informal offering fragmented services and plagued with wide and disperse ownership, and is thus essential that a systematic approach is defined to ensure the LBRP meets its objectives and deliver a better service to the good people of Lagos state.

In line with our corporate culture of looking at all facets of a project and to fulfil all elements of the Terms of Reference (ToR), the Lagos Bus Reform project has been structured into thirteen (13) different elements/tasks and these are as follows:

I. Planning:

- Development of strategic transport zones;
- Bus route planning;
- Traffic survey and passenger demand estimation;
- Planning for number of buses per route based on demand;
- Bus route coding; and
- Identification of the termination points for each route (Hubs).

II. Procurement of Buses:

- Identify appropriate vehicles;
- Issue bus specification and number of buses required;
- Order for buses;
- Pre-delivery inspection;
- Registration, insurance and branding of buses;
- Test run of buses; and
- Bus capitalization and cost recovery strategy.

III. Infrastructure Provision:

- Condition survey and inventory of existing bus stop, bus depots and bus terminal locations;
- Rationalisation of existing infrastructure based on passenger demand & determine location of required infrastructure; and
- Identify infrastructure gaps;
- Coding of bus stops.
- Determine appropriate designs for bus stop, bus depot and bus terminal locations;
- Construction of bus stops, bus depot and bus terminals; and

IV. Fare Collection System:

- Define E-Ticketing options and payment strategy
- Ordering, installation and integration of E-Ticketing facilities and equipment;
- Selection & appointment of ticket vendors as necessary; and
- Ticket discount rate options for students, elderly and disabled passengers

V. Intelligent Transport Systems (ITS):

- Define requirement for the ITS system
- Identify appropriate locations for siting of OCC;
- Determine facilities and equipment required for OCC, Passenger Information System, Fleet Management and Tracking;
- Ordering of facilities for OCC, passenger information system, fleet management and Tracking devices;
- Installation and integration of all ITS facilities;
- Test running of facilities; and
- Training of personal and maintenance programme for facilities.

VI. Stakeholders Engagement:

- Definition of engagement strategy and identification of stakeholders
- Define framework for integration of existing transport operators, including government MDA, general public and special interest groups;
- Design Capacity Building Programme; and
- Design materials and modes for public enlightenment including flyers, adverts, documentaries, radio jingles etc; and
- I.E.C.

VII. Institutional / Regulatory Framework:

- Identification of various authorities, agencies and institutions responsible for transport and traffic related issues in Lagos;
- Review of existing roles and functions of such authorities and agencies /institutions;
- Develop an appropriate and well-defined institutional & regulatory framework; etc.

VIII. Operations and Maintenance (O & M)

- Service and Operational Plan;
- Selection and recruitment of qualified drivers/bus attendants;
- Drivers Training (Biometric data entry, Eye/Vision Test and Driving Simulations);
- Procurement of uniforms for Drivers and Bus Crew members;
- Passenger Insurance;
- Service Quality Monitoring & Evaluation; and
- Commissioning and commencement of bus service.

IX. Socio – Economic Impact Assessment

- Impact on employment
- Comparative Analysis of Danfo Bus to LASG Reform
- Strategies for Job Replacement:

X. Resettlement Action Plan (RAP)

- Identification of project impact and affected populations:
- Legal framework for Land acquisition and compensation:
- Compensation Framework:
- Resettlement Assistance:
- Budgeting and Implementation Schedule:
- Organizational Responsibility:
- Framework for Public consultation, Participation and Development Planning:
- Grievance Redress
- Monitoring and Evaluation

XI. Work Programme

- A work programme will be developed to properly layout all the project task and their respective timelines for a successful implementation of the LBRP.

XII. Project Cost

- Determination/Estimation of cost of all project elements including the following
  - Rolling stock (buses)
  - Infrastructure – bus depot, shelters, terminals etc
  - ITS
  - Fare collection system
  - IEC
  - Capacity building & training

XIII. Project Risks

- Determination of project risks and analysis of potential impact;
- Assignment of risk to project to project partners most suited to bearing such risks
- Development of mitigation plan

3.3 Planning

The planning phase of a transport project and indeed any project is the most critical phase and can determine how successful the project would be at the implementation phase. The elements of transport planning for the Lagos Bus Reforms Project would include the following:

- **Strategic transport zones** - In order to achieve the goals of the Lagos Bus reforms, we have divided Lagos into strategic transport zones for better understanding of the transport conundrum, proffering feasible solutions peculiar to each area and efficient implementation of the project. Lagos has been divided into five (5) Strategic Transport Zones for the purpose of identifying transport and traffic dynamics of each of the zones and for efficient implementation of the project. The five zones are the major transport hubs in Lagos characterized by huge transport activities and also serve as prominent destinations.
- **Bus route planning –** This route planning task will seek to identify all Corridors, routes (origin – destination) and strategic linkages. This will make it easier to select route for implementation of the Lagos bus reform program.

- Traffic survey and passenger demand estimation – The main aim of the traffic survey is to serve as one of the major inputs for passenger demand projections and bus requirement estimation for the scheme. The traffic survey would seek to determine current traffic volumes and composition, major origins and destinations, existing trip patterns as well as passenger demand projections. Two (2) major types of traffic survey have identified as critical to the successful delivery of the Lagos Bus Reform project. The surveys are Manual Classified Count (MCC) and Bus Park Survey (BPS).
- Number of buses per route – This would be achieved based on the demand estimation. Each route (trip start – trip end) would be allocated sufficient number of buses based on peak demand.
- Bus Route Coding – Route coding would help to establish a simplified route identification system that would be helpful for planners, bus operators and bus users.
- Identification of the Termination points – Proper identification of origin and termination points would help to adequately design transport terminal that would be adequate for demand at that point.

3.4 Procurement of Buses

The procurement of buses is heavily dependent on the demand along each route. Accurate demand estimates from the traffic surveys would be used for estimating the number of buses that would be required for the Lagos Bus Reform project. Other tasks include the following:

- Identify Appropriate Vehicles – Appropriate vehicles for the Lagos Bus Reform project would be carefully identified, and will take into consideration minimum comfort level for users and all possible environmental impacts.
- Bus specification and Number of Buses Required – The planning process described above would ensure that bus specification and number of buses are accurately determined.
- Order, Pre-delivery Inspection and Test Run - This task would seek the timely delivery of the buses after all necessary inspection would have been performed by the special taskforce. Hereafter, the buses would be test run along a particular identified bus reform corridor.

3.5 Infrastructure Provision

The infrastructure provision for public transport projects needs to be demand responsive otherwise it is likely to negatively affect the ridership of such system. Infrastructure provision will include but not limited to; adequate and expandable stations /terminals, adequate bus stops/shelters, rehabilitation of faulty pavement along the route, real time passenger information etc.

- Condition survey and Inventory - This survey would seek to identify all the existing bus stop, bus depot and bus terminal location across the state. The will be assist in identifying all infrastructural gaps and will help in proffering the needed solution.
- Appropriate designs of infrastructure – Based on global best practices, appropriate designs for bus stops, bus depot and bus terminals will be provided.
- Construction of infrastructure – The required level of skilled expertise will be deployed to ensure the quality and timely construction of bus stop, bus depot and bus terminal according to contractual agreement.
- Bus stop coding - Appropriate coding system would be developed for buses and bus stops for clarity and easy identification.

3.6 Fare Collection System

Fare collection system is the collection of components that automate the ticketing system of a public transportation network. There are two type namely; Automatic fare collection (AFC) and Manual fare collection (MFC).

- Define E-Ticketing option and payment strategy – The automatic fare collection system will be adopted and implemented. This will help to eliminate fare evasion within the system.
- Ordering, installation and integration of E-Ticketing facilities and equipment – The expertise needed for this task will be adequately provided.
- Selection of appointment of ticket vendors
- Ticket discount rate options for students, elderly and disabled passengers: option for encouraging ridership amongst the 'at risk' population including the aged, school children and disabled persons.

3.7 Intelligent Transport System (ITS)

Intelligent transportation systems (ITS) are advanced applications which, without embodying intelligence as such, aim to provide innovative services relating to different modes of transport and traffic management and enable various users to be better informed and make safer, more coordinated, and 'smarter' use of transport networks.

- Operations Control Centre (OCC) - Identification of appropriate locations for siting of OCC and passenger information displays will be carried out as part of the route planning and condition survey.
- Determine facilities and equipment required for OCC, Passenger Information System, Fleet Management and Tracking; etc
- Ordering of facilities and equipment - For OCC, passenger information system, fleet management and Tracking devices, this will be achieved by employed out foreign technical partner in this area.
- Installation and integration of all ITS facilities – This will also be achieved with help from our foreign technical partner.
- Test running of facilities – This will be done by our in house team based on well define test route. An initial test run of the system has been done.
- Training of personnel and maintenance programme for facilities – A training and maintenance schedule will be developed to adequate achieve this task.

3.8 Stakeholder Engagement

The Lagos Bus Reform project would involve people or group of persons who would be affected by key decisions towards the smooth delivery of the project. Two types of stakeholders have been identified for the Lagos Bus Reform project. The first group of stakeholders comprises of the government MDAs such as MoT, LAMATA, LAGBUS, FRSC, LASTMA, etc. The second category is made up of basically the Road Transport Unions (NURTW and RETEAN), private public transport operators as well as the commuters (a special group of users).

Each of the identified categories of stakeholders would be duly carried along in the decision making process. Prominent among such stakeholders would include the NURTW and other private public transport operators.

- Define framework for NURTW participation as BOCs – This framework will be developed in conjunction with the Lagos state government.
- Information Education and Consultation (I.E.C) - An I.E.C implementation plan for the Lagos Bus Reform Project would be developed with the vision of ensuring the full benefit of the project is accrued for the good of the society at large. The vision basically, stands to support the economic development of the State and enhance the quality of life, safety and security of Lagosian while increasing transport connections and inter-modal connectivity.

- **Demonstrate strong political will to follow through policy –** A robust step by step process and rule of engagement will be developed to serve as an advisory document.

3.9 Institutional / Regulatory

It is important to understand the institutional and regulatory issues that might present unwanted hurdles during the implementation phase of the Lagos bus reform project. Presently in Lagos, there several authorities, agencies /institutions that is responsible for the transport and traffic issues in Lagos with no clear cut in their roles and responsibilities as they overlap. Such authorities and Agencies include:

- Ministry of Transport;
- LAMATA;
- LAGBUS;
- VIO;
- Federal Road Safety Commission (FRSC);
- LASTMA;
- Police, etc.

A review of the roles and functions of all the identified authorities and agencies /institutions responsible for transport and traffic related issues in Lagos would be performed with the intention of developing a well-defined and appropriate institutional & regulatory framework for the successful implementation of the Lagos Bus Reform project.

The Institutional, Regulatory and Legal requirements for the successful implementation of the Lagos Bus Reform project would be identified. The Governmental Ministries and/or Agencies that are most equipped to address these would also be identified with their respective roles and responsibilities well defined. It might be necessary to define regulatory reforms or specific regulations required for the project implementation, and designing new forms of collaboration between different authorities and agencies.

3.10 Operations and Maintenance (O&M) framework

This element of the Lagos bus reform project would spell out all the issues associated with the operations and maintenance of the reform bus system. The general framework and model for the operations and maintenance of the Lagos bus reform project would be developed. The BoCs would need to adapt the framework with their individual specifications and would need to adhere to the key performance indicator (KPIs) for the project. The following form the required tasks under the operations and maintenance for the project.

- Service and Operational Plan;
- Selection and recruitment of qualified drivers/bus attendants;
- Drivers Training (Biometric data entry, Eye/Vision Test and Driving Simulations);
- Procurement of uniforms for Drivers and Bus Crew members;
- Passenger Insurance;
- Service Quality Monitoring & Evaluation;
- Commissioning and commencement of bus service; etc.

3.11 Socio – Economic Impact Assessment

This element of the project would evaluates the socio-economic impact of the Lagos Bus Reform Project on all the road transport stakeholders including Passengers, LASG, transport operators as well as other road users, with major focus on analysing its effect on the level of employment and/or disengagement.

3.12 Resettlement Action Plan (RAP)

This Resettlement Action Plan (RAP) would examines the procedures to be followed and the actions to be taken to mitigate adverse effects, compensate losses and provide development benefits to persons/assets affected by the Lagos Bus Reform Project, whether physically or economically. This would strictly be based on the areas covered by the entire network of roads, the bus owners and operators as well as other affected road users.

Key focus would be in the area of:

- Identification of project impact and affected populations;
- Legal framework for Land acquisition and compensation;
- Compensation Framework;
- Resettlement Assistance;
- Budgeting and Implementation Schedule;
- Organizational Responsibility;
- Framework for Public consultation, Participation and Development Planning;
- Grievance Redress; and
- Monitoring and Evaluation.

3.13 Work Programme

A work programme will be developed to properly layout all the project task and their respective timelines for a successful implementation of the LBRP.

3.14 Project Cost

The cost of all elements of the Lagos Bus Reforms Projects would be determined,

3.15 Project Risk Register

The Lagos Bus reform Project like every other project will be affected by a number of risks. Towards effectively managing the risk associated with the project we would adopt four (4) steps, namely; Risk Identification, Risk Assessment, Risk Allocation and Risk Mitigation.

- Risk Identification – This involves identifying all the possible risks that might affect this project looking at past experiences and thinking innovatively about what could go wrong in the future.
- Risk Assessment – We need to assess all the possible risk that has been identified. Assessing the risk will enable us to prioritise, allowing us to determine the most serious hazards first. The risk has been assessed and measured in terms of High, Medium and Low risk.
- Risk Allocation – The allocation of whose stakeholder's responsibility to deal with the risk in the event of likely occurrence is very critical.
- Risk Mitigation – This involves the strategy that is been put in place to tackle this risk if and when they do occur.

4.0 Strategic Bus Zones

4.1 The Strategic Transport Hubs

In order to achieve the goals of the Lagos Bus reforms, we have divided Lagos into strategic transport zones for better understanding of the transport conundrum, proffering feasible solutions peculiar to each area and efficient implementation of the project.

Lagos has been divided into five (5) Strategic Transport Zones for the purpose of identifying transport and traffic dynamics of each of the zones and for efficient implementation of the project. The five zones are the major transport hubs in Lagos characterized by huge transport activities and also serve as prominent destinations.

Each of the identified strategic zones contains other transport sub hubs (constituting major origins). These transport sub hubs are the major trips origins from different parts of Lagos. These strategic transport zones include (see Table 4.1 and Figure 4.1):

- Zone 1A: Ikeja;
- Zone 1B: Lagos Island;
- Zone 2A: Oshodi;
- Zone 2B: Oshodi – Abule-Egba; and
- Zone 3: Strategic Linkages.

Table 4.1: Strategic Transport Zones

Zone 1A: Ikeja	Zone 1B: Lagos Island	Zone 2A: Oshodi	Zone 2B: Oshodi – Abule-Egba BRT	Zone 3: Strategic Linkages
• Ikeja • Ojota • Ogba • Ojodu-Berger • Yaba • Maryland • Ojuelegba • Pen Cinema • Iju-Ishaga • Oshodi • Iyana-Ipaja • Egbeda	• Marina/CMS • Idumota • Ajah • Yaba • Costain • Oyingbo • Ijora • Mushin • Epe • Mile 2 • Ikorodu • Obalende • Ojuelegba	• Oshodi • Abule-Egba • Sango/Toll Gate • Isolo • Ikotun • Ikeja • Ipaja • Ojota • Ikorodu • Alimosho • Mushin	• Oshodi • Ikeja • Dopemu • Abule-Egba • Iyana-Ipaja • Pleasure • Katangua	• Okokomaiko • Badagry • Igando • Iyana-Iba • Iba Town • Ayobo • Iyana-Meiran

4.2 The Hub & Spoke Model

The model for the implementation is the hub and spoke model or network system. This is a system of connections arranged like a wheel in which all traffic moves along key collector roads (spokes) connects to the hub at the center. Hubs will be strategically sited in locations where they can serve as the major collection and distribution point for passengers in that area. The hubs serve as terminal locations from where passengers can switch transport modes and are re-distributed to their final destinations either by smaller buses or alternative modes of transport (see Figure 4.2).

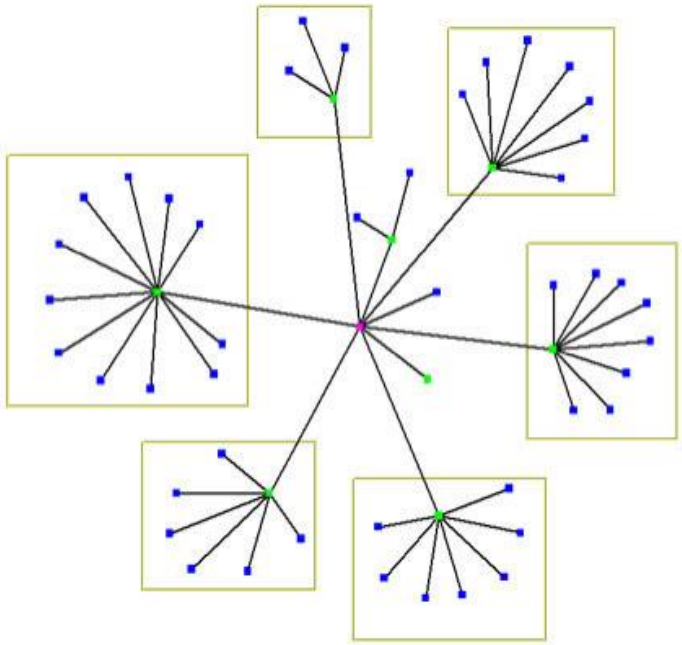


Figure 4.2: Hub and Spoke Model

Based on the current travel patterns, prevailing land use and existing bus parks that serve as major points of convergence for passengers, we have selected twenty (20) critical hubs for the Lagos Bus reform project as follows:

1. **Adeniji Adele / Obalende:** Located on Lagos Island, the bus parks at Adeniji Adele and bus terminal at Obalende are among the busiest on the Island and they provide bus services to numerous destinations across virtually every other part of Lagos. Some of the major Origins / Destinations from this hub are - Yaba, Oyingbo, Ijora, Costain, Ojuelegba, Mushin, Oshodi, Ogba, Ojodu Berger, Bariga, Ketu-Mile 12, Ikorodu, Iyana Ipaja, Lekki, Ajah, etc.
2. **CMS Marina / Apongbon /Idumota:** Also located on Lagos Island with bus parks and several loading points by the Marina and within the markets of the Central Business District, this hub is also one of the most active and services several destinations across Lagos which include Ijora, Costain, Ojuelegba, Ogba, Orile Mile 2, Bariga, Ketu-Mile 12, Ikorodu, Iyana Ipaja, Lekki, Ajah, Epe, etc.
3. **Costain:** Costain is a major stop over point for commercial buses and other vehicles coming from or going to Lagos Island (especially for vehicles that do not go through Third Mainland Bridge). Costain connects to the Island via Eko Bridge and serves as a hub to major feeder corridors such Funsho Williams Road, Ikorodu Road, Lagos – Badagry Expressway and Apapa Road.
4. **Barracks:** Barracks Bus stop is located along Bayo Shodipo road and is a major node from where buses connect to destinations such as Mushin, Oshodi, Ikeja, Ojota, etc.
5. **Yaba:** This location is a hub where buses from several other routes converge and also connect to other parts of Lagos. Yaba's proximity to the popular Yaba, Oyingbo and Tejuosho Markets; several Inter-State Bus Terminals at Jibowu; as well as to key Educational institutions such as Yaba College of Technology and University of Lagos make it a very busy and strategic transport hub in Lagos.
6. **Ojuelegba:** Another hub at a strategic junction with a major bus park that connects to virtually every other part of Lagos. Some major destinations from Ojuelegba include Apapa, Mile 2, Mushin, Okota, Itire, Oshodi, Lagos Island, Ikorodu, etc.
7. **Mile 2:** Mile 2 is a busy transport hub from where passengers can board buses going to other areas and hubs around Lagos such as Apapa, Oshodi, Badagry, and Lagos Island, etc.; and even out of Nigeria to other countries in the West African sub region. Mile 2 has massive potentials as it will serve as a future multi-modal hub with the presence of the Blue Line Light Rail tracks and train station.

8. **Iyana Iba:** Iyana Iba hub serves the LASU - Iba, Ojo, Agbara and Badagry areas of Lagos which are fast developing residential and industrial areas that hold lots of potential for future expansion of the Mega city.
9. **Mushin:** Mushin is strategically located along Agege Motor road and plays host to a major market and several bus parks. Mushin is also a densely populated area with huge passenger demand. Buses can be boarded to virtually every other hub from Mushin such as Lagos Island, Oshodi, Iyana Ipaja, Ikotun, Igando, Ojuelegba, Yaba, Ikorodu, Mile 2, etc.
10. **Ikotun:** Another hub located in a densely populated area of Ikotun Egbe in Idimu LGA. Ikotun serves other hubs such as Iyana Ipaja, Ikeja, Oshodi, Mile 2, Iyana Iba, etc.
11. **Oshodi:** Oshodi is a major transport hub which is centrally located and also connects to all parts of Lagos. There are several Inter-state bus parks at Oshodi, and Oshodi is also the site of a world class modern multi-storey bus terminal which is presently under construction.
12. **Ojota:** Another strategically located hub with both intra-city and inter-state parks. Most travellers coming into Lagos by road get to drop off at Ojota before connecting to their various destinations from this hub. Ojota hub connects to key destinations such as Ikeja, Ikorodu, Yaba, Lagos Island, and virtually all parts of Lagos.
13. **Ikeja:** Ikeja is the capital of Lagos State and as such plays host to several administrative and institutional land uses. It is also a major business district and commercial centre, with lots of inter-modal transport facilities such as railway station and Airport (Local and International). Ikeja hub has a number of bus parks that service several hubs and routes such as Agege, Iju Ishaga, Ogba, Ojodu Berger, Ketu, Egbeda, Iyana Ipaja, Ikotun, Oshodi, Lagos Island, etc.
14. **Iyana Ipaja:** Iyana Ipaja hub is a densely populated area located along the Lagos - Abeokuta Expressway at the junction with Ipaja road. Iyana Ipaja hub connects with other areas in Lagos such as Ikotun, Ayobo, Ipaja, Sango, Oshodi, Ikeja, Agege, etc.
15. **Abule Egba:** Abule Egba hub is also a densely populated area located along the Lagos – Abeokuta Expressway with connections to other hubs and zones such as Ikotun, Ayobo, Ipaja, Sango, Oshodi, Ikeja, Agege, etc.
16. **Ojodu Berger:** This hub is the gateway into Lagos by road as it shares boundary with Ogun State, hence it serves the huge volume of passengers who reside in Ogun and work in Lagos State. Berger hub is also the first terminal road travellers coming into Lagos Megacity get to disembark before getting vehicles to their destinations.
17. **Ajah:** The most rapidly expanding area of Lagos with steadily increasing population and volume of trips to and from the zone daily. Major hubs and areas from Ajah include CMS/Obalende, Oshodi, Iyana Ipaja, Ojodu Berger, Ojota, Epe, etc.
18. **Ikorodu:** Ikorodu hub is another densely populated and rapidly expanding suburb of Lagos metropolis. It generates very high volume of trips, especially with the extension of the BRT lane from Ketu Mile 12 to Ikorodu Town.
19. **Epe:** Epe is a fast developing town with huge potential for tourism, industries and agriculture. Its proximity to the Lekki Free Trade Zone and proposed Lagos State Airport make it suitable as a transport hub with great potential to attract increasing volume of passenger trips
20. **Badagry:** A historic and serene town with lots of potential for tourism. This hub serves residents, tourists and businesses that are visiting Badagry and connects with other major hubs such as Iyana Iba, Mile 2, Ikotun, and Lagos Island.

The map showing the selected major transport hubs in Lagos is shown in Figure 4.3.

4.3 Implementation Strategy

For the ease of implementation, the Lagos Bus Reform Project has been divided into phases:

- ***Phase 1A****: Ikeja Hubs;*
- ***Phase 1B:*** *Lagos Island Hubs;*

- *Phase 2A: Oshodi Hub;*
- *Phase 2B: Oshodi – Abule Egba BRT;*
- *Phase 3: Other Strategic Linkages.*

4.4 Bus Routes for Phase 1A

The Phase 1A (Ikeja Hub) and 1B (Lagos Island Hub) routes have been carefully selected based on the following criteria:

- Traffic Pattern and Demand;
- Land use and
- Socio-Economic Consideration.

The twenty (20) selected routes for **Ikeja hub** include:

- *Ikeja – Maryland – Ojuelegba – Stadium;*
- *Ikeja – Oyingbo;*
- *Ikeja – Toyin – Opebi;*
- *Ikeja – Iyana Oworo – CMS;*
- *Ikeja – Agege/Pen Cinema*
- *Ikeja – Obalende – CMS;*
- *Ikeja – Ojota;*
- *Ikeja – Agege/Pen Cinema- Iju Ishaga;*
- *Ikeja – Oba Akran Road – Ogba;*
- *Ikeja – Adeniyi Jones – Ogba;*
- *Ikeja – Abule Egba;*
- *Ikeja – Ketu;*
- *Ikeja – Alausa Secretariat -Iyana Oworo;*
- *Ikeja – Egbeda;*
- *Ikeja – Maryland - Yaba;*
- *Ikeja – Maryland - Ojuelegba;*
- *Ikeja – NAHCO (Airport);*
- *Ikeja – Allen – Opebi - Maryland ;*
- *Ikeja – Oshodi;*
- *Ikeja – Mile 2*

The twenty seven (27) selected routes for **Lagos Island hub** include:

- *Obalende - Iyana Oworo - Oshodi;*
- *Obalende - Sabo – Yaba;*
- *Obalende - Costain - Ojuelegba;*
- *Obalende - Ogba - Berger;*
- *Obalende - Ojota;*
- *Obalende - Lekki Ajah;*
- *Obalende - Eko Hotel;*

- *Obalende - Falomo;*
- *Obalende - Bariga;*
- *Apongbon - Ojuelegba;*
- *Apongbon - Oshodi;*
- *Apongbon - Mushin;*
- *Apongbon - Orile - Mile 2;*
- *CMS - Victoria Island;*
- *CMS - Lekki Ajah - Epe;*
- *CMS - Ikeja;*
- *Adeniji Adele - Mushin;*
- *Adeniji Adele - Ijora;*
- *Adeniji Adele - Ketu - Mile 12 - Ikorodu;*
- *Idumota - Ojodu Berger;*
- *Adeniji Adele - Yaba - Oyingbo;*
- *Adeniji Adele - Obalende;*
- *Idumota - Ojuelegba;*
- *Idumota - Oshodi;*
- *Idumota - Mile 2;*
- *Idumota - Ikeja and*
- *Tom Jones - Yaba*

5.0 Traffic Surveys and Methodology

5.1 Traffic Survey Objectives

The Lagos State Government (LASG) in line with the vision of His Excellency, Mr. Akinwunmi Ambode is undertaking a Bus Reform Project with the aim of Systematically restructuring the existing PT bus operations in Lagos through the introduction of a modern, safe, convenient, fuel efficient, environmental friendly and air conditioned buses to replace the existing old, dilapidated and rickety danfos from major roads in Lagos.

The Lagos Bus Reform is a unique project that requires attention to details as the outcomes of this study would influence the decision making process with regards to the bus operations plan, design and development of basic attendant PT infrastructure as well as the implementation plan. The study would also serve as a working document for the various stakeholders saddled with the responsibility of the implementation of the Lagos Bus Reform project.

The main aim of the traffic survey is to serve as one of the major inputs for passenger demand projections and bus requirement estimation for the scheme. Specific objective for the traffic survey are as follow:

- Determination of current traffic volumes and composition;
- Determination of major origins and destinations;
- Determination of the existing trip patterns;
- Passenger demand forecasting; etc.

5.2 Types of Surveys

Two (2) major surveys were identified as critical to the successful delivery of the Kano Light Rail Viability Studies. The surveys include:

- Manual Classified Count (MCC); and
- Bus Park Survey;

5.2.1 Objective for Manual Classified Count (MCC)

Manual Classified Count (MCC) is a volumetric count of traffic along a particular corridor over a specified period of time. Specific objective of MCC would include:

- To determine the present traffic volumes along a given corridor;
- To determine traffic composition along a given corridor;
- To evaluate prevailing travel pattern;
- To estimate passenger demand along a given corridor; etc.

5.2.2 Objective for Bus Park Survey (BPS)

The main aim of Bus Park Survey (BPS) is to provide useful information on volumes of different vehicle categories used for intra-city passenger trips at various parks. The survey focused on the volume of loading by different categories of PT vehicles currently used for intra-city Park.

The primary objective of the BPS was to determine the volume of vehicular and passenger trips originating from various parks to different destinations on daily basis with the intention of using such outcomes to estimate daily passenger demand and determination of bus requirement for various routes. The park survey was conducted for one (1) day at major parks between 7:00am and 7:00pm. Specific objective of BAC would include:

- Identification of locations of major intra-city parks;
- Determination of daily trip Volume

- Determination of daily passenger demand; and
- Determination of prominent trip origins and destinations.

5.3 Our Approach

It is important to have a proper understanding of the prevailing travel pattern, passenger demand and best options on each corridor identified within the Ikeja and Lagos Island Hub in order to design an efficient Bus Scheme that will meet the needs of commuters. Traffic surveys are a vital requirement for passenger demand forecasting and this entails comprehensive data collection. The surveys carried out have been carefully specified and tailored to the demand forecasting requirements, with each of the surveys providing specific inputs to the demand modelling. This chapter explains the various surveys carried out with the methodology adopted.

5.4 Traffic Surveys

The traffic surveys would be used to determine the present travel demand, generate the number of trips; and get a better understanding of the prevailing travel pattern, fare regime and passenger preferences; major places of origin and major destinations of commuters; with any other peculiarities of the existing transport system along the identified corridors.

The two (2) major traffic surveys conducted include:

- Manual Classified Count (MCC) and
- Bus Park Survey (BPS).

5.4.1 Manual Classified Count (MCC)

Manual Classified Counts would be used to determine traffic volume and also the volume of each vehicle class on the road. Bus Park Survey would determine the actual number of arrivals and departures from each bus park, giving the demand for public transport at the park. This could further be divided to obtain the demand per route.

Manual Classified Counts were carried out at critical junctions along the routes by traffic assistants who enumerated the total number of vehicles plying the routes while classifying them into corresponding vehicle types. The purpose of MCC is to factor up recorded results for each MCC location for each time period and then analyse it to get a full knowledge of the current traffic pattern and also predict future transport demand.

5.4.2 Bus Park Survey

Bus Park Survey was also conducted to understand the travel pattern of Public Transport buses at their respective bus park locations and collate information on basic trip data such as the length and frequency of trips. This also helped to capture the extent of public transport vehicular movement at the survey location.

Adequate preparations were made for the conduct of each of these counts. The preparations include the design of appropriate templates and questionnaires, and the determination of the manpower requirements for each of the counts. Samples of the forms used for each of the surveys are contained in the Appendix.

These surveys were identified as critical to the successful delivery and implementation of the phase 1A and 1B of the proposed Bus Reform project. They were carried out along the identified corridors, for a 12-hour period from 7:00am – 7:00pm.

5.5 Reconnaissance Survey

A reconnaissance survey was first undertaken along the various segments of the corridors. This was to have a better understanding of the corridor and to obtain important details such as major vehicle types along the corridor; prevalence of para-transit and existence of any formalized bus service; existing bus stops and other activity centres such as markets, motor parks, schools, etc.; major junctions and intersections that connect with the corridors; existing transport infrastructure and road condition; traffic flow pattern, and any other peculiarities along the corridors. This reconnaissance survey was carried out as a pre-assessment before the full-scale field surveys. The result of the reconnaissance survey was used in establishing the critical sections of the road and suitable locations for the traffic surveys. The locations selected for the different surveys are as shown in Table 5.1

Table 5.1: Survey Types and selected locations along Ikeja and Lagos Island Corridors

S/n	Hub	Survey Type	Location
1	Ikeja Hub	Manual Classified Count (MCC)	1. Ikeja – Ketu; 2. Ikeja – Egbeda; 3. Ikeja – Maryland – Yaba (One way route); 4. Ikeja – Berger; 5. Ikeja – Adeniyi Jones – Ogba; 6. Ikeja – Alausa Secretariat – Iyana Oworo; 7. Ikeja – Toyin – Opebi; 8. Ikeja – Maryland – Ojuelegba; 9. Ikeja – Allen – Opebi; 10. Ikeja – NAHCO; 11. Ikeja - Oba Akran – Ogba and 12. Ikeja – Ojota
2		Bus Park Survey	1. Olowu Park 2. Ikeja Along Park
3	Lagos Island Hub	Manual Classified Count (MCC)	1. Osborne Road; 2. Adeola Odeku Road; 3. Ozumba Mbadiwe Road; 4. Ahmadu Bello Way; 5. Obafemi Awolowo Way; 6. Third Mainland Bridge; 7. Eko Bridge 8. Carter Bridge / Idumota
4		Bus Park Survey	1. Obalende Bus Terminal; 2. CMS Bus Parks; 3. Adeniji Adele Bus Park; 4. Apongbon Bus Park; 5. Tom Jones Bus Park; 6. Idumota Bus Park; and 7. Sura Junction

5.6 Training and Pilot Surveys

Traffic Assistants were carefully screened and selected for the various traffic surveys. Training was done to explain the methodology for each of the counts, the different categories of vehicles to be counted by the observers (for MCC), recording procedures and time intervals for each of the surveys. Thereafter, a Pilot Survey was conducted for two (2) hours to ascertain that the Traffic Assistants had a complete understanding of what was required of them during the survey.

5.7 Procedure for Manual Classified Count (MCC)

Planet Projects Limited commenced preparation for the traffic surveys by developing forms to be used for data collection. The forms are for the collation of data from the field during the Manual Classified Count (MCC). Samples of the forms are shown in Appendix.

The Manual Classified Count was conducted at different locations along the Lagos Bus Reform corridors. The counts were done for twelve (12) hours from 7.00 am to 7.00 pm daily.

Traffic Survey teams, each comprising of a Supervisor and twelve (12) Traffic Assistants were deployed to each of the count locations. Each location had at least six (6) Traffic Assistants at every point in time. The Traffic assistants operated in shifts, and they were made to relieve each other every hour to prevent drudgery and reduce the margin for errors.

The different classes of vehicles were divided amongst the traffic assistants at each location ensuring that no assistant was overworked. Counts were recorded in 1 hour interval with the supervisor notifying assistants at the end of every 1 hour period.

Safety (reflective) jackets were provided for all assistants at all locations and the teams were located in spots that were away from the road, but provided good views of the traffic situation without endangering the lives of survey team members.

The classification of vehicles that were counted during the Manual Classified Count (MCC) includes:

i. Private Cars/SUV/Pick-Up
ii. LAGBUS / HOV
iii. Coaster
iv. Molue Bus
v. Trucks / Tanker
vi. Danfo / LT
vii. Minibus
viii. Taxi
ix. Motorcycle
x. Tricycle

5.8 Procedure for Bus Park Survey (BPS)

The Bus Park Survey forms used on the field by Planet Projects Limited are represented in the Appendix. These forms were used to collate appropriate data for the purpose of analysis, interpretation and presentation.

Each location had at least a supervisor and six (6) Traffic Assistants having undergone an initial comprehensive pilot-testing. The Traffic assistants operated in shifts and were made to relieve each other every hour to prevent fatigue and stress. This also reduced the margin for errors.

The Survey was conducted at the selected locations for twelve (12) hours from 7.00 am to 7.00 pm daily. Data taken includes Information on the number of buses loading passengers and leaving the various parks to diverse routes at every point in time. The purpose of a Bus Park Survey is to be able to suitably understand the current bus volume and predict transport demand in these parks of interest.

6.0 Traffic Data and Analysis

This section of the Report analyses the results of the traffic surveys conducted at Bus parks and along critical corridors in Ikeja and Lagos Island hubs. Traffic counts were conducted at Bus parks to determine the number of vehicles loading and leaving the major parks, and also at strategic points along the major corridors to determine the volume of vehicles and the vehicle composition along each of the routes.

6.1 Ikeja Hub

Manual Classified counts were conducted along all the identified routes within the Ikeja Hub, the counts were conducted for about 12 hours. The vehicles that were counted include:

- Private Cars/SUVs/Pick-up;
- Coasters;
- Danfo/LT;
- High Occupancy Vehicle (HOV);
- Mini Bus;
- Taxi;
- Tricycle and
- Trucks / Tankers.

The routes where the counts were taken include:

- Ikeja – Ketu;
- Ikeja – Egbeda;
- Ikeja – Maryland – Yaba (One way route);
- Ikeja – Berger;
- Ikeja – Adeniyi Jones – Ogba;
- Ikeja – Alausa Secretariat – Iyana Oworo;
- Ikeja – Toyin – Opebi;
- Ikeja – Maryland – Ojuelegba;
- Ikeja – Allen – Opebi;
- Ikeja – NAHCO;
- Ikeja - Oba Akran – Ogba and
- Ikeja - Ojota

i. Ikeja – Ketu

The location for the MCC along the Ikeja – Ketu route is along CMD Road (from Ikeja) and at 7Up Bottling Company Bus stop (to Ikeja) along Mobolaji Johnson Road. The Average Daily Traffic (ADT) in the direction From Ikeja is 3,407 vehicles with 401 and 395 vehicles in the AM and PM peak hours respectively.

This route is mostly travelled by Private cars and Danfos. Private Cars are the most prominent vehicle type along this segment of the road with 66% of total traffic volume. Danfos make up 30%. High Occupancy Vehicles (HOVs) are not common along this route as LAGBUS / HOV constitute 0.3%, while Coaster make up 0.4% of the total traffic volume. Trucks / Tankers makes up 0.5%, of the total traffic volume. Minibuses, Taxis and Tricycles make up 1.8%, 1.1% and 0.2% respectively of the traffic volume in this direction. Table 6.1 and Figure 6.1 depict the 12-Hour traffic volumes and traffic volume profile respectively.

In the other direction of traffic, the Average Daily Traffic (ADT) was 3,960 vehicles with 339 and 395 vehicles in the AM and PM peak hours respectively. Private Cars make up 47% of total traffic volume; LAGBUS / HOV constitute 0.4%, while Coaster makes up 1.4% of the total traffic. Trucks / Tankers makes up 15%, while Danfo Buses are 18% of the total traffic volume. Minibuses, Taxis and Tricycles make up 11%, 7%, and 0.2% of the traffic volume respectively in this direction. Table 6.2 and Figure 6.2 depict the 12-Hour traffic volumes and traffic volume profile respectively.

Similarly, Tables 6.3 shows the summary of traffic volumes and passenger demand in both directions along the Ikeja – Ketu route. Figures 6.3 and 6.4 are charts showing traffic volumes and passenger demand respectively at the MCC location.

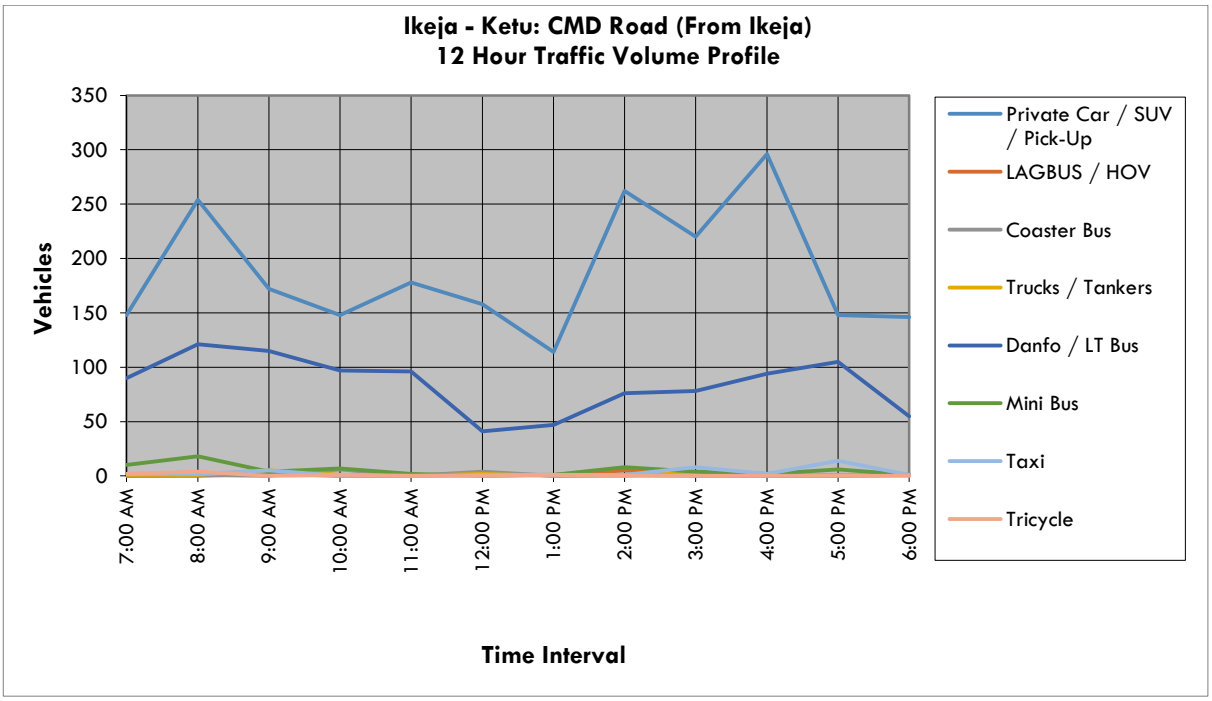


Figure 6.1: 12-Hour Traffic Volume Profile along Ikeja – Ketu Route (Direction: *From Ikeja*)

Table 6.1: 12-Hour Traffic Volume along Ikeja – Ketu Route (Direction: *From Ikeja*)

12-Hour Traffic Volumes

ROUTE:	Ikeja - Ketu	**DATE:**	March 15, 2017
SEGMENT:	CMD Road	**DAY:**	
LOCATION:	CMD Road	**DIR.:**	From Ikeja

TIME INTERVAL	Private Car / SUV / Pick-Up	LAGBUS / HOV	Coaster Bus	Trucks / Tankers	Danfo / LT Bus	Mini Bus	Taxi	Tricycle	*All Vehicles*
07:00-08:00	148	0	0	1	90	10	2	2	253
08:00-09:00	254	0	1	1	121	18	2	4	401
09:00-10:00	172	2	0	5	115	4	5	0	303
10:00-11:00	148	0	6	1	97	7	0	1	260
11:00-12:00	178	0	0	0	96	2	0	0	276
12:00-01:00	158	1	4	2	41	0	1	0	207
01:00-02:00	114	1	0	0	47	1	1	1	165
02:00-03:00	262	5	1	0	76	8	1	0	353
03:00-04:00	220	1	0	3	78	4	8	0	314
04:00-05:00	296	0	0	1	94	2	2	0	395
05:00-06:00	148	0	0	1	105	6	14	0	274
06:00-07:00	146	1	1	1	55	1	1	0	206
TOTAL	**2,244**	**11**	**13**	**16**	**1,015**	**63**	**37**	**8**	**3,407**
Percentage (%)	65.9%	0.3%	0.4%	0.5%	29.8%	1.8%	1.1%	0.2%	100.0%
						AM Peak	*8:00 AM*	*PM Peak*	*4:00 PM*
							401		395

Table 6.2: 12-Hour Traffic Volume along Ikeja – Ketu Route (Direction: *To Ikeja*)

12-Hour Traffic Volumes

ROUTE	Ikeja - Ketu	**DATE:**	March 15, 2017
SEGMENT:	Ziatech Road	**DAY:**	
LOCATION:	7Up Bottling Company	**DIR.:**	To Ikeja

TIME INTERVAL	Private Car / SUV / Pick-Up	LAGBUS / HOV	Coaster Bus	Trucks / Tankers	Danfo / LT Bus	Mini Bus	Taxi	Tricycle	*All Vehicles*
07:00-08:00	119	5	4	21	72	39	15	2	277
08:00-09:00	115	3	0	28	84	42	14	4	290
09:00-10:00	121	1	5	27	53	43	9	0	259
10:00-11:00	148	0	10	50	47	38	13	1	307
11:00-12:00	199	0	2	56	49	15	18	0	339
12:00-01:00	180	0	1	62	35	20	11	0	309
01:00-02:00	156	1	2	27	60	31	31	1	309
02:00-03:00	167	0	0	92	67	44	36	0	406
03:00-04:00	183	0	3	89	101	52	44	0	472
04:00-05:00	140	1	5	50	41	31	22	0	290
05:00-06:00	165	2	13	54	36	25	15	0	310
06:00-07:00	168	1	11	42	73	55	45	0	395
TOTAL	**1,858**	**14**	**56**	**598**	**718**	**435**	**273**	**8**	**3,960**
Percentage (%)	46.9%	0.4%	1.4%	15.1%	18.1%	11.0%	6.9%	0.0%	100.0%
							11:00 AM		*6:00 PM*
							339		395

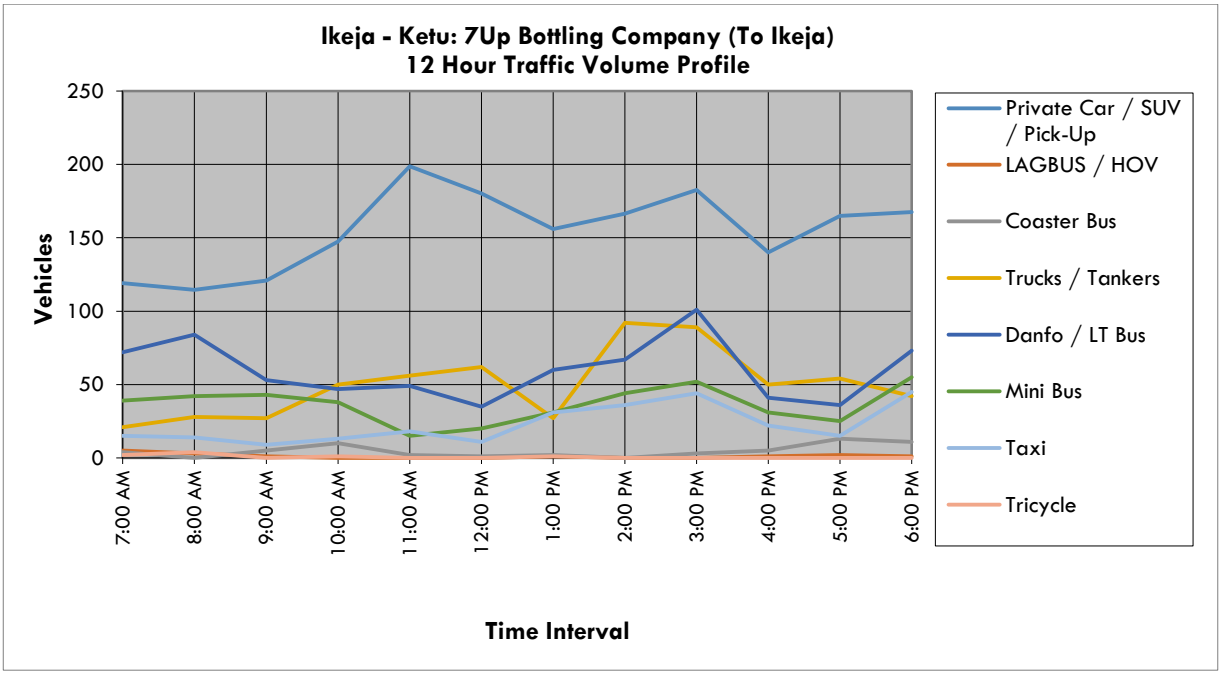


Figure 6.2: 12-Hour Traffic Volume Profile along Ikeja – Ketu Route (Direction: *To Ikeja*)

Table 6.3: 12-Hour Traffic Volume & Passenger Demand along Ikeja – Ketu Route (Both Directions)

TIME INTERVAL	Private Car / SUV / Pick-Up	LAGBUS / HOV	Coaster Bus	Trucks / Tankers	Danfo / LT Bus	Mini Bus	Taxi	Tricycle	TOTAL
07:00-08:00	267	5	4	22	162	49	17	4	530
08:00-09:00	369	3	1	29	205	60	16	8	691
09:00-10:00	293	3	5	32	168	47	14	0	562
10:00-11:00	296	0	16	51	144	45	13	2	567
11:00-12:00	377	0	2	56	145	17	18	0	615
12:00-01:00	338	1	5	64	76	20	12	0	516
01:00-02:00	270	2	2	27	107	32	32	2	474
02:00-03:00	429	5	1	92	143	52	37	0	759
03:00-04:00	403	1	3	92	179	56	52	0	786
04:00-05:00	436	1	5	51	135	33	24	0	685
05:00-06:00	313	2	13	55	141	31	29	0	584
06:00-07:00	314	2	12	43	128	56	46	0	601
Total	**4,102**	**25**	**69**	**614**	**1,733**	**498**	**310**	**16**	**7,367**
Average Volume/Hour	342	2	6	51	144	42	26	1	614
% Share	56%	0%	1%	8%	24%	7%	4%	0%	100%
Vehicle Capacity	5	50	36	3	14	14	4	3	
Vehicle Occupancy	40%	80%	70%	60%	80%	50%	40%	70%	
Daily Pax. Demand	**8,205**	**1,000**	**1,739**	**1,105**	**19,410**	**3,486**	**496**	**34**	**35,474**
Hourly Pax. Demand	684	83	145	92	1,617	291	41	3	2,956

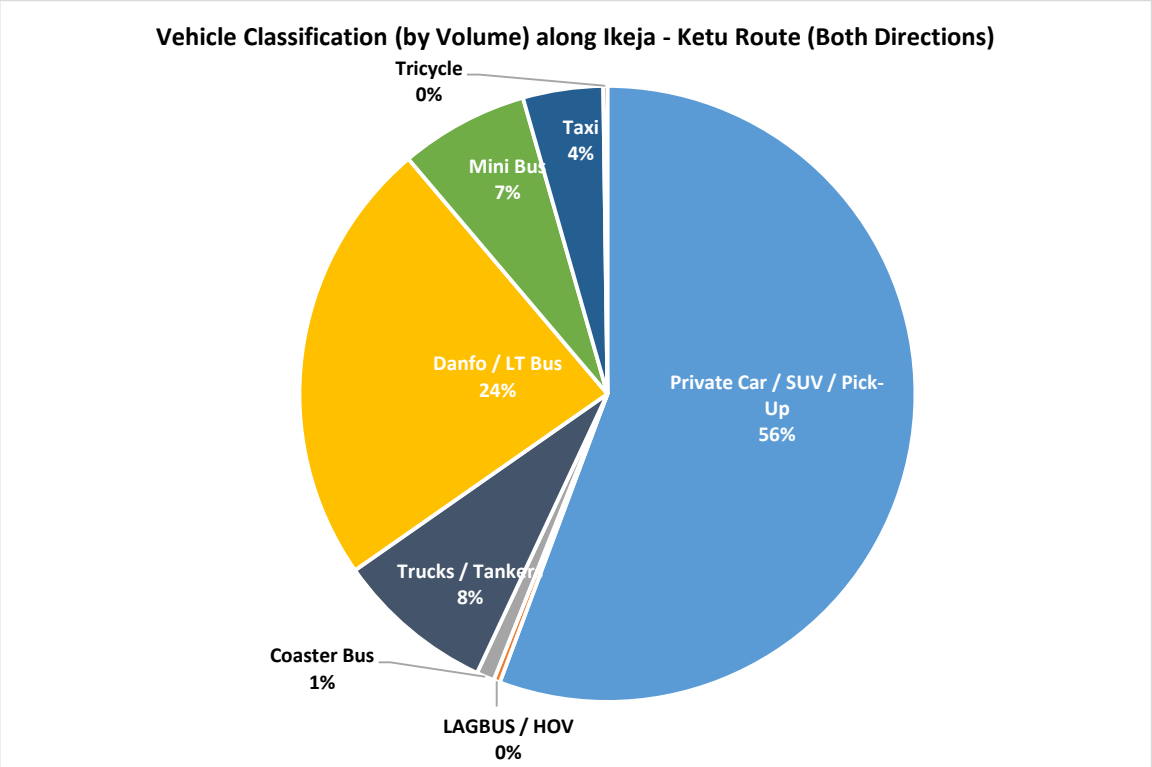


Figure 6.3: Traffic Volume along Ikeja – Ketu Route (Both Directions)

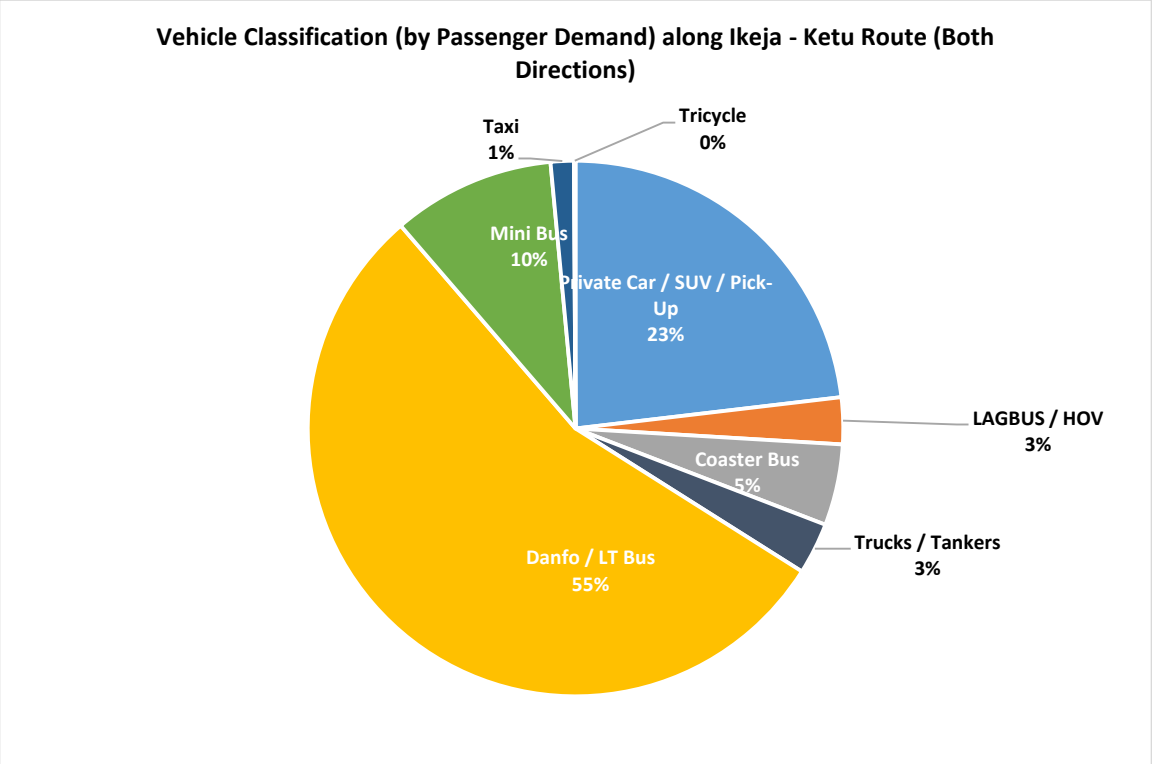


Figure 6.4: Passenger Demand along Ikeja – Ketu Route (Both Directions)

ii. Ikeja – Egbeda

The location for the MCC along the Ikeja – Egbeda route was around Bakery Bus stop along Akowonjo Road. The Average Daily Traffic (ADT) in the direction From Egbeda was 9,195 vehicles with 1,126 and 738 in the AM and PM peak hours respectively.

Private Cars are the most prominent vehicle type along this route with 48% of total traffic volume, LAGBUS / HOV constitute 0.1%, while Coaster make up 0.2% of the total traffic volume. Trucks / Tankers makes up 0.7%, of the total traffic volume. Danfos, Minibuses, Taxis, and Tricycles make up 29%, 2%, 1% and 18% of the traffic volume in this direction. Table 6.4 and Figure 6.5 depict the traffic volumes and traffic volume profile respectively.

In the other direction of traffic, the Average Daily Traffic (ADT) is 8,007 vehicles with 673 and 872 in the AM and PM peak hours respectively. Private Cars make up 49% of total traffic volume; LAGBUS / HOV constitute 0.3%, while Coaster makes up 0.4% of the total traffic. Trucks / Tankers makes up 2%, while Danfo Buses are 32% of the total traffic volume respectively. Minibuses, Taxis and Tricycles make up 3%, 0.8%, and 13% of traffic respectively in this direction. Table 6.5 and Figure 6.6 depict the traffic volumes and traffic volume profile respectively.

Similarly, Tables 6.6 shows the summary of traffic volumes and passenger demand at the bus stop along the Ikeja – Egbeda route. Figures 6.7 and 6.8 are charts showing traffic volumes and passenger demand respectively at the MCC location.

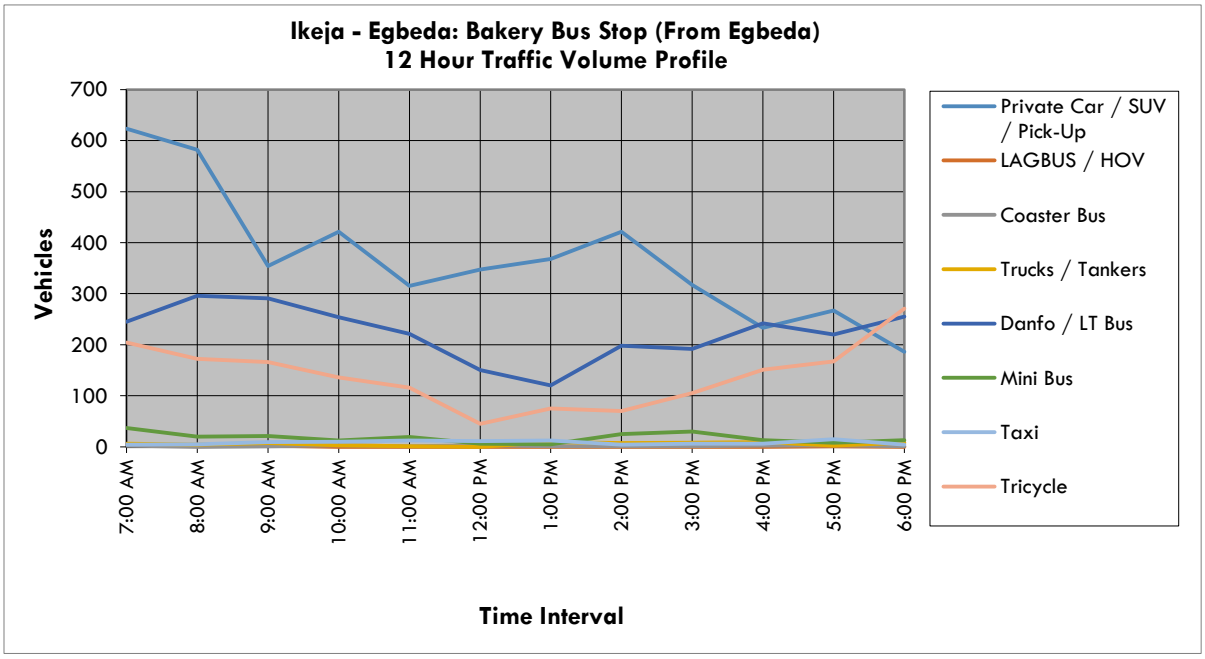


Figure 6.5: 12-Hour Traffic Volume along Ikeja – Egbeda route (Direction: *From Egbeda*)

Table 6.4: 12-Hour Traffic Volume along Ikeja – Egbeda route (Direction: *From Egbeda*)

12-Hour Traffic Volumes

ROUTE	Ikeja - Egbeda	**DATE:**	March 15, 2017
SEGMENT:	Akowonjo Road	**DAY:**	
LOCATION:	Bakery Bus Stop	**DIR.:**	From Egbeda

TIME INTERVAL	Private Car / SUV / Pick-Up	LAGBUS / HOV	Coaster Bus	Trucks / Tankers	Danfo / LT Bus	Mini Bus	Taxi	Tricycle	*All Vehicles*
07:00-08:00	623	5	2	6	245	37	4	204	1,126
08:00-09:00	582	1	0	4	296	20	5	172	1,080
09:00-10:00	354	2	1	7	291	21	9	166	851
10:00-11:00	421	0	3	3	254	12	10	136	839
11:00-12:00	315	0	1	1	221	19	12	116	685
12:00-01:00	347	0	3	0	150	6	11	45	562
01:00-02:00	368	0	1	9	120	5	12	75	590
02:00-03:00	421	0	1	7	198	25	4	70	726
03:00-04:00	317	0	1	8	192	30	6	105	659
04:00-05:00	233	0	2	9	242	13	6	151	656
05:00-06:00	267	1	3	2	220	8	15	167	683
06:00-07:00	186	0	1	8	255	13	4	271	738
TOTAL	**4,434**	**9**	**19**	**64**	**2,684**	**209**	**98**	**1,678**	**9,195**
Percentage (%)	48.2%	0.1%	0.2%	0.7%	29.2%	2.3%	1.1%	18.2%	100.0%
						AM Peak	*7:00 AM*	*PM Peak*	*6:00 PM*
							1,126		738

Table 6.5: 12-Hour Traffic Volume along Ikeja – Egbeda route (Direction: *To Egbeda*)

12-Hour Traffic Volumes

ROUTE	Ikeja - Egbeda	**DATE:**	March 15, 2017
SEGMENT:	Akowonjo Road	**DAY:**	
LOCATION:	Bakery Bus Stop	**DIR.:**	To Egbeda

TIME INTERNAL	Private Car / SUV / Pick-Up	LAGBUS / HOV	Coaster Bus	Trucks / Tankers	Danfo / LT Bus	Mini Bus	Taxi	Tricycle	*All Vehicles*
07:00-08:00	302	3	3	5	250	12	1	97	673
08:00-09:00	313	5	2	8	199	4	2	92	625
09:00-10:00	385	3	3	10	167	3	2	44	617
10:00-11:00	345	4	2	21	213	33	7	21	646
11:00-12:00	197	1	2	11	162	31	6	45	455
12:00-01:00	180	0	3	11	226	12	12	105	549
01:00-02:00	355	1	0	12	198	22	6	69	663
02:00-03:00	418	3	0	12	172	4	9	30	648
03:00-04:00	377	1	2	12	194	7	7	61	661
04:00-05:00	350	5	2	9	243	43	4	107	763
05:00-06:00	360	1	7	19	244	49	4	151	835
06:00-07:00	365	0	5	7	286	12	2	195	872
TOTAL	**3,947**	**27**	**31**	**137**	**2,554**	**232**	**62**	**1,017**	**8,007**
Percentage (%)	49.3%	0.3%	0.4%	1.7%	31.9%	2.9%	0.8%	12.7%	100.0%
						AM Peak	*7:00 AM*	*PM Peak*	*6:00 PM*
							673		872

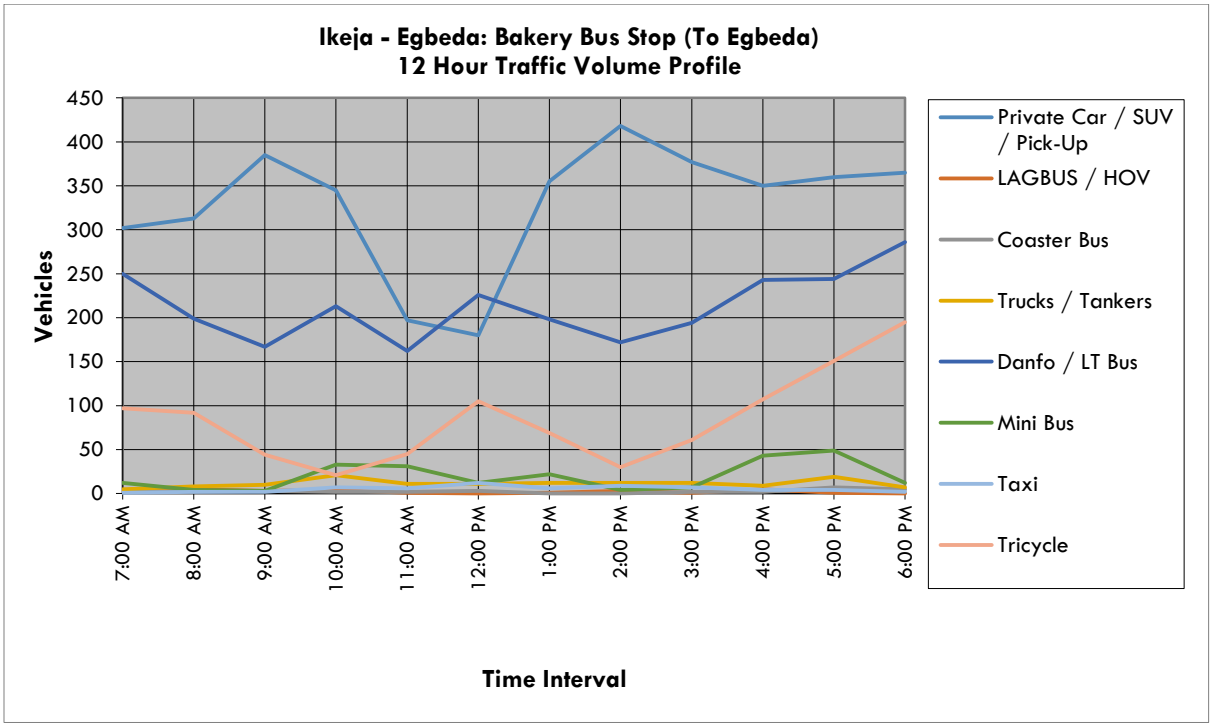


Figure 6.6: 12-Hour Traffic Volume along Ikeja – Egbeda route (Direction: *To Egbeda*)

Table 6.6: 12-Hour Traffic Volume & Passenger Demand along Ikeja – Egbeda Route (Both Directions)

TIME INTERVAL	Private Car / SUV / Pick-Up	LAGBUS / HOV	Coaster Bus	Trucks / Tankers	Danfo / LT Bus	Mini Bus	Taxi	Tricycle	TOTAL
07:00-08:00	925	8	5	11	495	49	5	301	1,799
08:00-09:00	895	6	2	12	495	24	7	264	1,705
09:00-10:00	739	5	4	17	458	24	11	210	1,468
10:00-11:00	766	4	5	24	467	45	17	157	1,485
11:00-12:00	512	1	3	12	383	50	18	161	1,140
12:00-01:00	527	0	6	11	376	18	23	150	1,111
01:00-02:00	723	1	1	21	318	27	18	144	1,253
02:00-03:00	839	3	1	19	370	29	13	100	1,374
03:00-04:00	694	1	3	20	386	37	13	166	1,320
04:00-05:00	583	5	4	18	485	56	10	258	1,419
05:00-06:00	627	2	10	21	464	57	19	318	1,518
06:00-07:00	551	0	6	15	541	25	6	466	1,610
Total	**8,381**	**36**	**50**	**201**	**5,238**	**441**	**160**	**2,695**	**17,202**
Average Volume/Hour	698	3	4	17	437	37	13	225	1,434
% Share	49%	0%	0%	1%	30%	3%	1%	16%	100%
Vehicle Capacity	5	50	36	3	14	14	4	3	
Vehicle Occupancy	40%	80%	70%	60%	80%	50%	40%	70%	
Daily Pax. Demand	**16,762**	**1,440**	**1,260**	**362**	**58,666**	**3,087**	**256**	**5,660**	**87,492**
Hourly Pax. Demand	1,397	120	105	30	4,889	257	21	472	7,291

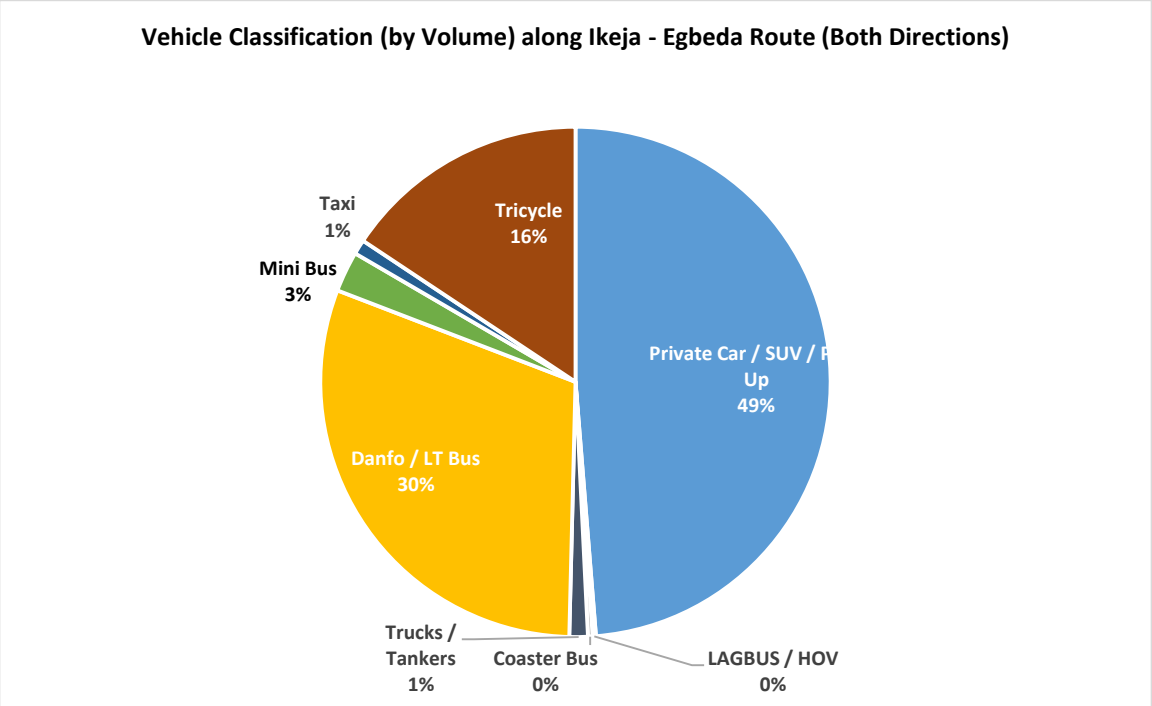


Figure 6.7: Traffic Volume along Ikeja – Egbeda Route (Both Directions)

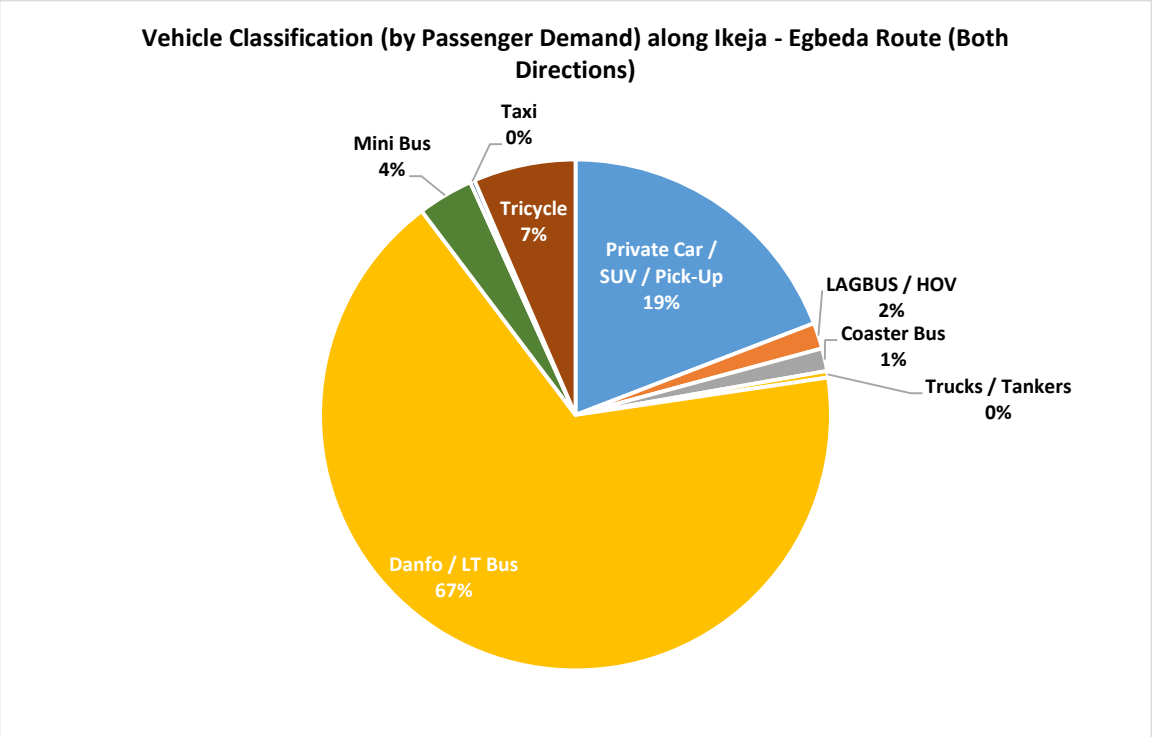


Figure 6.8: Passenger demand along Ikeja – Egbeda Route (Both Directions)

iii Ikeja – Maryland – Yaba (One way route)

The location for the MCC along the Ikeja – Yaba route was by the popular Efex transport company. Average Daily Traffic (ADT) in the direction From Ikeja was 13,667 vehicles with 1,496 and 1,286 in the AM and PM peak hours respectively.

The prominent means of Public Transport in this route is the Danfos. Private Cars are the most prominent vehicle type along this segment of the road with 44% of total traffic, LAGBUS / HOV constitute 3%, while Coaster make up 0.2% of the total traffic volume. Trucks / Tankers and Danfos makes up 0.7% and 34% of the total traffic volume respectively. Minibuses, Taxis, and Tricycles make up 3%, 7% and 10% of the traffic volume in this direction. Table 6.7 and Figure 6.9 depicts the traffic volumes and traffic volume profile respectively.

Tables 6.8 shows the summary of traffic volumes and passenger demand at the Ikeja – Maryland – Yaba route. Figures 6.10 and 6.11 are charts showing traffic volumes and passenger demand respectively at the MCC location.

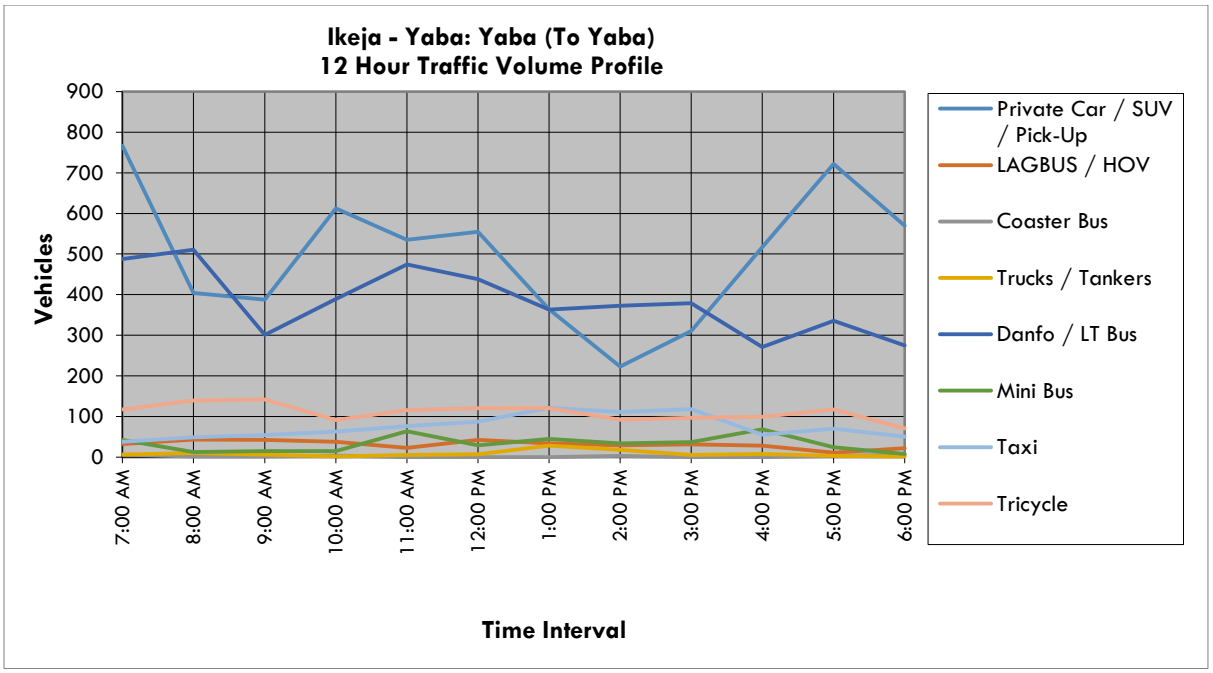


Figure 6.9: 12-Hour Traffic Volume Profile along Ikeja – Maryland – Yaba route (Direction: *To Yaba*)

Table 6.7: 12-Hour Traffic Volume along Ikeja – Maryland – Yaba route (Direction: *To Yaba*)

12-Hour Traffic Volumes

ROUTE	Ikeja - Maryland - Yaba	**DATE:**	March 15, 2017
SEGMENT:	Muritala Mohammed Way	**DAY:**	
LOCATION:	Yaba	**DIR.:**	To Yaba

TIME INTERVAL	Private Car / SUV / Pick-Up	LAGBUS / HOV	Coaster Bus	Trucks / Tankers	Danfo / LT Bus	Mini Bus	Taxi	Tricycle	*All Vehicles*
07:00-08:00	767	32	6	6	488	42	38	117	1,496
08:00-09:00	404	43	1	10	511	12	49	139	1,169
09:00-10:00	388	42	1	6	301	15	54	142	949
10:00-11:00	612	38	4	1	389	15	63	91	1,213
11:00-12:00	535	23	0	5	474	64	76	116	1,293
12:00-01:00	555	42	0	7	438	29	87	120	1,278
01:00-02:00	364	34	0	28	363	45	121	120	1,075
02:00-03:00	223	29	3	18	373	34	111	92	883
03:00-04:00	310	31	0	5	379	37	118	97	977
04:00-05:00	517	28	0	8	271	68	55	99	1,046
05:00-06:00	722	11	3	3	336	24	70	117	1,286
06:00-07:00	570	22	5	1	275	8	50	71	1,002
TOTAL	**5,967**	**375**	**23**	**98**	**4,598**	**393**	**892**	**1,321**	**13,667**
Percentage (%)	43.7%	2.7%	0.2%	0.7%	33.6%	2.9%	6.5%	9.7%	100.0%
							7:00 AM		*5:00 PM*
							1,496		1,286

Table 6.8: 12-Hour Traffic Volume & Passenger Demand along Ikeja – Maryland – Yaba Route (One Way)

TIME INTERVAL	Private Car / SUV / Pick-Up	LAGBUS / HOV	Coaster Bus	Trucks / Tankers	Danfo / LT Bus	Mini Bus	Taxi	Tricycle	TOTAL
07:00-08:00	767	32	6	6	488	42	38	117	1,496
08:00-09:00	404	43	1	10	511	12	49	139	1,169
09:00-10:00	388	42	1	6	301	15	54	142	949
10:00-11:00	612	38	4	1	389	15	63	91	1,213
11:00-12:00	535	23	0	5	474	64	76	116	1,293
12:00-01:00	555	42	0	7	438	29	87	120	1,278
01:00-02:00	364	34	0	28	363	45	121	120	1,075
02:00-03:00	223	29	3	18	373	34	111	92	883
03:00-04:00	310	31	0	5	379	37	118	97	977
04:00-05:00	517	28	0	8	271	68	55	99	1,046
05:00-06:00	722	11	3	3	336	24	70	117	1,286
06:00-07:00	570	22	5	1	275	8	50	71	1,002
Total	**5,967**	**375**	**23**	**98**	**4,598**	**393**	**892**	**1,321**	**13,667**
Average Volume/Hour	497	31	2	8	383	33	74	110	1,139
% Share	44%	3%	0%	1%	34%	3%	7%	10%	100%
Vehicle Capacity	5	50	36	3	14	14	4	3	
Vehicle Occupancy	40%	80%	70%	60%	80%	50%	40%	70%	
Daily Pax. Demand	**11,934**	**15,000**	**580**	**176**	**51,498**	**2,751**	**1,427**	**2,774**	**86,140**
Hourly Pax. Demand	995	1,250	48	15	4,291	229	119	231	7,178

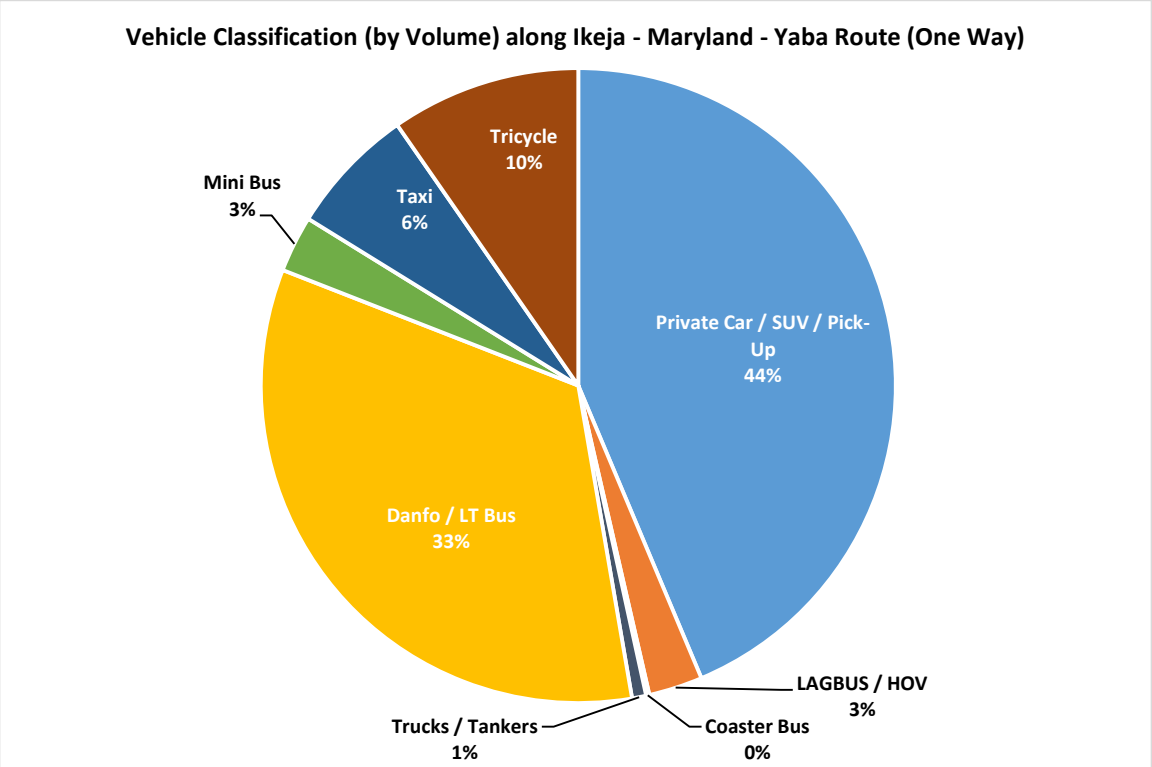


Figure 6.10: Traffic Volume along Ikeja – Maryland – Yaba Route (One Way)

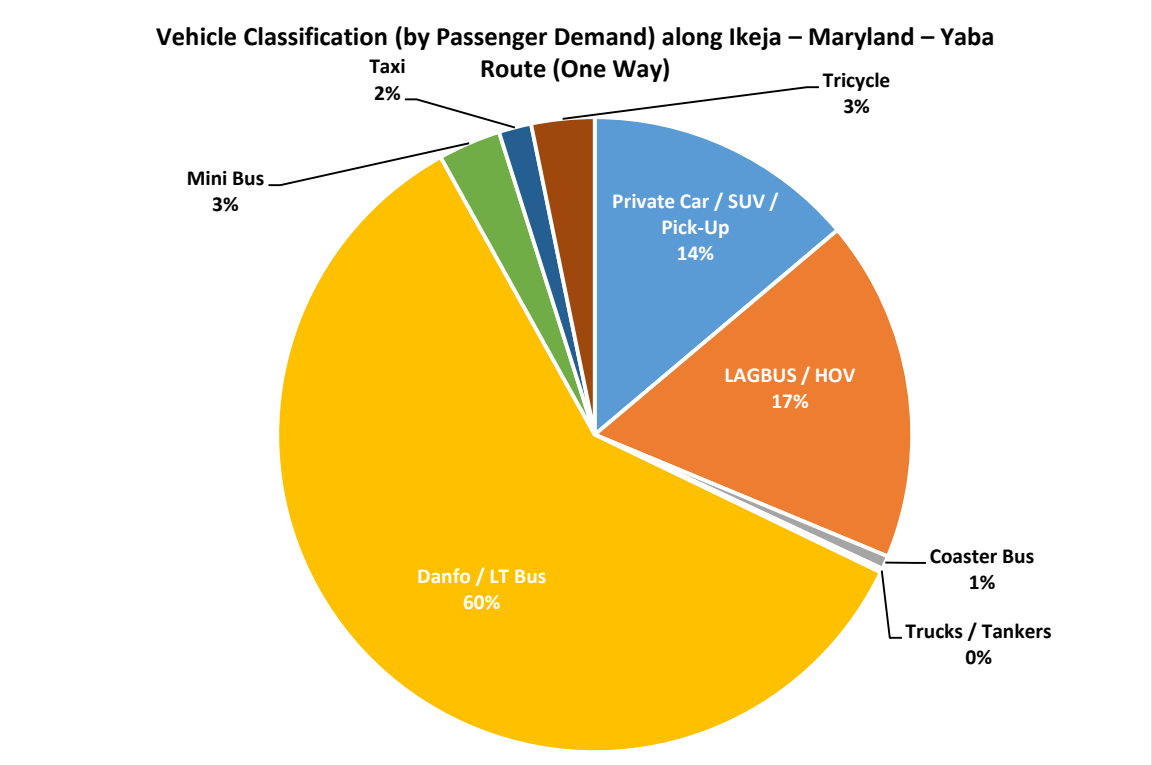


Figure 6.11: Passenger Demand along Ikeja – Maryland – Yaba Route (One Way)

iv. Ikeja – Berger

The location for the MCC along the Ikeja – Berger route was by the popular CLAM Church junction along Isheri road. The Average Daily Traffic (ADT) in the direction From Berger was 14,566 vehicles with 1,944 and 1,203 in the AM and PM peak hours respectively.

Private Cars are the most prominent vehicle type along this segment of the road with 49% of total traffic, followed by Tricycles which make up 33%, while Danfos make up 10% of the total 12-Hour traffic. Trucks / Tankers makes up 1.5%, Minibuses and Taxis constitute 4% and 2% of the traffic in this direction respectively. LAGBUS / HOV constitute 0.1%, while Coaster make up 0.1% of the total traffic volume. Table 6.9 and Figure 6.12 depict the 12-Hour traffic volumes and traffic volume profile respectively.

In the other direction of traffic, the Average Daily Traffic (ADT) was 12,612 vehicles with 1,225 and 1,849 in the AM and PM peak hours respectively. Private Cars make up 52% and Tricycles 31%, while Danfo Buses are 12% of the total traffic volume respectively. Minibuses and Taxis make up 1.5% and 1.8% of traffic volume respectively in this direction. Trucks / Tankers makes up 1%, LAGBUS / HOV constitute 0.1%, while Coaster makes up 0.3% of the total traffic. Table 6.10 and Figure 6.13 depicts the traffic volumes and traffic volume profile respectively.

Similarly, Tables 6.11 shows the summary of traffic volumes and passenger demand at the bus stop along the Ikeja – Berger route. Figures 6.14 and 6.15 are charts showing traffic volumes and passenger demand respectively at the MCC location.

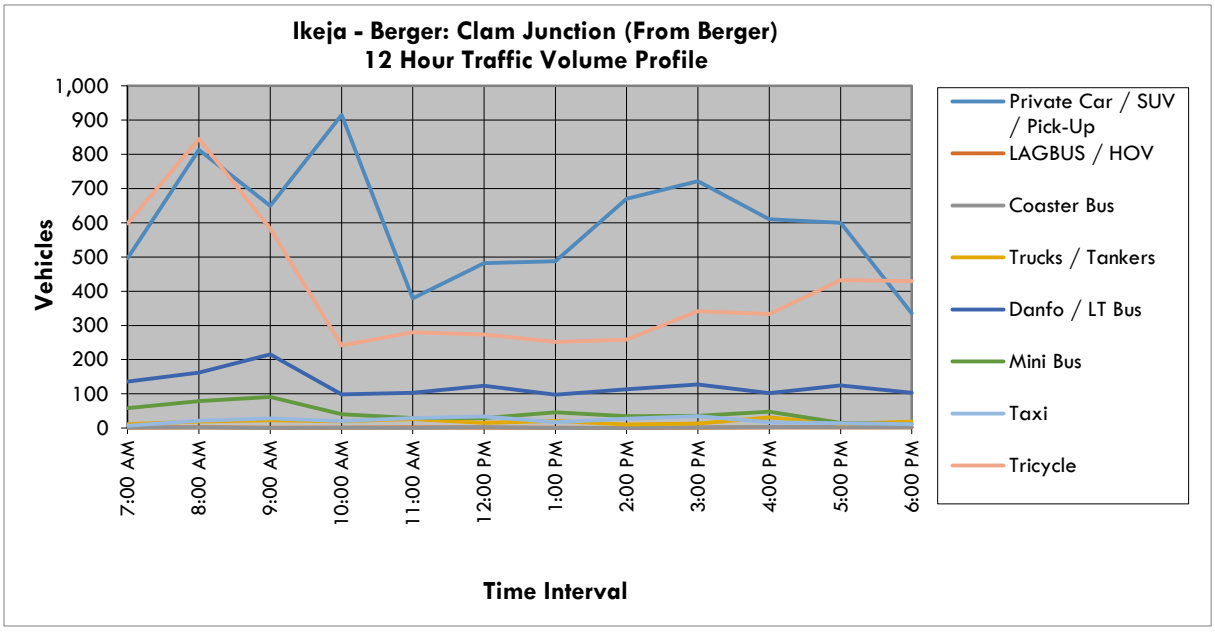


Figure 6.12: 12-Hour Traffic Volume profile along Ikeja – Berger route (Direction: *From Berger*)

Table 6.9: 12-Hour Traffic Volume along Ikeja – Berger route (Direction: *From Berger*)

12-Hour Traffic Volumes

ROUTE:	Ikeja - Berger	**DATE:**	March 15, 2017
SEGMENT:	Isheri Road	**DAY:**	
LOCATION:	Clam Church Junction	**DIR.:**	From Berger

TIME INTERVAL	Private Car / SUV / Pick-Up	LAGBUS / HOV	Coaster Bus	Trucks / Tankers	Danfo / LT Bus	Mini Bus	Taxi	Tricycle	*All Vehicles*
07:00-08:00	496	1	2	11	136	58	7	598	1,309
08:00-09:00	813	2	2	19	162	79	22	845	1,944
09:00-10:00	650	1	0	23	215	91	28	582	1,590
10:00-11:00	915	1	1	20	98	40	21	242	1,338
11:00-12:00	379	2	0	26	103	29	29	280	848
12:00-01:00	482	1	3	15	124	29	34	273	961
01:00-02:00	488	1	0	21	97	46	17	252	922
02:00-03:00	670	0	0	10	113	35	27	258	1,113
03:00-04:00	722	1	2	13	127	36	35	342	1,278
04:00-05:00	610	2	3	31	102	48	17	333	1,146
05:00-06:00	600	2	3	12	125	15	14	432	1,203
06:00-07:00	335	2	3	19	103	11	11	430	914
TOTAL	**7,160**	**16**	**19**	**220**	**1,505**	**517**	**262**	**4,867**	**14,566**
Percentage (%)	49.2%	0.1%	0.1%	1.5%	10.3%	3.5%	1.8%	33.4%	100.0%
							8:00 AM		*5:00 PM*
							1,944		1,203

Table 6.10: 12-Hour Traffic Volume along Ikeja – Berger route (Direction: *To Berger*)

12-Hour Traffic Volumes

ROUTE	Ikeja - Berger	**DATE:**	March 15, 2017
SEGMENT:	Isheri Road	**DAY:**	
LOCATION:	Clam Church Junction	**DIR.:**	To Berger

TIME INTERVAL	Private Car / SUV / Pick-Up	LAGBUS / HOV	Coaster Bus	Trucks / Tankers	Danfo / LT Bus	Mini Bus	Taxi	Tricycle	*All Vehicles*
07:00-08:00	429	1	6	14	183	27	9	556	1,225
08:00-09:00	284	2	0	11	133	16	10	404	860
09:00-10:00	196	0	0	2	88	17	11	277	591
10:00-11:00	626	2	13	5	159	17	36	243	1,101
11:00-12:00	557	2	14	20	134	15	40	294	1,076
12:00-01:00	437	1	4	20	130	8	50	259	909
01:00-02:00	234	0	0	18	49	12	6	162	481
02:00-03:00	326	1	0	35	74	8	11	189	644
03:00-04:00	371	3	2	13	87	19	9	227	731
04:00-05:00	833	2	0	25	152	20	8	389	1,429
05:00-06:00	1,140	2	1	33	157	20	17	346	1,716
06:00-07:00	1,065	2	4	32	173	12	24	537	1,849
TOTAL	**6,498**	**18**	**44**	**228**	**1,519**	**191**	**231**	**3,883**	**12,612**
Percentage (%)	51.5%	0.1%	0.3%	1.8%	12.0%	1.5%	1.8%	30.8%	100.0%
							7:00 AM		*6:00 PM*
							1,225		1,849

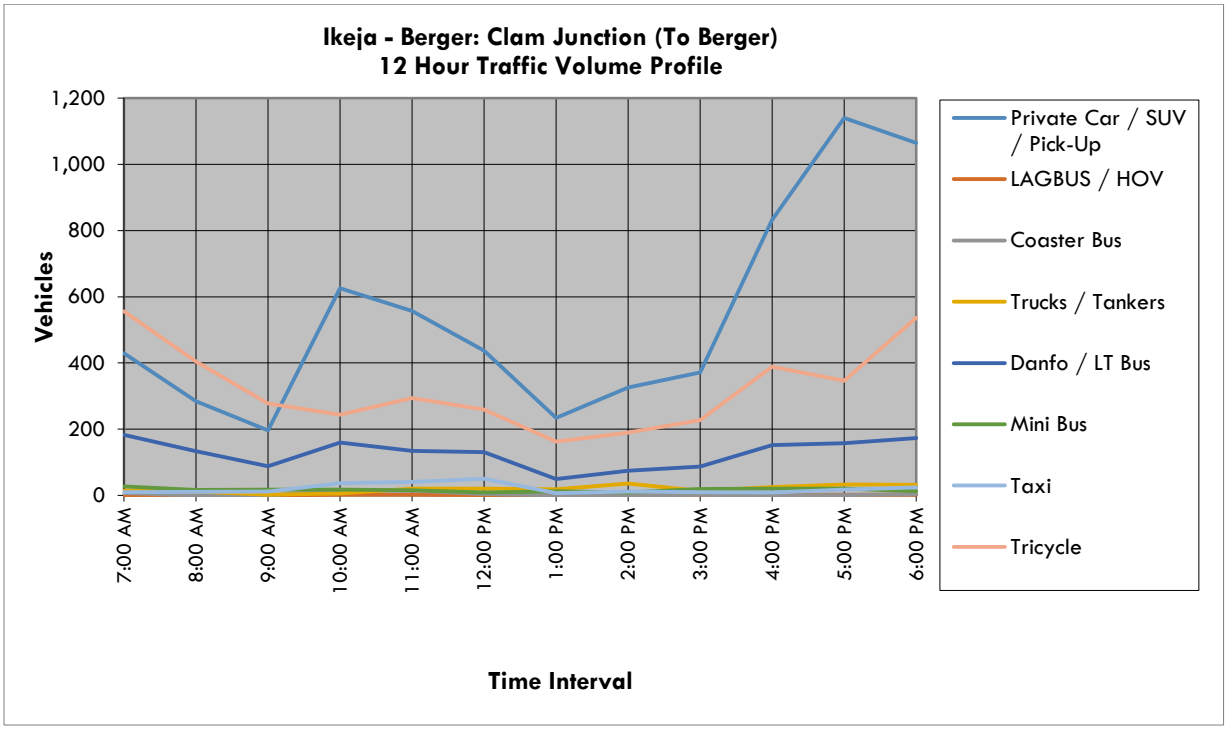


Figure 6.13: 12-Hour Traffic Volume profile along Ikeja – Berger route (Direction: *To Berger*)

Table 6.11: 12-Hour Traffic Volume & Passenger Demand along Ikeja – Berger (Both Directions)

TIME INTERVAL	Private Car / SUV / Pick-Up	LAGBUS / HOV	Coaster Bus	Trucks / Tankers	Danfo / LT Bus	Mini Bus	Taxi	Tricycle	TOTAL
07:00-08:00	925	2	8	25	319	85	16	1,154	2,534
08:00-09:00	1,097	4	2	30	295	95	32	1,249	2,804
09:00-10:00	846	1	0	25	303	108	39	859	2,181
10:00-11:00	1,541	3	14	25	257	57	57	485	2,439
11:00-12:00	936	4	14	46	237	44	69	574	1,924
12:00-01:00	919	2	7	35	254	37	84	532	1,870
01:00-02:00	722	1	0	39	146	58	23	414	1,403
02:00-03:00	996	1	0	45	187	43	38	447	1,757
03:00-04:00	1,093	4	4	26	214	55	44	569	2,009
04:00-05:00	1,443	4	3	56	254	68	25	722	2,575
05:00-06:00	1,740	4	4	45	282	35	31	778	2,919
06:00-07:00	1,400	4	7	51	276	23	35	967	2,763
Total	**13,658**	**34**	**63**	**448**	**3,024**	**708**	**493**	**8,750**	**27,178**
Average Volume/Hour	1,138	3	5	37	252	59	41	729	2,265
% Share	50%	0%	0%	2%	11%	3%	2%	32%	100%
Vehicle Capacity	5	50	36	3	14	14	4	3	
Vehicle Occupancy	40%	80%	70%	60%	80%	50%	40%	70%	
Daily Pax. Demand	**27,316**	**1,360**	**1,588**	**806**	**33,869**	**4,956**	**789**	**18,375**	**89,059**
Hourly Pax. Demand	2,276	113	132	67	2,822	413	66	1,531	7,422

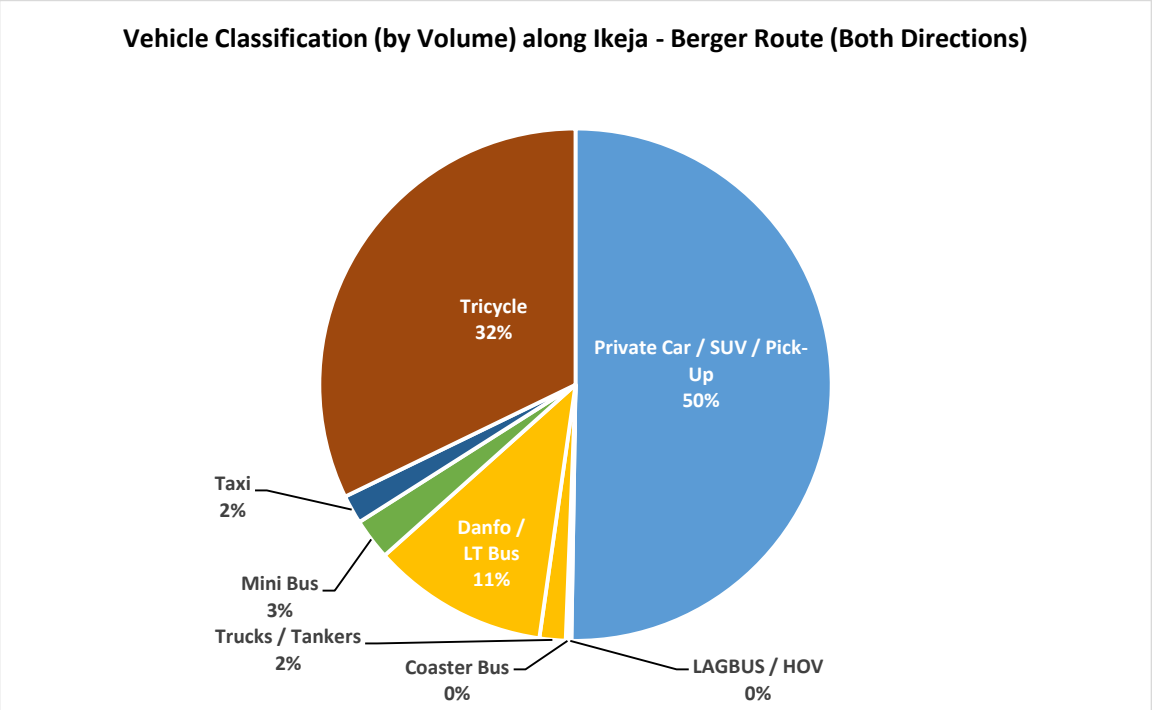


Figure 6.14: Traffic Volume along Ikeja – Berger Route (Both Directions)

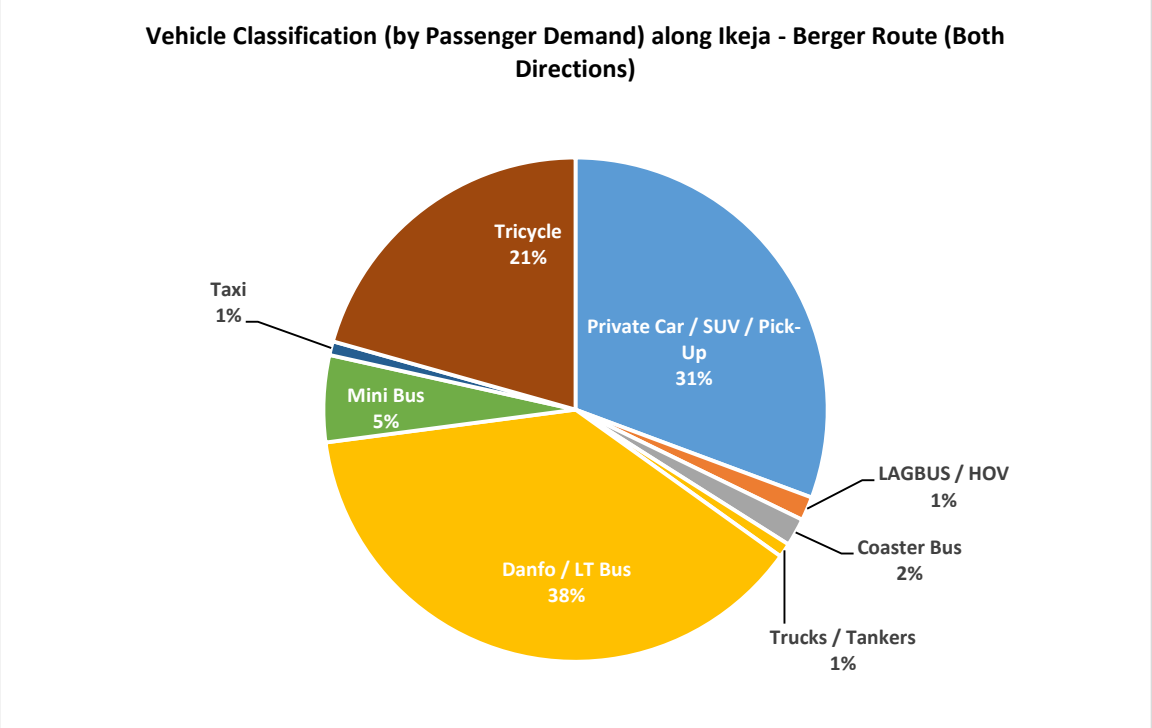


Figure 6.15: Passenger Demand along Ikeja – Berger Route (Both Directions)

v. Ikeja – Adeniyi Jones – Ogba

The location for the MCC along the Ikeja – Adeniyi Jones – Ogba route was by Vulcanizer junction along Adeniyi Jones Avenue. The traffic volume in the direction From Ikeja was 8,801 vehicles with 816 and 1,189 in the AM and PM peak hours respectively.

The prominent means of Public Transport in this route is the Tricycles. Private Cars are the most prominent vehicle type along this segment of the road with 64%, followed by Tricycles with 24% of total traffic. Trucks / Tankers makes up 2%, while Danfos make up 4% of the total 12-Hour traffic. Minibuses and Taxis make up 2%, 1.4% of the traffic respectively in this direction. LAGBUS / HOV are rare along along this corridor and constitute 0.0%, while Coaster make up 3% of the total traffic volume. Table 6.12 and Figure 6.16 depict the traffic volumes and traffic volume profile respectively.

In the other direction of traffic, the traffic volume in the direction towards Ikeja is 7,290 vehicles with 840 and 670 in the AM and PM peak hours respectively. Private Cars make up 58%, followed by Tricycles with 34% of total traffic volume, LAGBUS / HOV constitute 0.0%, while Coaster makes up 0.1% of the total traffic. Trucks / Tankers makes up 2%, while Danfo Buses are 2% of the total 12-Hour traffic respectively. Minibuses and Taxis make up 3.4%, 1.8% of traffic respectively in this direction. Table 6.13 and Figure 6.17 depict the 12-Hour traffic volumes and traffic volume profile respectively.

Similarly, Tables 6.14 shows the summary of traffic volumes and passenger demand at the bus stop along the Ikeja – Adeniyi Jones – Ogba route. Figures 6.18 and 6.19 are charts showing traffic volumes and passenger demand respectively at the MCC location.

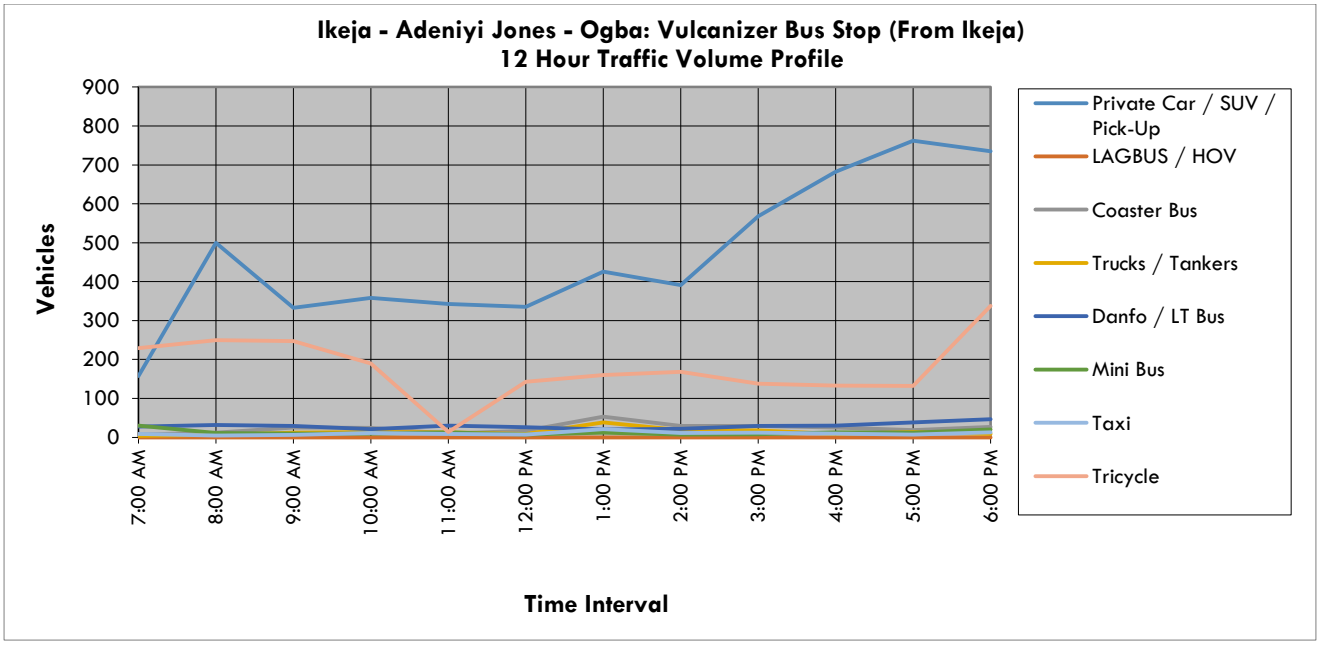


Figure 6.16: 12-Hour Traffic Volume profile along Ikeja – Adeniyi Jones – Ogba route (Direction: *From Ikeja*)

Table 6.13: 12-Hour Traffic Volume along Ikeja – Adeniyi Jones – Ogba route (Direction: *To Ikeja*)

12-Hour Traffic Volumes

ROUTE	Ikeja - Adeniyi Jones - Ogba	**DATE:**	March 15, 2017
SEGMENT:	Adeniyi Jones Avenue	**DAY:**	
LOCATION:	Vulcanizer Bus Stop	**DIR.:**	To Ikeja

TIME INTERVAL	Private Car / SUV / Pick-Up	LAGBUS / HOV	Coaster Bus	Trucks / Tankers	Danfo / LT Bus	Mini Bus	Taxi	Tricycle	*All Vehicles*
07:00-08:00	417	0	2	2	13	31	6	369	840
08:00-09:00	367	0	0	8	13	26	5	267	686
09:00-10:00	337	0	0	10	10	21	12	222	612
10:00-11:00	392	0	0	7	9	20	11	149	588
11:00-12:00	306	0	0	15	9	15	15	164	524
12:00-01:00	268	0	0	18	9	18	12	148	473
01:00-02:00	388	0	0	12	5	21	19	137	582
02:00-03:00	486	0	0	12	13	18	6	139	674
03:00-04:00	314	0	0	15	12	21	11	163	536
04:00-05:00	284	0	0	8	20	26	16	183	537
05:00-06:00	345	0	1	17	22	20	11	254	670
06:00-07:00	232	0	2	12	27	10	6	279	568
TOTAL	**4,136**	**0**	**5**	**136**	**162**	**247**	**130**	**2,474**	**7,290**
Percentage (%)	56.7%	0.0%	0.1%	1.9%	2.2%	3.4%	1.8%	33.9%	100.0%
							7:00 AM		*5:00 PM*
							840		670

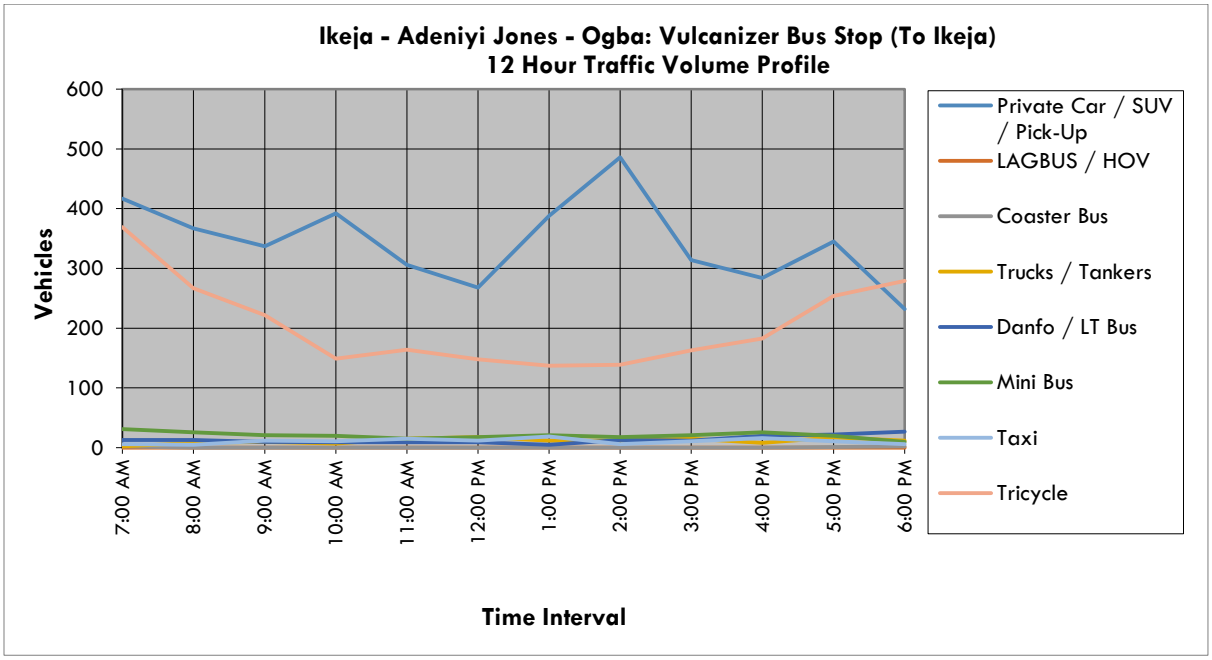


Figure 6.17: 12-Hour Traffic Volume profile along Ikeja – Adeniyi Jones – Ogba route (Direction: *To Ikeja*)

Table 6.14: 12-Hour Traffic Volume & Passenger Demand along Ikeja - Adeniyi Jones - Ogba (Both Directions)

Time Interval	Private Car / SUV / Pick-Up	LAGBUS / HOV	Coaster Bus	Trucks / Tankers	Danfo / LT Bus	Mini Bus	Taxi	Tricycle	TOTAL
07:00-08:00	575	0	9	6	41	61	15	598	1,305
08:00-09:00	867	0	12	14	45	37	10	517	1,502
09:00-10:00	670	0	25	22	39	31	18	469	1,274
10:00-11:00	750	0	24	21	30	30	22	339	1,216
11:00-12:00	649	0	10	28	39	28	24	178	956
12:00-01:00	603	0	17	27	35	25	19	291	1,017
01:00-02:00	814	0	53	50	25	33	40	297	1,312
02:00-03:00	877	0	29	31	35	25	17	307	1,321
03:00-04:00	882	0	29	33	41	29	23	301	1,338
04:00-05:00	966	0	25	17	50	39	26	316	1,439
05:00-06:00	1,107	0	20	31	60	32	18	386	1,654
06:00-07:00	967	0	29	21	74	30	19	617	1,757
Total	**9,727**	**0**	**282**	**301**	**514**	**400**	**251**	**4,616**	**16,091**
Average Volume/Hour	811	0	24	25	43	33	21	385	1,341
% Share	60%	0%	2%	2%	3%	2%	2%	29%	100%
Vehicle Capacity	5	50	36	3	14	14	4	3	
Vehicle Occupancy	40%	80%	70%	60%	80%	50%	40%	70%	
Daily Pax. Demand	**19,454**	**0**	**7,106**	**542**	**5,757**	**2,800**	**402**	**9,694**	**45,754**
Hourly Pax. Demand	1,621	0	592	45	480	233	33	808	3,813

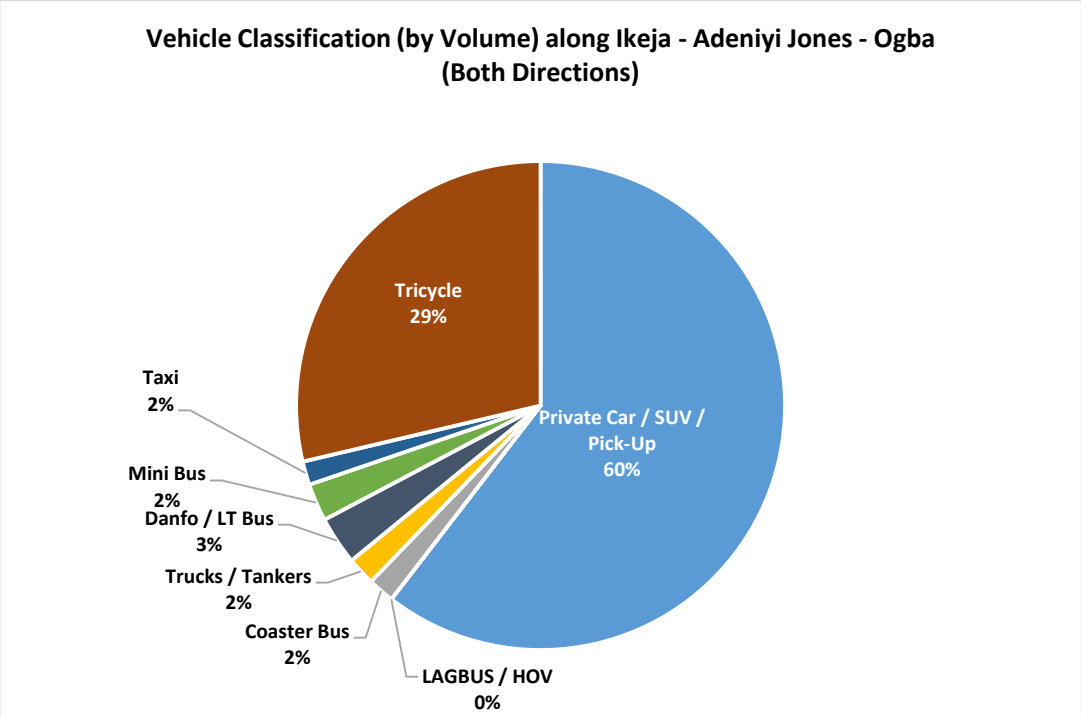


Figure 6.18: Traffic Volume along Ikeja - Adeniyi Jones - Ogba (Both Directions)

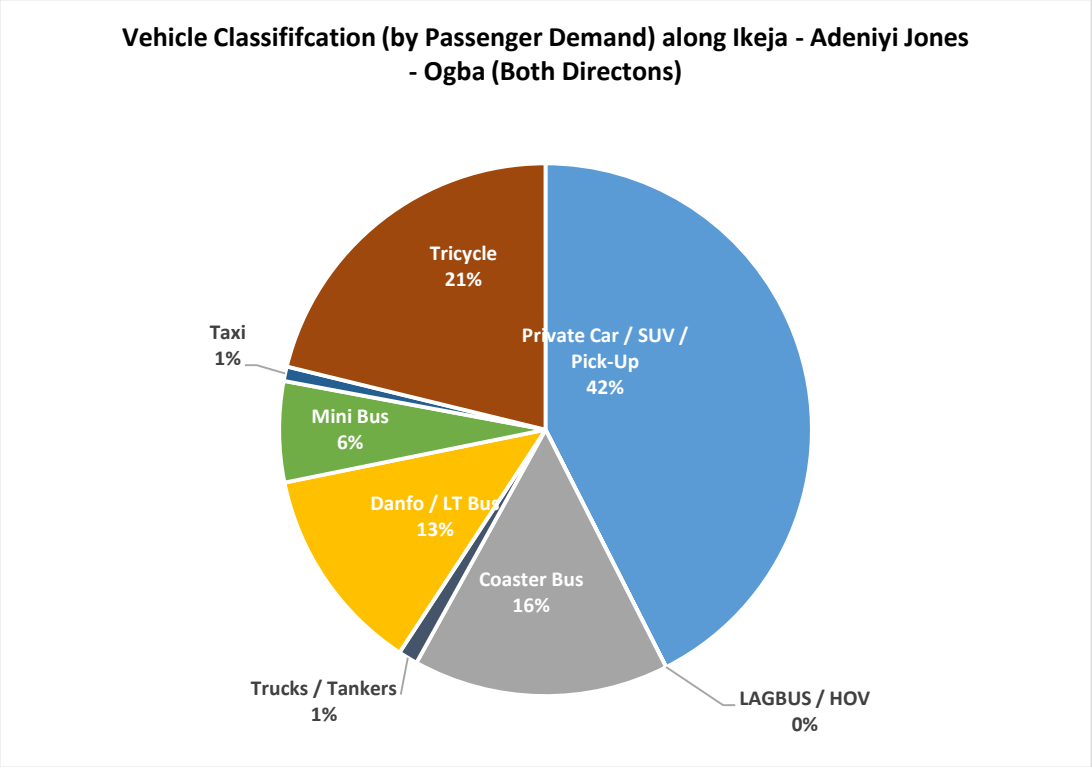


Figure 6.19: Passenger Demand along Ikeja - Adeniyi Jones - Ogba (Both Directions)

vi. Ikeja – Alausa Secretariat – Iyana Oworo

The location for the MCC along the Ikeja – Alausa Secretariat – Iyana Oworo route was by Alausa Secretariat along Obafemi Awolowo Way. The Average Daily Traffic (ADT) in the direction From Ikeja was 8,431 vehicles with 932 and 675 vehicles in the AM and PM peak hours respectively.

Private Cars are the most prominent vehicle type along this segment of the road with 78% of traffic, while Danfos make up 13.5% of the total traffic volume. Trucks / Tankers makes up 0.4%, LAGBUS / HOV constitute 0.3%, while Coaster make up 0.0% of the total 12-Hour traffic. Minibuses, Taxis, and Tricycles make up 5%, 2% and 0.1% of the traffic in this direction respectively. Table 6.15 and Figure 6.20 depicts the traffic volumes and traffic volume profile respectively.

In the other direction of traffic, the Average Daily Traffic was 8,148 vehicles with 967 and 795 in the AM and PM peak hours respectively. Private Cars make up 78%, while Danfo Buses are 15% of total traffic volume. LAGBUS / HOV constitute 0.3%, Coaster 0.1%, and Trucks / Tankers 0.3% of the total 12-Hour traffic. Minibuses, Taxis and Tricycles make up 4%, 3%, and 0.0% of traffic respectively in this direction. Table 6.16 and Figure 6.21 depict the traffic volumes and traffic volume profile respectively.

Similarly, Tables 6.17 shows the summary of traffic volumes and passenger demand at the bus stop along the Ikeja – Alausa Secretariat – Iyana Oworo route. Figures 6.22 and 6.23 are charts showing traffic volumes and passenger demand respectively at the MCC location.

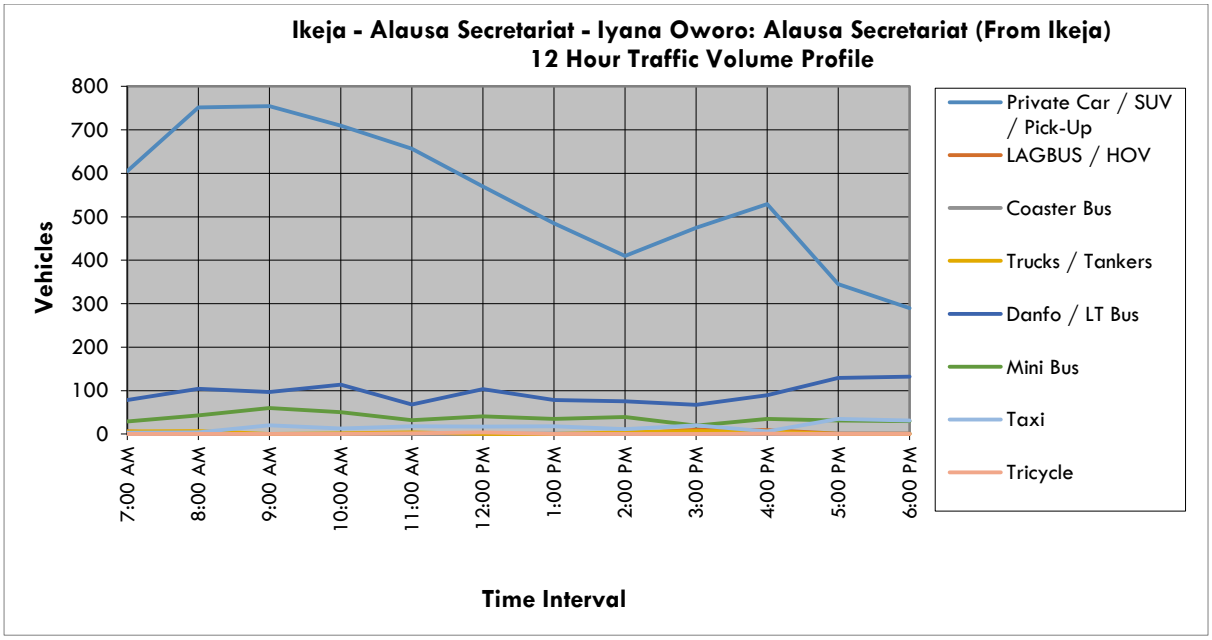


Figure 6.20: 12-Hour Traffic Volume profile along Ikeja – Alausa Secretariat – Iyana Oworo route

(Direction: *From Ikeja*)

Table 6.15: 12-Hour Traffic Volume along Ikeja – Alausa Secretariat – Iyana Oworo (Direction: *From Ikeja*)

12-Hour Traffic Volumes

ROUTE:	Ikeja - Alausa Secretariat - Iyana Oworo	**DATE:**	March 15, 2017
SEGMENT:	Obafemi Awolowo Way	**DAY:**	
LOCATION:	Alausa Secretariat	**DIR.:**	From Ikeja

TIME INTERVAL	Private Car / SUV / Pick-Up	LAGBUS / HOV	Coaster Bus	Trucks / Tankers	Danfo / LT Bus	Mini Bus	Taxi	Tricycle	*All Vehicles*
07:00-08:00	605	6	1	6	78	29	3	0	728
08:00-09:00	752	0	0	7	104	43	4	0	910
09:00-10:00	755	0	0	0	97	60	20	0	932
10:00-11:00	710	0	0	2	114	50	13	0	889
11:00-12:00	657	0	0	4	68	32	18	2	781
12:00-01:00	570	0	0	0	103	41	17	4	735
01:00-02:00	485	0	1	0	78	35	18	0	617
02:00-03:00	410	0	0	4	75	39	11	0	539
03:00-04:00	475	10	0	7	67	19	20	0	598
04:00-05:00	529	9	0	6	89	35	6	1	675
05:00-06:00	345	1	1	0	129	31	35	0	542
06:00-07:00	290	1	1	0	132	30	31	0	485
TOTAL	**6,583**	**27**	**4**	**36**	**1,134**	**444**	**196**	**7**	**8,431**
Percentage (%)	78.1%	0.3%	0.0%	0.4%	13.5%	5.3%	2.3%	0.1%	100.0%
							9:00 AM		*4:00 PM*
							932		675

Table 6.16: 12-Hour Traffic Volume along Ikeja – Alausa Secretariat – Iyana Oworo route (Direction: *To Ikeja*)

12-Hour Traffic Volumes

ROUTE	Ikeja - Alausa Secretariat - Iyana Oworo	**DATE:**	March 15, 2017
SEGMENT:	Obafemi Awolowo Way	**DAY:**	
LOCATION:	Alausa Secretariat	**DIR.:**	To Ikeja

TIME INTERVAL	Private Car / SUV / Pick-Up	LAGBUS / HOV	Coaster Bus	Trucks / Tankers	Danfo / LT Bus	Mini Bus	Taxi	Tricycle	*All Vehicles*
07:00-08:00	668	1	2	1	146	29	48	0	895
08:00-09:00	799	0	1	1	122	16	28	0	967
09:00-10:00	604	0	0	2	84	14	19	0	723
10:00-11:00	528	1	0	0	100	7	10	0	646
11:00-12:00	478	0	0	3	127	24	21	0	653
12:00-01:00	559	0	0	7	65	13	10	0	654
01:00-02:00	385	1	0	1	52	6	10	0	455
02:00-03:00	550	0	1	0	109	48	23	0	731
03:00-04:00	455	8	1	0	127	73	16	0	680
04:00-05:00	555	10	3	0	148	53	26	0	795
05:00-06:00	387	1	1	3	47	18	12	0	469
06:00-07:00	382	0	1	3	54	23	17	0	480
TOTAL	**6,350**	**22**	**10**	**21**	**1,181**	**324**	**240**	**0**	**8,148**
Percentage (%)	77.9%	0.3%	0.1%	0.3%	14.5%	4.0%	2.9%	0.0%	100.0%
							8:00 AM		*4:00 PM*
							967		795

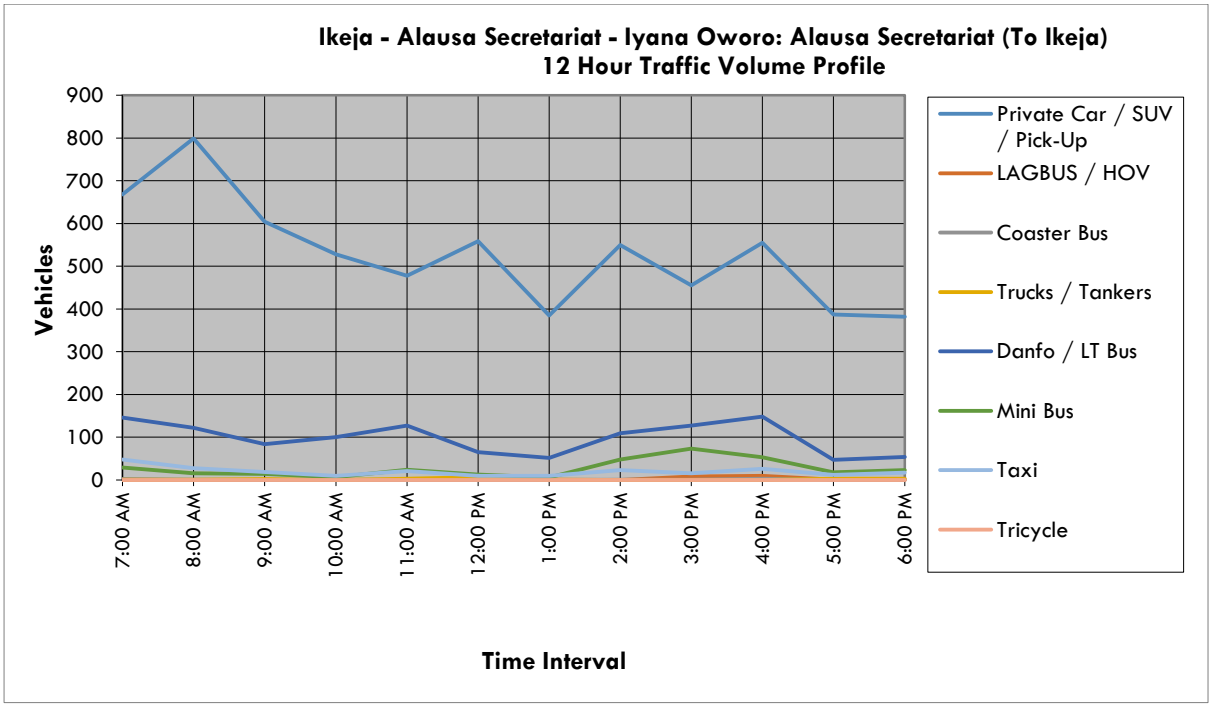


Figure 6.21: 12-Hour Traffic Volume profile along Ikeja – Alausa Secretariat – Iyana Oworo route (Direction: *To Ikeja*)

Table 6.17: 12-Hour Traffic Volume & Passenger Demand along Ikeja - Iyana Oworo (Both Directions)

Time Interval	Private Car / SUV / Pick-Up	LAGBUS / HOV	Coaster Bus	Trucks / Tankers	Danfo / LT Bus	Mini Bus	Taxi	Tricycle	TOTAL
07:00-08:00	1,273	7	3	7	224	58	51	0	1,623
08:00-09:00	1,551	0	1	8	226	59	32	0	1,877
09:00-10:00	1,359	0	0	2	181	74	39	0	1,655
10:00-11:00	1,238	1	0	2	214	57	23	0	1,535
11:00-12:00	1,135	0	0	7	195	56	39	2	1,434
12:00-01:00	1,129	0	0	7	168	54	27	4	1,389
01:00-02:00	870	1	1	1	130	41	28	0	1,072
02:00-03:00	960	0	1	4	184	87	34	0	1,270
03:00-04:00	930	18	1	7	194	92	36	0	1,278
04:00-05:00	1,084	19	3	6	237	88	32	1	1,470
05:00-06:00	732	2	2	3	176	49	47	0	1,011
06:00-07:00	672	1	2	3	186	53	48	0	965
Total	**12,933**	**49**	**14**	**57**	**2,315**	**768**	**436**	**7**	**16,579**
Average Volume/Hour	1,078	4	1	5	193	64	36	1	1,382
% Share	78%	0%	0%	0%	14%	5%	3%	0%	100%
Vehicle Capacity	5	50	36	3	14	14	4	3	
Vehicle Occupancy	40%	80%	70%	60%	80%	50%	40%	70%	
Daily Pax. Demand	**25,866**	**1,960**	**353**	**103**	**25,928**	**5,376**	**698**	**15**	**60,298**
Hourly Pax. Demand	2,156	163	29	9	2,161	448	58	1	5,025

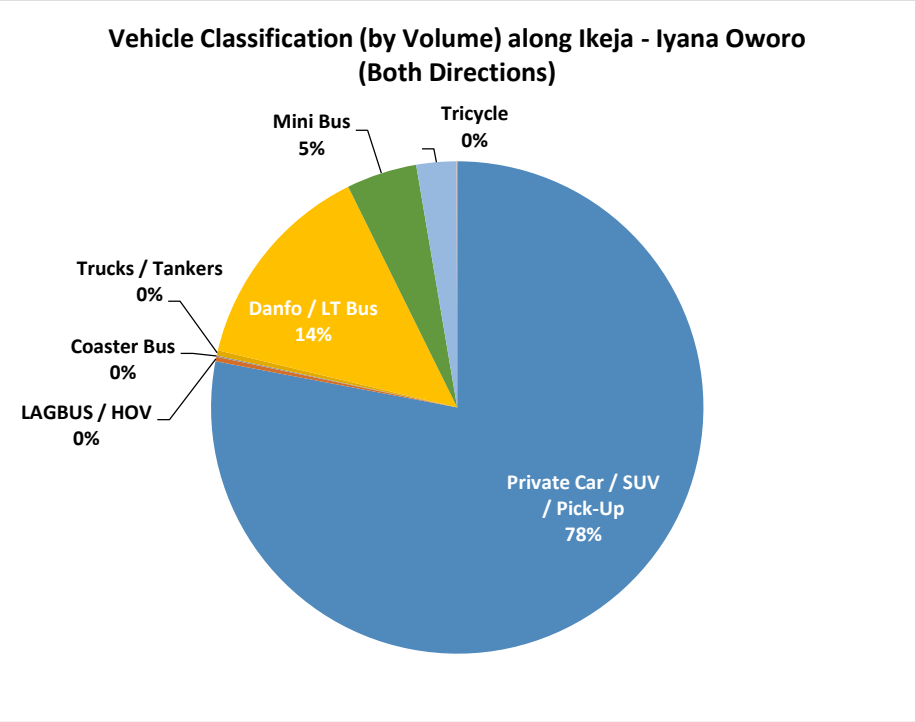


Figure 6.22: Traffic Volume along Ikeja – Iyana Oworo (Both Directions)

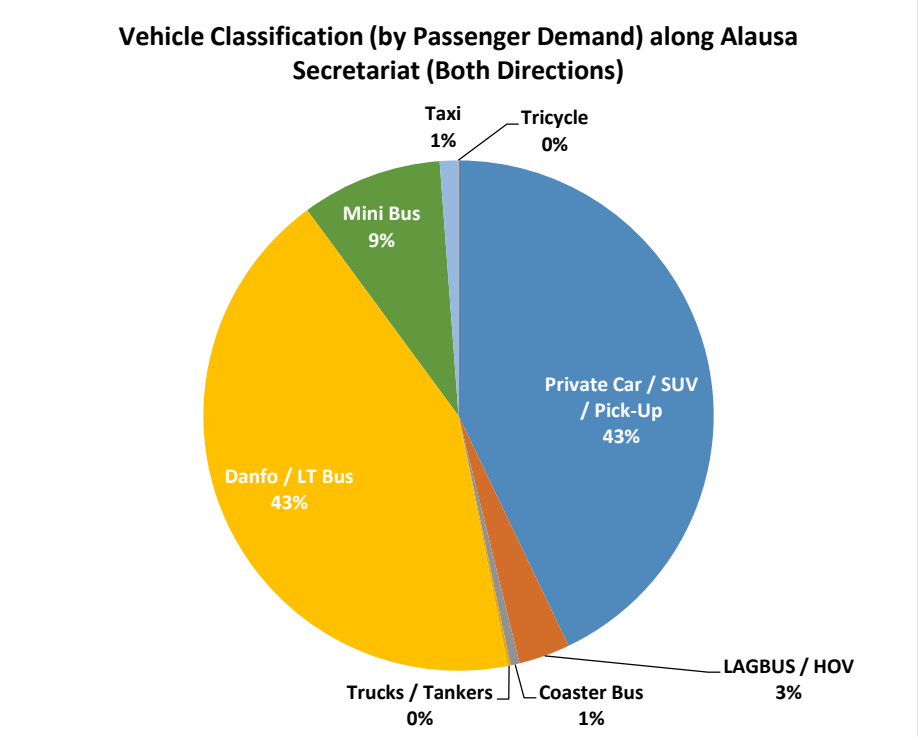


Figure 6.23: Passenger Demand along Ikeja – Iyana Oworo (Both Directions)

vii. Ikeja – Toyin – Opebi

The location for the MCC along the Ikeja – Toyin – Opebi route was by St. Leo Catholic church along Toyin Street. The Average Daily Traffic (ADT) in the direction From Ikeja was 12,401 vehicles with 1,460 and 851 in the AM and PM peak hours respectively.

The prominent means of Public Transport in this route is the Tricycles. Private Cars are the most prominent vehicle type along this segment of the road with 60.4% of total traffic, LAGBUS / HOV constitute 0.0%, while Coaster make up 0.2% of the total traffic volume. Trucks / Tankers makes up 0.5%, while Danfos make up 0.6% of the total traffic volume. Minibuses, Taxis, and Tricycles make up 2.6%, 3.3% and 32.5% of the traffic in this direction. Table 6.18 and Figure 6.24 depict the traffic volumes and traffic volume profile respectively.

In the other direction of traffic, the Average Daily Traffic (ADT) was 15,604 vehicles with 1,509 and 1,586 in the AM and PM peak hours respectively. Private Cars make up 54.9% of total traffic volume, LAGBUS / HOV constitute 0.0%, while Coaster makes up 0.1% of the total traffic. Trucks / Tankers makes up 0.6%, while Danfo Buses are 1.2% of the total 12-Hour traffic respectively. Minibuses, Taxis and Tricycles make up 1.8%, 3.7%, and 37.8% of traffic respectively in this direction. Table 6.19 and Figure 6.25 depict the traffic volumes and traffic volume profile respectively.

Similarly, Tables 6.20 shows the summary of traffic volumes and passenger demand at the bus stop along the Ikeja – Toyin – Opebi route. Figures 6.26 and 6.27 are charts showing traffic volumes and passenger demand respectively at the MCC location.

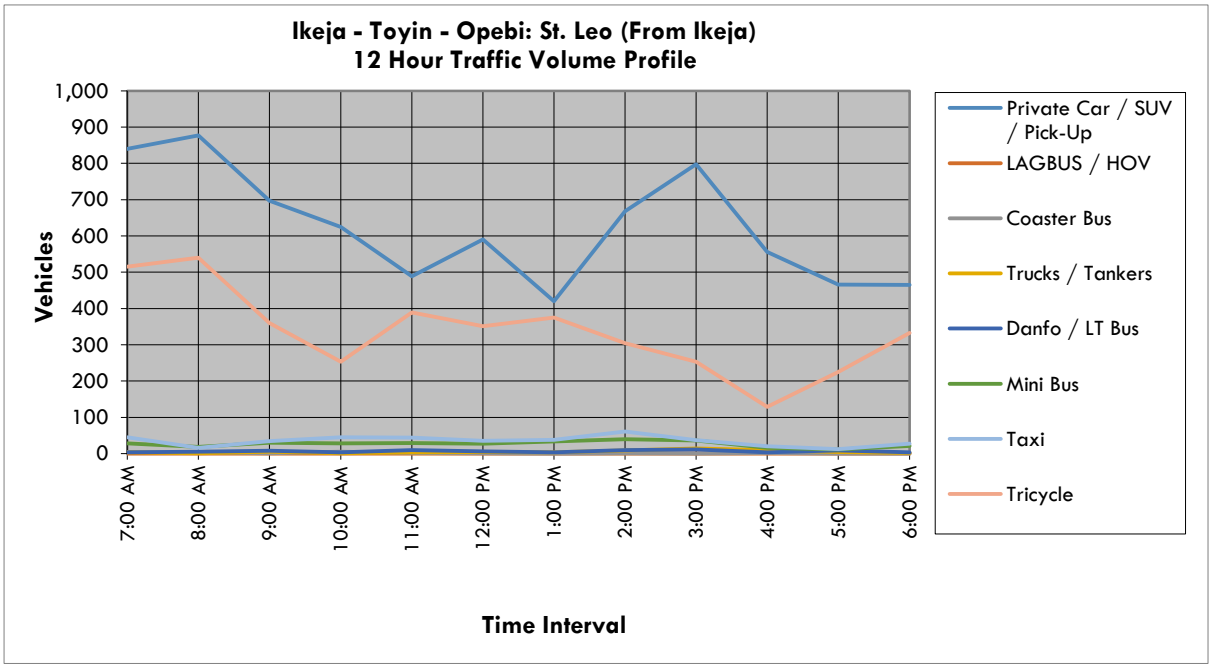


Figure 6.24: 12-Hour Traffic Volume profile along Ikeja – Toyin – Opebi route (Direction: *From Ikeja*)

Table 6.18: Traffic Volume along Ikeja – Toyin – Opebi route (Direction: *From Ikeja*)

12-Hour Traffic Volumes

ROUTE:	Ikeja - Toyin - Opebi	**DATE:**	March 15, 2017
SEGMENT:	Toyin Street	**DAY:**	
LOCATION:	St. Leo	**DIR.:**	From Ikeja

TIME INTERVAL	Private Car / SUV / Pick-Up	LAGBUS / HOV	Coaster Bus	Trucks / Tankers	Danfo / LT Bus	Mini Bus	Taxi	Tricycle	*All Vehicles*
07:00-08:00	840	0	4	3	3	28	45	515	1,438
08:00-09:00	877	0	3	1	5	18	16	540	1,460
09:00-10:00	697	0	1	5	8	30	34	360	1,135
10:00-11:00	625	0	5	1	3	28	45	253	960
11:00-12:00	489	0	2	3	10	29	44	389	966
12:00-01:00	590	0	1	4	6	27	35	351	1,014
01:00-02:00	420	0	0	3	3	33	38	375	872
02:00-03:00	668	0	1	9	10	40	61	304	1,093
03:00-04:00	798	0	0	14	11	36	37	253	1,149
04:00-05:00	556	0	2	10	3	16	20	129	736
05:00-06:00	466	0	0	4	9	11	12	225	727
06:00-07:00	465	0	0	2	3	21	27	333	851
TOTAL	**7,491**	**0**	**19**	**59**	**74**	**317**	**414**	**4,027**	**12,401**
Percentage (%)	60.4%	0.0%	0.2%	0.5%	0.6%	2.6%	3.3%	32.5%	100.0%
									8:00 AM
									1,460
									6:00 PM
									851

Table 6.19: 12-Hour Traffic Volume along Ikeja – Toyin – Opebi route (Direction: *To Ikeja*)

12-Hour Traffic Volumes

ROUTE	Ikeja - Toyin - Opebi	**DATE:**	March 15, 2017
SEGMENT:	Toyin Street	**DAY:**	
LOCATION:	St. Leo	**DIR.:**	To Ikeja

TIME INTERVAL	Private Car / SUV / Pick-Up	LAGBUS / HOV	Coaster Bus	Trucks / Tankers	Danfo / LT Bus	Mini Bus	Taxi	Tricycle	*All Vehicles*
07:00-08:00	546	0	4	7	3	16	26	538	1,140
08:00-09:00	753	0	1	2	3	10	35	705	1,509
09:00-10:00	743	0	1	12	5	17	31	550	1,359
10:00-11:00	870	0	0	5	10	17	27	512	1,441
11:00-12:00	916	0	2	7	7	20	48	468	1,468
12:00-01:00	639	0	0	23	17	16	41	395	1,131
01:00-02:00	680	0	0	12	11	14	20	230	967
02:00-03:00	782	0	0	8	11	21	34	202	1,058
03:00-04:00	779	0	0	2	14	29	59	507	1,390
04:00-05:00	612	0	1	5	17	42	103	625	1,405
05:00-06:00	823	0	1	3	31	44	61	623	1,586
06:00-07:00	421	0	0	0	61	39	89	540	1,150
TOTAL	**8,564**	**0**	**10**	**86**	**190**	**285**	**574**	**5,895**	**15,604**
Percentage (%)	54.9%	0.0%	0.1%	0.6%	1.2%	1.8%	3.7%	37.8%	100.0%
									8:00 AM
									1,509
									5:00 PM
									1,586

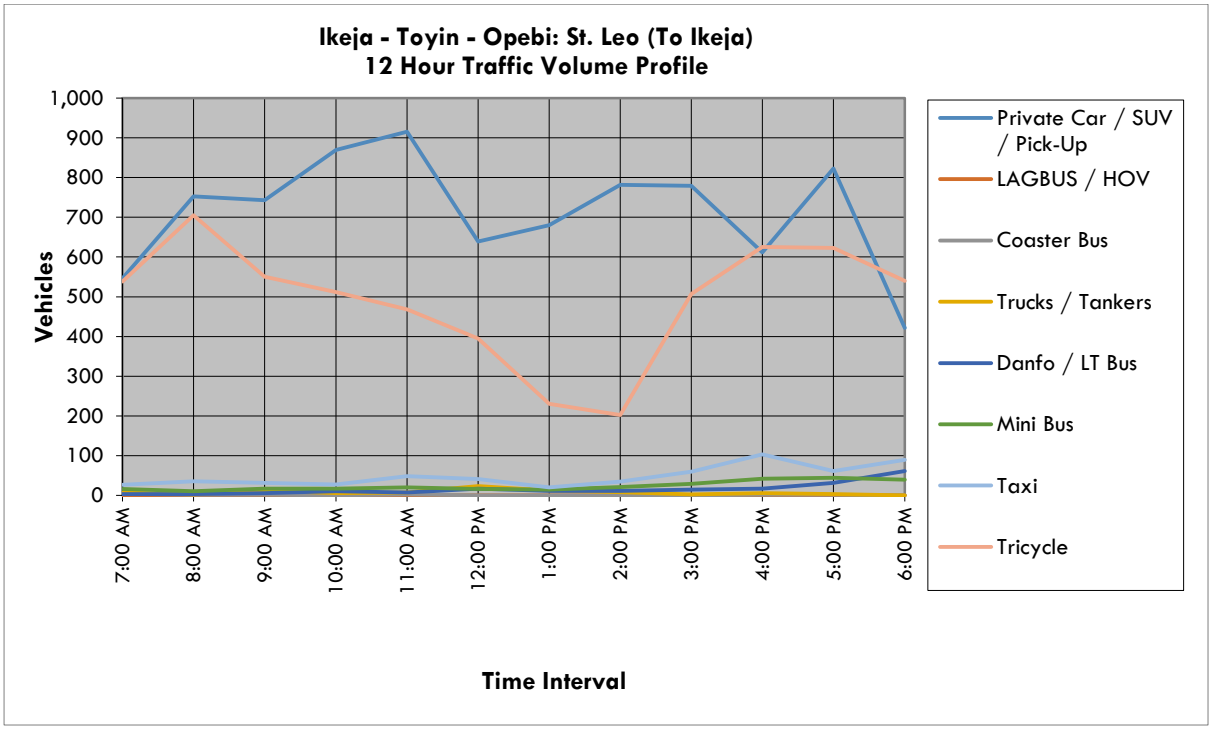


Figure 6.25: 12-Hour Traffic Volume profile along Ikeja – Toyin – Opebi route (Direction: *To Ikeja*)

Table 6.20: 12-Hour Traffic Volume & Passenger Demand along Ikeja - Toyin - Opebi (Both Directions)

TIME INTERVAL	Private Car / SUV / Pick-Up	LAGBUS / HOV	Coaster Bus	Trucks / Tankers	Danfo / LT Bus	Mini Bus	Taxi	Tricycle	TOTAL
07:00-08:00	1,386	0	8	10	6	44	71	1,053	2,578
08:00-09:00	1,630	0	4	3	8	28	51	1,245	2,969
09:00-10:00	1,440	0	2	17	13	47	65	910	2,494
10:00-11:00	1,495	0	5	6	13	45	72	765	2,401
11:00-12:00	1,405	0	4	10	17	49	92	857	2,434
12:00-01:00	1,229	0	1	27	23	43	76	746	2,145
01:00-02:00	1,100	0	0	15	14	47	58	605	1,839
02:00-03:00	1,450	0	1	17	21	61	95	506	2,151
03:00-04:00	1,577	0	0	16	25	65	96	760	2,539
04:00-05:00	1,168	0	3	15	20	58	123	754	2,141
05:00-06:00	1,289	0	1	7	40	55	73	848	2,313
06:00-07:00	886	0	0	2	64	60	116	873	2,001
Total	**16,055**	**0**	**29**	**145**	**264**	**602**	**988**	**9,922**	**28,005**
Average Volume/Hour	1,338	0	2	12	22	50	82	827	2,334
% Share	57%	0%	0%	1%	1%	2%	4%	35%	100%
Vehicle Capacity	5	50	36	3	14	14	4	3	
Vehicle Occupancy	40%	80%	70%	60%	80%	50%	40%	70%	
Daily Pax. Demand	**32,110**	**0**	**731**	**261**	**2,957**	**4,214**	**1,581**	**20,836**	**62,690**
Hourly Pax. Demand	2,676	0	61	22	246	351	132	1,736	5,224

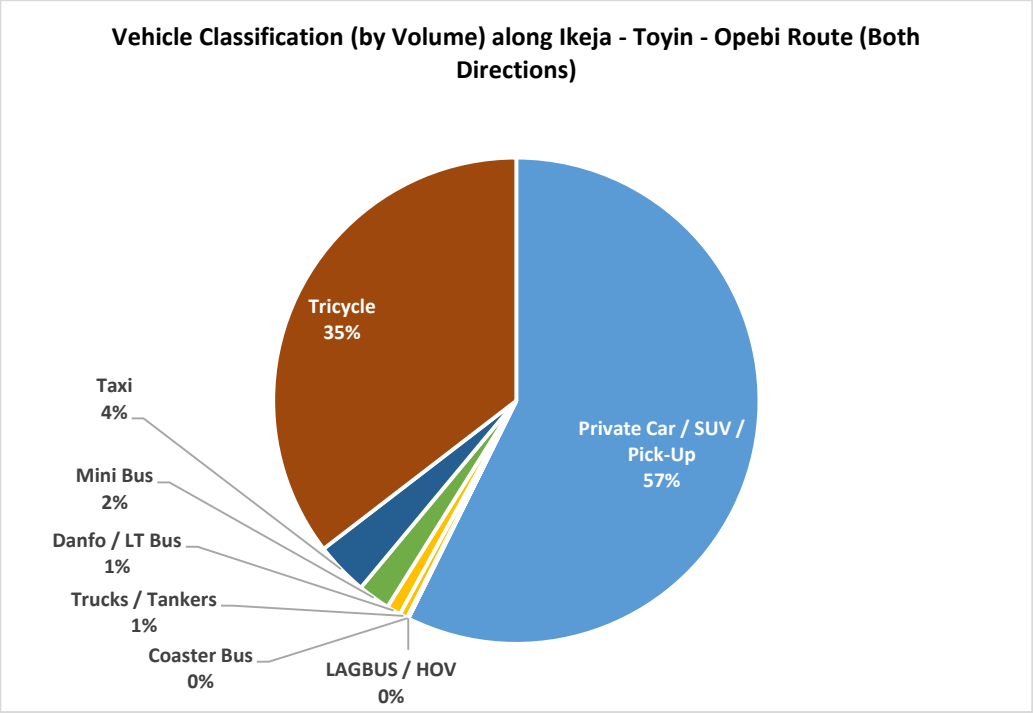


Figure 6.26: Traffic Volume along Ikeja – Toyin – Opebi (Both Directions)

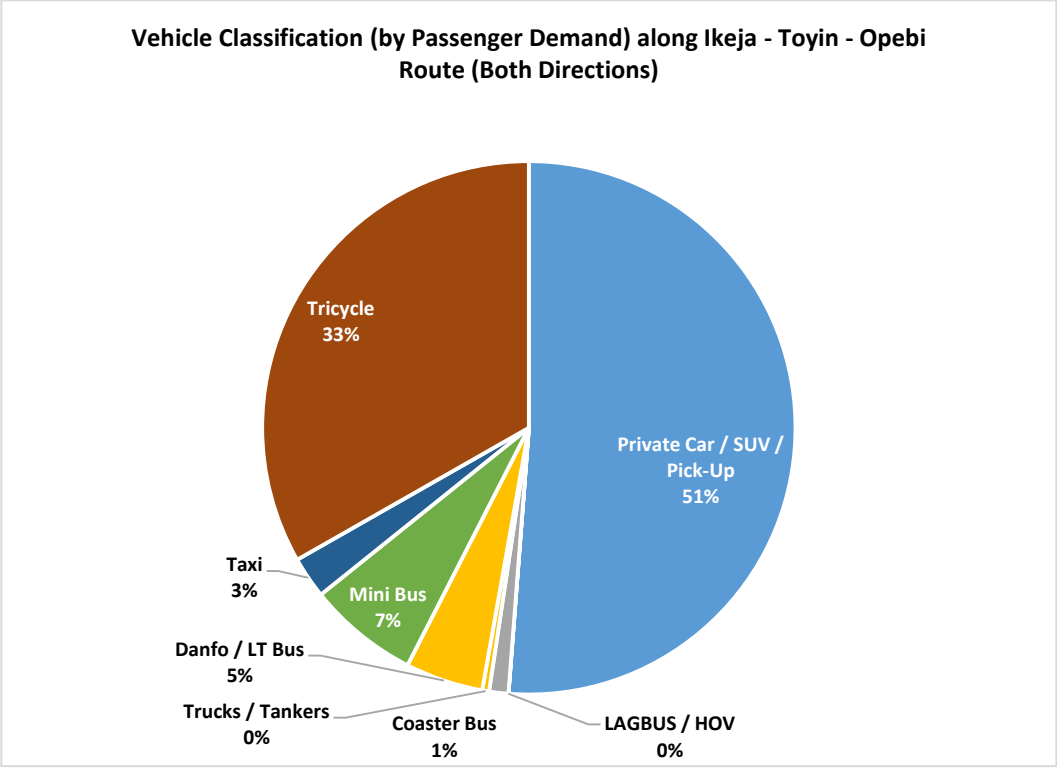


Figure 6.27: Passenger Demand along Ikeja – Toyin – Opebi (Both Directions)

viii. Ikeja – Maryland – Ojuelegba

The location for the MCC along the Ikeja – Maryland – Ojuelegba route was around Abati Barracks along Bayo Shodipo Road. The Average Daily Traffic (ADT) in the direction From Ikeja was 9,342 vehicles with 1,597 and 665 in the AM and PM peak hours respectively.

Private Cars are the most prominent vehicle type along this segment of the road with 45% of total traffic, LAGBUS / HOV constitute 0.8%, while Coaster make up 0.4% of the total traffic volume. Trucks / Tankers makes up 3%, while Danfos make up 21% of the total 12-Hour traffic. Minibuses, Taxis, and Tricycles make up 2%, 6% and 21% of the traffic in this direction. Table 6.21 and Figure 6.28 depict the traffic volumes and traffic volume profile respectively.

In the other direction of traffic, the Average Daily Traffic (ADT) was 12,860 vehicles with 1,269 and 1,085 in the AM and PM peak hours respectively. Private Cars make up 56% of total traffic volume, LAGBUS / HOV constitute 4%, while Coaster makes up 0.7% of the total traffic. Trucks / Tankers makes up 5%, while Danfo Buses are 18% of the total traffic volume respectively. Minibuses, Taxis and Tricycles make up 4%, 6%, and 7% of traffic volume respectively in this direction. Table 6.22 and Figure 6.29 depict the traffic volumes and traffic volume profile respectively.

Similarly, Tables 6.23 shows the summary of traffic volumes and passenger demand at the bus stop along the Ikeja – Maryland – Ojuelegba route. Figures 6.30 and 6.31 are charts showing traffic volumes and passenger demand respectively at the MCC location.

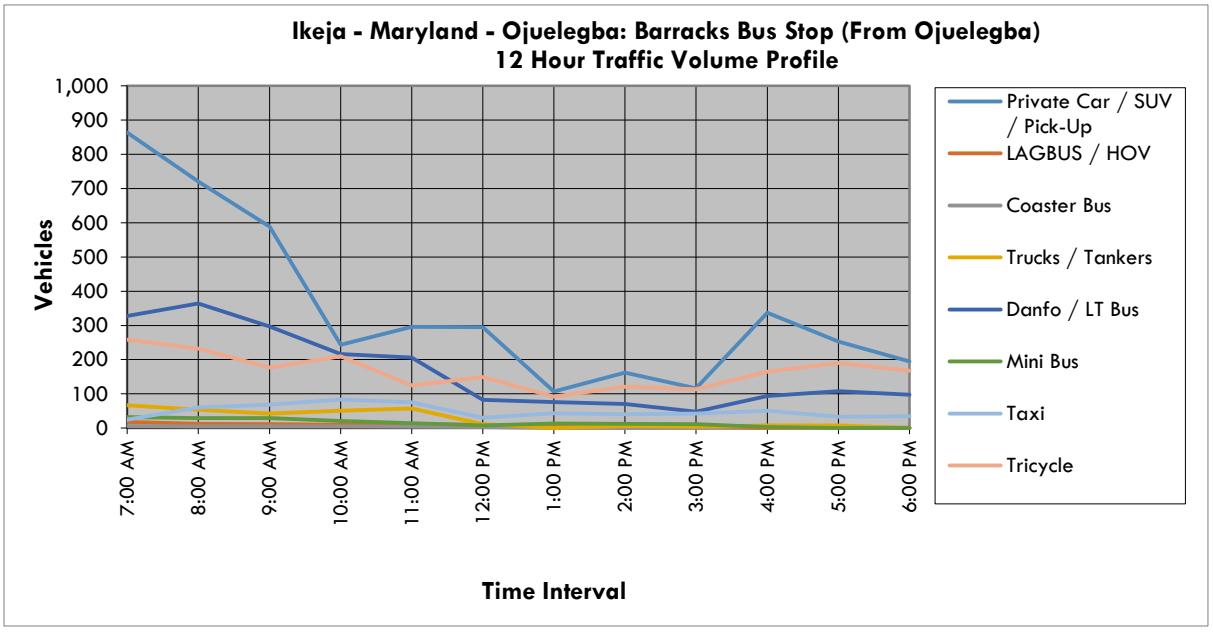


Figure 6.28: 12-Hour Traffic Volume profile along Ikeja – Maryland – Ojuelegba route (Direction: *From Ojuelegba*)

Table 6.21: 12-Hour Traffic Volume along Ikeja – Maryland – Ojuelegba route (Direction: *From Ojuelegba*)

12-Hour Traffic Volumes

ROUTE:	Ikeja - Maryland - Ojuelegba	**DATE:**	March 15, 2017
SEGMENT:	Bayo Shodipo	**DAY:**	
LOCATION:	Barracks Bus Stop	**DIR.:**	From Ojuelegba

TIME INTERVAL	Private Car / SUV / Pick-Up	LAGBUS / HOV	Coaster Bus	Trucks / Tankers	Danfo / LT Bus	Mini Bus	Taxi	Tricycle	*All Vehicles*
07:00-08:00	864	18	6	67	328	32	24	258	1,597
08:00-09:00	721	12	5	53	364	29	60	232	1,476
09:00-10:00	589	11	5	42	297	29	68	177	1,218
10:00-11:00	243	9	5	51	216	21	83	210	838
11:00-12:00	296	11	4	57	206	14	75	125	788
12:00-01:00	295	9	3	11	82	8	30	149	587
01:00-02:00	107	3	0	0	76	13	43	92	334
02:00-03:00	162	1	0	6	70	12	40	121	412
03:00-04:00	116	1	0	4	48	11	42	113	335
04:00-05:00	337	0	7	8	94	3	51	165	665
05:00-06:00	253	1	3	8	108	0	33	190	596
06:00-07:00	195	1	0	0	97	0	35	168	496
TOTAL	**4,178**	**77**	**38**	**307**	**1,986**	**172**	**584**	**2,000**	**9,342**
Percentage (%)	44.7%	0.8%	0.4%	3.3%	21.3%	1.8%	6.3%	21.4%	100.0%
									8:00 AM
									1,597
									4:00 PM
									665

Table 6.22: 12-Hour Traffic Volume along Ikeja – Maryland – Ojuelegba route (Direction: *To Ojuelegba*)

12-Hour Traffic Volumes

ROUTE	Ikeja - Maryland - Ojuelegba	**DATE:**	March 15, 2017
SEGMENT:	Bayo Shodipo	**DAY:**	
LOCATION:	Barracks Bus Stop	**DIR.:**	To Ojuelegba

TIME INTERVAL	Private Car / SUV / Pick-Up	LAGBUS / HOV	Coaster Bus	Trucks / Tankers	Danfo / LT Bus	Mini Bus	Taxi	Tricycle	*All Vehicles*
07:00-08:00	750	62	16	33	262	43	25	54	1,245
08:00-09:00	744	89	12	41	228	26	37	92	1,269
09:00-10:00	737	52	10	62	230	35	48	78	1,252
10:00-11:00	536	52	7	41	176	27	77	69	985
11:00-12:00	560	57	8	59	148	29	71	78	1,010
12:00-01:00	566	39	5	52	131	25	78	73	969
01:00-02:00	589	27	3	65	148	36	86	69	1,023
02:00-03:00	548	44	4	56	189	38	73	71	1,023
03:00-04:00	536	42	5	57	214	56	69	84	1,063
04:00-05:00	559	23	3	39	189	39	59	71	982
05:00-06:00	589	35	6	47	215	60	51	82	1,085
06:00-07:00	532	23	11	39	176	57	40	76	954
TOTAL	**7,246**	**545**	**90**	**591**	**2,306**	**471**	**714**	**897**	**12,860**
Percentage (%)	56.3%	4.2%	0.7%	4.6%	17.9%	3.7%	5.6%	7.0%	100.0%
									8:00 AM
									1,269
									5:00 PM
									1,085

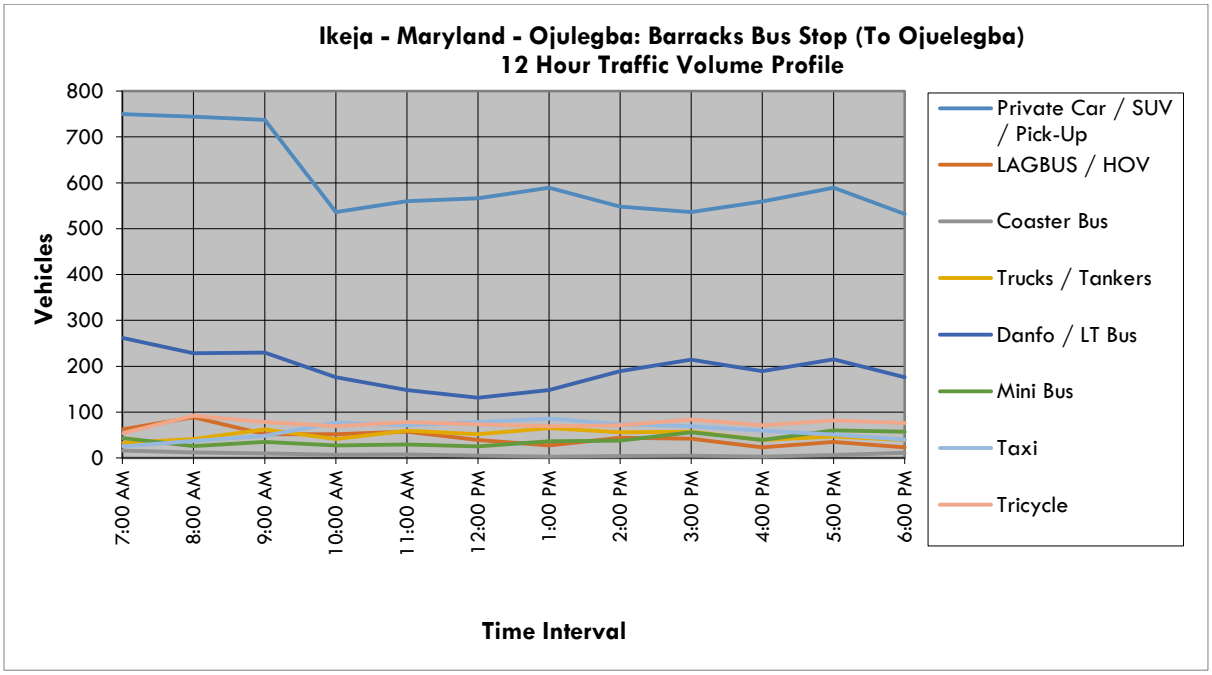


Figure 6.29: 12-Hour Traffic Volume profile along Ikeja – Maryland – Ojuelegba route (Direction: *To Ojuelegba*)

Table 6.23: 12-Hour Traffic Volume & Passenger Demand along Ikeja - Maryland - Ojulegba (Both Directions)

TIME INTERVAL	Private Car / SUV / Pick-Up	LAGBUS / HOV	Coaster Bus	Trucks / Tankers	Danfo / LT Bus	Mini Bus	Taxi	Tricycle	TOTAL
07:00-08:00	1,614	80	22	100	590	75	49	312	2,842
08:00-09:00	1,465	101	17	94	592	55	97	324	2,745
09:00-10:00	1,326	63	15	104	527	64	116	255	2,470
10:00-11:00	779	61	12	92	392	48	160	279	1,823
11:00-12:00	856	68	12	116	354	43	146	203	1,798
12:00-01:00	861	48	8	63	213	33	108	222	1,556
01:00-02:00	696	30	3	65	224	49	129	161	1,357
02:00-03:00	710	45	4	62	259	50	113	192	1,435
03:00-04:00	652	43	5	61	262	67	111	197	1,398
04:00-05:00	896	23	10	47	283	42	110	236	1,647
05:00-06:00	842	36	9	55	323	60	84	272	1,681
06:00-07:00	727	24	11	39	273	57	75	244	1,450
Total	**11,424**	**622**	**128**	**898**	**4,292**	**643**	**1,298**	**2,897**	**22,202**
Average Volume/Hour	952	52	11	75	358	54	108	241	1,850
% Share	51%	3%	1%	4%	19%	3%	6%	13%	100%
Vehicle Capacity	5	50	36	3	14	14	4	3	
Vehicle Occupancy	40%	80%	70%	60%	80%	50%	40%	70%	
Daily Pax. Demand	**22,848**	**24,880**	**3,226**	**1,616**	**48,070**	**4,501**	**2,077**	**6,084**	**113,302**
Hourly Pax. Demand	1,904	2,073	269	135	4,006	375	173	507	9,442

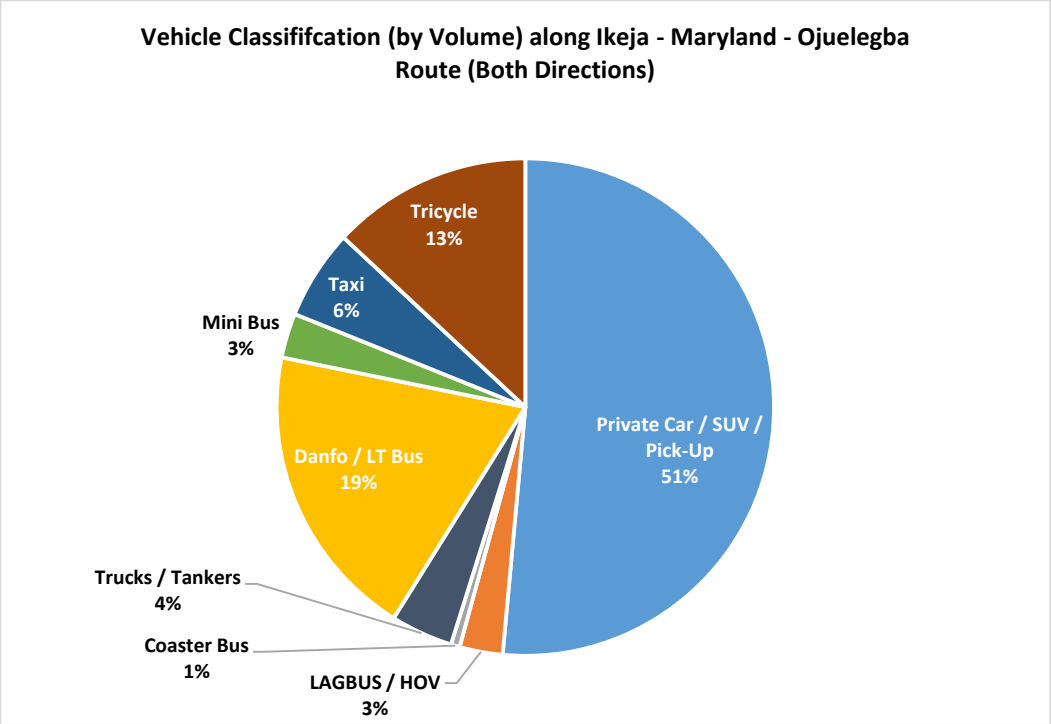


Figure 6.30: Traffic Volume along Ikeja – Maryland – Ojuelegba (Both Directions)

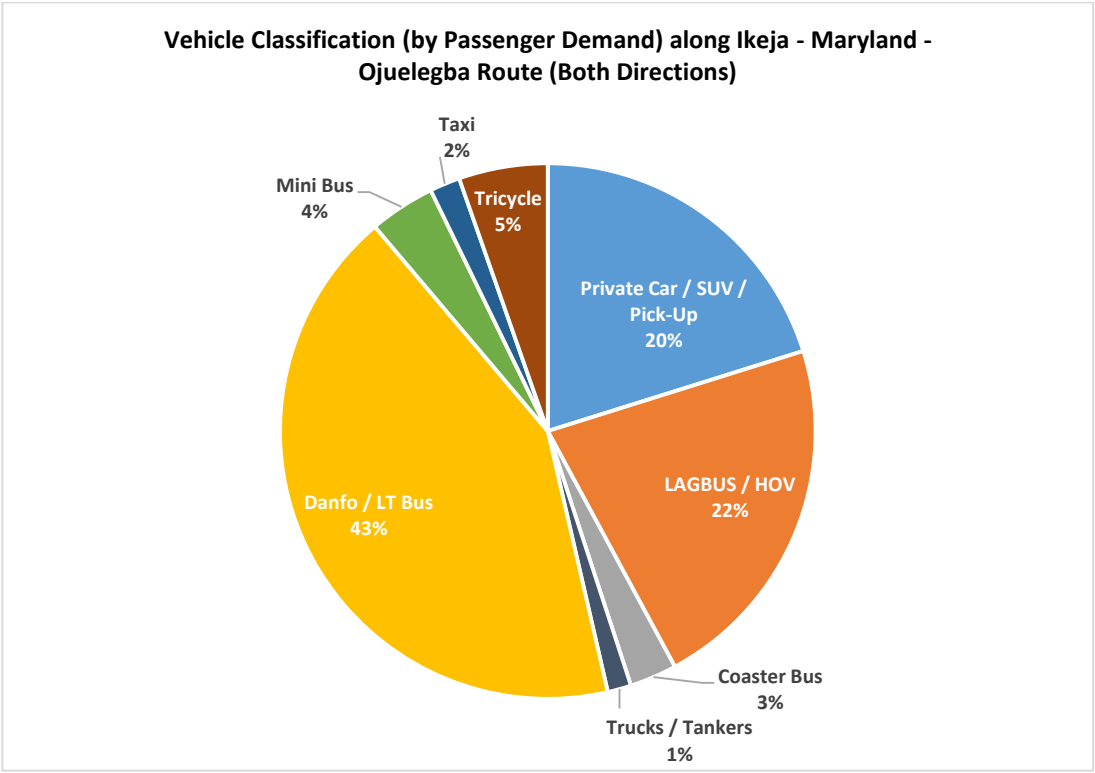


Figure 6.31: 12-Hour Passenger Demand along Ikeja – Maryland – Ojuelegba (Both Directions)

ix. Ikeja – Allen – Opebi

The location for the MCC along the Ikeja – Allen – Opebi route was at the Ladipo Kuku Junction along Allen Avenue. The Average Daily Traffic (ADT) in the direction From Ikeja was 12,868 vehicles with 1,227 and 1,002 in the AM and PM peak hours respectively.

Private Cars are the most prominent vehicle type along this segment of the road with 62% and Tricycles 29% of total traffic, LAGBUS / HOV constitute 0.0%, while Coaster make up 0.1% of the total traffic volume. Trucks / Tankers makes up 0.5%, while Danfos make up 3.5% of the total 12-Hour traffic. Minibuses, Taxis, and Tricycles make up 1.2%, and 3.8% of the traffic in this direction. Table 6.24 and Figure 6.32 depict the 12-Hour traffic volumes and traffic volume profile respectively.

In the other direction of traffic, the Average Daily Traffic (ADT) was 13,324 vehicles 1,226 and 946 in the AM and PM peak hours respectively. Private Cars make up 62% of total traffic volume, LAGBUS / HOV constitute 0.0%, while Coaster makes up 0.1% of the total traffic. Trucks / Tankers makes up 0.6%, while Danfo Buses are 6% of the total traffic respectively. Minibuses, Taxis and Tricycles make up 2%, 7%, and 22% of traffic respectively in this direction. Table 6.25 and Figure 6.33 depict the traffic volumes and traffic volume profile respectively.

Similarly, Tables 6.26 shows the summary of traffic volumes and passenger demand at the bus stop along the Ikeja – Allen – Opebi route. Figures 6.34 and 6.35 are charts showing traffic volumes and passenger demand respectively at the MCC location.

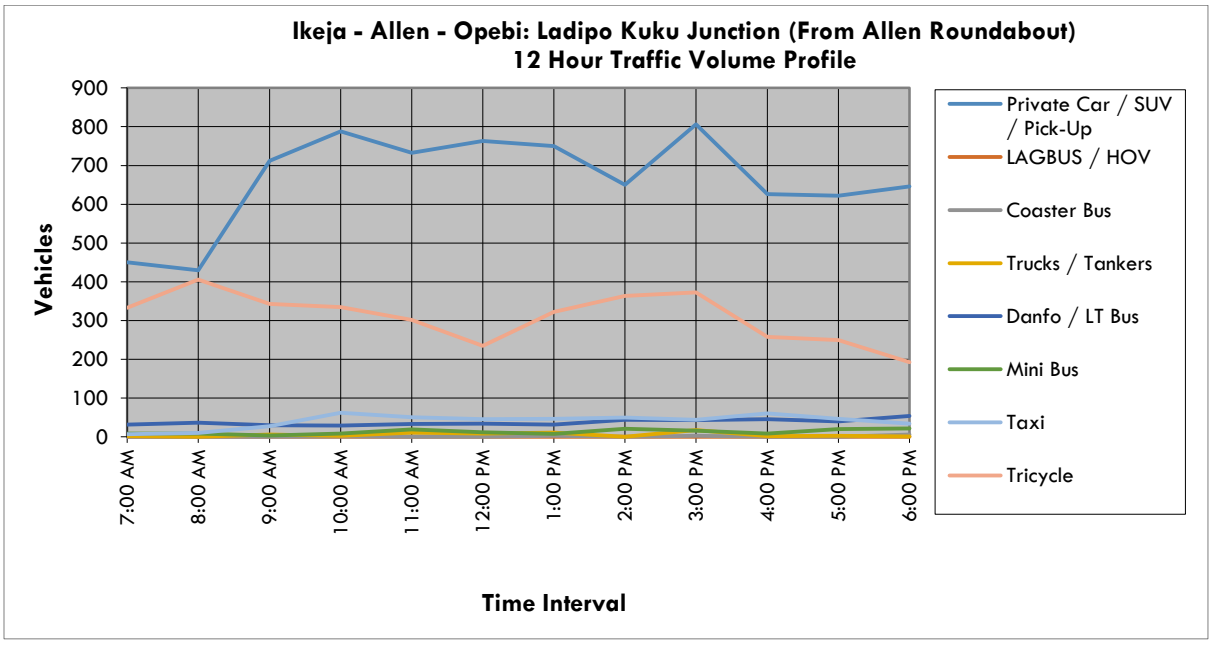


Figure 6.32: 12-Hour Traffic Volume profile along Ikeja – Allen – Opebi (Direction: *From Allen Roundabout*)

Table 6.24: 12-Hour Traffic Volume along Ikeja – Allen – Opebi route (Direction: *From Allen Roundabout*)

12-Hour Traffic Volumes

ROUTE:	Ikeja - Allen - Opebi	**DATE:**	March 15, 2017
SEGMENT:	Allen Avenue	**DAY:**	
LOCATION:	Ladipo Kuku Junction	**DIR.:**	From Allen RA.

TIME INTERVAL	Private Car / SUV / Pick-Up	LAGBUS / HOV	Coaster Bus	Trucks / Tankers	Danfo / LT Bus	Mini Bus	Taxi	Tricycle	*All Vehicles*
07:00-08:00	450	0	0	2	32	9	7	333	**833**
08:00-09:00	430	0	0	0	37	9	10	406	**892**
09:00-10:00	712	0	0	6	30	4	28	343	**1,123**
10:00-11:00	788	0	1	3	29	9	62	335	**1,227**
11:00-12:00	733	0	0	11	33	19	51	302	**1,149**
12:00-01:00	763	0	0	9	34	12	46	235	**1,099**
01:00-02:00	750	0	3	11	32	8	47	322	**1,173**
02:00-03:00	650	0	0	0	44	21	50	364	**1,129**
03:00-04:00	806	0	3	18	43	16	44	373	**1,303**
04:00-05:00	626	0	0	2	46	9	61	258	**1,002**
05:00-06:00	622	0	0	3	40	20	47	250	**982**
06:00-07:00	646	0	6	1	54	22	34	193	**956**
TOTAL	**7,976**	**0**	**13**	**66**	**454**	**158**	**487**	**3,714**	**12,868**
Percentage (%)	62.0%	0.0%	0.1%	0.5%	3.5%	1.2%	3.8%	28.9%	100.0%
									10:00 AM
									1,227
									4:00 PM
									1,002

Table 6.25: 12-Hour Traffic Volume along Ikeja – Allen – Opebi route (Direction: *To Allen Roundabout*)

12-Hour Traffic Volumes

ROUTE	Ikeja - Allen - Opebi	**DATE:**	March 15, 2017
SEGMENT:	Allen Avenue	**DAY:**	
LOCATION:	Ladipo Kuku Junction	**DIR.:**	To Allen Roundabout

TIME INTERVAL	Private Car / SUV / Pick-Up	LAGBUS / HOV	Coaster Bus	Trucks / Tankers	Danfo / LT Bus	Mini Bus	Taxi	Tricycle	*All Vehicles*
07:00-08:00	691	0	4	2	76	26	32	219	1,050
08:00-09:00	799	0	1	4	109	18	36	259	1,226
09:00-10:00	745	0	0	10	83	21	65	241	1,165
10:00-11:00	657	0	1	8	99	37	78	340	1,220
11:00-12:00	597	0	1	4	104	21	116	364	1,207
12:00-01:00	737	0	1	2	158	37	138	404	1,477
01:00-02:00	942	0	0	15	34	36	72	218	1,317
02:00-03:00	853	0	0	9	31	27	99	205	1,224
03:00-04:00	859	0	0	9	31	31	78	194	1,202
04:00-05:00	643	0	2	5	27	13	65	191	946
05:00-06:00	490	0	1	5	18	10	55	154	733
06:00-07:00	272	0	1	1	52	3	67	161	557
TOTAL	**8,285**	**0**	**12**	**74**	**822**	**280**	**901**	**2,950**	**13,324**
Percentage (%)	62.2%	0.0%	0.1%	0.6%	6.2%	2.1%	6.8%	22.1%	100.0%
									8:00 AM
									1,226
									4:00 PM
									946

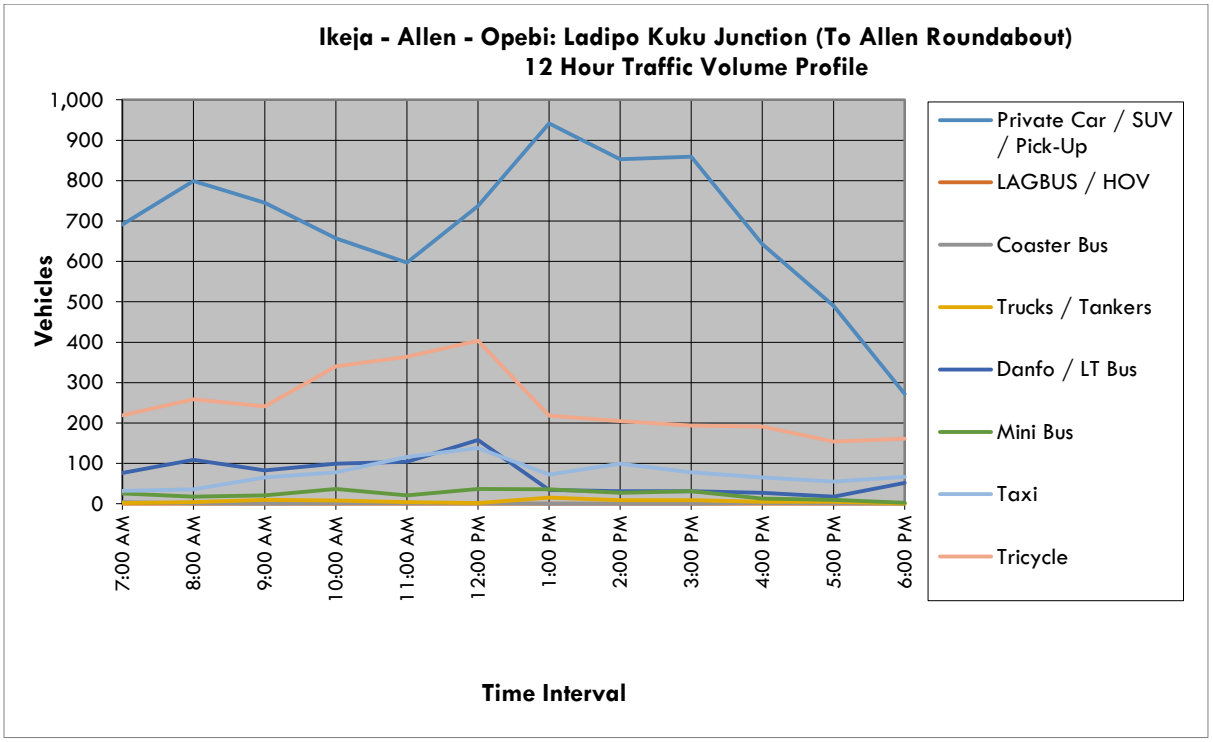


Figure 6.33: 12-Hour Traffic Volume profile along Ikeja – Allen – Opebi (Direction: *To Allen Roundabout*)

Table 6.26: 12-Hour Traffic Volume & Passenger Demand along Ikeja - Allen - Opebi (Both Directions)

TIME INTERVAL	Private Car / SUV / Pick-Up	LAGBUS / HOV	Coaster Bus	Trucks / Tankers	Danfo / LT Bus	Mini Bus	Taxi	Tricycle	TOTAL
07:00-08:00	1,141	0	4	4	108	35	39	552	1,883
08:00-09:00	1,229	0	1	4	146	27	46	665	2,118
09:00-10:00	1,457	0	0	16	113	25	93	584	2,288
10:00-11:00	1,445	0	2	11	128	46	140	675	2,447
11:00-12:00	1,330	0	1	15	137	40	167	666	2,356
12:00-01:00	1,500	0	1	11	192	49	184	639	2,576
01:00-02:00	1,692	0	3	26	66	44	119	540	2,490
02:00-03:00	1,503	0	0	9	75	48	149	569	2,353
03:00-04:00	1,665	0	3	27	74	47	122	567	2,505
04:00-05:00	1,269	0	2	7	73	22	126	449	1,948
05:00-06:00	1,112	0	1	8	58	30	102	404	1,715
06:00-07:00	918	0	7	2	106	25	101	354	1,513
Total	**16,261**	**0**	**25**	**140**	**1,276**	**438**	**1,388**	**6,664**	**26,192**
Average Volume/Hour	1,355	0	2	12	106	37	116	555	2,183
% Share	62%	0%	0%	1%	5%	2%	5%	25%	100%
Vehicle Capacity	5	50	36	3	14	14	4	3	
Vehicle Occupancy	40%	80%	70%	60%	80%	50%	40%	70%	
Daily Pax. Demand	**32,522**	**0**	**630**	**252**	**14,291**	**3,066**	**2,221**	**13,994**	**66,976**
Hourly Pax. Demand	2,710	0	53	21	1,191	256	185	1,166	5,581

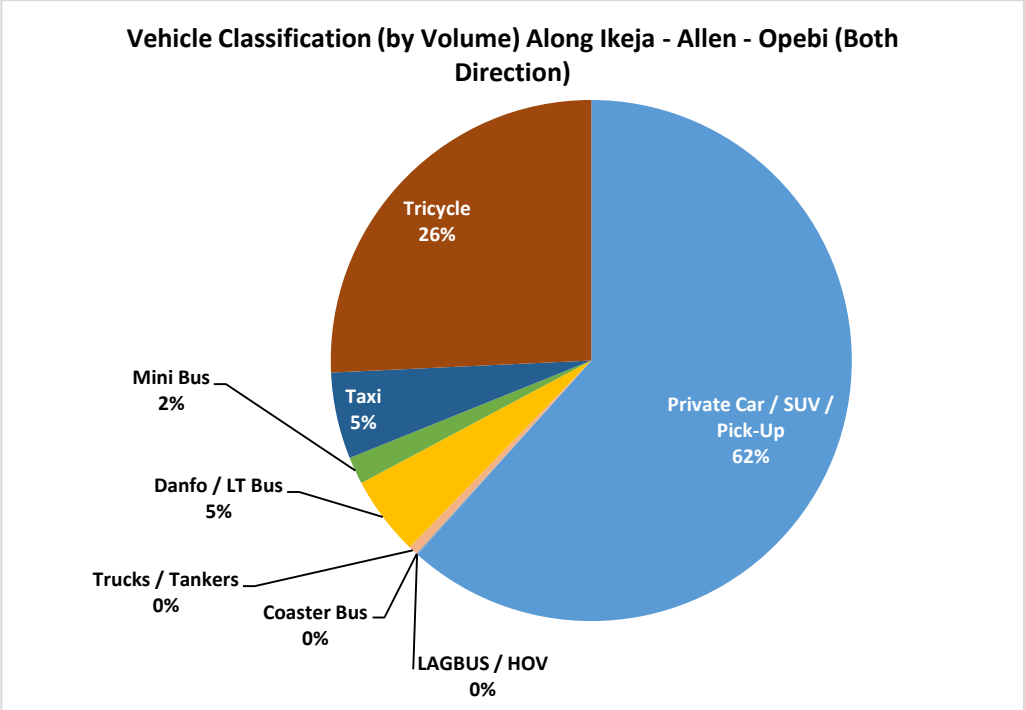


Figure 6.34: Traffic Volume along Ikeja – Allen – Opebi (Both Directions)

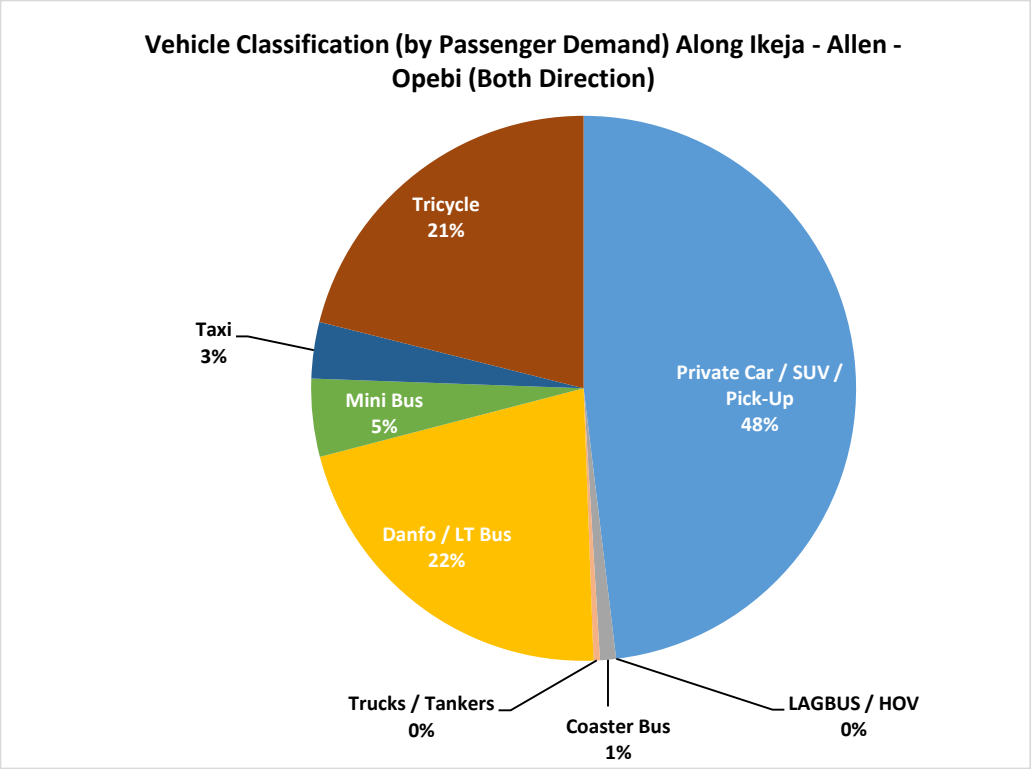


Figure 6.35: Passenger Demand along Ikeja – Allen – Opebi (Both Directions)

x. Ikeja – Airport / NAHCO

The location for the MCC along the Ikeja – Airport / NAHCO route was around the FAAN Headquarters Bus stop along Airport road. . The Average Daily Traffic (ADT) in the direction From Ikeja was 15,512 vehicles with 990 and 3,324 in the AM and PM peak hours respectively.

Private Cars are the most prominent vehicle type along this segment of the road with 88% of the total traffic volume. Danfos make up 3.3%, Trucks / Tankers 0.4%, Coaster 0.1%, while LAGBUS / HOV constitute 0.0% of the total traffic volume. Minibuses, Taxis, and Tricycles make up 2%, 6% and 0.0% of the traffic respectively in this direction. Table 6.27 and Figure 6.36 depict the 12-Hour traffic volumes and traffic volume profile respectively.

In the other direction of traffic, the Average Daily Traffic (ADT) was 15,593 vehicles with 1,813 and 1,396 vehicles in the AM and PM peak hours respectively. Private Cars make up 84% while Danfo Buses are 3.7% of total traffic volume. Minibuses, Taxis and Tricycles make up 3.3%, 8.8%, and 0.0% of traffic respectively in this direction. LAGBUS / HOV constitute 0.0%, while Coaster makes up 0.3% of the total traffic. Trucks / Tankers makes up 0.3%, of the total traffic volume respectively. Table 6.28 and Figure 6.37 depict the traffic volumes and traffic volume profile respectively.

Similarly, Tables 6.29 shows the summary of traffic volumes and passenger demand at the bus stop along the Ikeja – NAHCO route. Figures 6.38 and 6.39 are charts showing traffic volumes and passenger demand respectively at the MCC location.

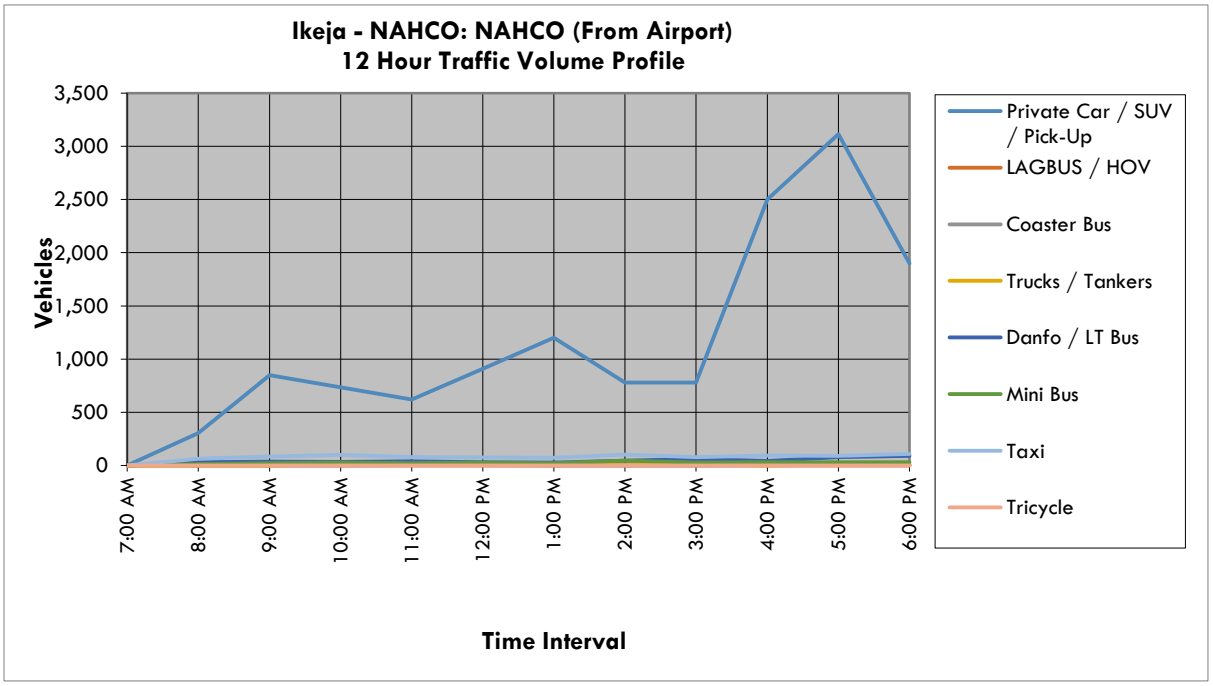


Figure 6.36: 12-Hour Traffic Volume profile along Ikeja – NAHCO Route (Direction: *From Airport*)

Table 6.27: 12-Hour Traffic Volume along Ikeja – NAHCO route (Direction: *From Airport*)

12-Hour Traffic Volumes

ROUTE:	Ikeja - NAHCO	**DATE:**	March 15, 2017
SEGMENT:	Airport Road	**DAY:**	
LOCATION:	NAHCO	**DIR.:**	From Airport

TIME INTERVAL	Private Car / SUV / Pick-Up	LAGBUS / HOV	Coaster Bus	Trucks / Tankers	Danfo / LT Bus	Mini Bus	Taxi	Tricycle	*All Vehicles*
07:00-08:00									
08:00-09:00	303	0	0	0	29	12	63	0	407
09:00-10:00	850	0	0	0	35	20	85	0	990
10:00-11:00	735	0	0	9	34	28	100	0	906
11:00-12:00	620	0	2	12	38	20	79	0	771
12:00-01:00	909	0	2	3	31	27	75	0	1,047
01:00-02:00	1,200	0	1	4	28	21	71	1	1,326
02:00-03:00	780	1	1	5	44	46	103	0	980
03:00-04:00	780	1	0	10	61	26	78	0	956
04:00-05:00	2,500	0	4	1	41	30	93	0	2,669
05:00-06:00	3,115	0	4	8	78	29	90	0	3,324
06:00-07:00	1,900	0	3	7	90	29	107	0	2,136
TOTAL	**13,692**	**2**	**17**	**59**	**509**	**288**	**944**	**1**	**15,512**
Percentage (%)	88.3%	0.0%	0.1%	0.4%	3.3%	1.9%	6.1%	0.0%	100.0%
									9:00 AM
									990
									5:00 PM
									3,324

Table 6.28: 12-Hour Traffic Volume along Ikeja – NAHCO route (Direction: *To Airport*)

12-Hour Traffic Volumes

ROUTE	Ikeja - NAHCO	**DATE:**	March 15, 2017
SEGMENT:	Airport Road	**DAY:**	
LOCATION:	NAHCO	**DIR.:**	To Airport

TIME INTERVAL	Private Car / SUV / Pick-Up	LAGBUS / HOV	Coaster Bus	Trucks / Tankers	Danfo / LT Bus	Mini Bus	Taxi	Tricycle	*All Vehicles*
07:00-08:00									
08:00-09:00	1,097	0	3	2	35	20	82	0	1,239
09:00-10:00	1,585	0	4	0	64	45	115	0	1,813
10:00-11:00	1,491	4	4	15	67	53	148	0	1,782
11:00-12:00	1,092	0	6	11	38	30	113	0	1,290
12:00-01:00	1,225	1	5	5	67	80	147	0	1,530
01:00-02:00	1,260	0	4	5	49	68	125	0	1,511
02:00-03:00	1,050	2	6	0	43	40	179	0	1,320
03:00-04:00	1,232	0	4	2	35	49	135	1	1,458
04:00-05:00	1,196	0	3	7	58	54	78	0	1,396
05:00-06:00	781	0	3	3	63	34	89	0	973
06:00-07:00	1,010	0	3	3	61	44	160	0	1,281
TOTAL	**13,019**	**7**	**45**	**53**	**580**	**517**	**1,371**	**1**	**15,593**
Percentage (%)	83.5%	0.0%	0.3%	0.3%	3.7%	3.3%	8.8%	0.0%	100.0%
									9:00 AM
									1,813
									4:00 PM
									1,396

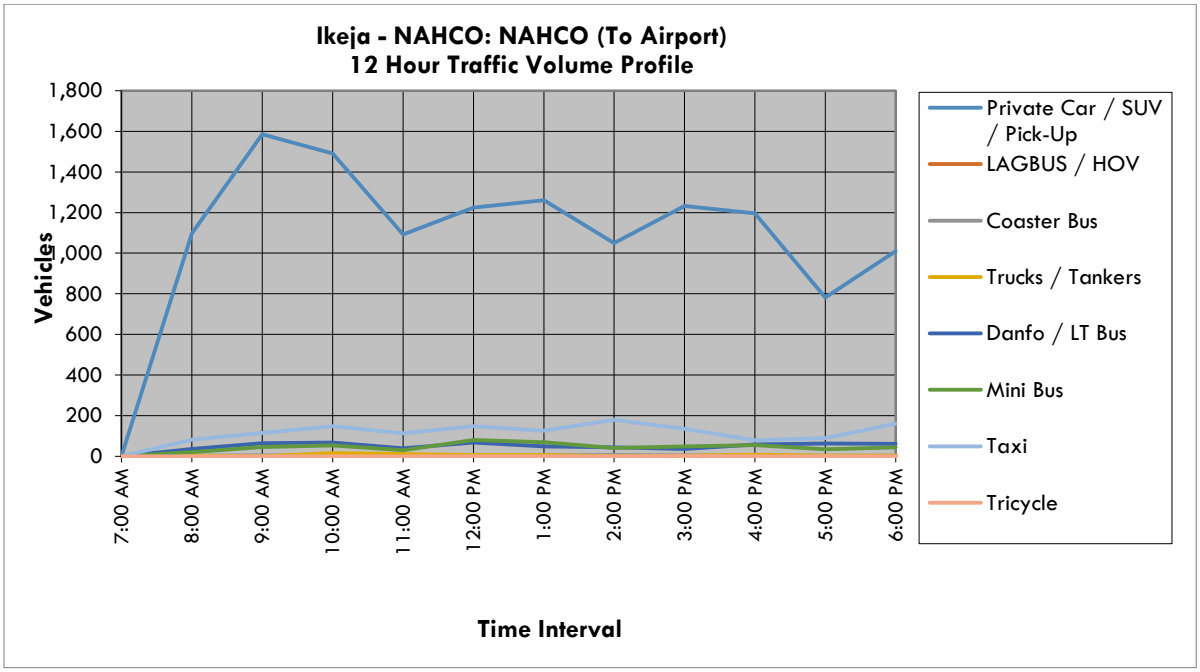


Figure 6.37: 12-Hour Traffic Volume profile along Ikeja – NAHCO Route (Direction: *To Airport*)

Table 6.29: 12-Hour Traffic Volume & Passenger Demand along Ikeja – NAHCO (Both Directions)

TIME INTERVAL	Private Car / SUV / Pick-Up	LAGBUS / HOV	Coaster Bus	Trucks / Tankers	Danfo / LT Bus	Mini Bus	Taxi	Tricycle	TOTAL
07:00-08:00	0	0	0	0	0	0	0	0	0
08:00-09:00	1,400	0	3	2	64	32	145	0	1,646
09:00-10:00	2,435	0	4	0	99	65	200	0	2,803
10:00-11:00	2,226	4	4	24	101	81	248	0	2,688
11:00-12:00	1,712	0	8	23	76	50	192	0	2,061
12:00-01:00	2,134	1	7	8	98	107	222	0	2,577
01:00-02:00	2,460	0	5	9	77	89	196	1	2,837
02:00-03:00	1,830	3	7	5	87	86	282	0	2,300
03:00-04:00	2,012	1	4	12	96	75	213	1	2,414
04:00-05:00	3,696	0	7	8	99	84	171	0	4,065
05:00-06:00	3,896	0	7	11	141	63	179	0	4,297
06:00-07:00	2,910	0	6	10	151	73	267	0	3,417
Total	**26,711**	**9**	**62**	**112**	**1,089**	**805**	**2,315**	**2**	**31,105**
Average Volume/Hour	2,226	1	5	9	91	67	193	0	2,592
% Share	86%	0%	0%	0%	4%	3%	7%	0%	100%
Vehicle Capacity	5	50	36	3	14	14	4	3	
Vehicle Occupancy	40%	80%	70%	60%	80%	50%	40%	70%	
Daily Pax. Demand	**53,422**	**360**	**1,562**	**202**	**12,197**	**5,635**	**3,704**	**4**	**77,086**
Hourly Pax. Demand	4,452	30	130	17	1,016	470	309	0	6,424

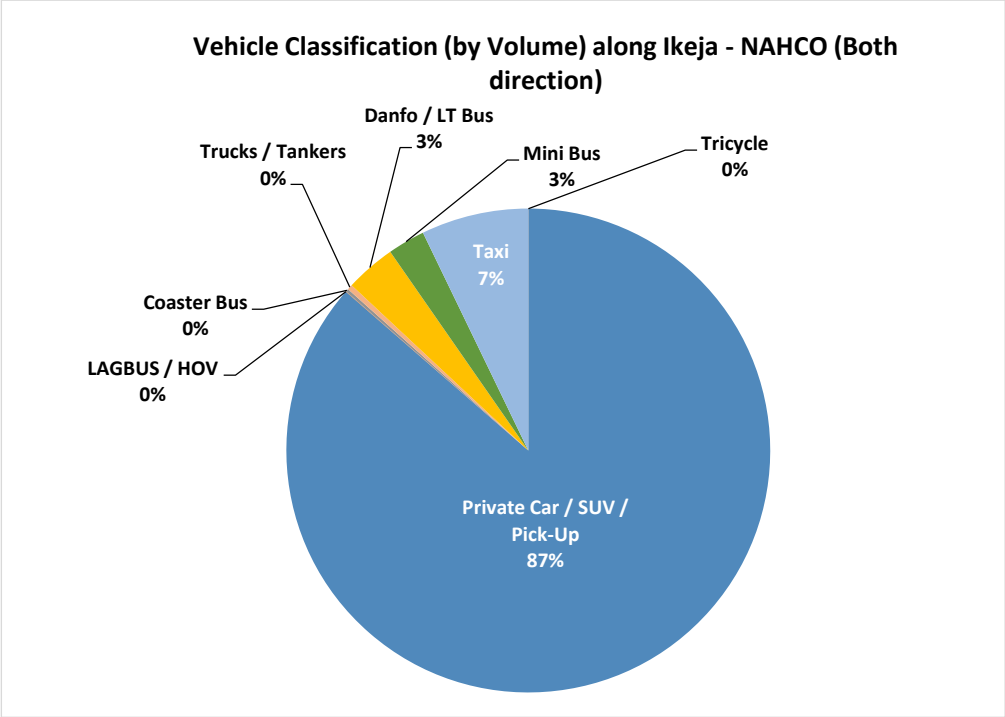


Figure 6.38: Traffic Volume along Ikeja – NAHCO (Both Directions)

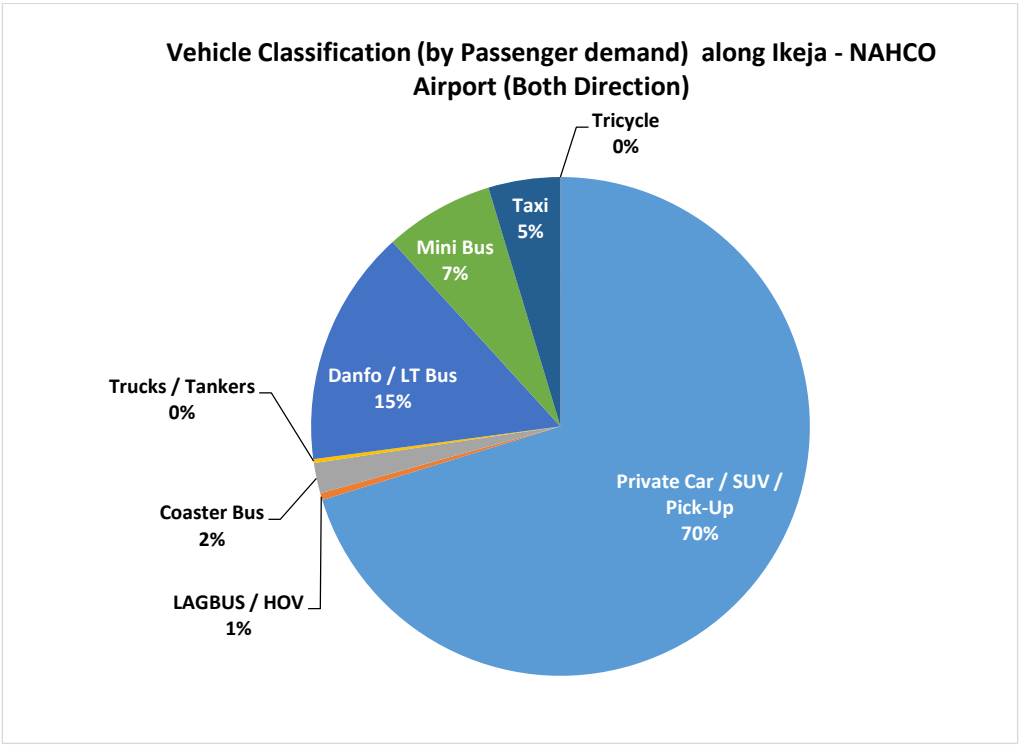


Figure 6.39: Passenger Demand along Ikeja – NAHCO (Both Directions)

xi. Ikeja – Oba Akran – Ogba

The location for the MCC along the Ikeja – Oba Akran – Ogba route was along Akilo Road. The Average Daily Traffic (ADT) in the direction From Ikeja was 8,926 vehicles with 738 and 992 in the AM and PM peak hours respectively.

Private Cars are the most prominent vehicle type along this segment of the road with 61.0% of total traffic; LAGBUS / HOV constitute 0.0%, while Coaster make up 0.1% of the total traffic volume. Trucks / Tankers makes up 1.9%, while Danfos make up 5.4% of the total traffic volume. Minibuses, Taxis, and Tricycles make up 2.8%, 1.9% and 27.0% of the traffic in this direction. Table 6.30 and Figure 6.40 depict the traffic volumes and traffic volume profile respectively.

In the other direction of traffic, the Average Daily Traffic (ADT) was 10,180 vehicles with 1,448 788 in the AM and PM peak hours respectively. Private Cars make up 62.5% of total traffic volume; LAGBUS / HOV constitute 0.0%, while Coaster makes up 1.0% of the total traffic. Trucks / Tankers makes up 2.6%, while Danfo Buses are 4.3% of the total traffic volume respectively. Minibuses, Taxis and Tricycles make up 4.6%, 2.7%, and 22.3% of traffic volume respectively in this direction. Table 6.31 and Figure 6.41 depict the traffic volumes and traffic volume profile respectively.

Similarly, Tables 6.32 shows the summary of traffic volumes and passenger demand at the bus stop along the Ikeja – Oba Akran – Ogba route. Figures 6.42 and 6.43 are charts showing traffic volumes and passenger demand respectively at the MCC location.

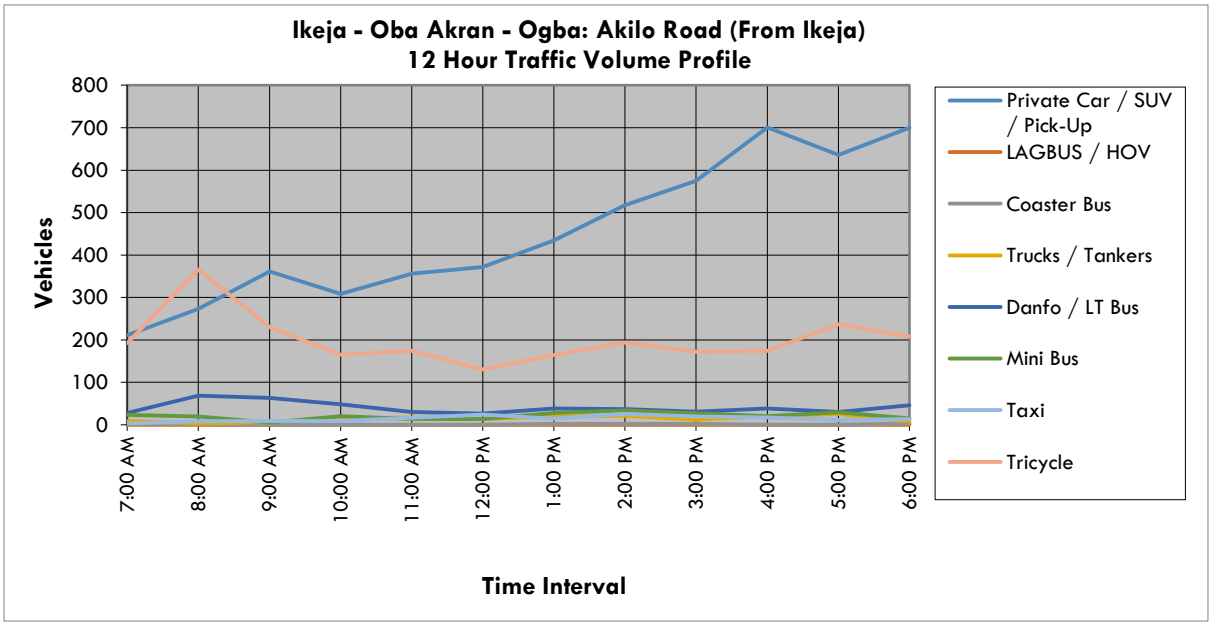


Figure 6.40: 12-Hour Traffic Volume profile along Ikeja – Oba Akran – Ogba Route (Direction: *From Ikeja*)

Table 6.30: 12-Hour Traffic Volume along Ikeja – Oba Akran – Ogba route (Direction: *From Ikeja*)

12-Hour Traffic Volumes

ROUTE:	Ikeja - Oba Akran - Ogba	**DATE:**	March 15, 2017
SEGMENT:	Akilo Road	**DAY:**	
LOCATION:	Akilo Road	**DIR.:**	From Ikeja

TIME INTERVAL	Private Car / SUV / Pick-Up	LAGBUS / HOV	Coaster Bus	Trucks / Tankers	Danfo / LT Bus	Mini Bus	Taxi	Tricycle	*All Vehicles*
07:00-08:00	211	0	3	9	28	23	3	192	469
08:00-09:00	273	0	1	3	68	19	8	366	738
09:00-10:00	361	0	0	6	63	5	9	230	674
10:00-11:00	308	0	0	14	48	20	9	165	564
11:00-12:00	356	0	0	17	30	13	16	174	606
12:00-01:00	372	0	0	13	26	13	24	130	578
01:00-02:00	434	0	2	19	38	28	14	164	699
02:00-03:00	517	0	2	21	37	34	25	194	830
03:00-04:00	575	0	2	12	31	27	19	172	838
04:00-05:00	701	0	0	20	38	20	17	174	970
05:00-06:00	636	0	0	25	30	29	11	237	968
06:00-07:00	700	0	3	7	46	15	13	208	992
TOTAL	**5,444**	**0**	**13**	**166**	**483**	**246**	**168**	**2,406**	**8,926**
Percentage (%)	61.0%	0.0%	0.1%	1.9%	5.4%	2.8%	1.9%	27.0%	100.0%
									8:00 AM
									738
									6:00 PM
									992

Table 6.31: 12-Hour Traffic Volume along Ikeja – Oba Akran – Ogba route (Direction: *To Ikeja*)

12-Hour Traffic Volumes

ROUTE:	Ikeja - Oba Akran - Ogba	**DATE:**	March 15, 2017
SEGMENT:	Akilo Road	**DAY:**	
LOCATION:	Akilo Road	**DIR.:**	To Ikeja

TIME INTERVAL	Private Car / SUV / Pick-Up	LAGBUS / HOV	Coaster Bus	Trucks / Tankers	Danfo / LT Bus	Mini Bus	Taxi	Tricycle	*All Vehicles*
07:00-08:00	1,055	0	18	11	49	51	13	251	1,448
08:00-09:00	873	0	16	5	26	61	17	296	1,294
09:00-10:00	710	1	15	50	15	69	27	226	1,113
10:00-11:00	695	0	1	15	19	65	41	142	978
11:00-12:00	412	0	15	16	16	46	35	161	701
12:00-01:00	515	0	8	18	91	62	67	247	1,008
01:00-02:00	327	0	4	16	66	19	16	154	602
02:00-03:00	373	0	0	27	24	24	10	109	567
03:00-04:00	330	0	0	19	26	19	18	115	527
04:00-05:00	270	0	2	19	38	29	5	159	522
05:00-06:00	329	0	0	29	42	16	15	201	632
06:00-07:00	470	0	25	36	28	8	12	209	788
TOTAL	**6,359**	**1**	**104**	**261**	**440**	**469**	**276**	**2,270**	**10,180**
Percentage (%)	62.5%	0.0%	1.0%	2.6%	4.3%	4.6%	2.7%	22.3%	100.0%
									7:00 AM
									1,448
									6:00 PM
									788

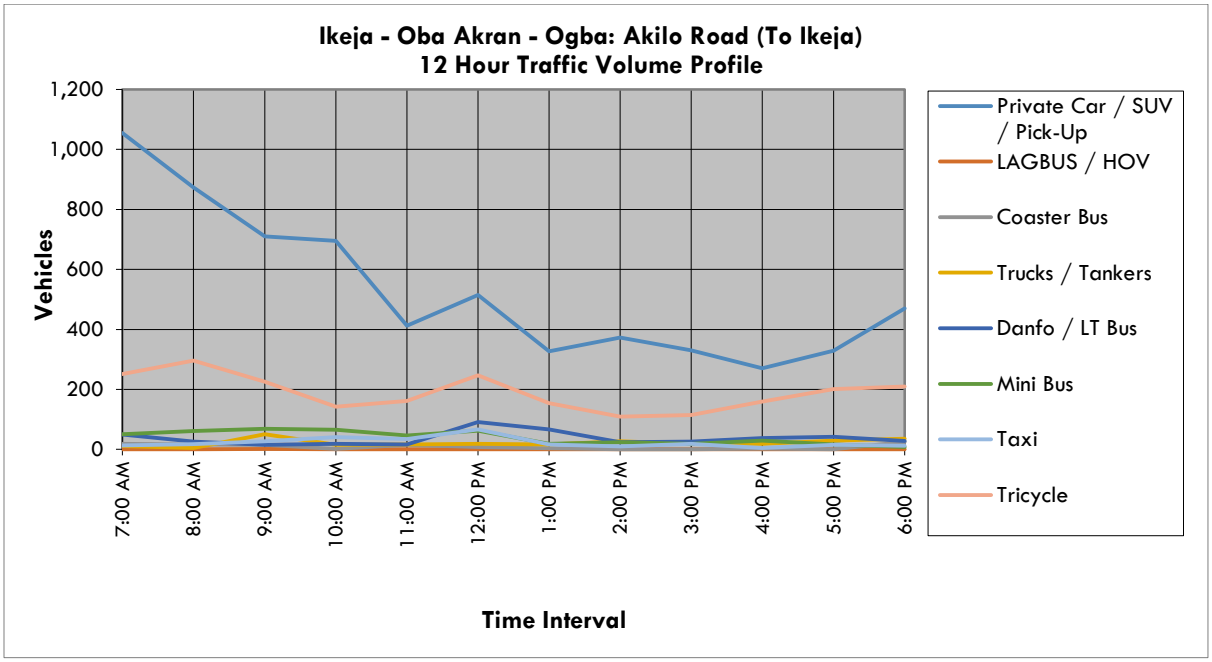


Figure 6.41: 12-Hour Traffic Volume profile along Ikeja – Oba Akran – Ogba Route (Direction: *To Ikeja*)

Table 6.32: 12-Hour Traffic Volume & Passenger Demand along Ikeja – Oba Akran - Ogba (Both Directions)

TIME INTERVAL	Private Car / SUV / Pick-Up	LAGBUS / HOV	Coaster Bus	Trucks / Tankers	Danfo / LT Bus	Mini Bus	Taxi	Tricycle	TOTAL
07:00-08:00	1,266	0	21	20	77	74	16	443	1,917
08:00-09:00	1,146	0	17	8	94	80	25	662	2,032
09:00-10:00	1,071	1	15	56	78	74	36	456	1,787
10:00-11:00	1,003	0	1	29	67	85	50	307	1,542
11:00-12:00	768	0	15	33	46	59	51	335	1,307
12:00-01:00	887	0	8	31	117	75	91	377	1,586
01:00-02:00	761	0	6	35	104	47	30	318	1,301
02:00-03:00	890	0	2	48	61	58	35	303	1,397
03:00-04:00	905	0	2	31	57	46	37	287	1,365
04:00-05:00	971	0	2	39	76	49	22	333	1,492
05:00-06:00	965	0	0	54	72	45	26	438	1,600
06:00-07:00	1,170	0	28	43	74	23	25	417	1,780
Total	**11,803**	**1**	**117**	**427**	**923**	**715**	**444**	**4,676**	**19,106**
Average Volume/Hour	984	0	10	36	77	60	37	390	1,592
% Share	62%	0%	1%	2%	5%	4%	2%	24%	100%
Vehicle Capacity	5	50	36	3	14	14	4	3	
Vehicle Occupancy	40%	80%	70%	60%	80%	50%	40%	70%	
Daily Pax. Demand	**23,606**	**40**	**2,948**	**769**	**10,338**	**5,005**	**710**	**9,820**	**53,236**
Hourly Pax. Demand	1,967	3	246	64	861	417	59	818	4,436

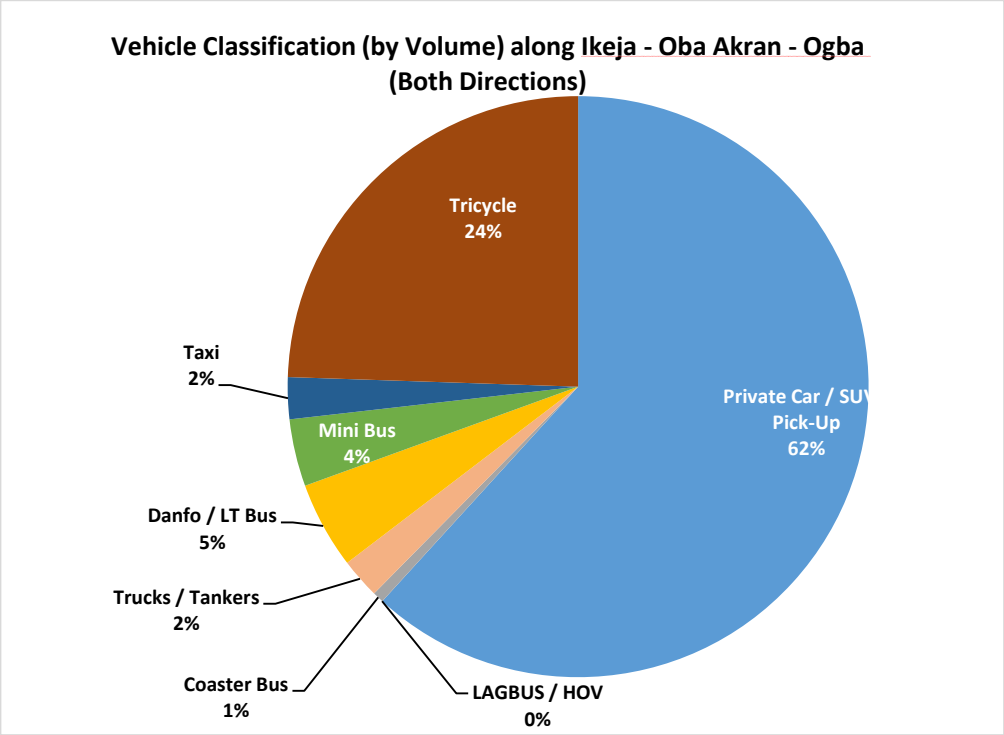


Figure 6.42: 12-Hour Traffic Volume along Ikeja – Oba Akran – Ogba (Both Directions)

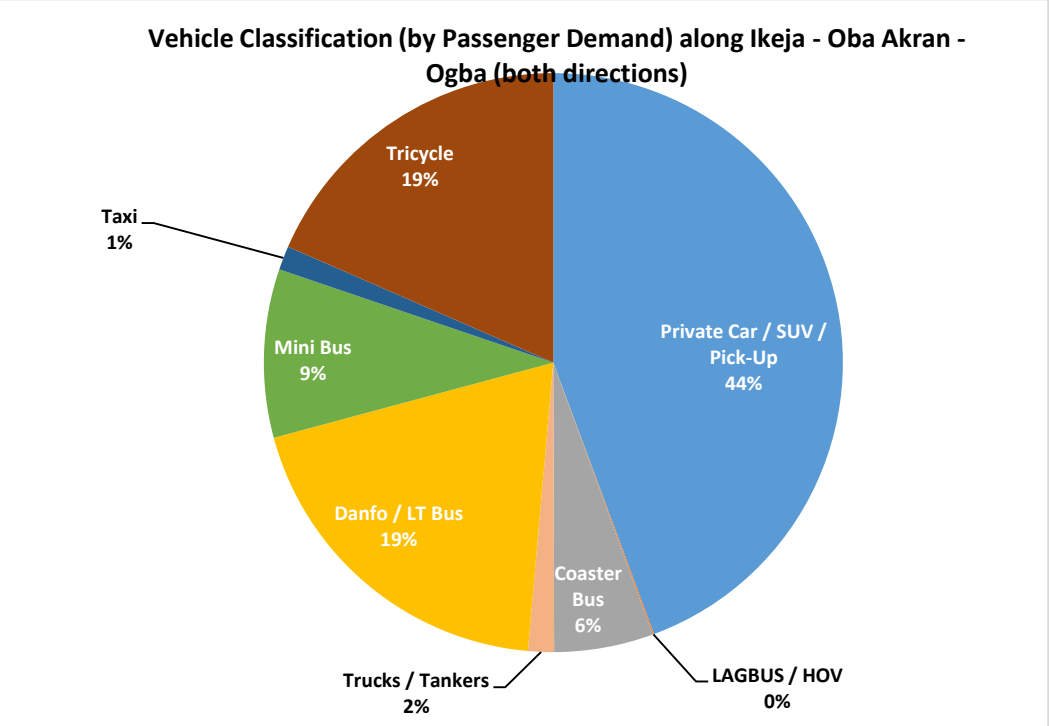


Figure 6.43: 12-Hour Passenger Demand along Ikeja - Adeniyi Jones - Ogba (Both Directions)

xii. Ikeja – Ojota

The location for the MCC the Ikeja – Ojota route was at Olusosun area along Kudirat Abiola Way. The Average Daily Traffic (ADT) in the direction From Ikeja was 8,875 vehicles with 1,034 and 846 vehicles in the AM and PM peak hours respectively.

Private Cars and Tricycles are the most prominent vehicle types along this segment of the road with 42% and 34% of traffic respectively, while Danfos make up 12% of total traffic. Trucks / Tankers makes up 5%, with Minibuses 1.4%, and Taxis making up 5.2% of the traffic respectively in this direction. LAGBUS / HOV constitute 0.2%, while Coaster make up 0.1% of the total traffic volume. Table 6.33 and Figure 6.44 depict the 12-Hour traffic volumes and traffic volume profile respectively.

In the other direction of traffic, the Average Daily Traffic (ADT) was 8,923 vehicles with 888 and 953 in the AM and PM peak hours respectively. Private Cars make up 42% and Tricycles also 42% of total traffic volume. Trucks / Tankers makes up 2.5%, while Danfo Buses are 10.2% of the total traffic volume respectively. Minibuses and Taxis make up 1.4% and 4.4% respectively; LAGBUS / HOV constitute 0.3%, while Coaster makes up 0.1% of traffic respectively in this direction. Table 6.34 and Figure 6.45 depict the traffic volumes and traffic volume profile respectively.

Similarly, Tables 6.35 shows the summary of traffic volumes and passenger demand at the bus stop along the Ikeja – Ojota road. Figures 6.46 and 6.47 are charts showing traffic volumes and passenger demand respectively at the MCC location.

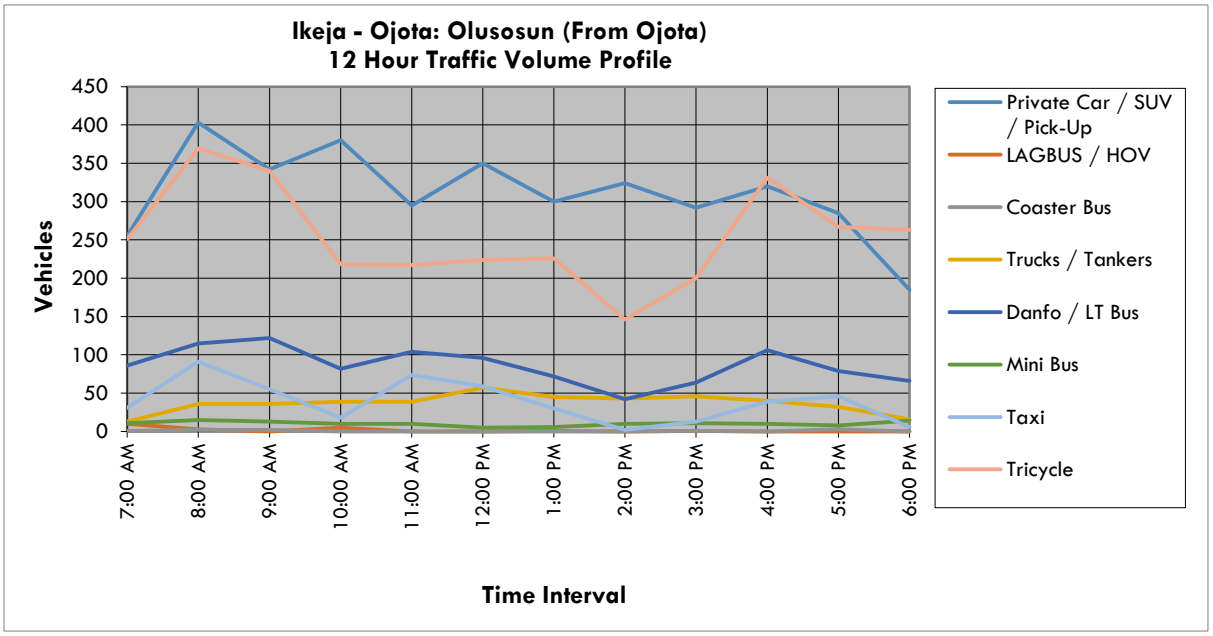


Figure 6.44: 12-Hour Traffic Volume profile along Ikeja – Ojota Route (Direction: *From Ojota*)

Table 6.33: 12-Hour Traffic Volume along Ikeja – Ojota route (Direction: *From Ojota*)

12-Hour Traffic Volumes

ROUTE:	Ikeja - Ojota	**DATE:**	March 15, 2017
SEGMENT:	Kudirat Abiola Way	**DAY:**	
LOCATION:	Olusosun	**DIR.:**	From Ojota

TIME INTERNAL	Private Car / SUV / Pick-Up	LAGBUS / HOV	Coaster Bus	Trucks / Tankers	Danfo / LT Bus	Mini Bus	Taxi	Tricycle	*All Vehicles*
07:00-08:00	255	10	1	13	86	11	31	251	658
08:00-09:00	403	3	2	36	115	15	91	369	1,034
09:00-10:00	342	0	2	36	122	13	55	340	910
10:00-11:00	380	5	0	39	82	10	18	218	752
11:00-12:00	295	0	0	39	104	10	74	217	739
12:00-01:00	350	0	0	57	96	5	59	224	791
01:00-02:00	300	1	0	45	72	6	30	226	680
02:00-03:00	324	0	0	43	42	10	2	146	567
03:00-04:00	292	1	1	46	64	11	13	200	628
04:00-05:00	320	0	0	40	106	10	39	331	846
05:00-06:00	285	0	3	32	79	8	46	267	720
06:00-07:00	185	0	0	16	66	14	6	263	550
TOTAL	**3,731**	**20**	**9**	**442**	**1,034**	**123**	**464**	**3,052**	**8,875**
Percentage (%)	42.0%	0.2%	0.1%	5.0%	11.7%	1.4%	5.2%	34.4%	100.0%
									8:00 AM
									1,034
									4:00 PM
									846

Table 6.34: 12-Hour Traffic Volume along Ikeja – Ojota route (Direction: *To Ojota*)

12-Hour Traffic Volumes

ROUTE	Ikeja - Ojota	**DATE:**	March 15, 2017
SEGMENT:	Kudirat Abiola Way	**DAY:**	
LOCATION:	Olusosun	**DIR.:**	To Ojota

TIME INTERVAL	Private Car / SUV / Pick-Up	LAGBUS / HOV	Coaster Bus	Trucks / Tankers	Danfo / LT Bus	Mini Bus	Taxi	Tricycle	*All Vehicles*
07:00-08:00	267	1	0	6	97	6	8	305	690
08:00-09:00	323	0	0	8	117	5	8	421	882
09:00-10:00	276	1	0	10	109	8	14	341	759
10:00-11:00	446	0	0	55	78	9	12	288	888
11:00-12:00	320	2	0	27	76	7	18	236	686
12:00-01:00	296	6	1	18	58	16	23	229	647
01:00-02:00	272	0	0	14	65	10	26	272	659
02:00-03:00	234	2	0	12	63	7	27	298	643
03:00-04:00	187	0	0	5	49	13	15	255	524
04:00-05:00	465	6	2	24	79	28	24	325	953
05:00-06:00	301	6	2	27	59	9	20	332	756
06:00-07:00	330	1	1	18	62	7	20	397	836
TOTAL	**3,717**	**25**	**6**	**224**	**912**	**125**	**215**	**3,699**	**8,923**
Percentage (%)	41.7%	0.3%	0.1%	2.5%	10.2%	1.4%	2.4%	41.5%	100.0%
									10:00 AM
									888
									4:00 PM
									953

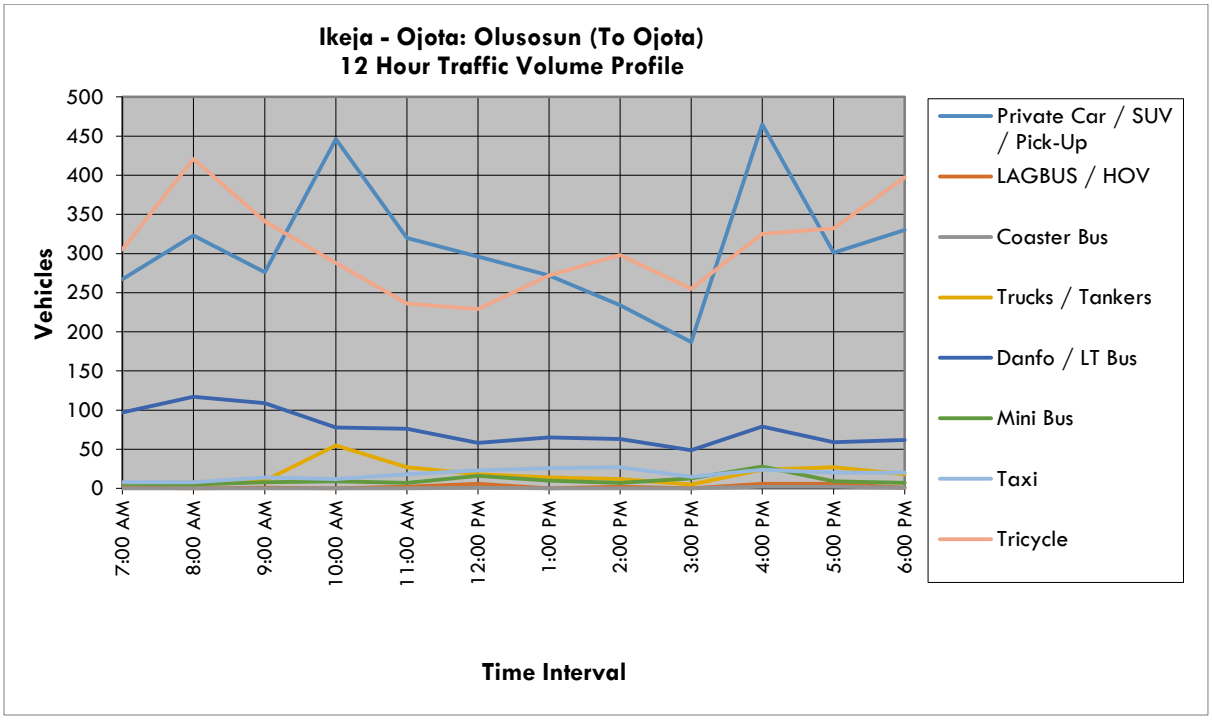


Figure 6.45: 12-Hour Traffic Volume profile along Ikeja – Ojota Route (Direction: *To Ojota*)

Table 6.35: 12-Hour Traffic Volume & Passenger Demand along Ikeja - Ojota (Both Directions)

Time Interval	Private Car / SUV / Pick-Up	LAGBUS / HOV	Coaster Bus	Trucks / Tankers	Danfo / LT Bus	Mini Bus	Taxi	Tricycle	TOTAL
07:00-08:00	522	11	1	19	183	17	39	556	1,348
08:00-09:00	726	3	2	44	232	20	99	790	1,916
09:00-10:00	618	1	2	46	231	21	69	681	1,669
10:00-11:00	826	5	0	94	160	19	30	506	1,640
11:00-12:00	615	2	0	66	180	17	92	453	1,425
12:00-01:00	646	6	1	75	154	21	82	453	1,438
01:00-02:00	572	1	0	59	137	16	56	498	1,339
02:00-03:00	558	2	0	55	105	17	29	444	1,210
03:00-04:00	479	1	1	51	113	24	28	455	1,152
04:00-05:00	785	6	2	64	185	38	63	656	1,799
05:00-06:00	586	6	5	59	138	17	66	599	1,476
06:00-07:00	515	1	1	34	128	21	26	660	1,386
Total	**7,448**	**45**	**15**	**666**	**1,946**	**248**	**679**	**6,751**	**17,798**
Average Volume/Hour	621	4	1	56	162	21	57	563	1,483
% Share	42%	0%	0%	4%	11%	1%	4%	38%	100%
Vehicle Capacity	5	50	36	3	14	14	4	3	
Vehicle Occupancy	40%	80%	70%	60%	80%	50%	40%	70%	
Daily Pax. Demand	**14,896**	**1,800**	**378**	**1,199**	**21,795**	**1,736**	**1,086**	**14,177**	**57,068**
Hourly Pax. Demand	1,241	150	32	100	1,816	145	91	1,181	4,756

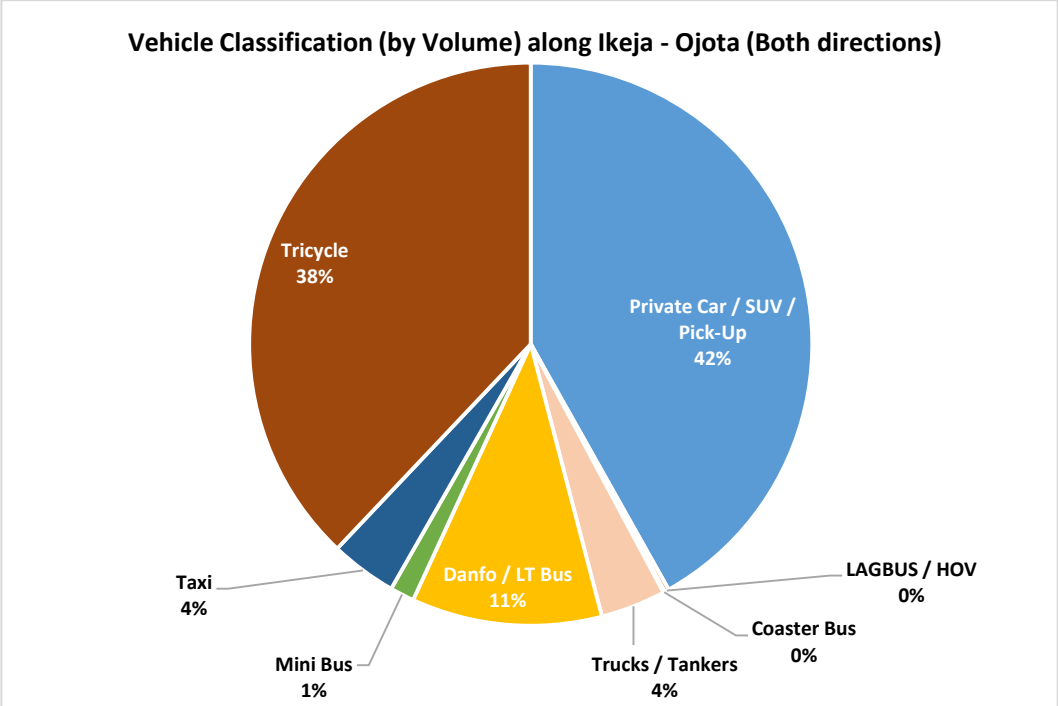


Figure 6.46: Traffic Volume along Ikeja – Ojota (Both Directions)

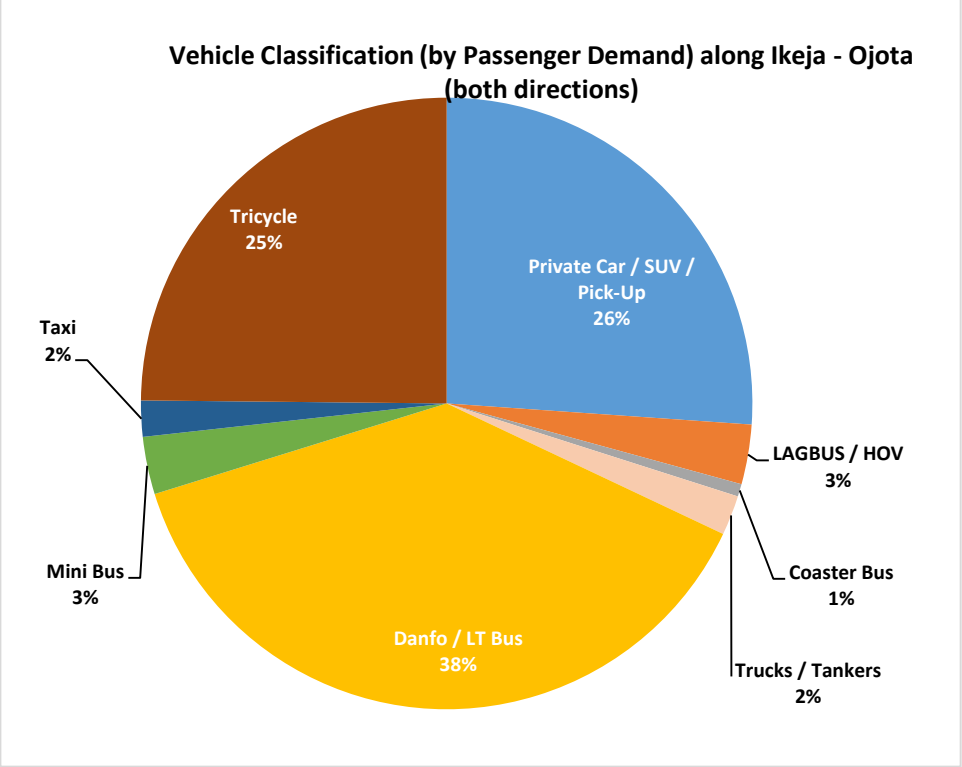


Figure 6.47: Passenger Demand along Ikeja – Ojota (Both Directions)

6.2 Lagos Island Hub

The Lagos Island hub is known as the economic and financial nerve center of the country. It houses most of the headquarters of financial institutions, major multi-national companies, and Embassies/Consulates of other Countries. It also plays host to several markets that serve as major destinations and traffic generators for a high volume of passengers to the Island. However, there is a huge vacuum in the transport sector as over 70% of the commuters that troop into Lagos Island daily are not adequately taken care and are forced to make use of mainly dilapidated infrastructure and rickety vehicles.

As part of the process of generating a passenger demand for the Lagos Island Hub, a traffic count (Bus Park Survey) was commissioned to have an understanding of the volume of commuters that use public transport daily.

6.2.1 Procedure for Park Survey

Park surveys were conducted at strategic bus parks in Lagos Island on Friday, March 17, 2017 between 7.00am and 7.00pm. These parks include:

i. Obalende Bus Terminal;
ii. CMS Marina Bus Parks;
iii. Adeniji Adele Bus Park;
iv. Apongbon Bus Park;
v. Tom Jones Bus Park;
vi. Idumota Bus Park; and
vii. Sura Junction

Traffic Assistants were deployed to each of the identified park and were stationed at the exit point of each of the loading points in the park. This was done in order to count the various vehicles going out of the parks with passengers throughout the survey duration (12 hours). The major vehicle categories include:

- Danfo bus (14 passengers);
- Danfo LT bus (18 passengers);
- Unpainted Taxis (Kabu-kabu)
- Tricycles;
- Minivans & SUVs;
- Coaster Bus;
- High-Occupancy-Vehicles (HOV – LAGBUS)

At the point of exit from the parks, traffic assistants were stationed and they focused primarily on vehicles that were loaded with passengers, the volume of fully loaded vehicles would be used to estimate the daily vehicular volume and passenger throughput from the parks.

Similarly, traffic assistant took a count of all parked vehicles in their respective bus parks every hour. This would be used as additional information to know the park capacity and for design purposes.

6.2.2 Analysis of Bus Park Survey Data

i. Obalende Bus Terminal

Obalende Bus Terminal is one of the busiest transport hubs in Lagos metropolis. Passengers from various parts of Lagos mainland, Lagos Island (Victoria Island, Ikoyi, Banana Island, etc.), Lekki Peninsula and Ajah environs all connect to their destinations from Obalende.

The prominent destinations on the Island from Obalende include Bar Beach / Eko Hotel, Falomo, Park View Estate, Osborne, Banana Island, Lekki Phase 1 & 2, Lekki Jakande Junction, Ajah, etc; while the major

destinations on the mainland from Obalende include Yaba, Oyingbo, Mile 2, Oshodi, Ogba, Berger, Iyana Ipaja, Ketu / Ojota, and Ikorodu.

Tricycles are the most prominent public transport vehicle used for commuting from Obalende; with an average daily volume of 3,306 vehicles which represents 62% of all public transport vehicles in Obalende Terminal. Taxis are mainly used on the Parkview Estate and Banana Island route and have 776 vehicles which make up 14% of total volume of vehicles. Danfo and Danfo LT buses counted were 648 (12%) and 354 (7%) respectively, they are popular on the longer routes out of the Island such as Ikeja, Ikorodu, Yaba, Iyana Ipaja, etc; and on Ajah, Lekki routes; while HOVs at Obalende are mainly LAG-Buses with 253 (5%) daily vehicular volume respectively.

Tricycles are mainly used for the shorter commutes within the Island on routes such as Adeola Odeku, Bar Beach/ Eko Hotel, Keffi - Ribadu Street, Falomo, Alagbon Passport Office, CMS/Tom Jones/ Idumota, etc. Table 6.36 shows the daily vehicular volume to all routes from Obalende, while Figures 6.48 - 6.53 shows the distribution for various vehicle categories at Obalende.

Figure 6.48: View of Obalende showing LAGBus Terminal, Danfo Park and road side Tricycle Park

Table 6.36: Average Daily Vehicle Volume for Bus Routes from Obalende Bus Terminal

OBALENDE TERMINAL																		
Destinations	Oshodi		Ikorodu	Ojota	Ojodu Berger	Ajah			Park View	Banana Island	Adeola Odeku	Eko Hotel	Falomo	Keffi / Ribadu	Passport Office	Egbeda Ikotun	Ikeja	Yaba
	Vehicle Type		Vehicle Type	Vehicle Type	Vehicle Type	Vehicle Type			Vehicle Type		Vehicle Type		Vehicle Type	Vehicle Type	Vehicle Type	Vehicle Type	Vehicle Type	Vehicle Type
Time	Danfo LT	LAG-Bus	LAG-Bus	Danfo LT	Danfo LT	Danfo LT	Danfo	HOV	Taxi	Taxi	Tricycle	Tricycle	Danfo	Tricycle	Tricycle	Mini-bus	Mini-bus	Danfo
07:00-08:00	11	5	1	3	3	2	66	3	37	13	128	92	6	45	25	2	3	15
08:00-09:00	6	17	1	7	3	3	51	4	43	15	116	95	7	39	28	3	2	9
09:00-10:00	3	17	1	5	5	1	58	5	50	17	102	99	3	36	32	4	4	23
10:00-11:00	2	24	1	5	4	2	25	6	48	20	127	101	6	35	30	6	4	22
11:00-12:00	10	34	1	4	3	2	34	5	56	22	87	104	9	33	26	3	3	19
12:00-01:00	8	16	1	2	5	4	26	3	60	37	149	91	4	30	23	4	3	37
01:00-02:00	16	12	1	6	4	2	22	3	67	28	151	83	10	32	21	5	4	15
02:00-03:00	17	10	1	2	3	1	24	5	52	14	122	83	3	30	13	4	4	10
03:00-04:00	20	10	3	7	2	2	15	8	37	17	101	75	6	40	7	5	2	8
04:00-05:00	15	10	1	3	4	0	28	9	42	16	161	118	6	32	5	5	4	7
05:00-06:00	17	12	2	8	4	2	30	7	37	12	123	104	8	30	8	7	4	21
06:00-07:00	15	12	1	4	1	4	5	1	26	10	152	123	6	12	7	5	2	4
Total	**140**	**179**	**15**	**56**	**41**	**25**	384	59	**555**	221	**1,519**	**1,168**	**74**	**394**	**225**	**53**	**39**	**190**
Average	**12**	**15**	**1**	**5**	**3**	**2**	**32**	**5**	**46**	**18**	**127**	**97**	**6**	**33**	**19**	**4**	**3**	**16**
Vehicle Capacity	**18**	**45**	**45**	**18**	**18**	**18**	**14**	**50**	**4**	**4**	**4**	**4**	**14**	**4**	**4**	**14**	**18**	**14**
Pax. Demand	**2,520**	**8,055**	**675**	**1,008**	**738**	**450**	**5,376**	**2,950**	**2,220**	**884**	**6,076**	**4,672**	**1,036**	**1,576**	**900**	**742**	**702**	**2,660**
Fare	**150**	**100**	**200**	**200**	**200**	**250**	**300**	**200**	**100**	**150**	**100**	**100**	**100**	**100**	**100**	**300**	**200**	**100**
Revenue	**378,000**	**805,500**	**135,000**	**201,600**	**147,600**	**112,500**	**1,612,800**	**590,000**	**222,000**	**132,600**	**607,600**	**467,200**	**103,600**	**157,600**	**90,000**	**222,600**	**140,400**	**266,000**

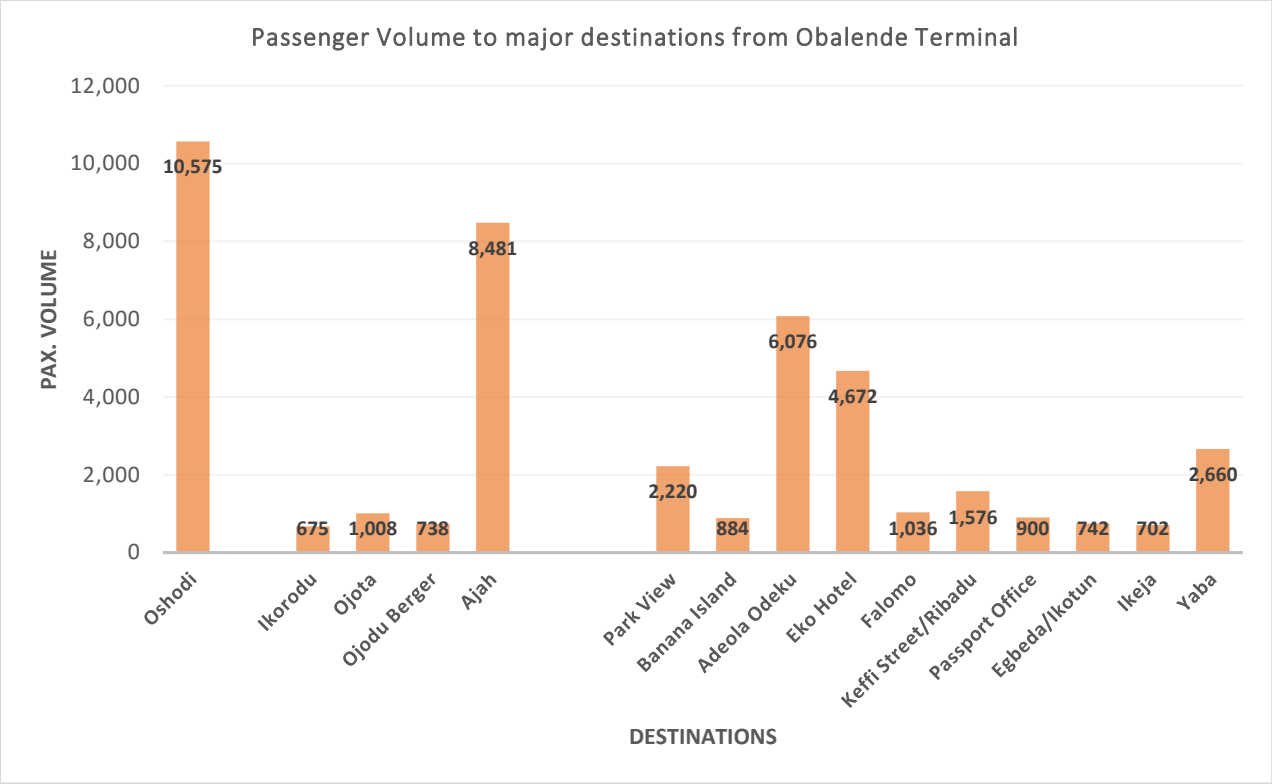


Figure 6.49: Daily passenger Volume to major destinations from Obalende Terminal

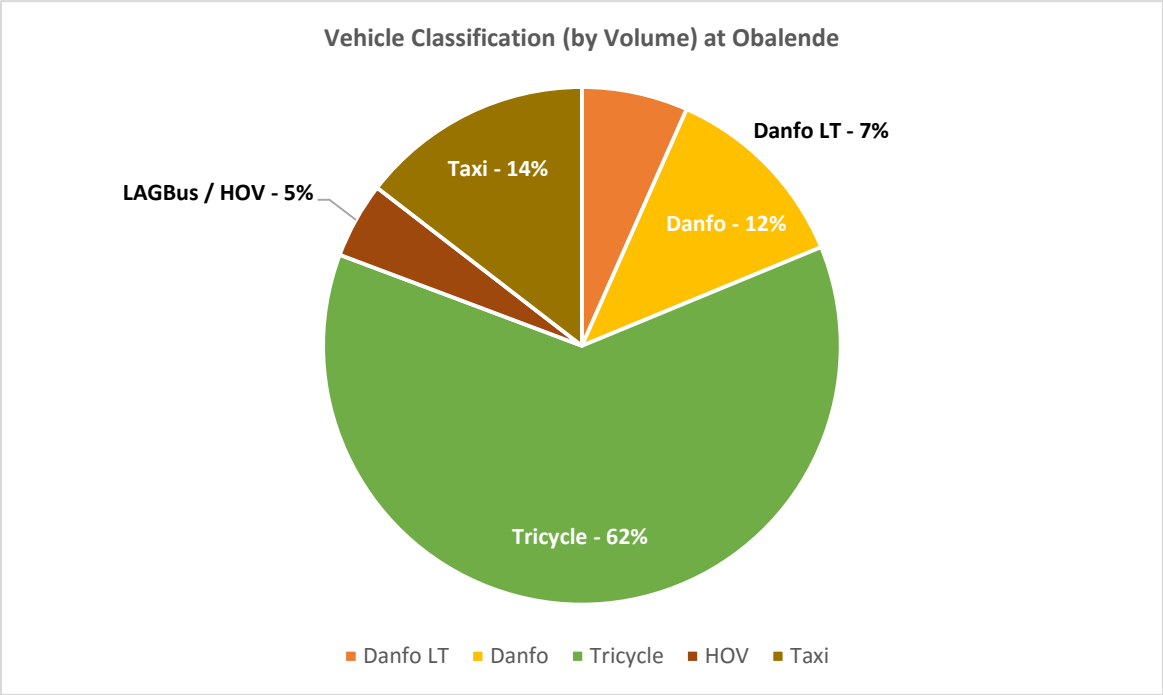


Figure 6.50: Vehicle volume at Obalende Terminal

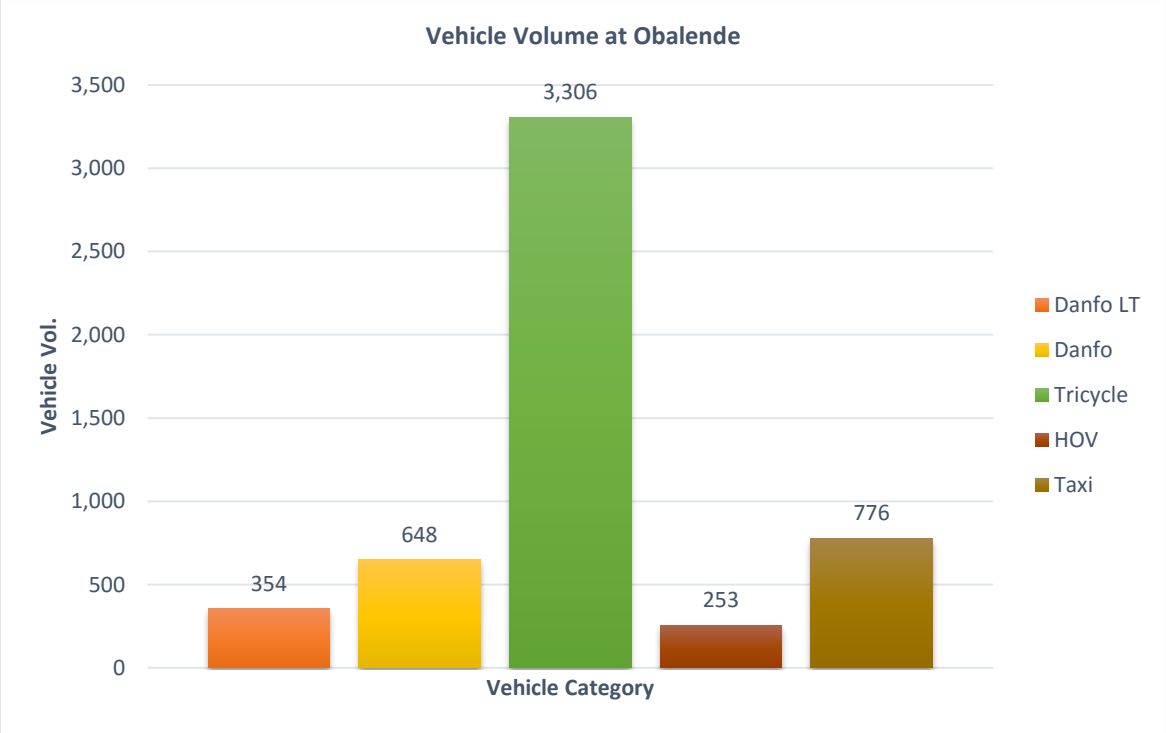


Figure 6.51: Vehicle volume at Obalende Terminal

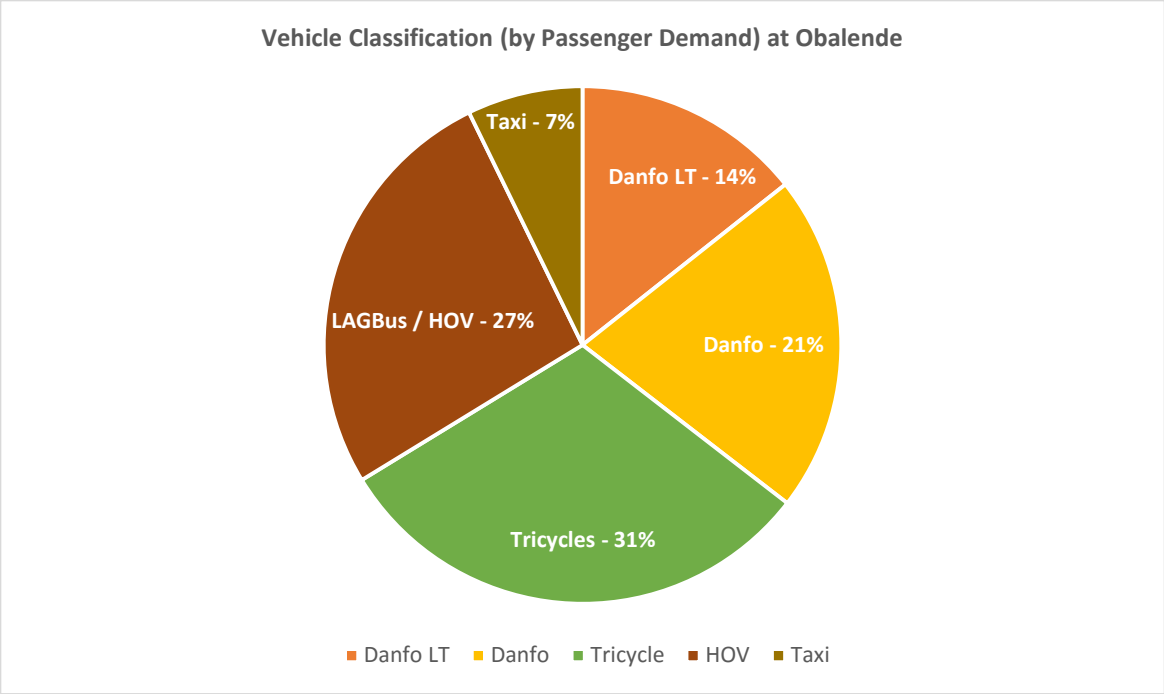


Figure 6.52: Passenger volume at Obalende Terminal

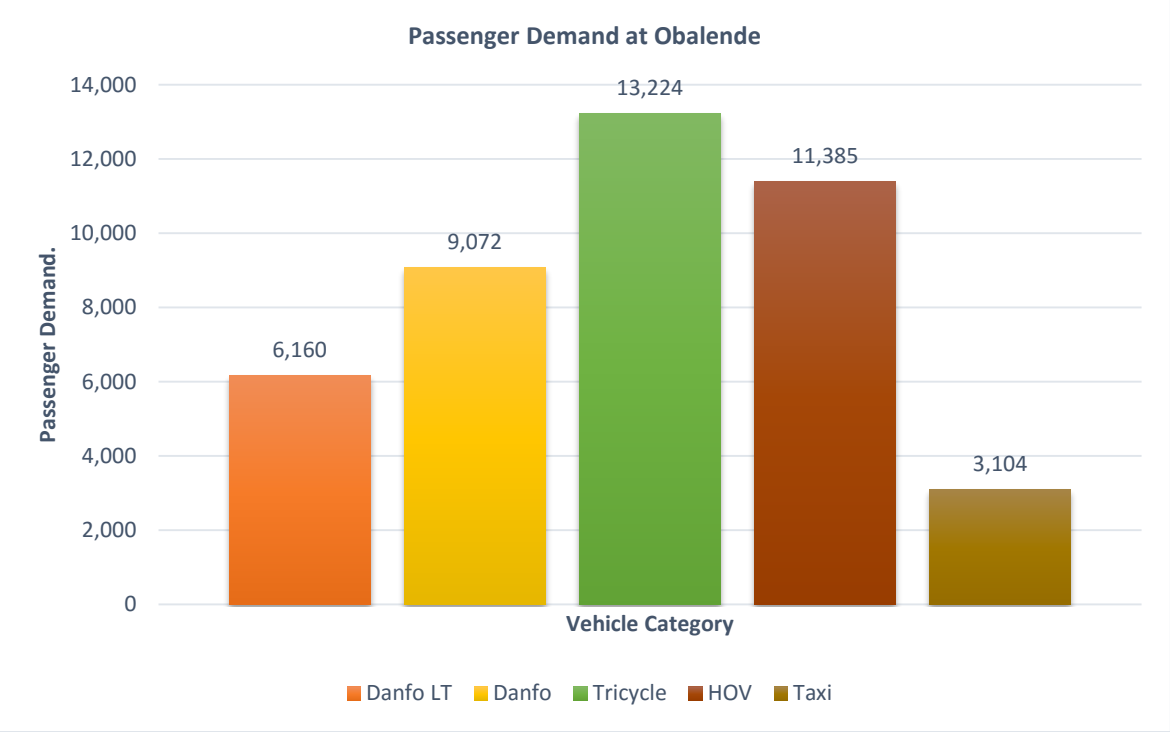


Figure 6.53: Passenger Demand at Obalende Terminal

ii. CMS/Marina Bus Parks

CMS /Marina Bus Parks serve as one of the busiest and most strategic transport hubs in Lagos Island. The major Bus Park around CMS / Marina is located opposite Christ the King Cathedral, while other parks and loading points are situated along Outer Marina Road and also under the Marina Bridge. Passengers from various parts of Lagos mainland, Victoria Island, Lekki and Ajah arrive at Lagos Island and also connect to their destinations from the Bus Parks at CMS / Marina.

The prominent destinations on the Island from CMS /Marina include Bar Beach / Eko Hotel, Adeola Odeku, Lekki Phase 1 & 2, Lekki Jakande, Ajah, Sangotedo, Epe, etc. Other destinations on the mainland from CMS /Marina include Orile, Mile 2, Ikotun, Masha/Kilo, Mushin, Costain, Ojuelegba, etc.

Danfo buses are the most prominent public transport vehicle at the CMS /Marina Parks; with a daily average volume of 1,717 vehicles which represents 72% of all public transport vehicles in CMS /Marina. Danfo LT buses are also used mainly on the Ajah, Mile 2, Orile routes and represent 16% of the total traffic. Other vehicle categories at CMS / Marina Bus Park include Coaster Bus with 134 vehicles which represents 6%, LAG-Bus with 85 vehicles (3%), Taxi with 55 (2%) and SUV/Sienna with 18 (1%) of total traffic

Figure 6.55; show the average daily vehicular volume for various vehicle categories at CMS /Marina.

Figure 6.54: Aerial View of CMS Marina Bus Park on the RHS

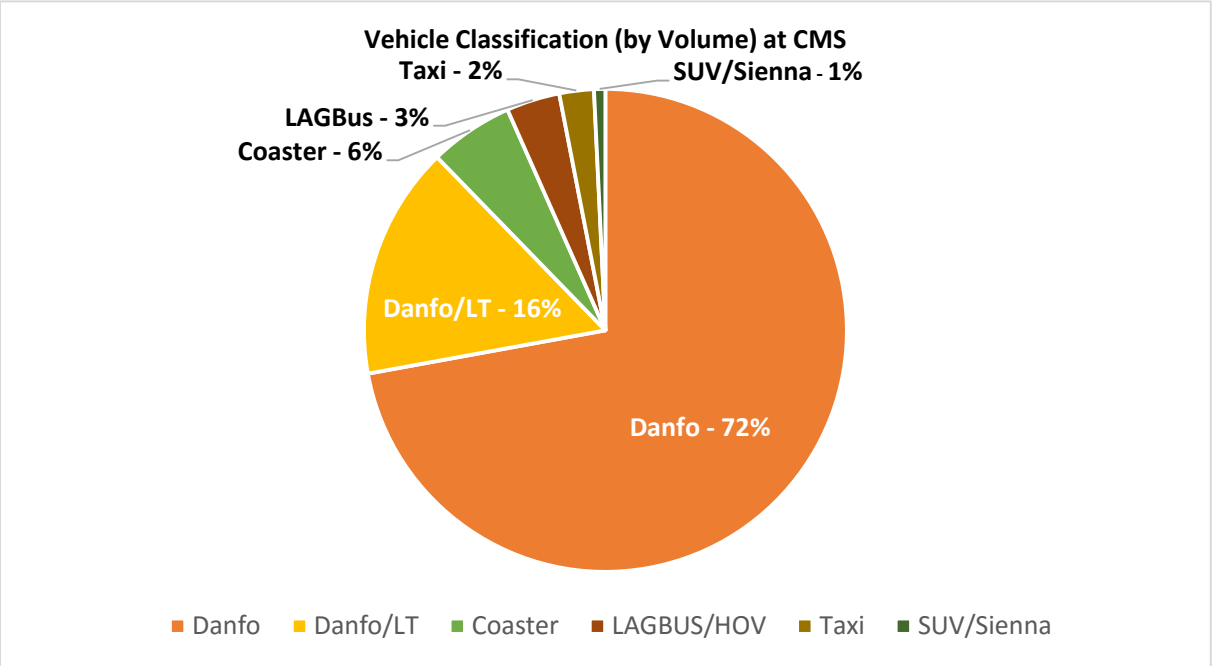


Figure 6.55: Vehicle volume at CMS Marina

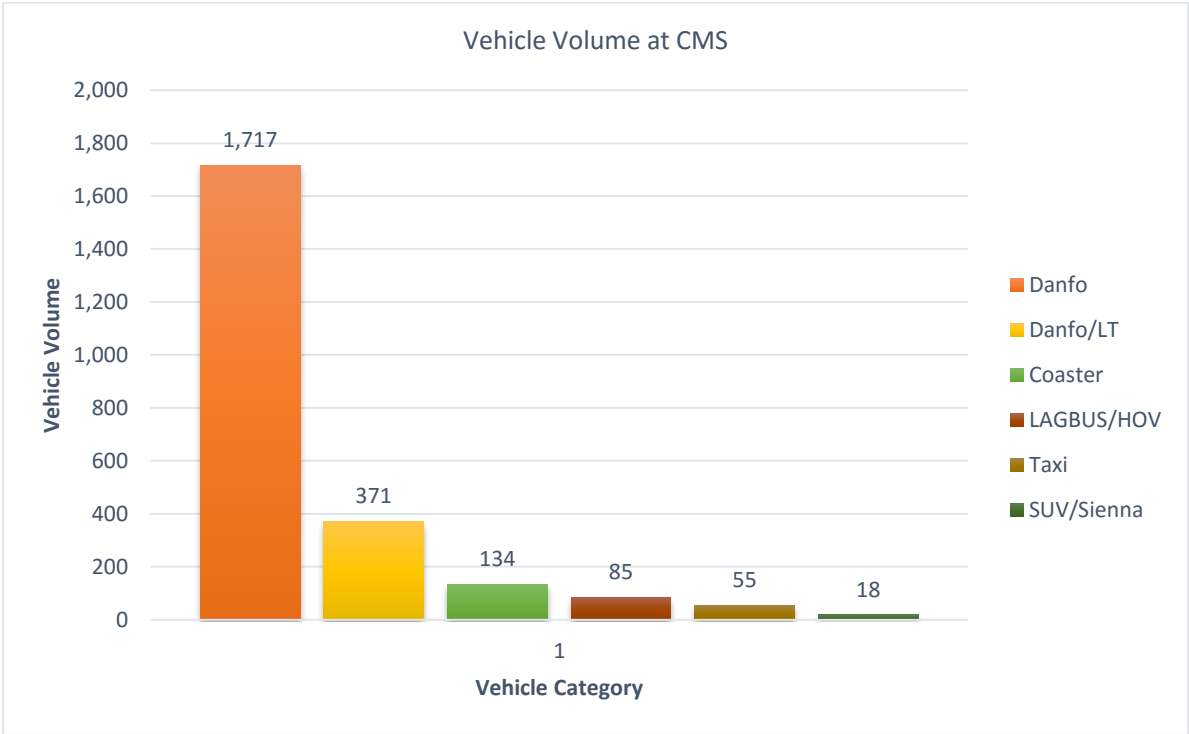


Figure 6.56: Vehicle volume at CMS Marina

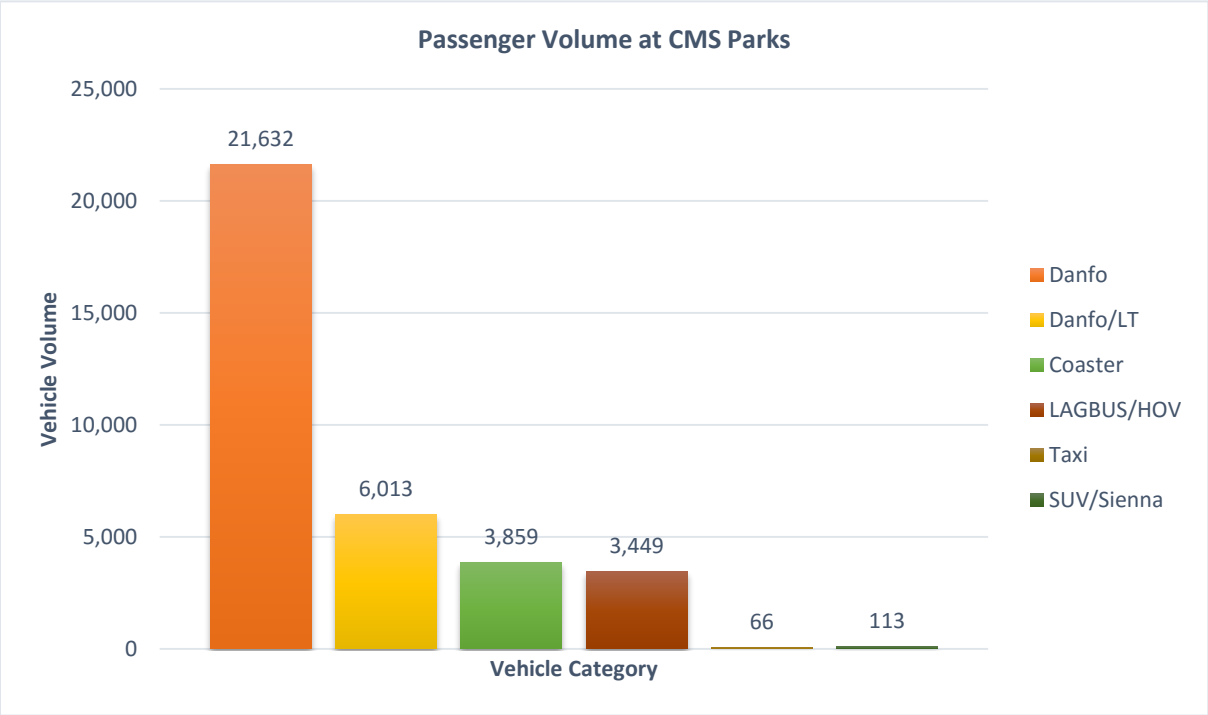


Figure 6.57: Passenger volume at CMS Marina

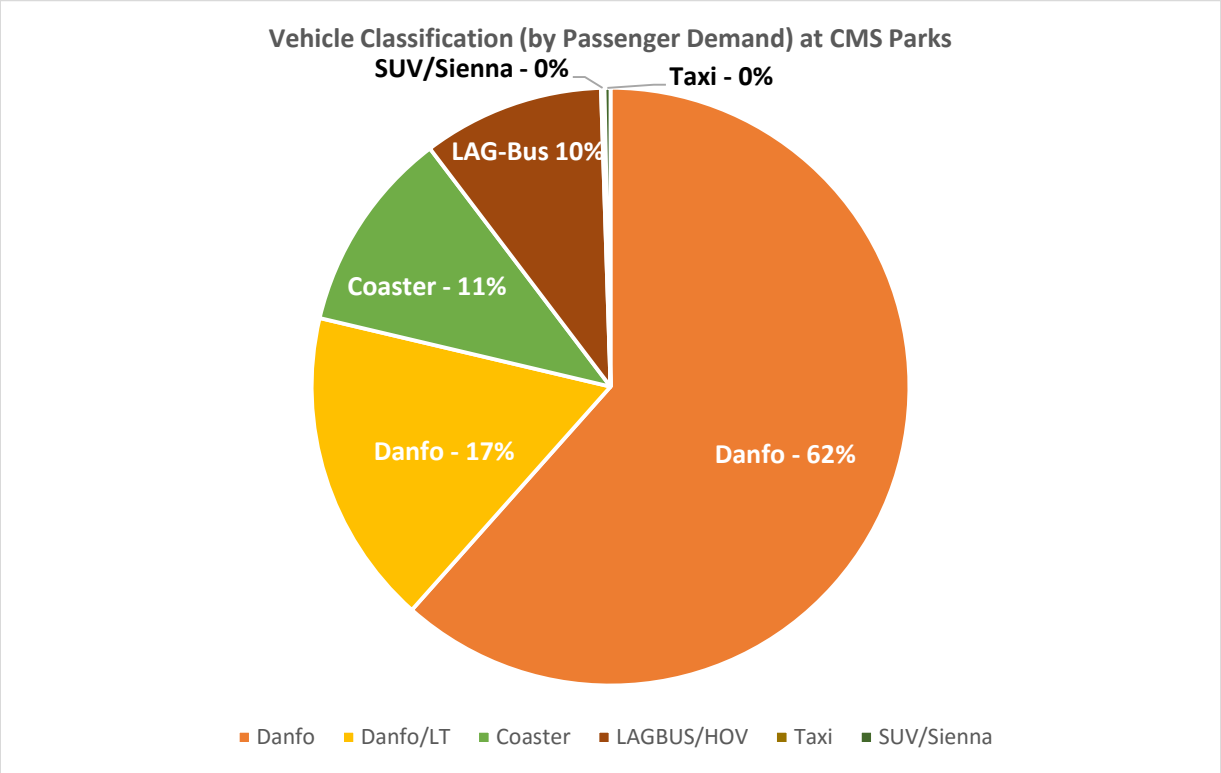


Figure 6.58: Passenger volume at CMS Marina

iii. Adeniji Adele Bus Park

Adeniji Adele Bus Park is one of the busiest parks in Lagos Island. The prominent destinations from Adeniji Adele are Idumota and Ikorodu routes. Other important destinations on the mainland include Adekunle, Yaba, Oyingbo, Mile 2, Ijora, and Oshodi.

Danfo buses are the most common public transport vehicle from Adeniji Adele Bus Park with an average daily volume of 362 vehicles which represents 55% of all the public transport vehicles. Minibuses (mainly Mazda 18 seater bus) are also very popular on the routes out of the Island such as along the Ikeja, Ikorodu, Oshodi routes, with 274 vehicles representing 41% of traffic volume; Danfo LT buses loading from Adeniji are not as much with 26 buses representing 4% of total traffic volume. Table 6.37 shows the daily vehicular volume to all routes from Adeniji Adele, while Figures 6.59 - 6.63 shows the distribution for various vehicle categories at Adeniji.

Table 6.37: Average Daily Vehicle Volume for routes from Adeniji Adele Bus Park

ADENIJI ADELE									
Destinations	**Yaba**	**Oyingbo**	**Idumota**	**Ijora**	**Ikorodu**	**Oshodi**	**Adekunle**	**Ajah**	**Ketu**
	Vehicle Type	**Vehicle Type**	**Vehicle Type**	**Vehicle Type**	**Vehicle Type**	**Vehicle Type**	**Vehicle Type**	**Vehicle Type**	**Vehicle Type**
Time	**Danfo**	**Danfo**	**Danfo**	**Mini Bus**	**Mini Bus**	**Mini Bus**	**Danfo LT**	**Mini Bus**	**Danfo**
07:00-08:00	0	2	14	1	11	0	3	14	5
08:00-09:00	1	2	15	1	9	0	1	8	3
09:00-10:00	1	1	23	5	13	0	2	5	5
10:00-11:00	1	1	24	3	9	0	2	8	4
11:00-12:00	0	2	28	3	10	1	2	7	2
12:00-01:00	0	3	13	3	13	1	2	7	3
01:00-02:00	4	4	24	3	11	0	1	10	6
02:00-03:00	3	4	30	5	13	1	2	9	9
03:00-04:00	0	0	29	2	14	1	2	6	6
04:00-05:00	0	0	23	2	10	2	2	5	9
05:00-06:00	0	0	19	2	13	2	4	8	13
06:00-07:00	0	0	17	3	13	1	3	6	9
Total	**10**	**19**	**259**	**33**	**139**	**9**	**26**	**93**	**74**
Average/Hour	**1**	**2**	**22**	**3**	**12**	**1**	**2**	**8**	**6**
Veh. Capacity	14	14	14	18	18	18	18	18	18
Pax. Demand	**140**	**266**	**3,626**	**594**	**2,502**	**162**	**468**	**1,674**	**1,332**
Fare	100	100	100	100	300	200	100	200	200
Revenue	**14,000**	26,600	362,600	59,400	750,600	32,400	46,800	334,800	266,400

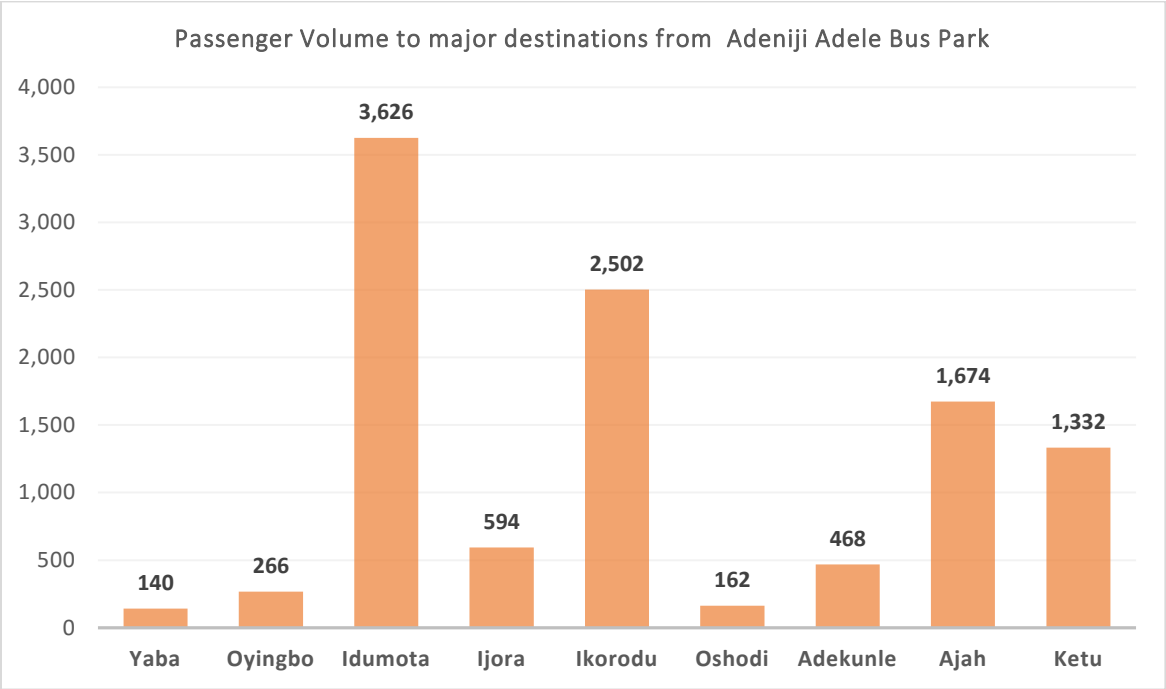


Figure 6.59: Vehicle categories and their respective volumes at Adeniji Adele Park

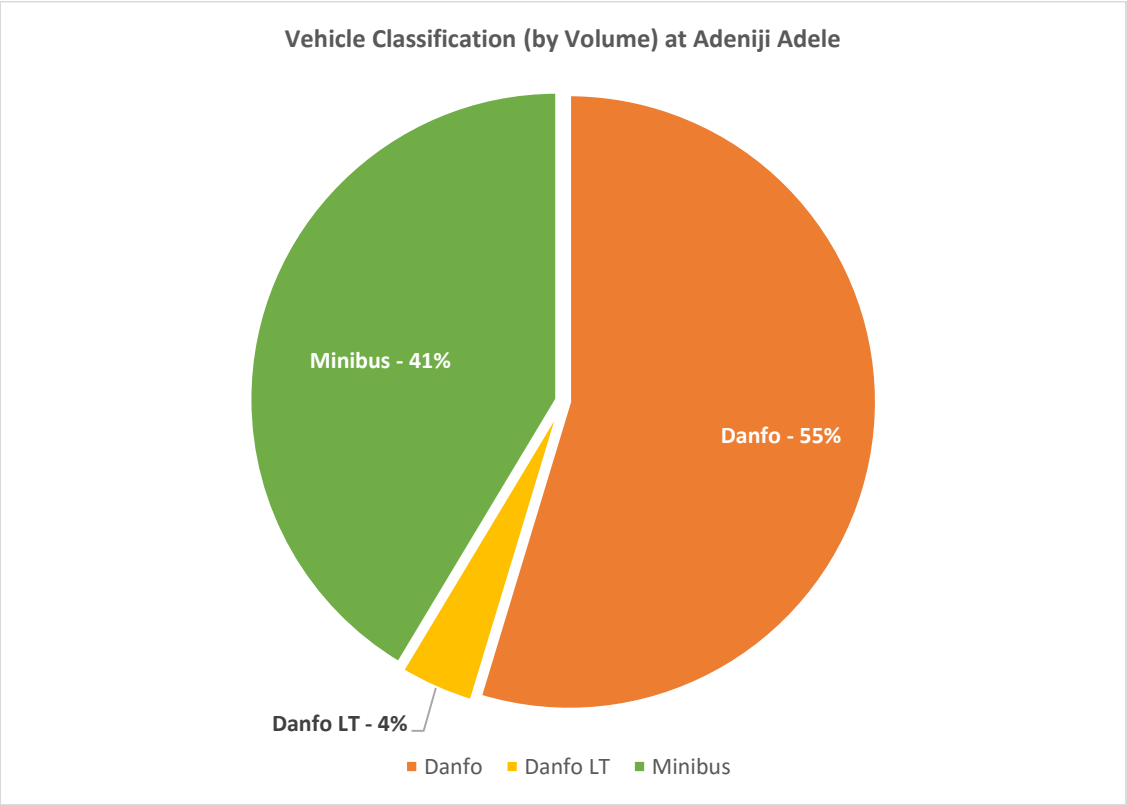


Figure 6.60: Vehicle volume at Adeniji Adele Park

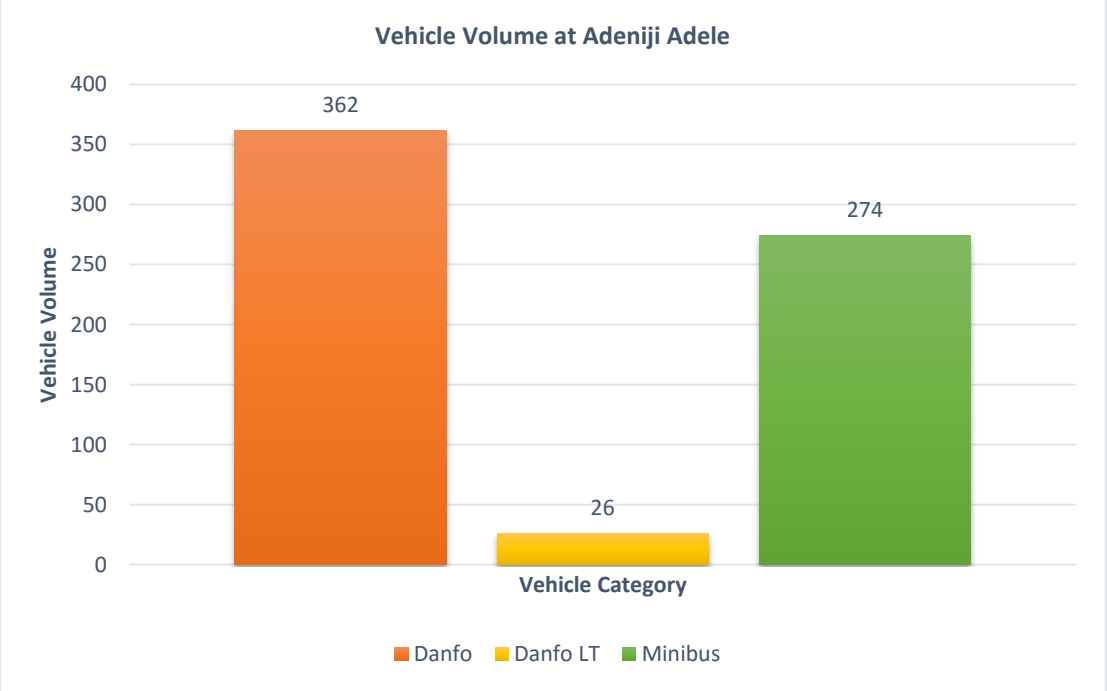


Figure 6.61: Vehicle volume at Adeniji Adele Park

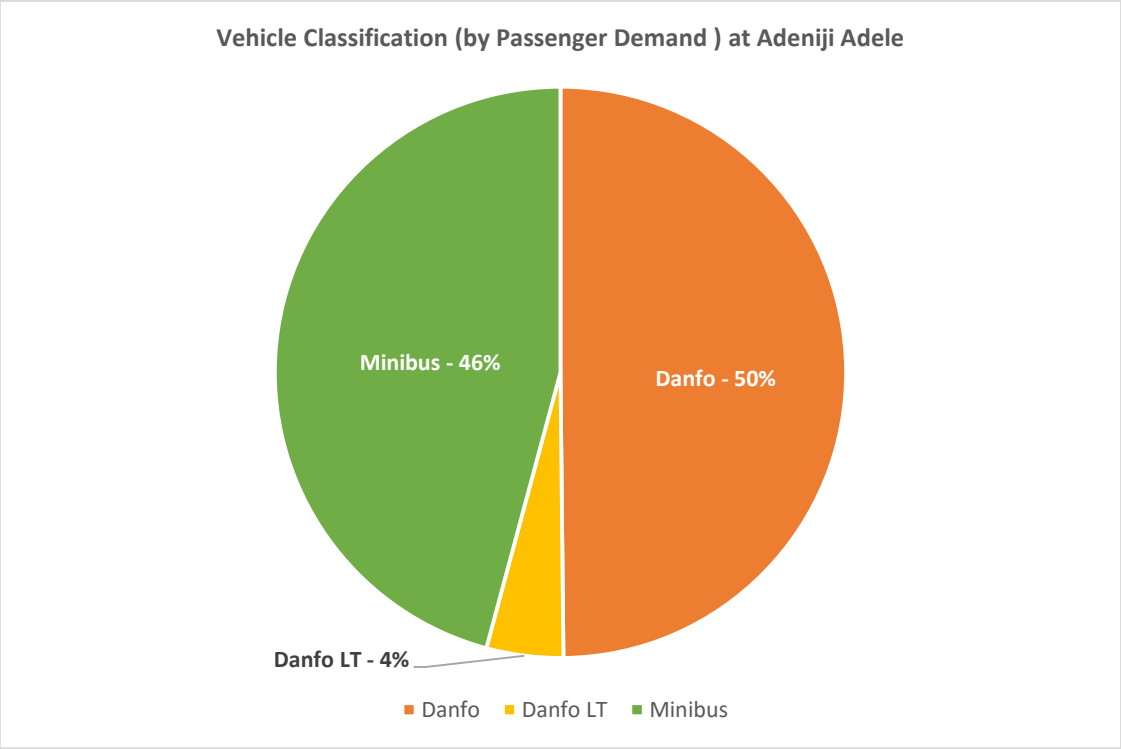


Figure 6.62: Passenger volume at Adeniji Adele Park

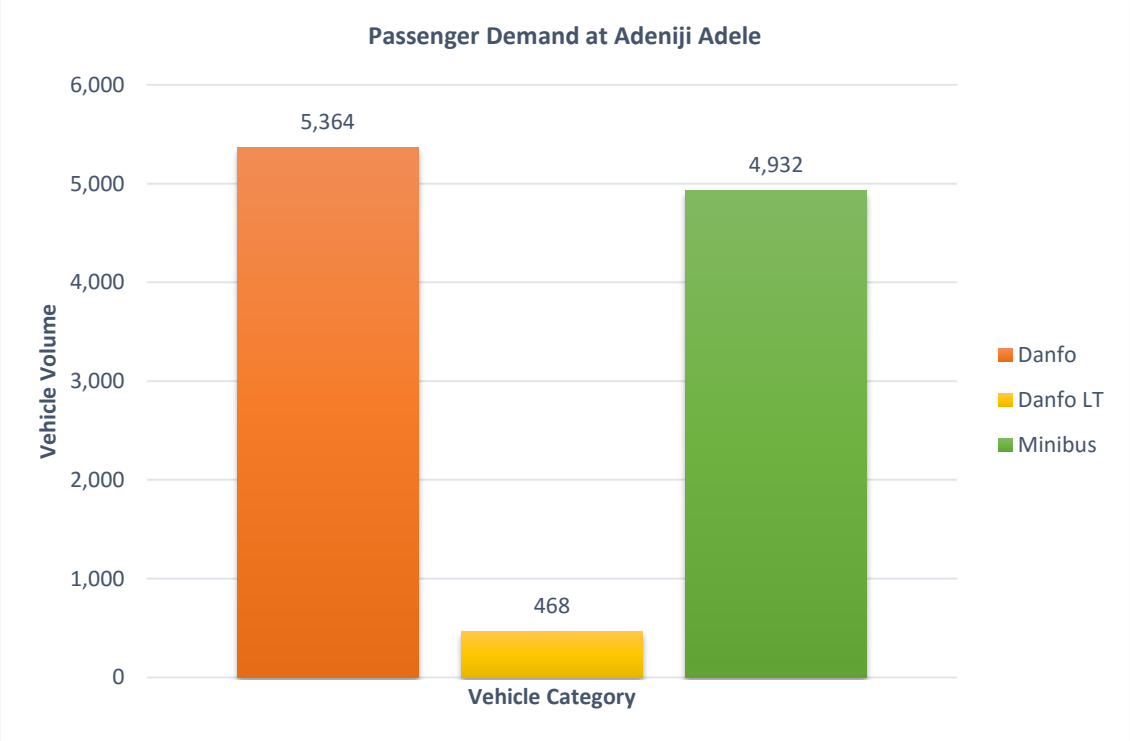


Figure 6.63: Passenger Demand at Adeniji Adele Park

iv. Apongbon Bus Park

Apongbon Park is an on-street bus park situated along the Apongbon exit from Broad Street in Lagos Island. The prominent destinations from Apongbon are Masha - Kilo and Costain / Lawanson, others are Mile 2, Orile and Ojuelegba.

Danfo buses are the most common public transport vehicle from Apongbon Bus Park with an average daily volume of 854 vehicles which represents 57% of all the public transport vehicles. Coaster buses are common at Apongbon with 415 vehicles representing 27% of traffic volume; LAG-Bus/HOVs, Taxis and Sienna represent 13%, 2% and 1% of total traffic volume respectively. Table 6.38 shows the daily vehicular volume to all routes from Apongbon, while Figures 6.64 - 6.68 shows the distribution for various vehicle categories at Apongbon.

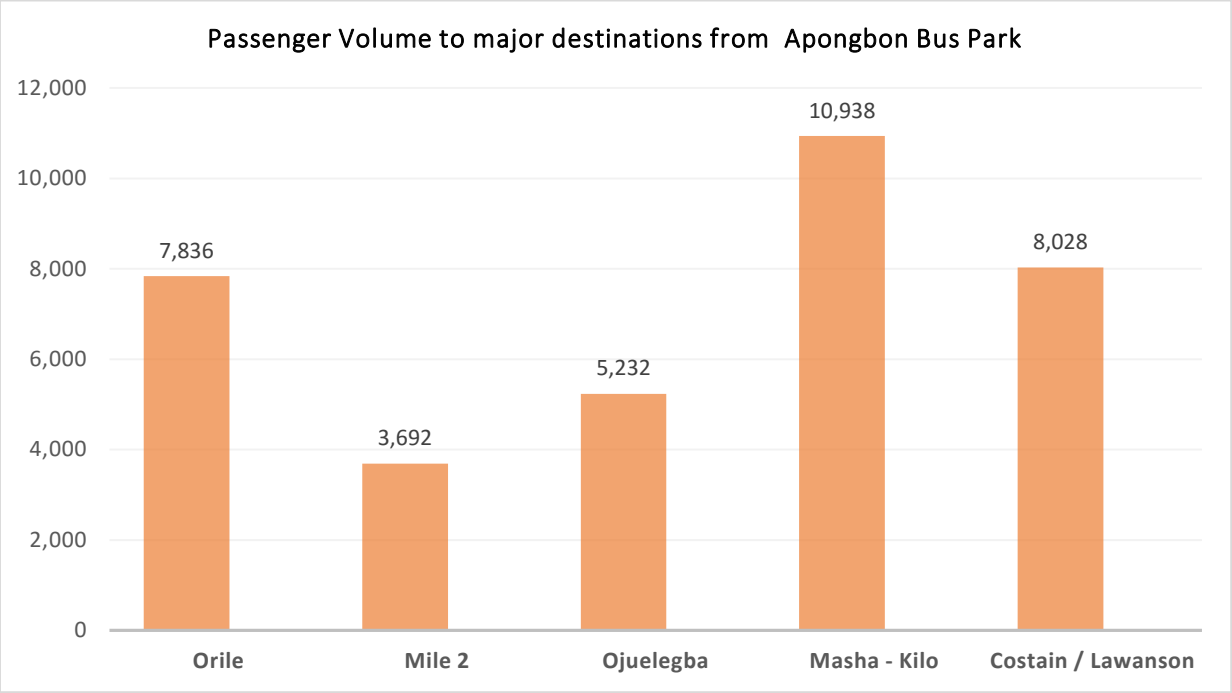


Figure 6.64: Vehicle categories and their respective volumes at Apongbon Park

Table 6.38: Average Daily Vehicle Volume for all routes

Apongbon																			
Destinations	Orile					Orile / Mile 2			Ojuelegba			Mile 2	Masha / kilo				Costain / Lawson		
	Vehicle Type					Vehicle Type			Vehicle Type			Vehicle Type	Vehicle Type				Vehicle Type		
Time	Danfo	Coaster	LAGBUS/ HOV	Taxi	SUV/Sienna	Danfo	Coaster	Taxi	Danfo	Coaster	Taxi	Coaster	Danfo	Coaster	LAGBUS/ HOV	Taxi	Danfo	Coaster	LAGBUS/ HOV
07:00-08:00	5	4	0	0	0	4	0	0	23	0	0	0	8	6	3	0	8	4	3
08:00-09:00	8	9	0	0	0	5	0	0	34	1	0	2	12	11	6	1	12	6	4
09:00-10:00	4	6	1	1	0	6	3	0	28	2	1	3	14	12	8	1	14	7	6
10:00-11:00	2	5	1	1	1	7	5	0	30	4	4	4	17	13	10	2	13	8	7
11:00-12:00	6	7	0	2	1	5	0	0	27	6	2	6	15	9	10	5	10	10	9
12:00-01:00	10	8	2	1	1	6	3	0	15	2	2	13	15	8	8	0	15	5	5
01:00-02:00	19	6	1	0	4	7	0	0	10	4	0	8	10	7	7	0	8	3	4
02:00-03:00	15	7	5	0	1	4	4	0	10	6	0	12	18	10	8	0	12	6	7
03:00-04:00	21	14	6	2	2	2	0	0	19	4	0	10	15	11	10	0	18	10	6
04:00-05:00	27	6	0	4	0	3	0	2	12	6	0	0	18	10	7	0	7	7	9
05:00-06:00	39	10	6	0	0	4	0	0	23	6	1	2	20	8	9	0	14	6	7
06:00-07:00	67	12	6	1	0	7	0	0	19	6	0	4	15	9	10	0	13	9	9
Total	**223**	**94**	**28**	**12**	**10**	**60**	**15**	**2**	**250**	**47**	**10**	**64**	**177**	**114**	**96**	**9**	**144**	**81**	**76**
Average	**19**	**8**	**2**	**1**	**1**	**5**	**1**	**0**	**21**	**4**	**1**	**5**	**15**	**10**	**8**	**1**	**12**	**7**	**6**
Veh. Capacity	14	36	45	4	7	14	36	4	14	36	4	36	14	36	45	4	14	32	45
Pax. Demand	**3,122**	**3,384**	**1,260**	**48**	**70**	**840**	**540**	**8**	**3,500**	**1,692**	**40**	**2,304**	**2,478**	**4,104**	**4,320**	**36**	**2,016**	**2,592**	**3,420**
Fare	**200**	**150**	**150**	**300**	**300**	**150**	**150**	**250**	**200**	**150**	**250**	**200**	**150**	**100**	**100**	**150**	**100**	**150**	**150**
Revenue	**624,400**	**507,600**	**189,000**	**14,400**	**21,000**	**126,000**	**81,000**	**2,000**	**700,000**	**253,800**	**10,000**	**460,800**	**371,700**	**410,400**	**432,000**	**5,400**	**201,600**	**388,800**	**513,000**

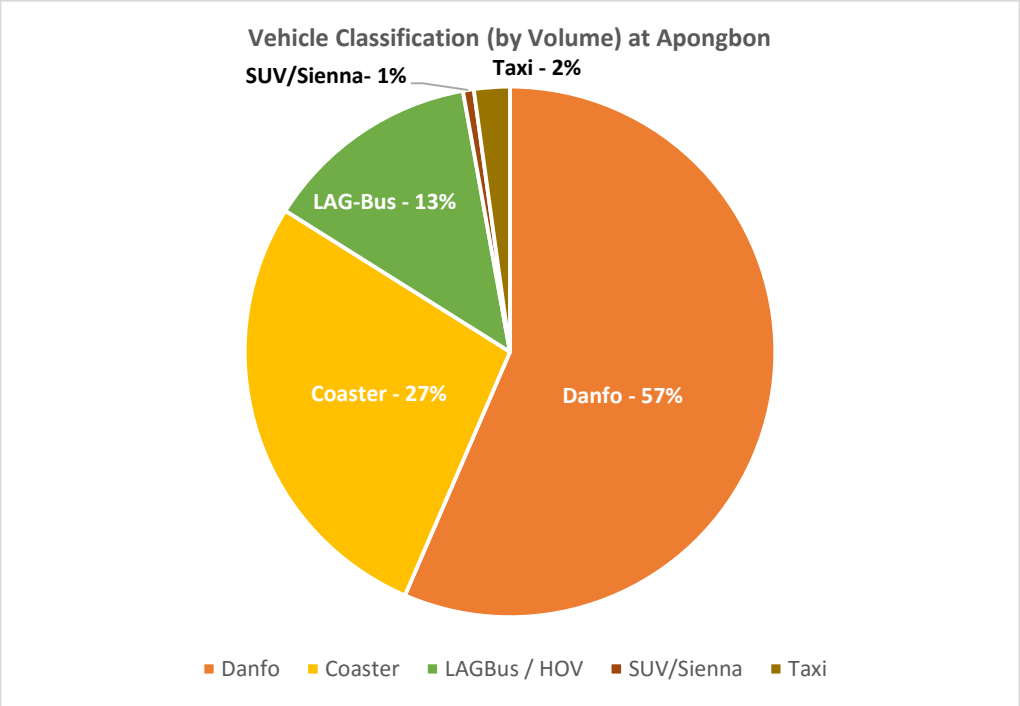


Figure 6.65: Vehicle Volume at Apongbon Park

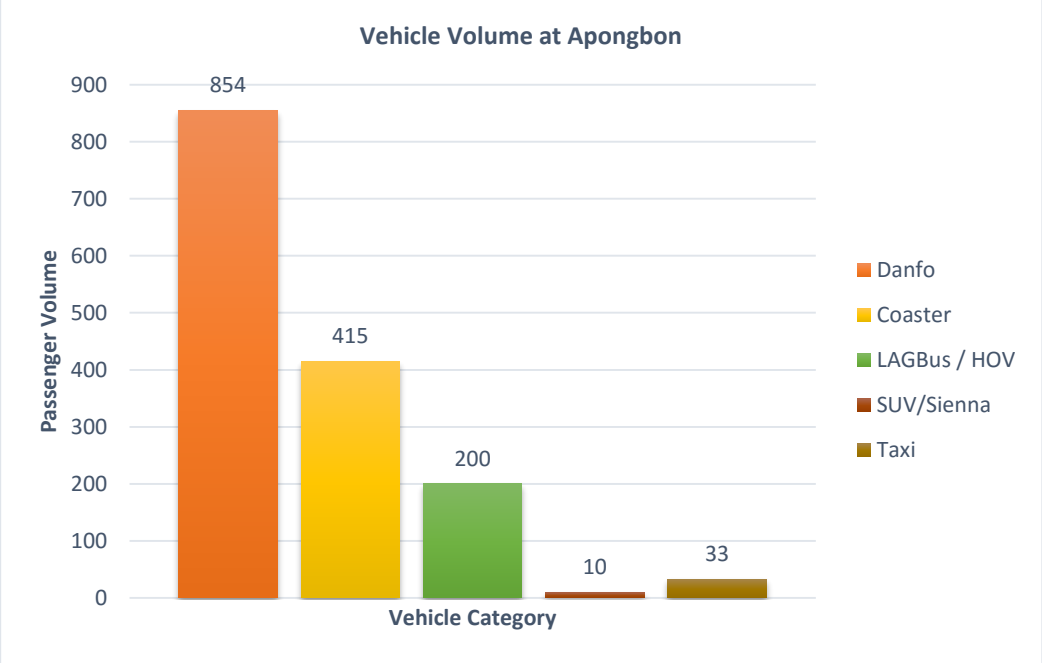


Figure 6.66: Vehicle Volume at Apongbon Park

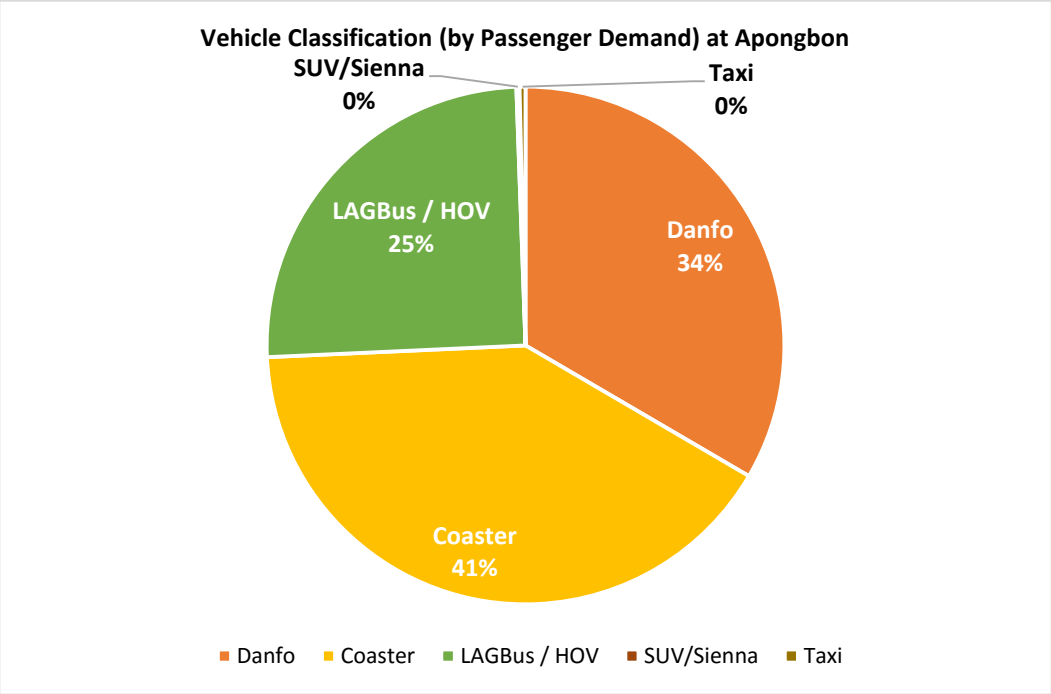


Figure 6.67: Passenger Volume at Apongbon

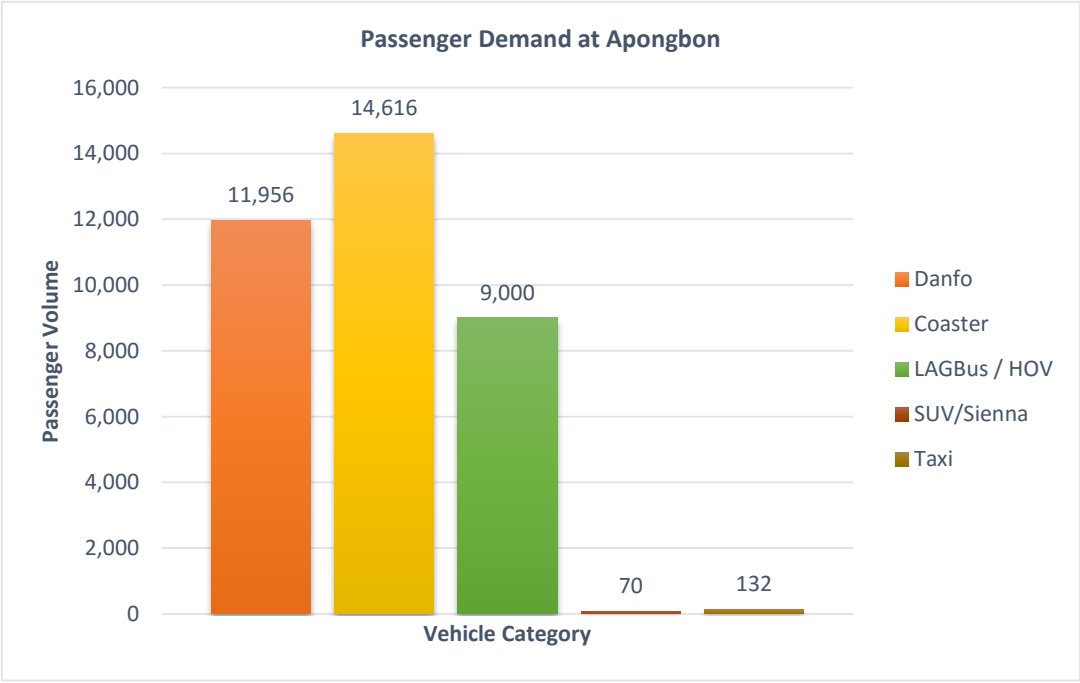


Figure 6.68: Passenger Demand at Apongbon

v. Tom Jones Bus Park

The prominent destinations from Tom Jones are Oshodi and Ijora. Others include Ikorodu, Ikotun, Bariga, Agege, Ogba, Ojodu Berger and Mowe Ibafo. The most commonly used public transport vehicle from Tom Jones are Danfo buses which represent 65%, followed by Danfo LT with 25%. Others are LAG-Bus with 8% and Sienna with 2% of total traffic. Danfo buses also carry the most share of passengers (53%), with Danfo LT and LAG-Bus moving 26% and 20% of passenger volume, while SUV/Sienna carry the remaining 1% of passengers from Tom Jones. Figure 6.69 shows the daily vehicular volume to all routes from Tom Jones while Figures 6.70 - 6.73 shows the distribution for various vehicle categories at Tom Jones.

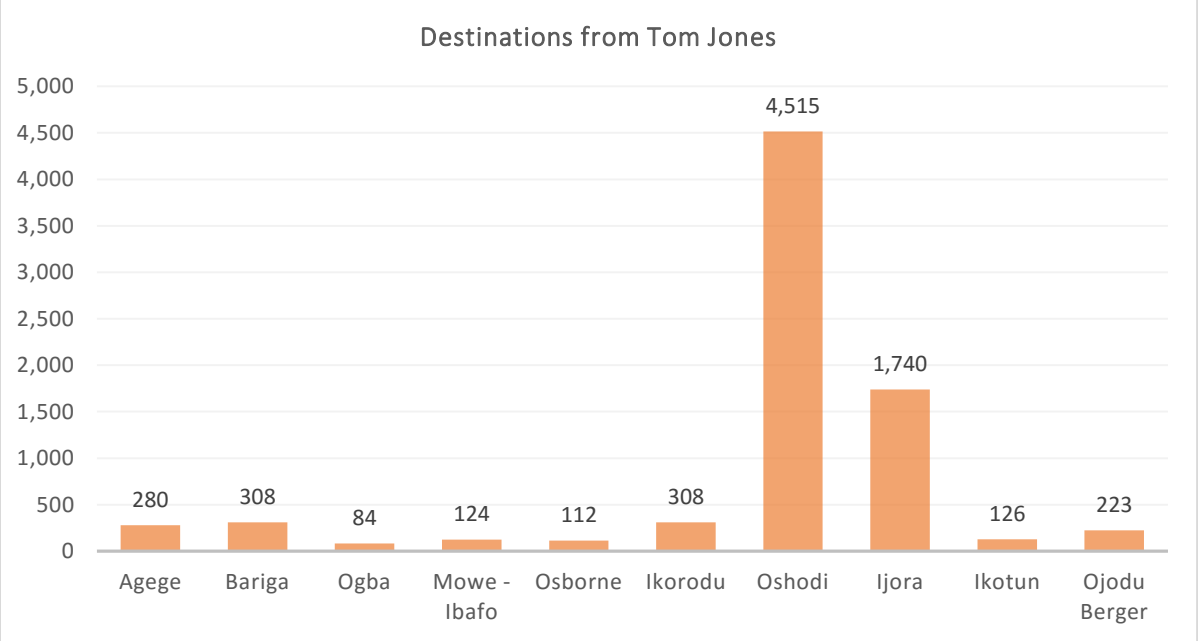


Figure 6.62: Vehicle categories and their respective volumes at Tom Jones Park

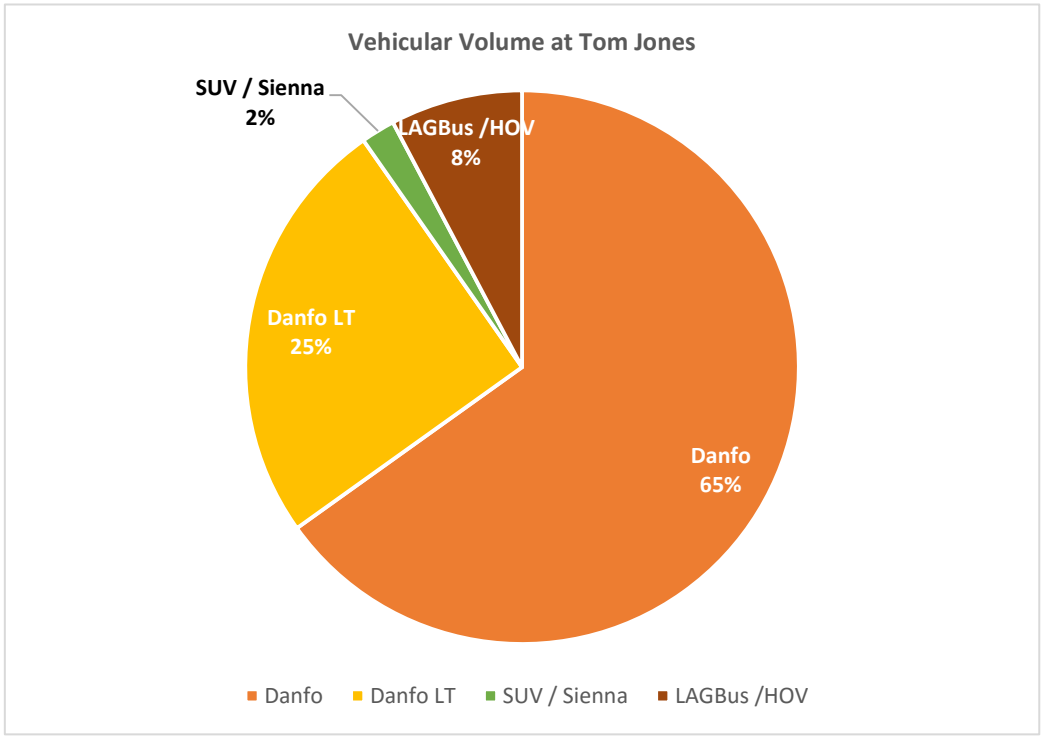


Figure 6.70: Vehicle Volume at Tom Jones Bus Park

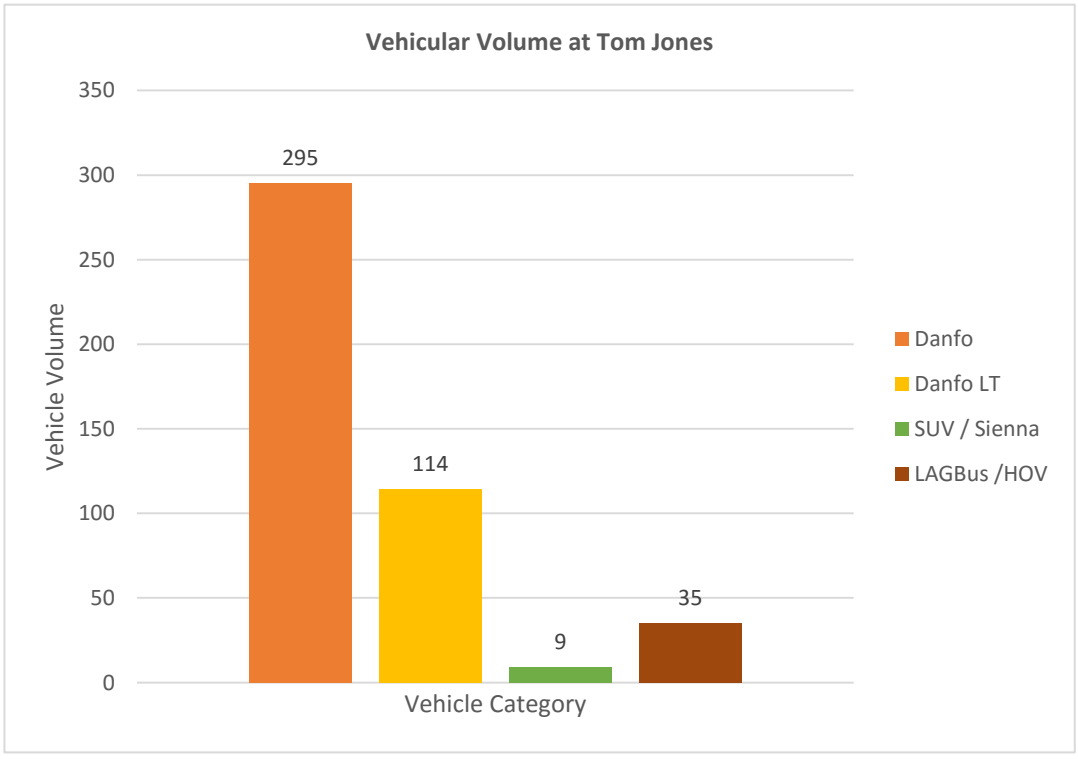


Figure 6.71: Vehicle Volume at Tom Jones Bus Park

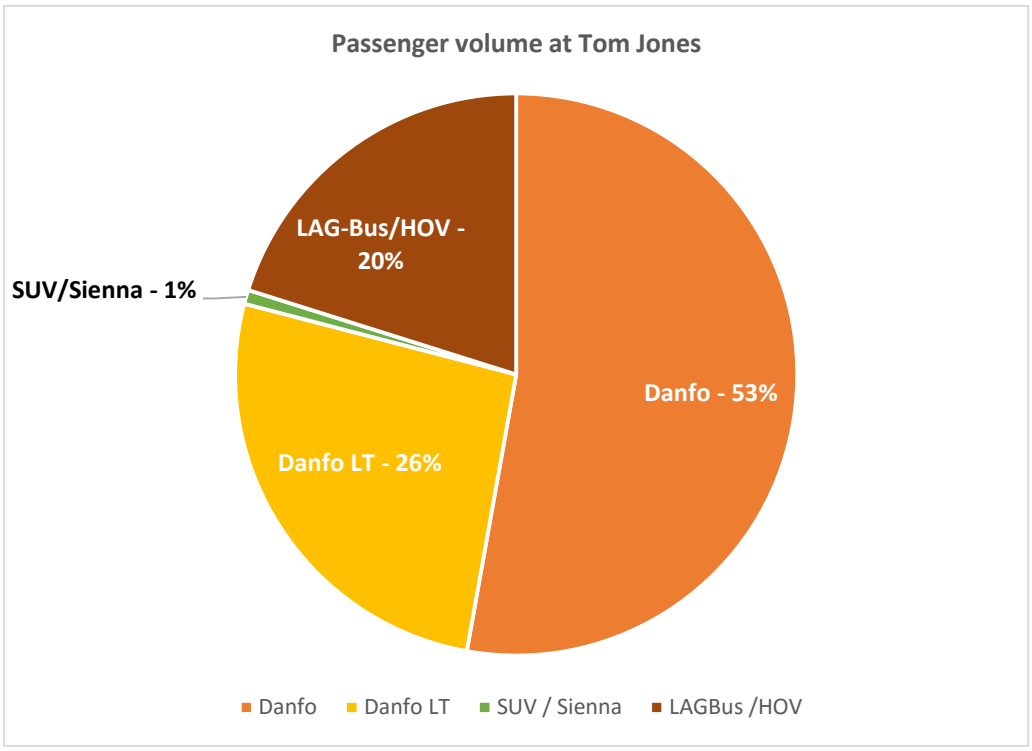


Figure 6.72: Passenger Volume at Tom Jones Bus Park

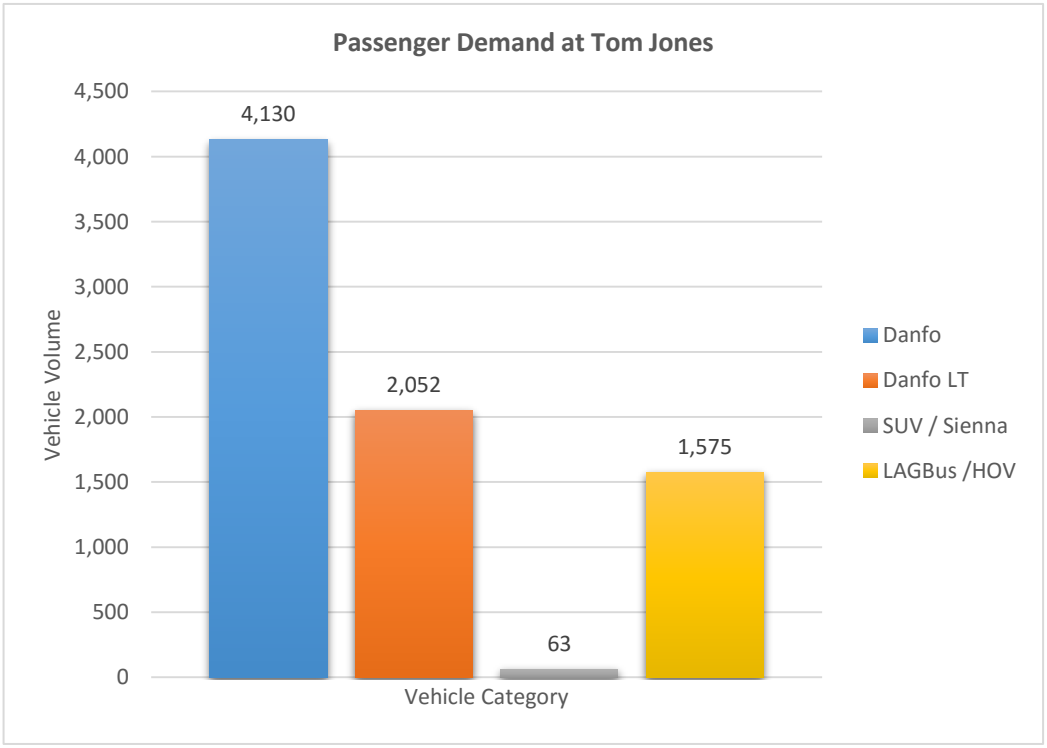


Figure 6.73: Passenger Demand at Tom Jones Bus Park

vi. Sura Bus Stop

Sura Bus Stop is the last Bus stop along Simpson Street before connecting to the Third Mainland Bridge from Lagos Island. Buses pick up passengers from Bookshop House Bus stop along Odunlami Street, along Igbosere Street, and finally at Sura Bus Stop on their way out of the Island. The prominent destinations from Sura are Ikeja, Yaba and Oshodi. The public transport vehicles at Sura are Danfo and Danfo LT buses which represent 62% and 38% of total public transport respectively. Danfo buses mostly heading for Yaba carry the most share of passengers (56%), while Danfo LT going to Ikeja or Oshodi convey the remaining 44% of passengers. Table 6.39 shows the daily vehicular volume to all routes from Sura while Figures 6.74 - 6.78 shows the distribution for various vehicle categories at Sura.

Table 6.39: Average Daily Vehicle Volume at Sura Bus stop

SURA			
Destinations	**Yaba**	**Oshodi**	**Ikeja**
	Vehicle Type		
Time	**Danfo**	**Danfo**	**Danfo LT**
07:00-08:00	26	8	21
08:00-09:00	24	11	18
09:00-10:00	20	14	17
10:00-11:00	19	16	26
11:00-12:00	28	15	30
12:00-01:00	25	12	28
01:00-02:00	20	14	23
02:00-03:00	35	23	30
03:00-04:00	39	22	33
04:00-05:00	39	20	38
05:00-06:00	58	29	49
06:00-07:00	35	32	44
Total	**368**	**216**	**357**
Average/Hour	25	14	24
Vehicle Capacity	14	14	18
Pax. Demand	**5,152**	**3,024**	**6,426**
Fare	**100**	**150**	**200**
Revenue	**515,200**	453,600	1,285,200

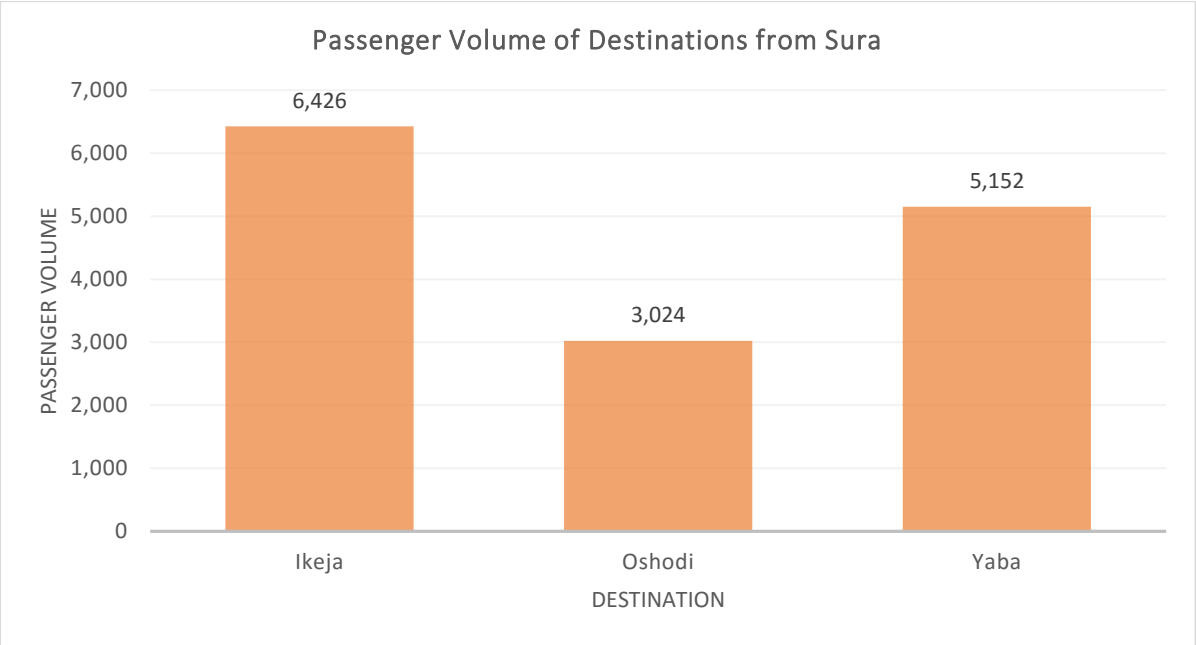


Figure 6.74: Passenger Volume at Sura

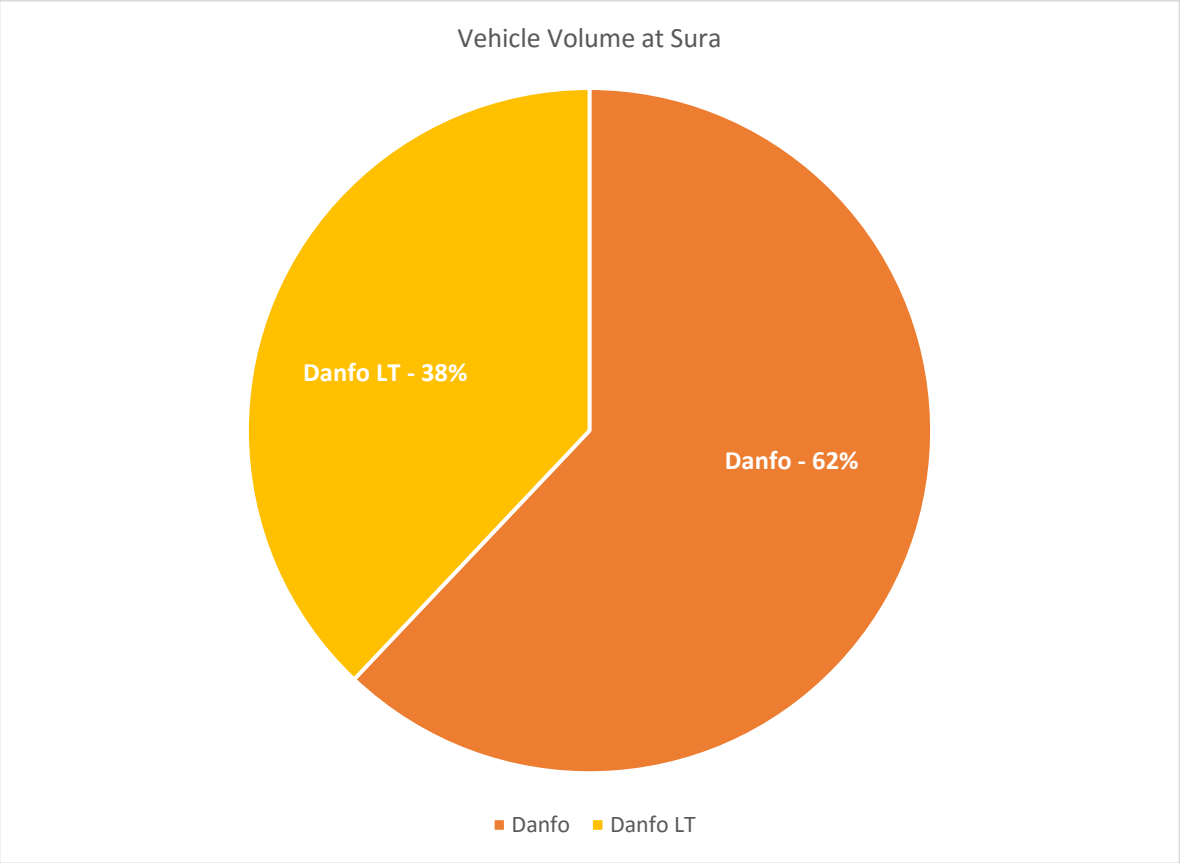


Figure 6.75: Passenger Volume at Sura

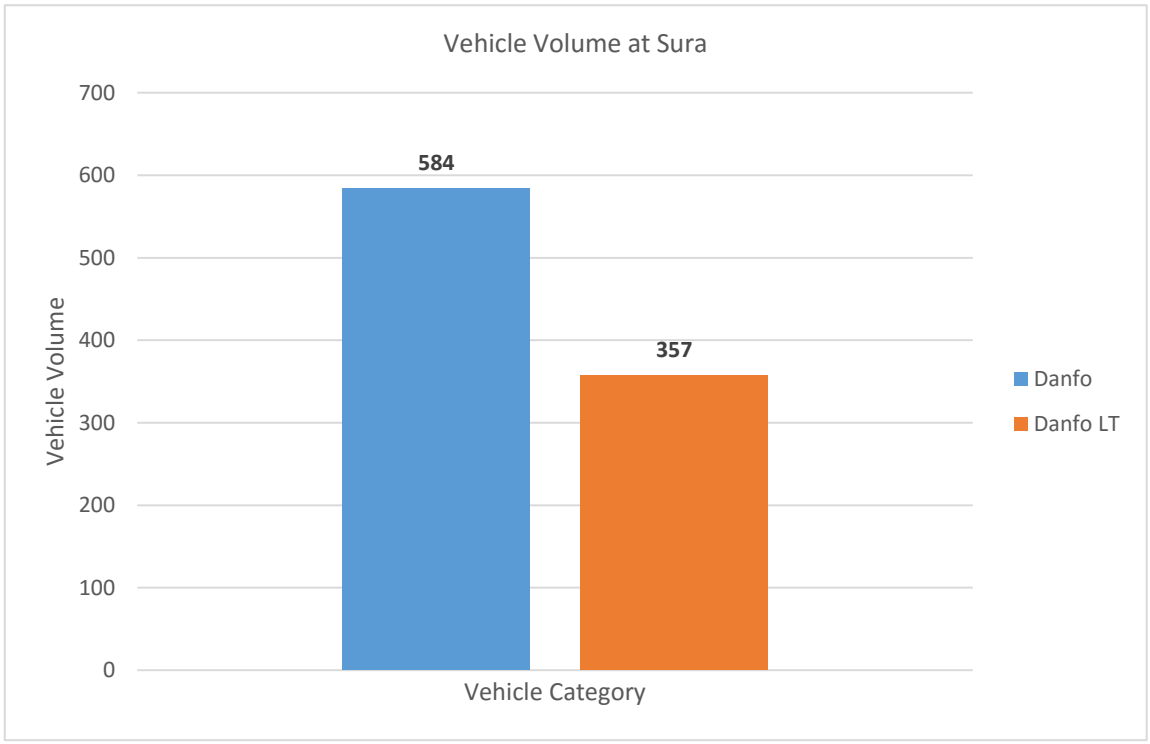


Figure 6.76: Vehicle Volume at Sura

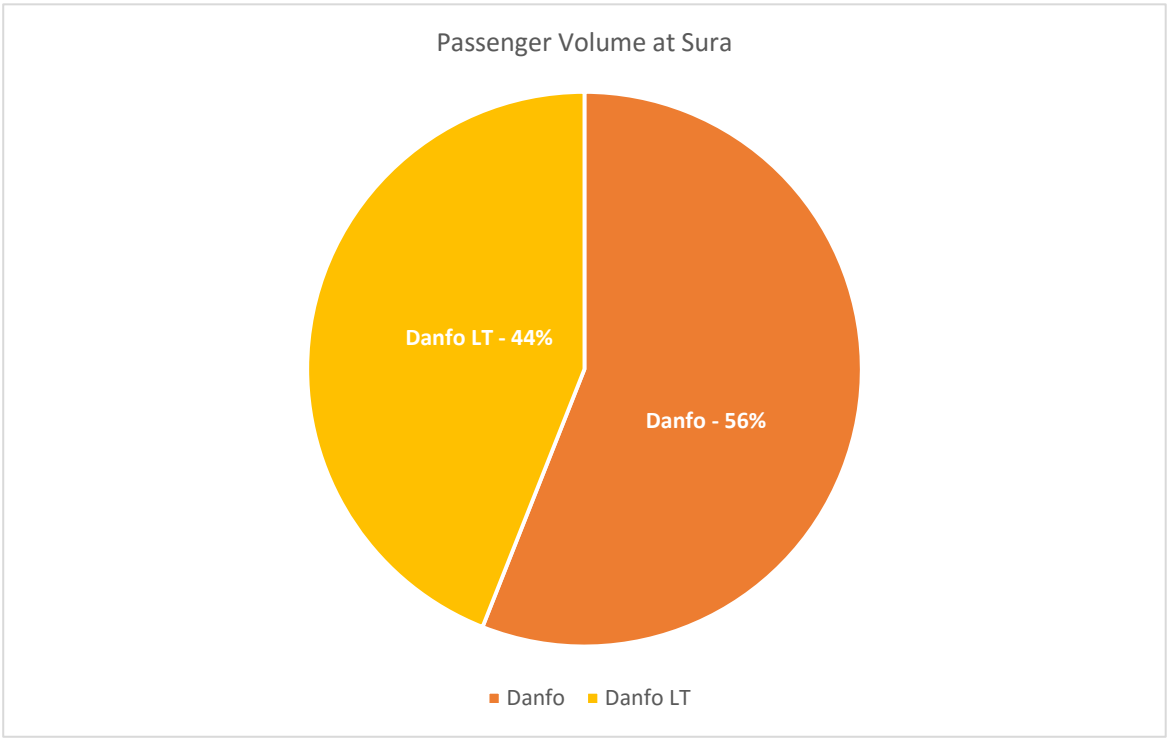


Figure 6.77: Passenger Volume at Sura

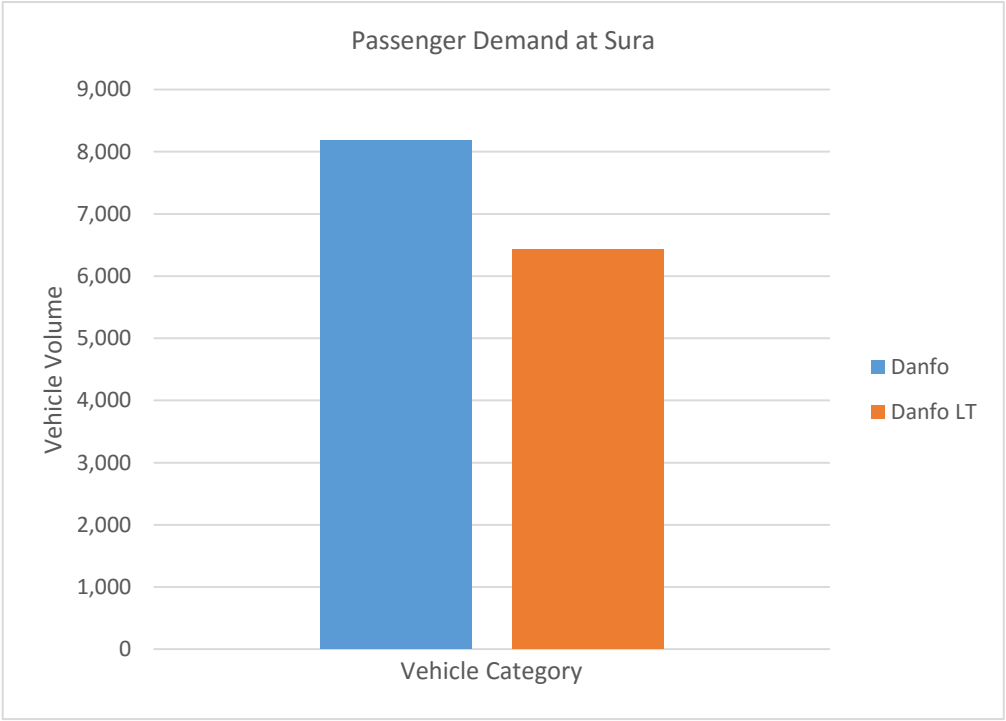


Figure 6.78: Passenger Demand at Sura

6.2.3 Analysis of Manual Classified Count (MCC) Survey Data

Manual Classified Count were conducted along the major corridors in Lagos Island to determine the vehicle volume and composition of traffic, and also generate the passenger demand along these corridors. The critical roads on the Island where the MCC were conducted are:

- Osborne Road;
- Adeola Odeku Road
- Ozumba Mbadiwe Road
- Ahmadu Bello Way
- Obafemi Awolowo Way
- Third Mainland Bridge
- Eko Bridge
- Carter Bridge / Idumota

Table 6.40 shows the traffic volume and composition along each of these routes.

Table 6.40: Average Daily Traffic for major routes on Lagos Island

Corridor	Private Car / SUV / Pick-Up	LAGBUS / HOV	Coaster Bus	Trucks / tankers	Danfo / LT Bus	Mini Bus	Taxi	Tricycle	TOTAL
Osborne Road	34,062	44	321	1,243	1,210	1,168	760	3,248	42,056
Adeola Odeku Way	14,759	23	438	1,202	1,441	1,448	1,263	7,127	27,701
Ahmadu Bello Way	16,585	21	190	313	1,449	476	1,157	4,832	25,023
Obafemi Awolowo Way	9,531	1	237	183	926	282	444	3,298	14,902
Ozumba Mbadiwe Road	28,618	164	184	677	2,632	740	629	382	34,026
Third Mainland Bridge	44,462	90	415	594	7,586	2,332	1,396	0	56,875
Eko Bridge	20,411	1,110	432	1,193	7,942	718	1,552	121	33,479
Idumota / Carter Bridge	12,155	721	168	656	5,258	1,194	1,280	1,045	22,477
ADT	**180,583**	**2,174**	**2,385**	**6,061**	**28,444**	**8,358**	**8,481**	**20,053**	**256,539**
Percentage	*70%*	*0.8%*	*1%*	*2%*	*11%*	*3%*	*3%*	*8%*	*100%*

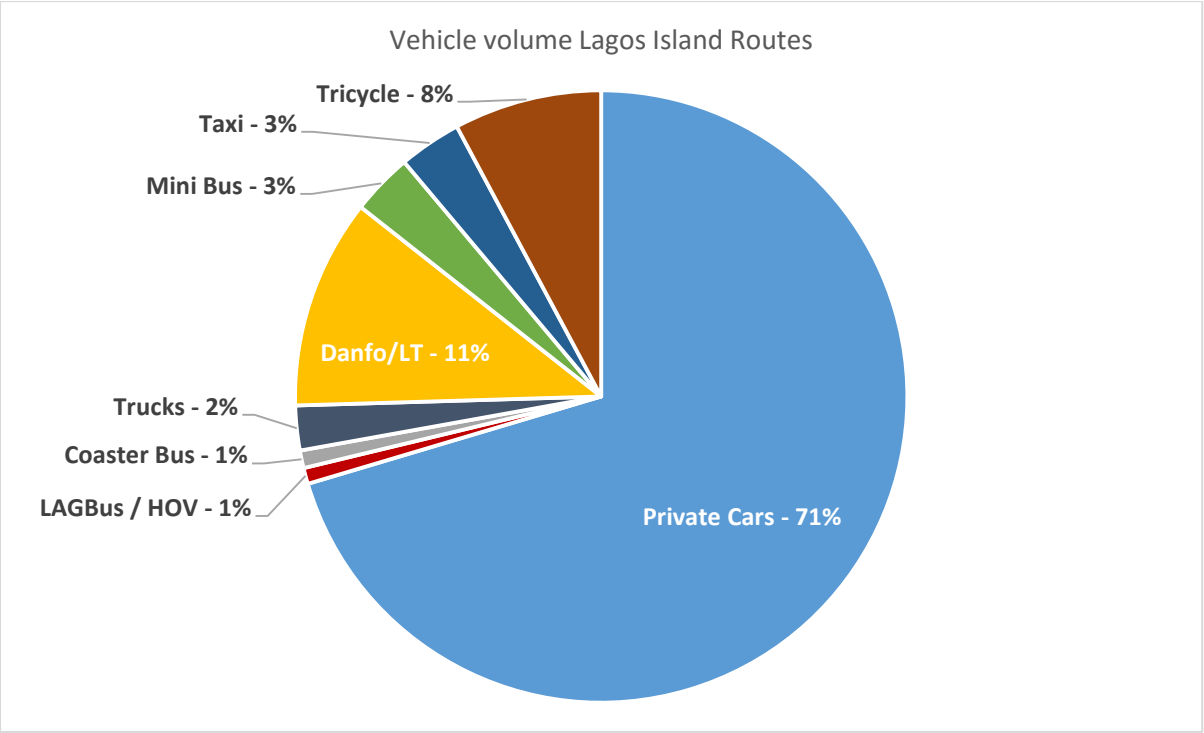


Figure 6.79: Vehicle Volume along key Lagos Island Routes

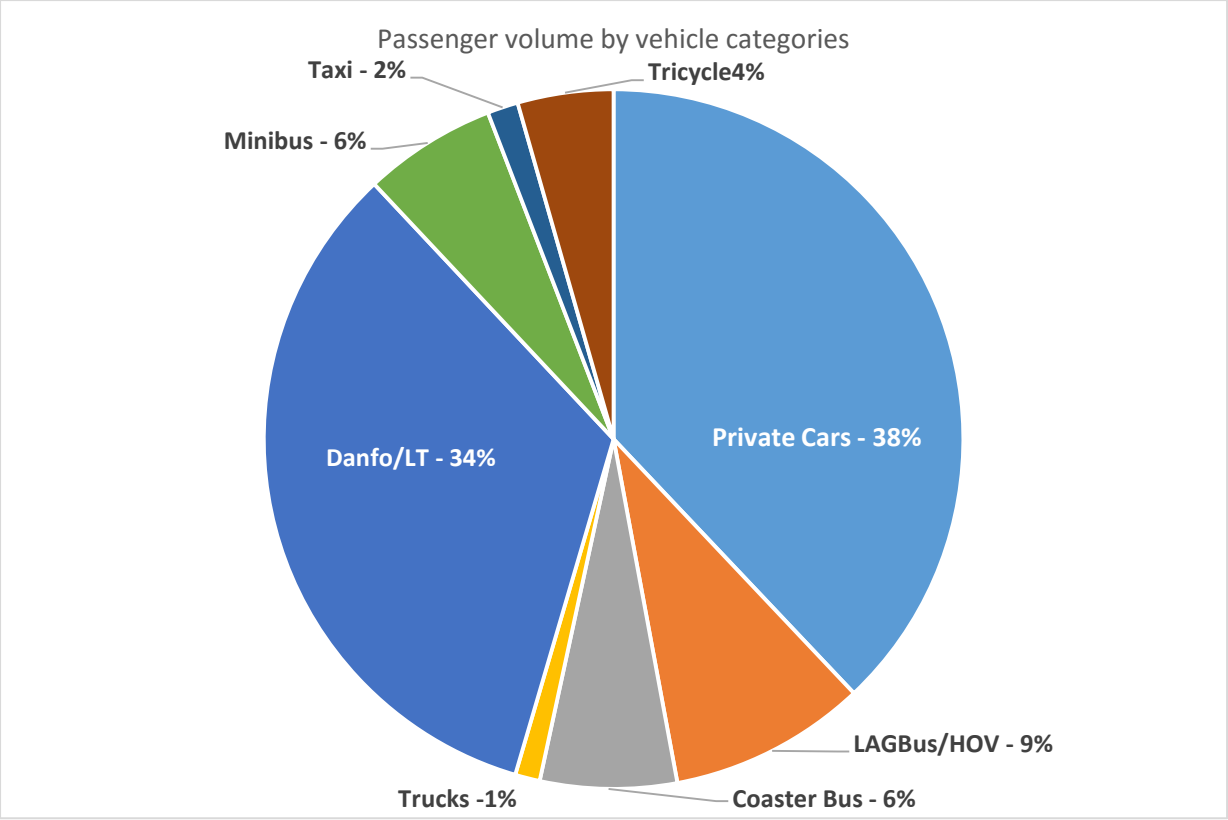


Figure 6.80: Passenger Volume along key Lagos Island Routes

i. Osborne Road

The location for the MCC along the Osborne road was around Osborne Estate. The traffic volume in the direction From Third Mainland Bridge was 19,865 vehicles with 2,079 and 1,871 in the AM and PM peak hours respectively.

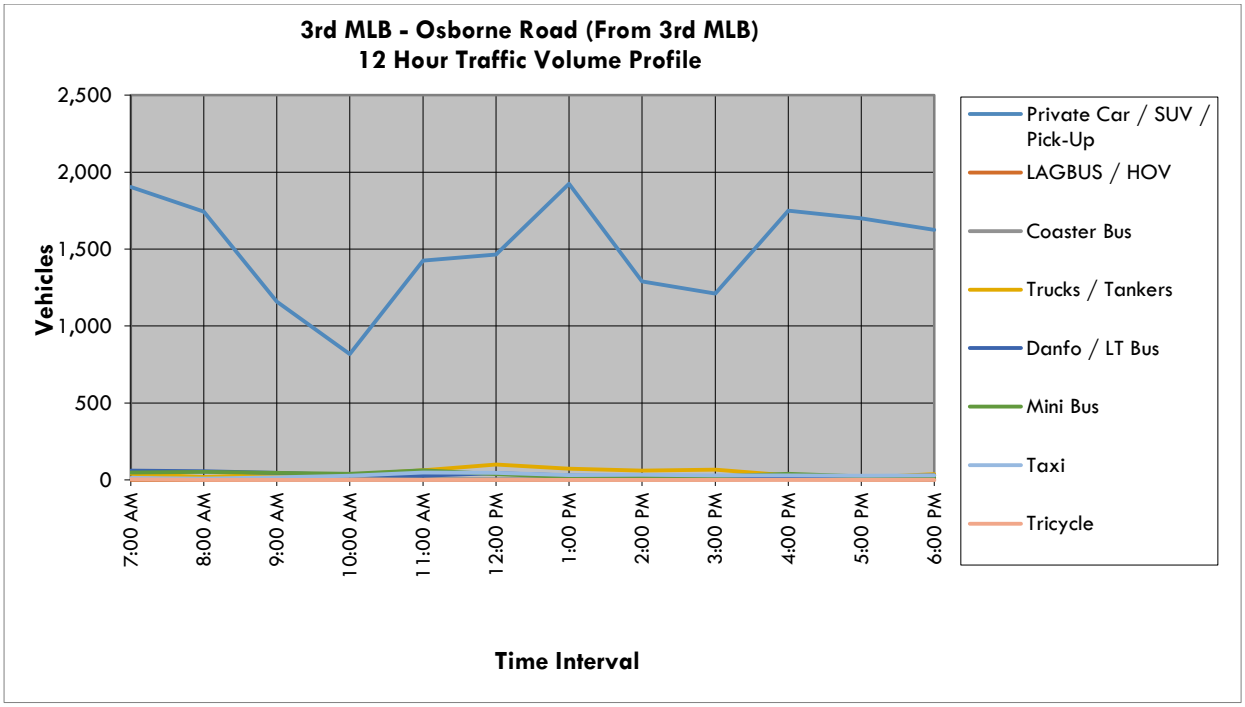
Private Cars are the most prominent vehicle type along this route with 91% of total traffic volume, LAGBUS / HOV constitute 0.1%, while Coaster make up 0.4% of the total traffic volume. Trucks / Tankers makes up 3%, of the total 12-Hour traffic. Danfos, Minibuses, Taxis, and Tricycles make up 2%, 2.2%, 2% and 0% of the traffic volume in this direction. Table 6.41 and Figure 6.81 depict the 12-Hour traffic volumes and traffic volume profile respectively.

Table 6.41: 12-Hour Traffic Volume along Osborne Road (*Direction From 3rd Mainland Bridge*)

12-Hour Traffic Volumes

ROUTE:	Osborne Road	**DATE:**	March 17, 2017
SEGMENT:	Third Mainland Bridge - Osborne	**DAY:**	
LOCATION:	Osborne	**DIR.:**	From 3rd Mlnd Bridge

TIME INTERNAL	Private Car / SUV	LAGBUS / HOV	Coaster Bus	Trucks / Tankers	Danfo / LT Bus	Mini Bus	Taxi	Tricycle	*All Vehicles*
7:00 AM	1,904	0	9	40	60	48	13	5	2,079
8:00 AM	1,743	0	7	19	56	52	9	0	1,886
9:00 AM	1,159	2	4	35	46	46	16	0	1,308
10:00 AM	818	2	4	34	32	39	28	0	957
11:00 AM	1,426	2	5	62	28	63	49	1	1,636
12:00 PM	1,465	1	4	100	43	38	47	0	1,698
1:00 PM	1,925	2	5	73	29	18	32	0	2,084
2:00 PM	1,290	3	7	60	26	24	34	0	1,444
3:00 PM	1,210	3	9	66	21	24	29	0	1,362
4:00 PM	1,750	5	9	30	7	40	30	0	1,871
5:00 PM	1,700	3	10	15	22	24	27	0	1,801
6:00 PM	1,625	1	3	37	29	15	29	0	1,739
TOTAL	**18,015**	**24**	**76**	**571**	**399**	**431**	**343**	**6**	**19,865**
Percentage (%)	90.7%	0.1%	0.4%	2.9%	2.0%	2.2%	1.7%	0.0%	100.0%
							8:00 AM		*6:00 PM*
							2,079		1,871



6.81: 12-Hour Traffic Volume Profile along Osborne Road (*Direction From 3rd Mainland Bridge*)

In the other direction of traffic, the traffic volume in the direction towards Third Mainland Bridge is 22,338 vehicles with 1,856 and 2,656 in the AM and PM peak hours respectively. Private Cars make up72% of total traffic volume, LAGBUS / HOV constitute 0.1%, while Coaster makes up 1.1% of the total traffic. Trucks / Tankers makes up 3%, while Danfo Buses are 4% of the total 12-Hour traffic respectively. Minibuses, Taxis and Tricycles make up 4%, 1.8%, and 15% of traffic respectively in this direction. Table 6.45 and Figure 6.74 depicts the 12-Hour traffic volumes and traffic volume profile respectively.

Similarly, Tables 6.42 shows the summary of traffic volumes and passenger demand at the bus stop along the Osborne road. Figures 6.82 - 6.84 are charts showing traffic volumes and passenger demand respectively at the MCC location.

Table 6.42: 12-Hour Summary of Traffic Volume along Osborne Road (*Direction To 3rd Mainland Bridge*)

12-Hour Traffic Volumes

ROUTE	Osborne Road	**DATE:**	March 17, 2017
SEGMENT:	Third Mainland Bridge - Osborne	**DAY:**	
LOCATION:	Osborne	**DIR.:**	To 3rd Mnld Bridge

TIME INTERVAL	Private Car / SUV	LAGBUS / HOV	Coaster Bus	Trucks / Tankers	Danfo / LT Bus	Mini Bus	Taxi	Tricycle	*All Vehicles*
7:00 AM	950	0	22	24	33	26	11	35	1,101
8:00 AM	1,180	2	17	34	39	31	16	224	1,543
9:00 AM	1,317	1	12	67	58	68	24	309	1,856
10:00 AM	675	3	10	51	58	65	33	296	1,191
11:00 AM	640	2	4	48	52	76	41	341	1,204
12:00 PM	1,077	1	4	61	61	48	39	390	1,681
1:00 PM	1,650	3	0	77	47	33	33	331	2,174
2:00 PM	1,903	3	2	75	57	45	68	331	2,484
3:00 PM	1,732	1	7	59	69	59	43	248	2,218
4:00 PM	2,110	2	48	47	96	81	40	232	2,656
5:00 PM	1,678	1	53	55	147	158	27	269	2,388
6:00 PM	1,253	0	70	56	121	84	22	236	1,842
TOTAL	**16,165**	**19**	**249**	**654**	**838**	**774**	**397**	**3,242**	**22,338**
Percentage (%)	72.4%	0.1%	1.1%	2.9%	3.8%	3.5%	1.8%	14.5%	100.0%
							8:00 AM		*5:00 PM*
							1,856		2,656

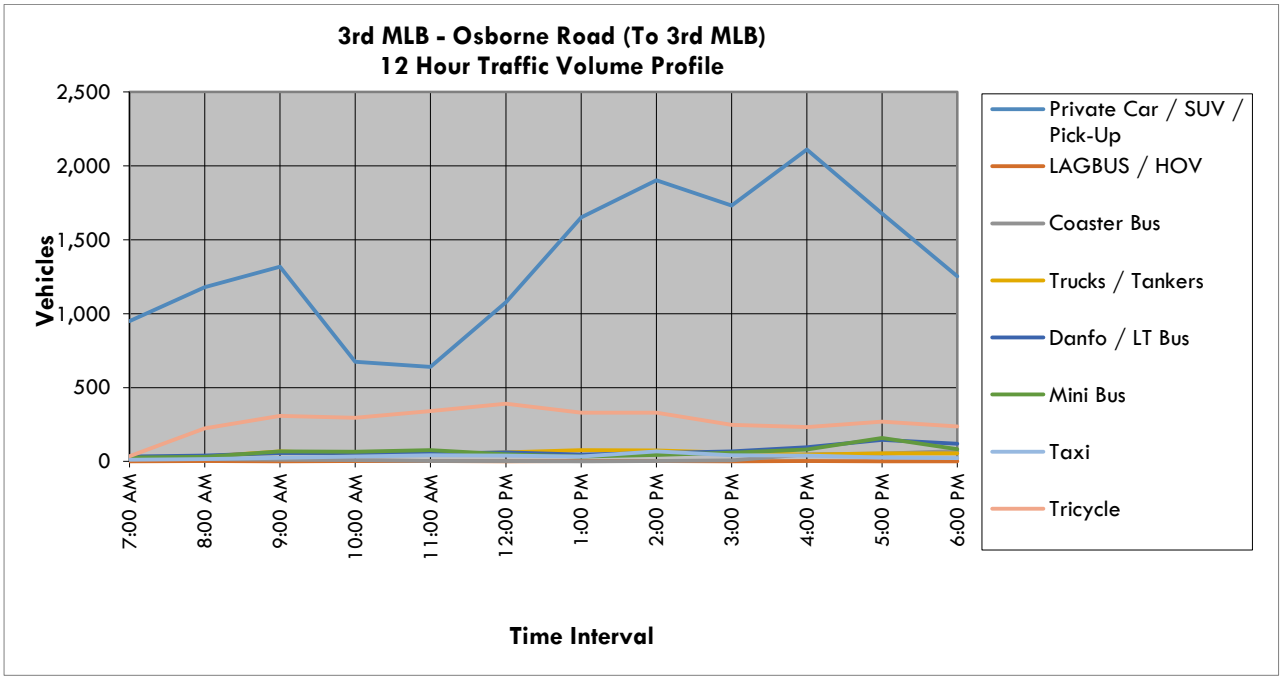


Figure 6.82: 12-Hour Traffic Volume Profile along Osborne Road (*Direction To 3rd Mainland Bridge*)

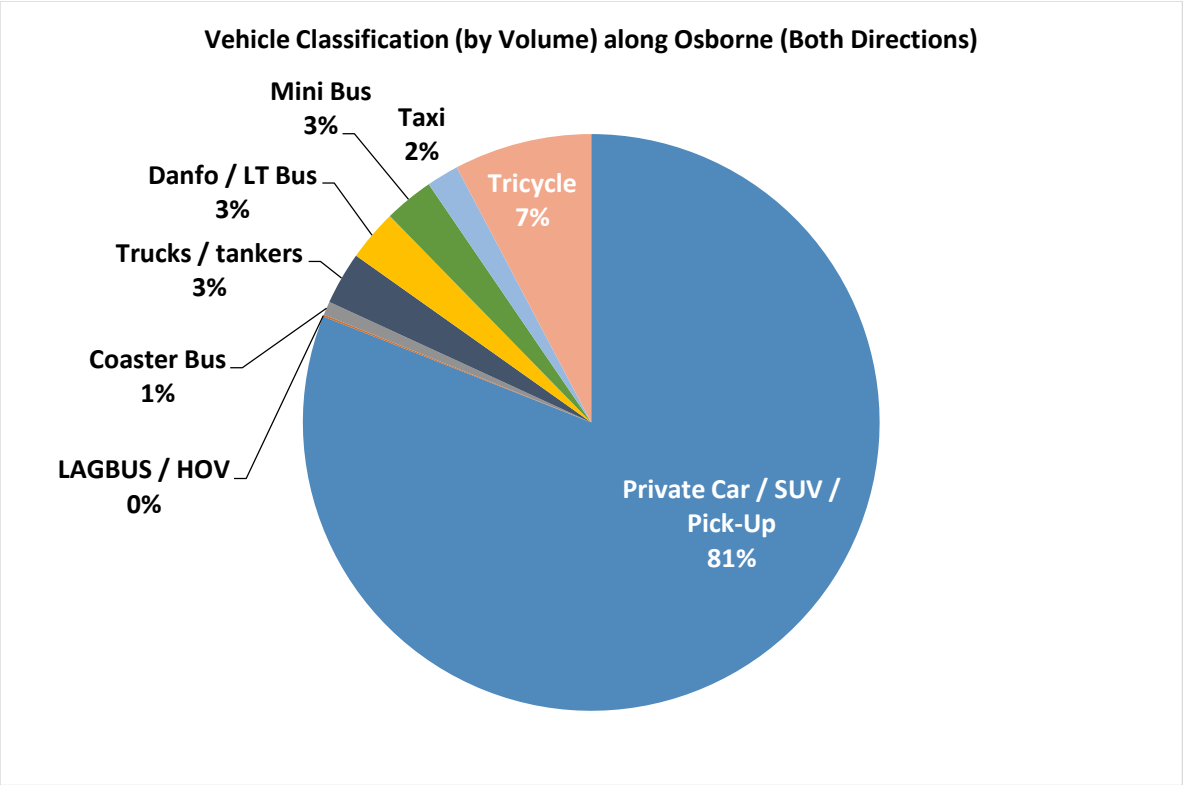


Figure 6.83: Vehicle Volume along Osborne (Both Directions)

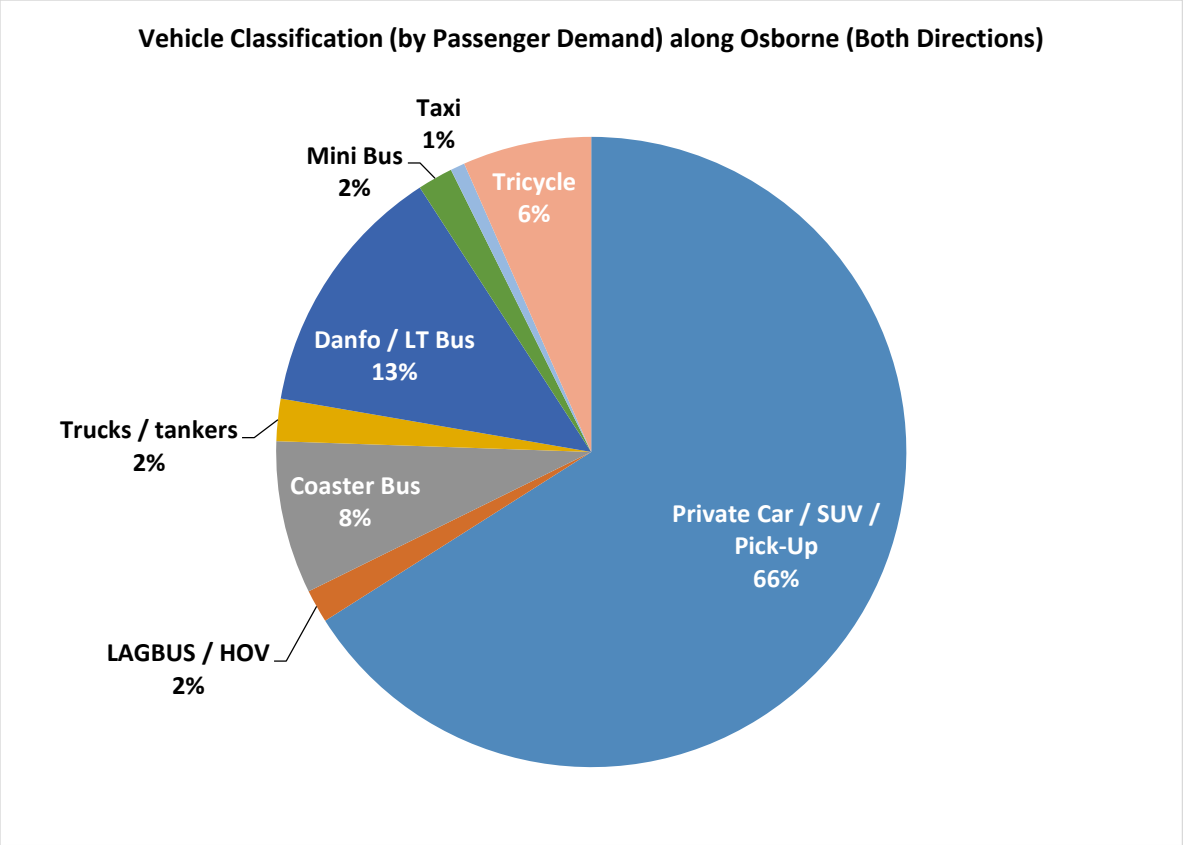


Figure 6.84: Passenger Volume along Osborne (Both Directions)

6.3 Oshodi – Abule Egba BRT

Manual Classified counts were conducted along the Oshodi – Abule Egba Corridor, the counts were conducted for about 16 hours for 7 Days. The vehicle categories that were counted include:

- Private Cars/SUV/Pick-Up;
- LAGBUS / HOV;
- Coaster;
- Molue Bus;
- Trucks / Tanker;
- Danfo / LT;
- Minibus;
- Taxi;
- Motorcycle; and
- Tricycle.

The locations for the Manual Classified Count (MCC) include:

i. Ikeja Along;
ii. Cement;
iii. Adealu;
iv. Ilepo;
v. Ijaiye;
vi. Tollgate.

As observed in the counts, passenger volumes show significant variation during the peak periods of the day i.e. flows in one direction in the morning peak and in the opposite direction during the evening peak hours. In the morning peak, the main movement of people is towards Ikeja and Oshodi, while in the evening, the main flow is towards Abule Egba. This is due to the fact that Abule – Egba Axis is highly residential while a good majority of the residents work in Ikeja and Lekki. Hence the evening peak from people returning home from work.

The summary of traffic volume along Oshodi – Abule Egba road shows an average daily traffic volume of 42,576 and average hourly volume of 2,661. Private car has the highest average daily traffic volume of 21,101 representing 50% of the daily average volume total. LAGBus/HOV, Coaster, Molue and trucks has 720, 482, 204 and 1,565 average daily traffic volumes representing 2%, 1%, 0% and 4% respectively. Danfo/LT, Mini-bus, taxi, motorcycle and tricycles have 12,607; 1,804; 618; 3,356 and 120 average daily traffic volume representing 30%; 4%; 1%; 8%; and 0% respectively. The high incidence of private cars reflects the inefficiency of the current public transport system along the corridor (an efficient public transport system encourages people to drop their cars and embrace a cheaper, safe, comfortable, reliable, accessible means of movement). Table 6.43 and Figure 6.85 and 6.86 show the average daily traffic (ADT) and passenger demand along Oshodi – Abule Egba corridor.

Table 6.43: Average Daily Traffic (ADT) and Passenger Demand along Oshodi – Abule Egba Corridor.

Location	Private Car / SUV / Pick-Up	LAGBUS / HOV	Coaster Bus	Molue Bus	Trucks / Tankers	Danfo / LT Bus	Mini Bus	Taxi	Motorcycle	Tricycle	TOTAL
Ikeja Along	50,670	1,240	785	277	2,107	20,019	3,394	1,604	6,510	45	**86,651**
Cement	29,550	948	521	269	1,221	12,418	1,425	918	2,640	73	**49,984**
Adealu	10,735	938	478	370	725	12,789	1,815	505	1,846	123	**30,323**
Ilepo	7,025	634	157	188	1,029	9,019	1,096	161	760	122	**20,190**
Ijaiye	13,049	456	346	114	2,013	11,746	1,405	387	2,453	158	**32,129**
Tollgate	15,578	105	601	3	2,297	9,648	1,687	135	5,928	198	**36,180**
TOTAL	**126,607**	**4,321**	**2,889**	**1,221**	**9,391**	**75,640**	**10,822**	**3,709**	**20,137**	**720**	**255,458**
Average Vol. / Location	**21,101**	**720**	**482**	**204**	**1,565**	**12,607**	**1,804**	**618**	**3,356**	**120**	**42,576**
Average Vol. /Hour	**1,319**	**45**	**30**	**13**	**98**	**788**	**113**	**39**	**210**	**8**	**2,661**
% Share	50%	2%	1%	0%	4%	30%	4%	1%	8%	0%	100%
Vehicle Capacity	5	50	36	36	3	14	14	4	2	3	
Vehicle Occupancy	40%	80%	70%	70%	60%	80%	50%	40%	50%	70%	
Daily Pax. Demand	**42,202**	**28,809**	**12,134**	**5,129**	**2,817**	**139,915**	**12,626**	**989**	**3,356**	**252**	**248,230**

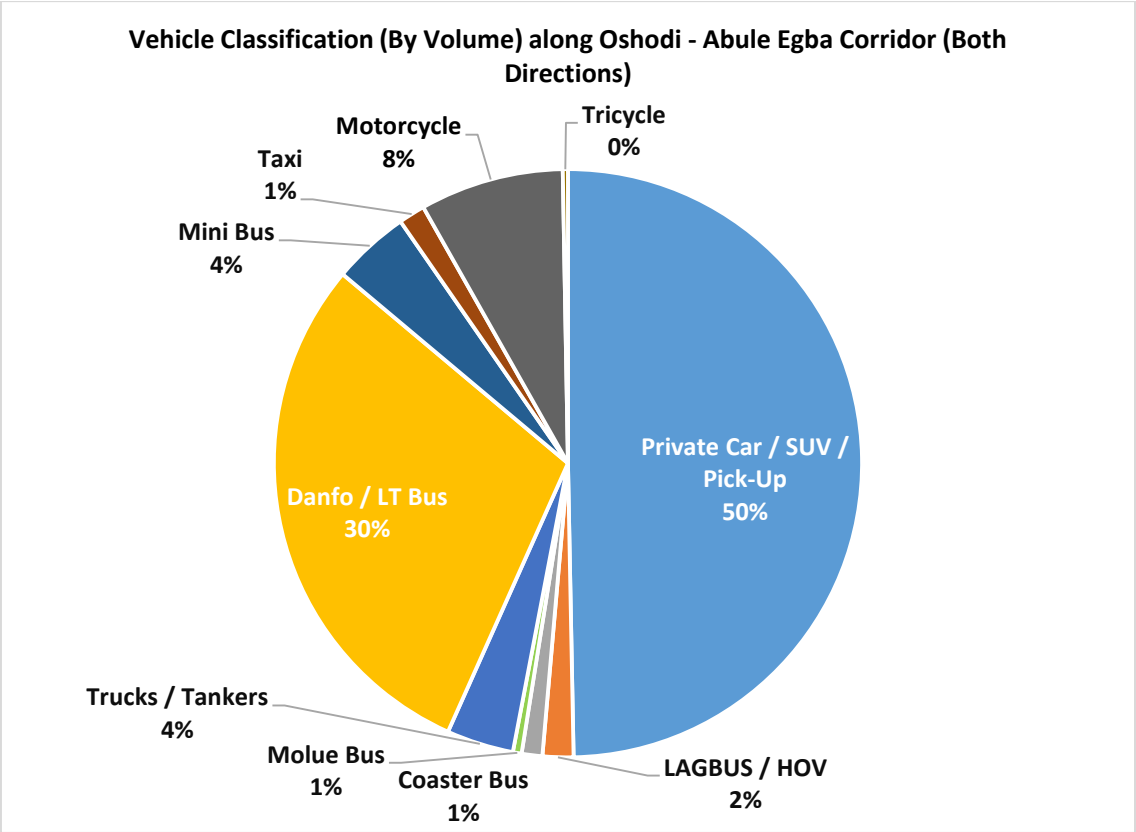


Figure 6.85: Vehicle Volume along Oshodi – Abule Egba Corridor (Both Directions)

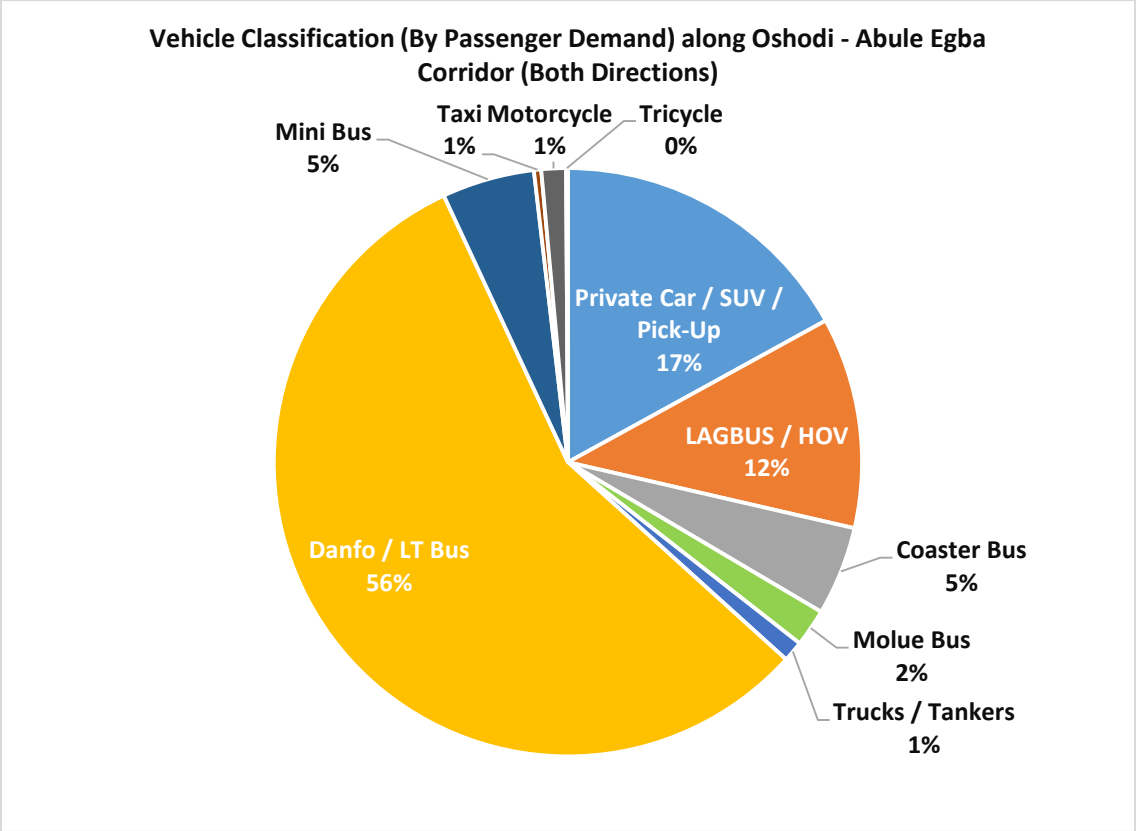


Figure 6.86: Passenger Demand along Oshodi – Abule Egba Corrdor (Both Directions)

6.4 Lekki-Epe Expressway

Manual Classified counts were conducted along the Lekki-Epe expressway, the counts were conducted for about 14 hours for 7 Days. The vehicle categories that were counted include:

- Private Cars/SUV/Pick-Up
- Minibus
- Taxi
- HOV / Coaster
- Danfo / LT
- Tricycle.
- Motorcycle
- Trucks

The locations for the Manual Classified Count (MCC) include:

i. Between Tollgate & 1st Roundabout
ii. Between 1st & 2nd Roundabout
iii. Between 2nd & 3rd Roundabout
iv. Between 3rd & 4th Roundabout
v. Between 4th & 5th Roundabout
vi. Between 5th & 6th Roundabout
vii. Between 7th & 8th Roundabout
viii. Between 8th & 9th Roundabout

As observed in the counts, passenger volumes show significant variation during the peak periods of the day i.e. flows in one direction in the morning peak and in the opposite direction during the evening peak hours. In the morning peak, the main movement of people is towards Lekki, while in the evening, the main flow is towards Ajah. This is largely due to the fact that Ajah Axis is highly residential while a good majority of the residents work in Lekki and on the mainland. Hence the evening peak from people returning home from work.

The summary of traffic volume along Lekki-Epe expressway shows a daily average traffic volume of 56,382 and average hourly volume of 4,027. Private car has the highest daily average traffic volume of 42,521 representing 75% of the daily average volume total. Minibus, Taxi and HOV / Coaster has 1,160, 773 and 519 daily average traffic volumes representing 2%, 1% and % respectively. Danfo/LT, Tricycle, motorcycle and trucks have 6,168; 1,409; 2,050 and 1,781 daily average traffic volume representing 11%; 2%; 4%; and 3% respectively. Again, the high incidence of private cars reflects the inefficiency of the current public transport system along the corridor (an efficient public transport system encourages people to drop their cars and embrace a cheaper, safe, comfortable, reliable, accessible means of movement). Table 6.44 and Figure 6.87 and 6.88 show the average daily traffic (ADT) and passenger demand along Lekki-Epe Expressway.

Table 6.44: Average Daily Traffic (ADT) and Passenger Demand along Lekki-Epe Expressway.

Location	Private Cars	Minibus	Taxi	HOV / Coaster	Danfo / LT	Tricycle	Motorcycle	Trucks	Total
Btw Toll Gate & 1st Roundabout	45,912	848	807	547	6,299	2	2,103	952	**57,472**
Btw 1st & 2nd Roundabout	46,214	674	652	556	6,946	9	2,060	1,017	**58,129**
Btw 2nd & 3rd Roundabout	42,675	698	662	539	6,255	37	1,981	1,690	**54,536**
Btw 3rd & 4th Roundabout	39,459	861	737	459	5,945	42	2,156	1,485	**51,145**
Btw 4th & 5th Roundabout	51,751	1,973	1,257	578	6,049	52	1,742	1,513	**64,915**
Btw 5th & 6th Roundabout	40,452	1,359	854	526	6,913	95	2,128	2,389	**54,715**
Btw 6th & 7th Roundabout	43,147	1,083	561	509	6,536	364	2,394	2,231	**56,824**
Btw 7th & 8th Roundabout	44,590	1,684	777	516	5,339	3,642	1,975	2,246	**60,769**
Btw 8th & 9th Roundabout	28,491	1,262	648	443	5,228	8,441	1,916	2,506	**48,935**
Total	**382,691**	**10,442**	**6,955**	**4,671**	**55,511**	**12,685**	**18,454**	**16,031**	**507,440**
Average Vol. / Location	**42,521**	**1160**	**773**	**519**	**6,168**	**1,409**	**2,050**	**1781**	**56,382**
Average Vol. /Hour	3,037	83	55	37	441	101	146	127	**4,027**
% Share	75%	2%	1%	1%	11%	2%	4%	3%	100%
Vehicle Capacity	5	14	4	50	14	3	2	3	
Vehicle Occupancy	40%	50%	40%	80%	80%	70%	50%	60%	
Daily Pax. Demand	**85,042**	**8,120**	**1,237**	**20,760**	**69,082**	**2,959**	**2,050**	**3,206**	**192,455**

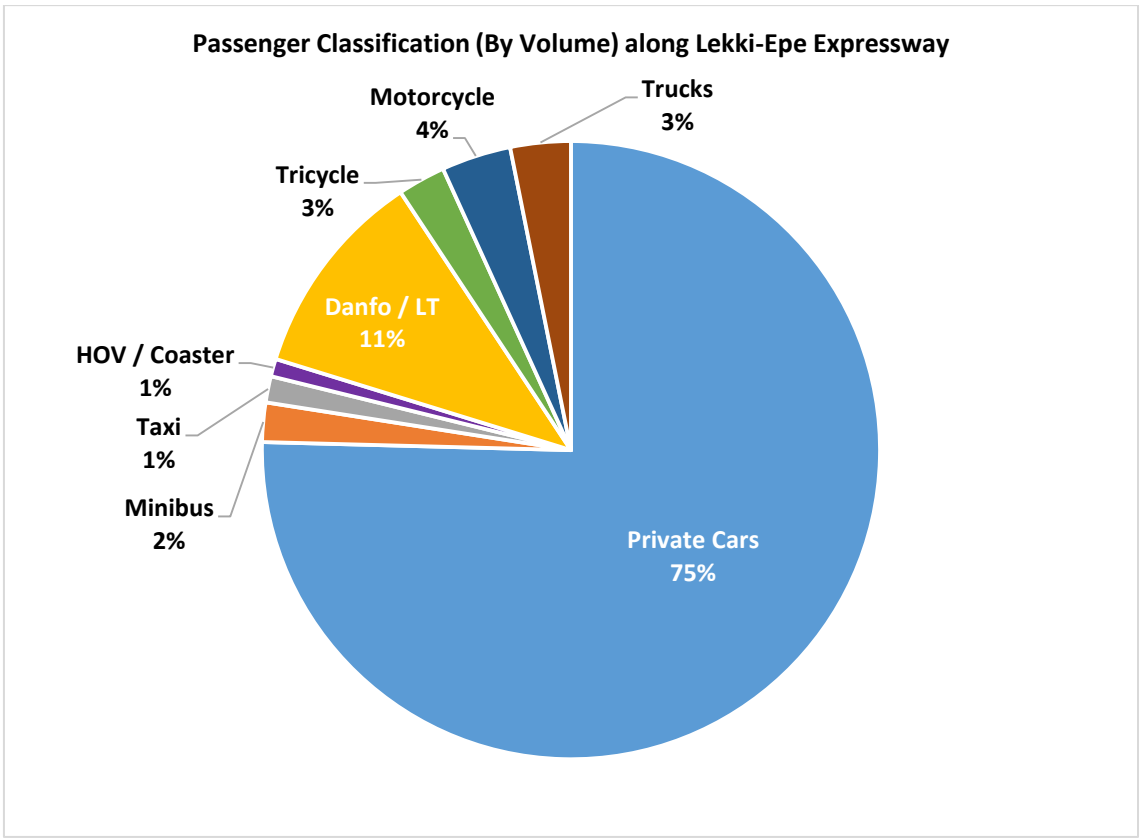


Figure 6.87: Vehicle Volume along Lekki-Epe Expressway (Both Directions)

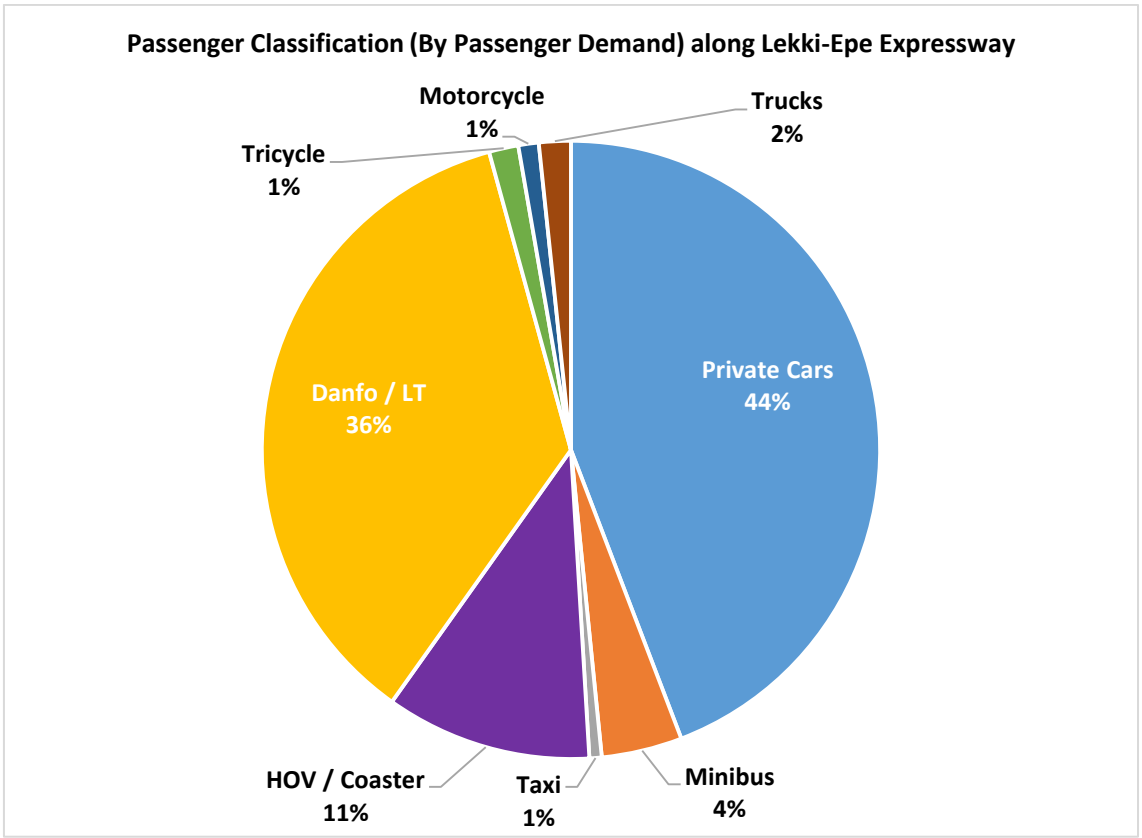


Figure 6.88: Passenger Demand along Lekki-Epe Expressway (Both Directions)

7.0 Passenger Demand Estimation and Projection

7.1 Introduction

This chapter presents commuters demand estimate for the proposed Lagos Bus Reform and the methodology by which they were derived. The demand profile is based on the passenger demand data that were obtained from the current traffic surveys conducted; followed by further processing and analysis of all relevant data to generate passenger demand.

7.2 Assumptions

For the purpose of the demand studies, some basic assumptions were made to ensure that our passenger demand figures are realistic. The basis for the assumptions includes:

- Average Daily Traffic (ADT) figures from Manual Classified Count (MCC) along the major roads on the Island were used to estimate the demand for private vehicles and public transport.
- The findings from the Bus park survey conducted for Lagos Island Hub has been used to determine the volume of vehicles and passengers leaving each of the major parks on the Island.
- Based on our observations and available information, a high percentage of public transport vehicles (especially tricycles and Danfo minibuses) do not load from the parks and were not captured in the Bus park survey. To make provision for this volume of passengers that do not board from the parks, our figures from the Bus park survey have been marked up by a factor of 2.5.
- All passengers currently carried by the Danfos and Tricycles would switch modes to the new buses of the Bus Reform Scheme

In lieu of the proposal to also integrate LAG-Bus operations, it is assumed that the passengers from the LAG-Buses would be converted into the Bus Scheme.

Furthermore, different scenarios have also been considered to reflect a high and low case demand scenario. These two scenarios will also be explained in this chapter.

7.3 Demand Estimation for Ikeja Hub

The passenger demand for Ikeja Hub was estimated based on current traffic volume gathered from the Manual Classified Counts (MCC) conducted along the critical corridors in and out of Ikeja. The passenger demand estimation for Ikeja hub was largely influenced by the commuting pattern of passengers.

The Passenger Demand has been divided into two based on the mode of transport: Private Vehicles and Public transport modes (Danfo/LT, HOV/LAGBUS, Tricycles & Taxis) It was discovered from our traffic surveys that almost 60% of the Ikeja routes are operated by Tricycles (Keke).

The current passenger demand estimates from our traffic surveys show that over 970,951 passengers use public transport and 722,656 passengers use private transport daily in the Ikeja area. The summary of the current passenger demand for Ikeja Hub is shown in Table 7.1.

For the Bus Reform Scheme, three scenarios have been developed to reflect a low, medium and high passenger demand. The different scenarios is based on our estimation of different levels of modal-shift from private car users that will be attracted to the Bus scheme, when given an efficient, comfortable, affordable, and reliable bus services.

- ***Scenario 1****: All Danfo Bus and Tricycle users will use the new Bus Scheme;*
- ***Scenario 2****: All Public Transport Vehicles and a modal shift of 10% from Private car users;*
- ***Scenario 3:*** *All Public Transport Vehicles and a modal shift of 20% from Private car users.*

Tables 7.2 show the summary of the Passenger Demand for Scenario 1, 2, 3.

Table 7.1: Existing Passenger Demand for Public and Private Transport on Routes within Ikeja Hub

S/No.	Routes	Passenger Demand	
		Public Transport	Private Vehicles
1	Ikeja - Mile 2	48,495	48,192
2	Ikeja - Iyana Ipaja - Toll Gate	89,527	29,606
3	Ikeja - Agege - Pen Cinema	52,053	27,473
4	Ikeja - Oshodi	88,826	54,562
5	Ikeja - Egbeda	79,776	26,274
6	Ikeja - Maryland - Yaba	87,200	19,319
7	Ikeja - Berger	71,748	43,001
8	Ikeja - Adeniyi Jones - Ogba	29,324	29,635
9	Ikeja - Alausa Secretariat - Iyana Oworo	36,713	40,749
10	Ikeja - Toyin - Opebi	31,881	47,561
11	Ikeja - Maryland - Ojuelegba	99,029	37,655
12	Ikeja - Allen - Opebi	37,591	46,592
13	Ikeja - NAHCO	18,360	77,037
14	Ikeja - Oba Akran - Ogba	30,090	38,194
15	Ikeja - Ojota	49,595	23,180
16	Ikeja - Ketu	28,792	16,635
17	Ikeja - Obalende - CMS	91,949	116,991
	TOTAL	**970,951**	**722,656**
		1,693,607	

Table 7.2: Passenger Demand for Ikeja Hub with different Scenarios

S/No.	Routes	Passenger Demand		
		Scenario 1	Scenario 2	Scenario 3
1	Ikeja - Mile 2	48,495	53,314	58,133
2	Ikeja - Iyana Ipaja - Toll Gate	89,527	92,487	95,449
3	Ikeja - Agege - Pen Cinema	52,053	54,800	57,548
4	Ikeja - Oshodi	88,826	94,283	99,739
5	Ikeja - Egbeda	79,776	82,403	85,030
6	Ikeja - Maryland - Yaba	87,200	89,132	91,064
7	Ikeja - Berger	71,748	76,049	80,349
8	Ikeja - Adeniyi Jones - Ogba	29,324	32,287	35,251
9	Ikeja - Alausa Secretariat - Iyana Oworo	36,713	40,788	44,863
10	Ikeja - Toyin - Opebi	31,881	36,637	41,393
11	Ikeja - Maryland - Ojuelegba	99,029	102,795	106,560
12	Ikeja - Allen - Opebi	37,591	42,250	46,909
13	Ikeja - NAHCO	18,360	26,064	33,768
14	Ikeja - Oba Akran - Ogba	30,090	33,909	37,729
15	Ikeja - Ojota	49,595	51,913	54,231
16	Ikeja - Ketu	28,792	28,792	28,792
17	Ikeja - Obalende - CMS	91,949	103,648	115,348
TOTAL		**970,951**	**1,041,550**	**1,112,155**

7.4 Demand Estimation for Lagos Island Hub

The passenger demand for Lagos Island Hub was estimated based on current traffic volume and vehicle composition gathered from the Manual Classified Count (MCC) along all the major routes on the Island. Bus Park Survey (BPS) was also conducted at major parks/loading points on the Island. The BPS concentrated on public transport vehicles that carried passengers from the parks to various destinations within the Lagos metropolis. The parks investigated include:

i. Obalende Bus Terminal;
ii. CMS Bus Parks;
iii. Adeniji Adele Bus Park;
iv. Apongbon Bus Park;
v. Tom Jones Bus Park;
vi. Idumota Bus Park; and
vii. Sura Junction.

The passenger demand was estimated based on the number of public transport vehicles (Danfo/LT, HOV Buses, SUV/Sienna, Tricycles, etc.) loading passengers and leaving each park to identified destinations. The count revealed that over 53,650 vehicle departures take place at all parks daily with a passenger demand of

771,006 passengers using public transport from Lagos Island daily. The summary of the current passenger demand for Lagos Island Hub is shown in Table 7.3.

Table 7.3: Summary of Vehicle Volume and Passenger Demand for Lagos Island Hub

S/No.	Routes	Vehicle Volume	Passenger Demand
1	Tom Jones - Yaba	128	1,779
2	Tom Jones - Ikotun	63	1,143
3	Tom Jones - Alakuko	54	980
4	Obalende - Osborne -Dolphin	1,143	16,008
5	Obalende - Ojota	509	9,147
6	Obalende - Ogba - Berger	372	6,698
7	Obalende - Lekki - Ajah	4,247	79,643
8	Obalende - Falomo	672	9,402
9	Obalende - Eko Hotel	24,384	97,538
10	Obalende - Costain- Ojuelegba	980	13,722
11	Obalende - Bariga	408	5,718
12	Obalende - Mushin - Iyana Ipaja	191	3,431
13	Obalende - Ikeja	354	6,371
14	Obalende - Iyana Oworo - Oshodi	2,895	104,091
15	Idumota - Oshodi	4,266	95,705
16	Idumota - Ojuelegba	2,250	31,509
17	Idumota - Ojodu Berger	1,380	19,311
18	Idumota - Mushin	3,830	63,398
19	Idumota - Mile 2	6,371	108,972
20	Idumota - Ikeja	3,231	45,230
21	Idumota - Ijora	917	12,833
22	CMS - Victoria Island	4,829	67,590
23	CMS - Lekki - Ajah - Epe	3,231	55,721
24	CMS - Ikeja	2,622	36,717
25	Apongbon - Palmgroove	807	11,307
26	Apongbon - Oshodi	3,866	69,587
27	Apongbon - Orile	2,931	62,264
28	Apongbon - Ojuelegba	1,979	35,666
29	Apongbon - Mile 2	1,071	28,986
30	Apongbon - Mushin	1,199	16,770
31	Adeniji Adele -Yaba	137	1,907
32	Adeniji Adele - Oyingbo	227	3,177
33	Adeniji Adele - Mushin	435	6,099
34	Adeniji Adele - Ketu - Mile 12 - Ikorodu	1,262	22,706
35	Adeniji Adele - Ijora	300	5,391
		83,535	**1,156,509**

To have a holistic understanding of the traffic composition and volume of passengers using all other modes of transport along the major corridors in Lagos Island, Manual Classified Counts (MCC) were also conducted along the identified corridors. The passenger demand for Public Transport and Private Vehicles for Lagos Island Hub was estimated based on current traffic volume gathered from the MCC.

The passenger demand has also been separated into two based on the modes of travel: Private Vehicles and Public transport modes (Danfo/LT, Coaster Bus, HOV/LAGBUS, Tricycles and Taxis). From our traffic surveys, we discover that 70% of the vehicles along major routes in Lagos Island are Private Vehicles (high level of motorization). Danfos make up 11%, Tricycle (Keke) constitute 8%, while LAG-Bus, Coaster Buses and High Occupancy Vehicles (HOVs) make up less than 2% of total traffic.

Despite the higher percentage of private vehicles on the roads, our passenger demand analysis reveals that over 1,120,152 passengers use public transport and 828,989 passengers use private transport daily in and around Lagos Island hub. The summary of the current passenger demand for Lagos Island hub is shown in Table 7.4.

For the Bus Reform Scheme, three scenarios have been developed to reflect a low, medium and high passenger demand scenarios. The basis for the different scenarios is an assumption that there will be a modal-shift from private car users that will be absorbed into the Bus scheme given an efficient, comfortable, affordable, and reliable bus service.

- *Scenario 1: All Public Transport Vehicles will use the Bus Reform;*
- *Scenario 2: All Public Transport Vehicles and a modal shift of 10% from the Private car users.*
- *Scenario 3: All Public Transport Vehicles and a modal shift of 20% from the Private car users.*

Tables 7.5 show the summary of the Passenger Demand for Scenario 1, 2, 3.

Table 7.4: Summary of Passenger Demand for Public and Private Transport on Roads within Lagos Island Hub

S/n	Corridor	Passenger Demand	
		Public Transport	Private Vehicles
1	Osborne Road	81,048	156,635
2	Adeola Odeku Way	115,268	69,662
3	Ahmadu Bello Way	76,817	75,477
4	Awolowo Way	52,733	43,383
5	Ozumba Mbadiwe Road	91,548	130,610
6	Third Mainland Bridge	232,227	201,683
7	Eko Bridge	275,972	95,070
8	Idumota / Carter Bridge	194,541	56,469
	TOTAL	1,120,152	828,989
		1,949,141	

Table 7.5: Summary of Passenger Demand Estimation for Lagos Island Hub per Scenario

S/n	Location	Passenger Demand		
		Scenario I	Scenario II	Scenario III
1	Osborne	81,048	96,711	100,391
2	Adeola Odeku	115,268	122,234	139,715
3	Ahmadu Bello	76,817	84,365	93,689
4	Falomo	52,733	57,071	64,148
5	Ozumba Mbadiwe	91,548	104,609	112,469
6	Third Mainland Bridge	232,227	252,395	282,705
7	Eko Bridge	275,972	285,479	333,068
8	Idumota	194,541	200,189	234,579
	TOTAL	**1,120,152**	**1,203,050**	**1,360,761**

7.5 10-Year Demand Projection (2017-2026)

The demand projection was done by taking into consideration key factors such as:

- Population;
- Land use;
- Volume of socio-economic activities;
- New developments; and
- Transport Statistics; etc.

These factors influence the choices people make, and we will also be estimating the influence or impact of these factors. An evaluation of these key factors and their future dynamics has been carefully considered for the different year of demand projection for the Lagos Bus Reform Project. However, due to the unavailability of reliable data for most of the afore-mentioned factors, we are constrained to make do with the Gross Domestic Product (GDP) of Lagos State.

Hence, for the purpose of this report, we have used a projected growth of the economy of Lagos State to be stipulated at 6.5%. The contribution of road transport (26.47%) to the GDP was then factored into the GDP and a growth rate for the passenger demand was generated.

A 10 year demand forecast has been modelled for this project, 2.3% was used for the growth rate in year 1 growing at 5% for subsequent years until year 10. Table 7.6 below shows the passenger demand growth rates for the 10 years.

Table 7.6: Summary of Passenger Demand Growth Rate

Year	Growth Rate
1	2.3
2	2.42
3	2.54
4	2.66
5	2.80
6	2.94
7	3.08
8	3.24
9	3.40
10	3.57

Using the above calculated growth rates, the passenger demand figure for year 1 for scenarios 1, 2 and 3 are 764,063, 819,621 and 875,180 respectively. By year 5, these figures grow to 846,840, 908,418 and 969,995 for scenarios 1, 2 and 3 respectively; in year 10 it grows to 993,488, 1,065,729, and 1,137,970. Table 7.7 shows the 10-year passenger demand projection.

The Lagos Island hub will also grow with the same percentages as in Table 7.4; the passenger demand summary for the 10-years is shown in Table 7.8. The passenger demand figures for Year 1, Year 5 and Year 10 are 788,739, 874,190 and 1,025,579 respectively

Table 7.7: 10-Year Passenger Demand Projection for Ikeja Hub

Years		Growth Rate	Scenario 1	Scenario 2	Scenario 3
1	2017	2.30%	993,282	1,065,507	1,137,734
2	2018	2.42%	1,017,319	1,091,292	1,165,267
3	2019	2.54%	1,043,159	1,119,011	1,194,865
4	2020	2.66%	1,070,907	1,148,777	1,226,648
5	2021	2.80%	1,100,893	1,180,943	1,260,995
6	2022	2.94%	1,133,259	1,215,662	1,298,068
7	2023	3.08%	1,168,163	1,253,105	1,338,048
8	2024	3.24%	1,206,012	1,293,705	1,381,401
9	2025	3.40%	1,247,016	1,337,691	1,428,369
10	2026	3.57%	1,291,535	1,385,447	1,479,361

Table 7.8: 10-Year Demand Projection for Lagos Island Hub

Years		Growth Rate	Scenario 1	Scenario 2	Scenario 3
1	2017	2.30%	1,120,152	1,203,050	1,360,761
2	2018	2.42%	1,147,260	1,232,164	1,393,691
3	2019	2.54%	1,176,400	1,263,461	1,429,091
4	2020	2.66%	1,207,692	1,297,069	1,467,105
5	2021	2.80%	1,241,508	1,333,387	1,508,184
6	2022	2.94%	1,278,008	1,372,588	1,552,525
7	2023	3.08%	1,317,371	1,414,864	1,600,342
8	2024	3.24%	1,360,053	1,460,706	1,652,193
9	2025	3.40%	1,406,295	1,510,370	1,708,368
10	2026	3.57%	1,456,500	1,564,290	1,769,357

Based on our knowledge of transport in Lagos and the growth rate, we are choosing the scenario 3 which give us the passenger demand of 1,137,734 for Ikeja Hub and passenger demand of 1,360,761 for Lagos Island Hub.

7.6 Summary of Manual Classified Count (MCC) along Oshodi – Abule Egba Corridor

As observed in the counts, passenger volumes show significant variation during the peak periods of the day i.e. flows in one direction in the morning peak and in the opposite direction during the evening peak hours. In the morning peak, the main movement of people is towards Ikeja and Oshodi, while in the evening, the main flow is towards Abule Egba. This is largely due to the fact that Abule – Egba Axis is highly residential while a good majority of the residents work in Ikeja and Lekki. Hence the evening peak from people returning home from work.

The summary of traffic volume along Oshodi – Abule Egba road shows a daily average traffic volume of 42,576 and average hourly volume of 2,661. Private car has the highest daily average traffic volume of 21,101 representing 50% of the daily average volume total. LAGBus/HOV, Coaster, Molue and trucks has 720, 482, 204 and 1,565 daily average traffic volumes representing 2%, 1%, 0% and 4% respectively. Danfo/LT, Mini-bus, taxi, motorcycle and tricycles have 12,607; 1,804; 618; 3,356 and 120 daily average traffic volume representing 30%; 4%; 1%; 8%; and 0% respectively. The high incidence of private cars reflects the inefficiency of the current public transport system along Oshodi – Abule Egba road (an efficient public transport system encourages people to drop their cars and embrace a cheaper, safe, comfortable, reliable, accessible means of movement). Table 7.9 shows the average daily traffic (ADT) and passenger demand along Oshodi – Abule Egba corridor.

Table 7.9: Average Daily Traffic (ADT) along Oshodi – Abule Egba Corridor.

Location	Private Car / SUV / Pick-Up	LAGBUS / HOV	Coaster Bus	Molue Bus	Trucks / Tankers	Danfo / LT Bus	Mini Bus	Taxi	Motorcycle	Tricycle	TOTAL
Ikeja Along	50,670	1,240	785	277	2,107	20,019	3,394	1,604	6,510	45	**86,651**
Cement	29,550	948	521	269	1,221	12,418	1,425	918	2,640	73	**49,984**
Adealu	10,735	938	478	370	725	12,789	1,815	505	1,846	123	**30,323**
Ilepo	7,025	634	157	188	1,029	9,019	1,096	161	760	122	**20,190**
Ijaiye	13,049	456	346	114	2,013	11,746	1,405	387	2,453	158	**32,129**
Tollgate	15,578	105	601	3	2,297	9,648	1,687	135	5,928	198	**36,180**
TOTAL	**126,607**	**4,321**	**2,889**	**1,221**	**9,391**	**75,640**	**10,822**	**3,709**	**20,137**	**720**	**255,458**
Average Volume/Location	**21,101**	**720**	**482**	**204**	**1,565**	**12,607**	**1,804**	**618**	**3,356**	**120**	**42,576**
Average Volume/Hour	**1,319**	**45**	**30**	**13**	**98**	**788**	**113**	**39**	**210**	**8**	**2,661**
% Share	50%	2%	1%	0%	4%	30%	4%	1%	8%	0%	100%
Vehicle Capacity	5	50	36	36	3	14	14	4	2	3	
Vehicle Occupancy	40%	80%	70%	70%	60%	80%	50%	40%	50%	70%	
Daily Pax. Demand	**42,202**	**28,809**	**12,134**	**5,129**	**2,817**	**141,195**	**12,626**	**989**	**3,356**	**252**	**249,510**
Hourly Pax. Demand	**2,638**	**1,801**	**758**	**321**	**176**	**8,825**	**789**	**62**	**210**	**16**	**15,594**

The vehicle composition was further categorized into public transport and private transport. The public transport vehicles include: LAGBUS / HOV, Coaster Bus, Molue Bus, Danfo / LT Bus, Taxi, Motorcycle, Tricycle while the Private cars include: SUV / Pick-up, Trucks/ Tankers and Mini-Bus. The yellow mini buses popularly known as 'Danfos' constitutes about 70% of the public transport vehicles; 75,640 buses per day. These mini buses transport 839,491 passengers daily. Table 7.10 shows the public transport vs private transport distribution along the corridor.

Table 7.10: Public Transport (PT) vs Private Vehicles along Oshodi – Abule Egba Corridor

Type	Vehicle Category	Vehicles		Passengers	
		ADT	%	DD	%
Private Vehicles and Trucks	Private Cars	126,607	54	253,213	26
	Trucks	9,391		16,904	
	Minibus (*Inter-state & other Private use*)	10,822		75,755	
Public Transport (PT)	LAGBUS	4,321	46	172,851	74
	Danfo / LT	75,640		839,491	
	Coaster	2,889		72,803	
	Molue	1,221		30,776	
	Taxi	3,709		5,935	
	Motorcycle	20,137		20,137	
	Tricycle	720		1,512	
TOTAL		**255,458**	**100**	**1,489,378**	**100**

Public Transport was further classified into Formal and Informal types along Oshodi-Abule Egba Corridor. The Informal Public Transport consist of Coaster Bus, Molue Bus, Danfo / LT Bus, Taxi, Motorcycle, Tricycle while the Formal Public Transport is basically the LAGBUS / HOV.

The Informal Public Transport has an average vehicular volume of 103,631 (96%) and an average demand of 970,654 passengers (85%) while the Formal Public Transport shows an average vehicular volume of 4,321 (4%) and an average demand of 172,851 passengers (15%) making a total average of 107,952 vehicles and 1,143,505 passengers along the corridor. The passenger demand distribution shows that Danfo conveys over 70% of the passengers and unfortunately, the services these Danfos offer is characterized by poor drivers' attitude and rickety vehicles with no consideration for the safety and comfort of the passengers. Table 7.11 shows the formal and informal transport

Table 4.5: Informal Vs. Formal Public Transport

Category	Vehicular Volumes	Passenger Demand
Informal Public Transport	103,631	970,654
Formal Public Transport	4,321	172,851
Total	**107,952**	**1,143,505**

8.0 Bus Requirements

8.1 Introduction

This chapter presents the estimates of the number of buses as well as infrastructure requirements to successfully implement Phases 1A (Ikeja) and 1B (Lagos Island) of the Lagos Bus Reform

Major public transport operations around the world are run on special scheduling i.e. giving specific times of departure and arrival at bus stops along the route. These are often difficult to maintain in the event of traffic congestion, breakdowns, on/off bus incidents, road blockage or bad weather. Predictable effects such as morning and evening rush hour traffic are often accounted for in timetables using past experience of the effects. Therefore, there is need to ensure that adequate provision is made for the number of buses required to adequately cater to the needs of commuters along the corridor.

8.2 Number of Buses

Some assumptions have been made in the estimation of the number of buses required to run both phases of the Lagos Bus Reform. These include:

- A bus makes an average of 8 trips per day;
- The average occupancy rate is 80%; and
- The capacity of the bus is 37 passengers.

8.2.2 Methodology

In calculating the required number of buses, we consider the length of each route, travel time and the layover time at the end of the route. The cycle time (Travel time *2) + layover time is calculated and a headway (Time interval between Bus A departure and the arrival of bus B at a given bus stop).

To get the total number of buses required, we divide the cycle time by headway (Cycle time/headway).

$$\text{Number of Buses} = \frac{Cycle\ Time}{Headway}$$

Table 8.1 shows a summary of the total passenger demand and the number of buses required for the Ikeja and Lagos Island hub. Similarly, the number of buses required to cater for the demand of the individual routes is shown in Table 8.2 and table 8.3 for Lagos Island and Ikeja hubs respectively.

Table 8.1: Bus Requirement for the Ikeja and Lagos Island Hubs (Passenger Demand)

Hub	Number of trips per day	Occupancy Rate (%)	Bus Capacity	Number of Buses	Recommended Number of Buses
Ikeja	8	80%	37	745	800
Lagos Island	8	80%	37	1,181	1,200
TOTAL				**1,926**	**2,000**

Table 8.2: Number of Buses for Lagos Island Hub

S/No	Routes	No of Buses
1	Tom Jones - Yaba	23
2	Tom Jones - Ikotun	66
3	Tom Jones - Abule Egba / Alakuko	77
4	Obalende - Sabo - Yaba	29
5	Obalende - Osborne -Dolphin	7
6	Obalende - Ojota	20
7	Obalende - Ogba - Berger	46
8	Obalende - Lekki - Ajah	50
9	Obalende - Falomo	16
10	Obalende - Eko Hotel	11
11	Obalende - Costain- Ojuelegba	29
12	Obalende - Bariga	18
13	Obalende - Mushin - Iyana Ipaja	40
14	Obalende - Ikeja	30
15	Obalende - Iyana Oworo - Oshodi	36
16	Idumota - Oshodi	36
17	Idumota - Ojuelegba	27
18	Idumota - Ojodu Berger	63
19	Idumota - Mushin	29
20	Idumota - Mile 2	31
21	Idumota - Ikeja	44
22	Idumota - Ijora	12
23	CMS - Victoria Island	25
24	CMS - Lekki - Ajah - Epe	92
25	CMS - Ikeja	41
26	Apongbon - Palmgroove	35
27	Apongbon - Oshodi	42
28	Apongbon - Orile Mile 2	32
29	Apongbon - Ojuelegba	24
30	Apongbon - Mushin	39
31	Adeniji Adele - Obalende	9
32	Adeniji Adele - Yaba - Oyingbo	21
33	Adeniji Adele - Mushin	28
34	Adeniji Adele - Ketu - Mile 12 - Ikorodu	45
35	Adeniji Adele - Ijora	8
	Total	**1,181**

Table 8.3: Number of Buses for Ikeja Hub

S/No	Routes	No of Buses
1	Ikeja - Maryland - Ojuelegba	41
2	Ikeja - Ojota	54
3	Ikeja - Ketu	44
4	Ikeja - Egbeda	26
5	Ikeja - Maryland - Yaba	31
6	Ikeja - Oshodi	47
7	Ikeja - NAHCO	18
8	Ikeja - Mile 2	52
9	Ikeja - Toyin - Opebi	50
10	Ikeja - Allen - Opebi	50
11	Ikeja - Agege Pen Cinema	31
12	Ikeja - Adeniyi jones - Ogba	75
13	Ikeja - Oba Akran - Ogba	39
14	Ikeja - Iyana Ipaja - Toll Gate	56
15	Ikeja - Agege Pen Cinema - Iju Ishaga	38
16	Ikeja - Ojodu Berger	16
17	Ikeja - Alausa Secretariat - Iyana Oworo	77
	Total	**745**

Table 8.4 presents a summary of 3-Year Strategic Bus Requirement Plan for the successful and smooth running of the Lagos Bus Reform project.

Table 8.4: Bus Requirement – *A 3-Year Strategic Bus Reform Plan*

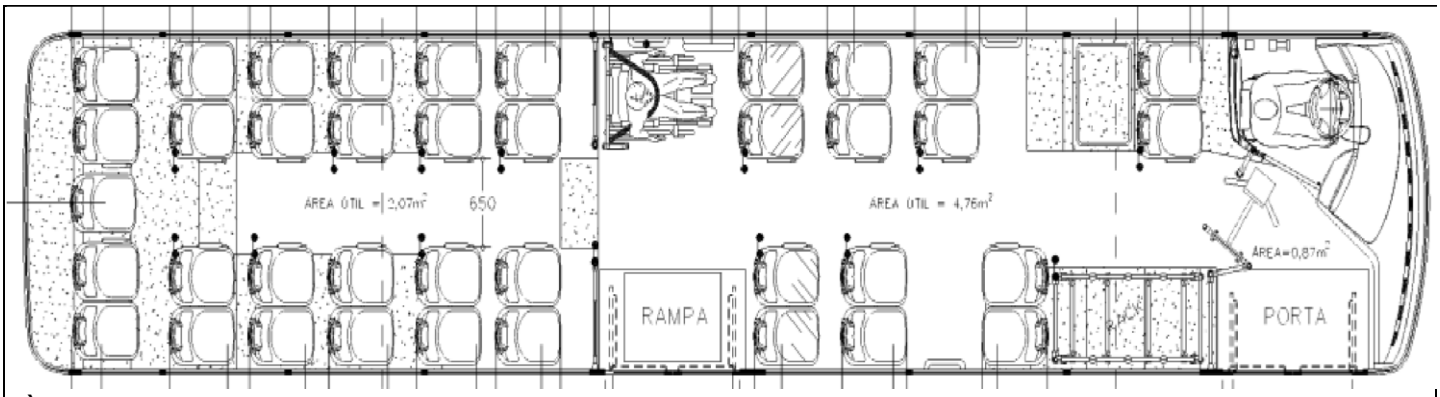
Zones	Year 1		Year 2		Year 3
	Phase 1A: Ikeja	**Phase 1B: Lagos Island**	**Phase 2A: Oshodi**	**Phase 2B: Oshodi – Abule-Egba BRT**	**Strategic Linkages**
Locations covered	- Ikeja - Ojota - Opebi - Ikorodu Road - Ojodu Berger - Yaba - Maryland - Ojuelegba - Pen Cinema - Iju-Ishaga - Iyana-Ipaja - Oshodi - Egbeda	- Marina/CMS - Idumota - Ajah - Yaba - Costain - Oyingbo - Mushin - Epe - Mile 2	- Oshodi - Abule-Egba - Sango/Toll Gate - Isolo - Ikotun - Obalende - Ikeja - Ipaja - Ojota - Ikorodu	- Oshodi - Ikeja - Dopemu - Abule-Egba - Pleasure - Katangua	
New Bus Requirement					
Medium Capacity	800	1,200	1,000	-	1,000
High capacity	200	200	300	400	300
Articulated Buses	-	-	-	-	200
Total	**1,000**	**1,400**	**1,300**	**400**	**1,500**
Total (by years)	**2,400**		**1,700**		**1,500**
Grand Total					**5,600**

8.3 Bus Type and Configuration

Two major bus types have been identified for the efficient and effective implementation of the Lagos Bus Reform. These bus types include midi and high occupancy buses. These two major bus types have been carefully selected based on astringent factors ranging from road condition, junction geometry, road length to passenger demand along a given corridor. The specifications for the Midi and High Capacity buses are shown in table 8.4 below

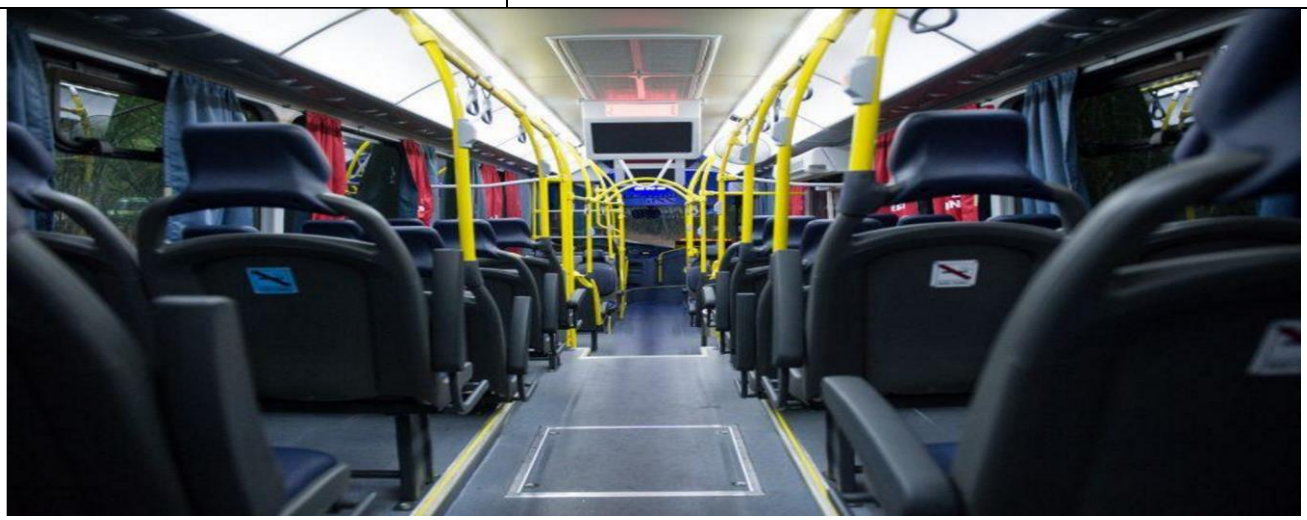
Table 8.4: Bus Requirement for Medium and High Capacity Buses

Configuration and size	a. 2-axle single deck, b. High – Length: 12.0m – 13.0m Width: 2.4m – 2.55m c. Medium – Length: 7m – 11m Width: 2.2m – 2.4m	
Seating Capacity	a. High – (40 – 50) b. Medium – (27 – 33)	
	c.	2x2 distribution Vinyl seat covers
Standing Capacity	a.	High – (30 – 45)
	b.	Medium – (10 – 20)
Passenger Door numbers	a.	2 double leaf pneumatically operated doors
	b.	Door release valve for emergency exit
	c.	Manual ramp for wheelchair access
Passenger door positions	a. Ahead of front axle b. Ahead of rear axle	



Ventilation and climate control	a.	Fully air conditioned
	b.	Sliding windows – tinted glasses with UV filtering and heat insulation
	c.	Roof hatches with 4 opening positions and emergency exit
Suspension configuration	a.	Air suspension
	b.	Kneeling suspension
Steering configuration	a.	Left hand drive with integrated power steering
	b.	Steering column with pneumatic height and tilt adjustment
Braking system	a.	Self-adjusting braking system (slack adjusters, automatic)
	b.	Drum brake
	c.	Exhaust brake control, automatic
	d.	Retarder
Power-plant location	a.	Centrally and longitudinally rear
Engine	a.	High – 5-cylinder, in-line, direct injection, turbo-charged, 250hp
	b.	Medium – 4-cylinder, in-line, direct injection, turbo-charged, 150hp
Power-plant fueling	a.	Automotive Gas Oil (Diesel)
Exhaust emissions standards and treatments	a. b.	Euro III Diesel particulate filter
	c.	Exhaust catalysts
	d.	Fuel cooler

	e.	Centrifugal oil cleaner
Transmission type	a.	Automatic 6-speed transmission
Windscreen	a.	Front – 2 piece green laminated glass (ECE–R 43)
	b.	Rear – 1 piece green laminated glass
Destination signs	a. Electronic – LED b. Exterior and interior	



Electrical system	a.	Alternators – 2 x 100A
	b.	Batteries – 2 x 225Ah (high) 2 x 150Ah (medium), maintenance free
Fuel Tank	a.	Internally coated
	b.	Minimum 300 liters capacity with preferably 2 filling points
	c.	Anti-siphon device fitted
Front Axle	a.	High - 7 tonnes
	b.	Medium – 3 tonnes
Rear Axle	a.	High – min 12 tonnes
	b.	Medium – 6 tonnes
Body and Flooring	a.	Full body frame insulation with injected polyurethane
	b.	Overall anticorrosion treatment on body frame
	c.	Fibreglass and aluminium body
	d.	Flooring – marine plywood, 14mm thickness
	e.	Flooring covered with heavy duty synthetic material
Interior Accessories	a.	1 6kg fire extinguisher – driver's compartment
	b.	1 set of triangular early warning device

c.	1 box of first aid kit
d.	4 pieces of hammers for breaking windows in case of an emergency
e.	Windscreen roller blind
f.	Passenger bells with buzzer and warning light on the driver's dashboard
g.	PA system
h.	Tool box
i.	Entertainment system (DVD and radio) with speakers on parcel rack

Additional requirements:

1. Driver's enclosure
2. Tropicalisation of engines to minimise engine overheating issues
3. Speed limiting device
4. Warranty 5-years rust free on body frame
5. Electronic Ticketing Machine ready
6. Turnstiles at entry and exit points
7. GPS enabled
8. CCTV with minimum of 4 cameras for exterior and interior views
9. Hub odometers
10. Customised operator logo
11. Workshop and operation manuals
12. 3-year warranty or 150,000km whichever comes first
13. Provision of factory and local technical training
14. Setup and initial managing of central workshops
15. Provision of recommended fast moving spare parts list with part numbers for 3 years with fixed prices
16. Ability to set up Bus Manufacturing Assembly Plant in Lagos, Nigeria within specified timeframe
17. USB charging points at all passenger seats
18. In-bus WIFI coverage

9.0 Bus Master Plan

9.1 Bus Master Plan

The Bus Master Plan gives the general outline and summarizes all the various components of the Lagos Bus Reform Project across all the identified zones. The components of the Bus Master Plan include:

i. Bus Routes;
ii. Bus requirements per route;
iii. Infrastructure requirements for each route;
iv. Classification of Infrastructures (bus terminals) into primary and secondary terminals;
v. Location of Corridor interventions;
vi. Location of Junction Improvement Works;
vii. Etc.

The Master Plan integrates Rolling Stock (buses) and Infrastructure (bus shelters, depots and terminals) into a functional system (in plan and quantities) to deliver an efficient Public Transport System based on land-use, traffic data, travel patterns and socio-economic considerations. The map of the Lagos Master Plan is attached.

The total number of buses for required for the three phases is 5,600 on bus routes of about 1,000 km. Total bus stops and laybys is 886 to be complemented by five bus depots for stalling the buses, 38 bus terminals and major interventions to be carried out along the routes include 13 Junction Improvement Works (JIW) and road rehabilitation on some parts of the routes totalling to about 8.5km. Figure 9.1 shows the map of the Lagos Bus Reform Master Plan

9.2 Ikeja Bus Master Plan

Ikeja Hub is estimated to have a daily passenger demand of over 1.69 million passengers daily with 57% of the passengers (963,000) using Public Transport and 43% (726,700) make use of Private Vehicles. The requirements for the Ikeja Zone include 1,000 buses, 260 bus shelters and lay-bys, 2 bus depots, 16 bus terminals and 13 Junction Improvement Works (JIW). Table 9.1 shows the summary of the components for Ikeja Hub.

Table 9.1: Ikeja Bus Master Plan

S/n	Component	Quantity
1.	Bus Requirement	1,000
2.	Routes	17
3.	Total Distance of Bus routes (Chainage)	132 Km
4.	Bus Shelter and Lay-by	260
5.	Bus Depot	2
6.	Bus Terminal (Main)	1
7.	Bus Terminal	16
8.	Junction Improvement Works	13
9.	Corridor Interventions – Aromire Road (Dualization); – Adeniyi Jones Avenue (Dualization); – Oba Akran Road (Resurfacing); – Ogba Road (Dualization) – Lateef Jakande Road (Dualization)	 0.6 Km 2.4 Km 2.3 Km 2.3 Km 1.0 Km

Figure 9.2 shows the map of Ikeja Master Plan

9.3 Lagos Island Bus Master Plan

Lagos Island Hub is estimated to have a daily passenger demand of 1.94 million passengers daily with 57% of the passengers (1,105,800) using Public Transport and 43% (834,000) make use of Private Vehicles. With the high commuter demand in Lagos Island hub, 1,400 buses is would be needed to conveniently move the passengers. The infrastructure needed for this Zone include: 398 Bus Shelters and laybys, 3 Bus Depots and 19 Bus Terminals. Figure 9.3 show the map of Lagos Island master plan and table 9.2 shows the summary of the components for Lagos Island Hub.

Table 9.2: Bus Master Plan components for Lagos Island Hub

S/n	Component	Quantity
1.	Bus Requirement	1,400
2.	Routes	37
3.	Total Distance of Bus routes (Chainage)	590
4.	Bus Shelter and Lay-by	398
5.	Bus Depot	3
6.	Bus Terminal (Main)	1
7.	Bus Terminal (Primary)	19
8.	Bus Terminal (Secondary)	-
9.	Junction Improvement Works	-
10.	Corridor Intervention	-

9.4 Oshodi Bus Master Plan

Oshodi Hub is a major transport hub with huge volume of transport and economic activities occurring there daily. Oshodi has about 22 routes with a total distance of 272 km, about 228 bus shelters and lay-bys and 4 bus terminals. Figure 9.4 shows the map of Oshodi Master Plan and table 9.3 shows the summary of the components for Oshodi Hub.

Table 9.3: Bus Master Plan components for Oshodi Hub

S/n	Component	Oshodi
1.	Bus Requirement	1,000
2.	Routes	22
3.	Total Distance of Bus routes (Chainage)	272
4.	Bus Shelter and Lay-by	228
5.	Bus Depot	-
6.	Bus Terminal (Main)	1
7.	Bus Terminal (Primary)	3
8.	Bus Terminal (Secondary)	-
9.	Junction Improvement Works	-
10.	Corridor Intervention	-

9.5 Mini-bus Routes

The mini-bus routes also known as the strategic linkages are other important connecting routes that are not highlighted as part of the hubs. The routes cover the following areas:

- Okokomaiko;
- Badagry;
- Igando;
- Iyana-Iba;
- Iba Town;
- Ayobo and
- Iyana-Meiran

Figure 9.5 is a map showing the mini bus routes is attached.

9.6 3-Year Strategic Plan

A three (3) strategic plan has been developed to execute the Lagos Bus Reform Master plan in phases.

- Phase 1 includes Ikeja and Lagos Island Zones which would be executed in Year 1;
- Phase 2 involves Oshodi and Oshodi – Abule Egba Route to be executed in Year 2 and
- Phase 3 is the Strategic Linkages.

Table 9. 4 shows the summery of the 3-year strategic plan for Phases 1, 2 and 3.

Table 9.4: Three (3) Year Strategic Bus Master Plan

Zones	**Year 1**		**Year 2**		**Year 3**
	Phase 1A: Ikeja	**Phase 1B: Lagos Island**	**Phase 2A: Oshodi**	**Phase 2B: Oshodi – Abule-Egba BRT**	**Phase 3: Strategic Linkages**
Locations covered	- Ikeja - Ojota - Opebi - Ikorodu Road - Ojodu Berger - Yaba - Maryland - Ojuelegba - Pen Cinema - Iju-Ishaga - Iyana-Ipaja - Oshodi - Egbeda	- Marina/CMS - Idumota - Ajah - Yaba - Costain - Oyingbo - Mushin - Epe - Mile 2	- Oshodi - Abule-Egba - Sango/ Toll Gate - Isolo - Ikotun - Obalende - Ikeja - Ipaja - Ojota - Ikorodu	- Oshodi - Ikeja - Dopemu - Abule-Egba - Pleasure - Katangua	
New Bus Requirement					
Medium Capacity	800	1,200	1,000	-	1,000
High capacity	200	200	300	400	300
Articulated Buses	-	-	-	-	200
Total	**1,000**	**1,400**	**1,300**	**400**	**1,500**
Total (by years)	**2,400**		**1,700**		**1,500**

Grand Total	**5,600**

10.0 Infrastructure Requirement

10.1 Inventory of existing Infrastructure

An inventory and condition survey of all transport infrastructures have been concluded and results combined in a reconnaissance survey report; a comprehensive list of the existing Public Transport (PT) infrastructure (Bus stops & Bus Parks) with their respective GPS coordinates. This is as presented in the Appendix

10.2 Rationalization

On realizing that some bus shelters and infrastructure may have been sited in the wrong locations or there may have been shifts in demographics and travel patterns causing some infrastructure to become redundant, it became necessary to access all identified infrastructures to determine the locations that would best serve the Lagos Bus Reform Project.

The number of necessary infrastructure (Bus stops and Terminals) along selected bus routes have been rationalized based on a number of criteria as follows:

- Proximity to activity centres;
- Distance between the bus stops;
- Proximity to major junctions;
- Present and future land use;
- Etc.

The list of selected locations per route are as attached in the Appendix.

10.3 Infrastructure Requirement

The infrastructure required for the Lagos Bus Reform includes:

- Terminals
- Depots
- Bus shelters
- Lay-bys

The provision of key infrastructure such as bus shelters and lay-by along the routes will make it easy for passengers to board and alight at their destinations and for the buses not to hinder other road users when picking up/dropping off passengers

Bus terminals will be sited at the end of each of the routes to handle higher volume of passengers and enable easy transfer of passengers from one mode of transport to the other. Terminals could also be centrally located at the hubs and at popular destinations with large passenger demand.

Table 10.1 - 10.3 shows the infrastructure requirements for all the zones i.e. Ikeja, Lagos Island, Oshodi and the 'Strategic Linkages' zone.

Table 10.1: Infrastructure Requirement for Phase 1A (Ikeja)

S/N	Route	Bus Shelter	Laybys	Bus Terminals	Bus Depots
1	Ikeja - Ketu	7	7		
2	Ikeja - Ojodu Berger	8	8		
3	Ikeja - Maryland - Ojuelegba	0	0		
4	Ikeja - Toyin - Opebi	8	8		
5	Ikeja - Allen - Opebi	0	0		
6	Ikeja - Alausa Secretariat - Iyana Oworo	12	12		
7	Ikeja - NAHCO	6	6		
8	Ikeja - Maryland- Yaba	19	19		
9	Ikeja - Oba Akran- Ogba	4	4		
10	Ikeja - Agege Pen Cinema	22	22		
11	Ikeja - Adeniyi Jones - Ogba	7	7	13	3
12	Ikeja - Agege Pen Cinema - Iju Ishaga	18	18		
13	Ikeja - Ojota	9	9		
14	Ikeja - Iyana Ipaja - Toll Gate	44	44		
15	Ikeja - Egbeda	5	5		
16	Ikeja - Mile 2	18	18		
17	Ikeja - CMS	4	4		
18	Ikeja - Obalende	6	6		
19	Ikeja - Barracks/ Stadium	2	2		
20	Ikeja - Oyingbo	8	8		
21	Ikeja - Oshodi	8	8		
	Total	**215**	**215**	**13**	**3**

Table 10.2: Infrastructure Requirement for the Phase 1B (Lagos Island)

S/N	Route	Bus Shelter	Laybys	Bus Terminals	Bus Depots
1	Tom Jones - Yaba	20	20		
2	Tom Jones - Ikotun	34	34		
3	Tom Jones - Alakuko	59	59		
4	Obalende - Sabo - Yaba	7	7		
5	Obalende - Osborne -Dolphin	2	2		
6	Obalende - Ojota	18	18		
7	Obalende - Ogba - Berger	1	1		
8	Obalende - Lekki - Ajah	37	37		
9	Obalende - Falomo	6	6		
10	Obalende - Eko Hotel	17	17		
11	Obalende - Costain- Ojuelegba	0	0		
12	Obalende - Bariga	4	4		
13	Obalende - Mushin - Iyana Ipaja	7	7		
14	Obalende - Ikeja	0	0		
15	Obalende - Iyana Oworo - Oshodi	0	0		
16	Idumota - Oshodi	1	1		
17	Idumota - Ojuelegba	0	0		
18	Idumota - Ojodu Berger	13	13	5	1
19	Idumota - Mushin	10	10		
20	Idumota - Mile 2	15	15		
21	Idumota - Ikeja	22	22		
22	Idumota - Ijora	3	3		
23	CMS - Victoria Island	5	5		
24	CMS - Lekki - Ajah - Epe	77	77		
25	CMS - Ikeja	2	2		
26	Apongbon - Palmgroove	0	0		
27	Apongbon - Oshodi	0	0		
28	Apongbon - Orile Mile 2	3	3		
29	Apongbon - Ojuelegba	0	0		
30	Apongbon - Mushin	0	0		
31	Adeniji Adele - Obalende	3	3		
32	Adeniji Adele - Yaba - Oyingbo	4	4		
33	Adeniji Adele - Mushin	0	0		
34	Adeniji Adele - Ketu - Mile 12 - Ikorodu	28	28		
35	Adeniji Adele - Ijora	0	0		
	Total	**398**	**398**	**5**	**1**

Table 10.3: Infrastructure Requirement for Phases 2A & 2B (Oshodi)

S/N	Route	Bus Shelter	Laybys	Bus Terminals	Bus Depots
1	Oshodi - Agege	18	18		
2	Oshodi - Obalende via TMB	12	12		
3	Oshodi - CMS via TMB	15	15		
4	Oshodi - Mushin	5	5		
5	Oshodi - Orile/ Costain/ Ijora	17	17		
6	Oshodi - Cele/ Mile 2	16	16		
7	Oshodi - Ikotun	23	23		
8	Oshodi - Jibowu/ Yaba	2	2		
9	Oshodi - Bariga	6	6		
10	Oshodi - Ketu via Oworonshoki	15	15		
11	Oshodi - Egbeda	12	12	3	0
12	Oshodi - Ikeja	10	10		
13	Oshodi - Airport Road (NAHCO)	4	4		
14	Oshodi - Ajegunle	5	5		
15	Oshodi - Apapa	10	10		
16	Oshodi - Ojota/ Mile 12 via Ikorodu road	7	7		
17	Oshodi - Anthony/ Palmgroove/ Ojuelegba	0	0		
18	Oshodi - Ojota via Oworonshoki	4	4		
19	Oshodi - Iyana Ipaja	6	6		
20	Oshodi - Ojodu/ Berger	11	11		
21	Oshodi - Iyana Oworo	0	0		
22	Oshodi - Ajah	30	30		
	Total	**228**	**228**	**3**	**0**

The Public Transport (PT) routes that are envisaged under the 'Strategic Linkages' zone include:

- Iyana Ipaja – Iyana Iba
- Iyana Ipaja – Badagry
- Ekoro Road
- Meiran Road
- Iyana Iba – Badagry
- Other Linkages

These are additional to the linkages that would be identified in each of the preceding zones (Ikeja, Lagos Island & Oshodi). These routes would cover the areas that are yet to be served by the Lagos Bus Reform Project.

A provision of 225 Bus shelters and lay-bys, 5 Terminals and 3 depots are being made for this

10.4 Infrastructure Concepts

Concepts for these infrastructures – bus terminals, depot, bus shelters and lay-by are respectively shown in Figures 10.1 – 10.4

The 3D Models of some of the Infrastructure (Terminals, Depots, Bus Shelters and Lay-Bys) are presented in 'Appendix V: 3D Visuals & Design Drawings'.

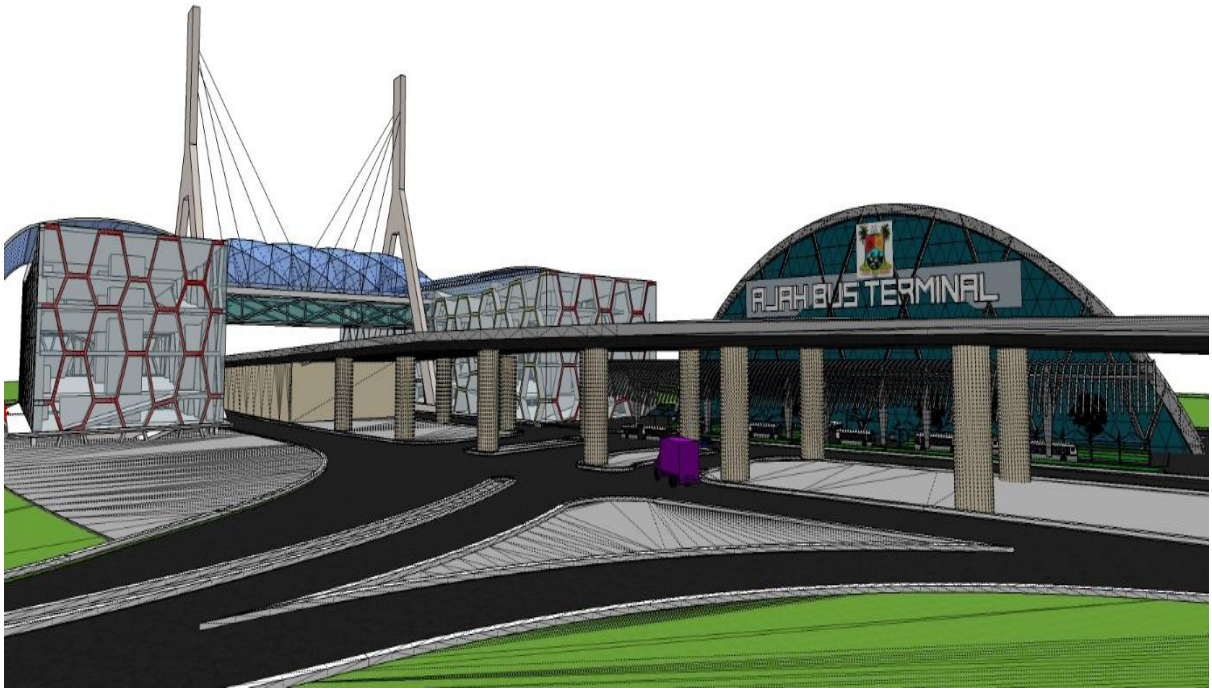


Figure 10.1: Typical Terminal Concept

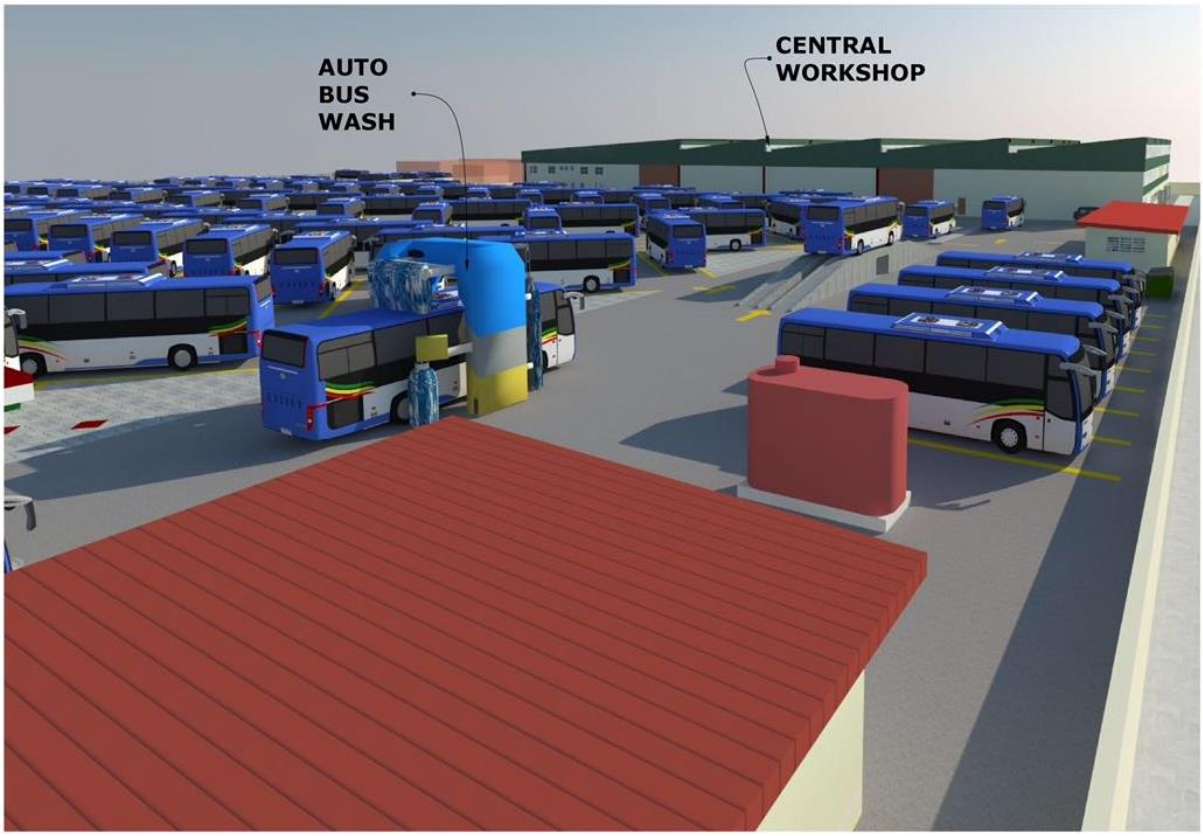


Figure 10.2: Typical Depot Concept

Figure 10.3: Typical Bus Shelter Concept

Figure 10.4: Typical Lay-by Concept

11.0 Intelligent Transport Systems (ITS)

11.1 Introduction

Intelligent Transport System (ITS) is the application of information and communication technology to transport infrastructures and vehicles to improve transport mobility, safety and travel reliability. This includes stand-alone applications such as traffic management systems, information and warning systems installed in individual vehicles, as well as cooperative ITS (C-ITS) applications involving vehicle to infrastructure and vehicle-to-vehicle communications.

Modern life in urban environments in combination with citizens' rising transportation needs have turned integrated transport systems into high priority. Passengers now require precise and punctual information in real time at the bus stops and terminal stations or on the train platforms making public transport become more user-friendly, and citizens are encouraged to use them on a regular basis instead of their private vehicles.

The introduction of ITS to public transport will contribute significantly to the sustainable development in public transport, the decongestion of traffic networks in cities, the reduction of emissions and the protection of the urban environment in general.

Elements of a robust Intelligent Transport System (ITS) for the Lagos State Bus Reforms Projects would be explained in the following section.

11.2 Public Transport Fleet Management Software

A fleet management software would be an integral part of the ITS solution and for this, FLASH manufactured by Italian company Mizar Automazione S.P.A is being proposed. The FLASH application is one of the "state of the art" applications in Europe for the management and the monitoring of fleets, providing at the same time the functionality for the informative system's implementation for the citizens. The application's purpose is the representation of public transport time-table execution on real time, the monitoring of the time programs implementation, the efficient management of the available resources, as such the provision of continuously information in real time to the passengers of public transport. Figure 11.1 shows a typical ITS control centre while Figures 11.2 and 11.3 shows features of the ITS application

Figure 11.1: ITS Control Centre

Features of Application:

- Control in real time of the various processes of the fleet's transportation;
- Communication between the drivers and the Control Center;
- Integration of the devices that are installed on the vehicles and the Control Center;
- Support of the public transport organizations about the maintenance;
- Management of data for the services analysis, the programming and the planning processes support through open models – "Open Database"

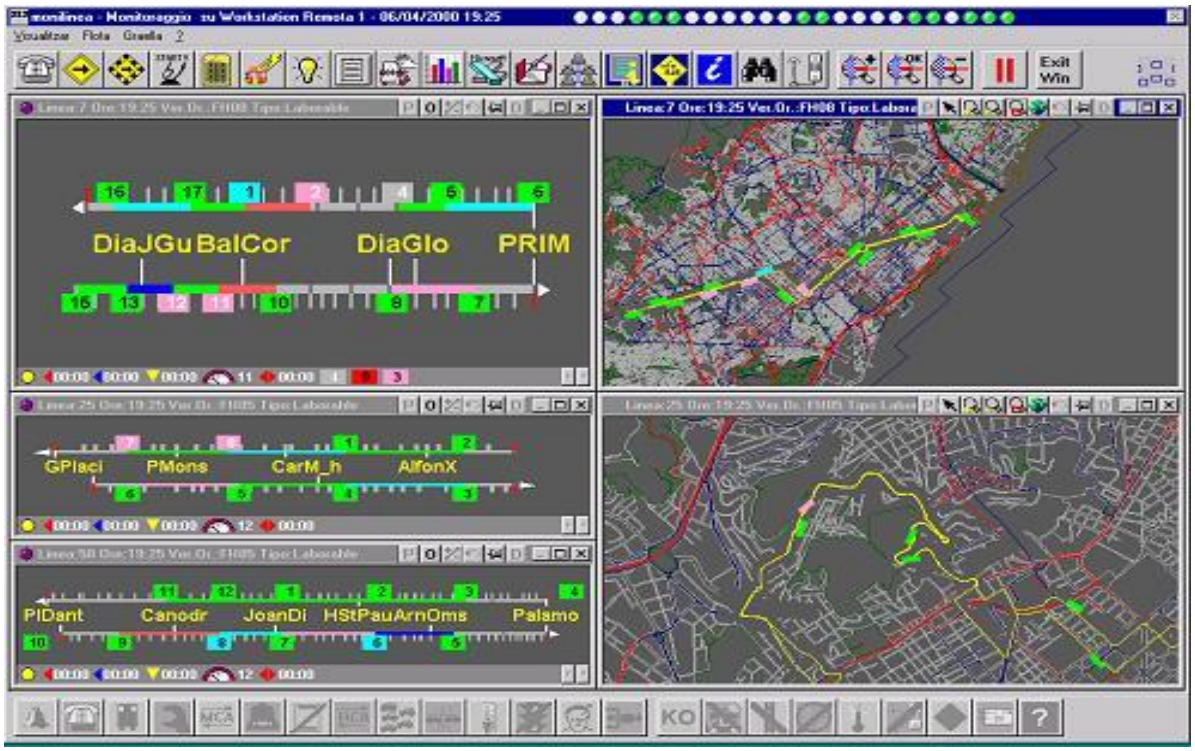


Figure 11.2: Monitoring vehicles on-screen at the Control Centre

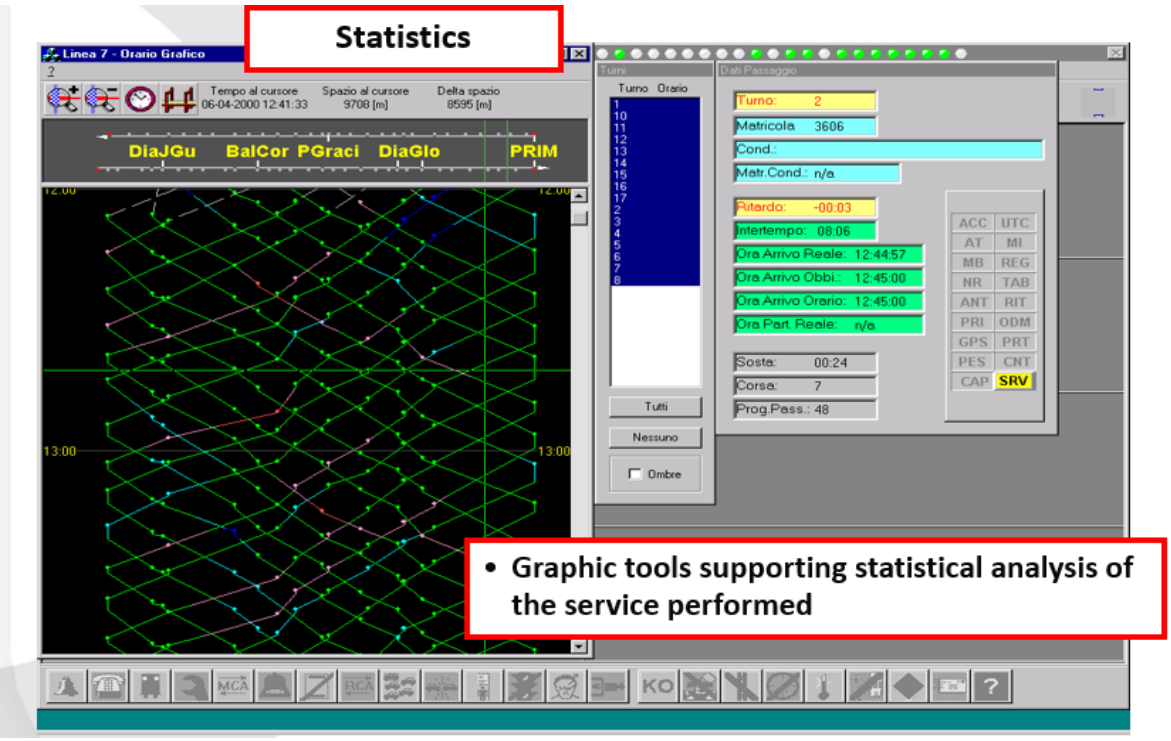


Figure 11.3: Graphical Tools makes analysis easier

The FLASH architecture is modular and distributed, and allows managing simultaneously the connection with different public transport fleets, possibly equipped with different on-board units and connected by different communication media. Figure 11.4 shows the components of the software architecture

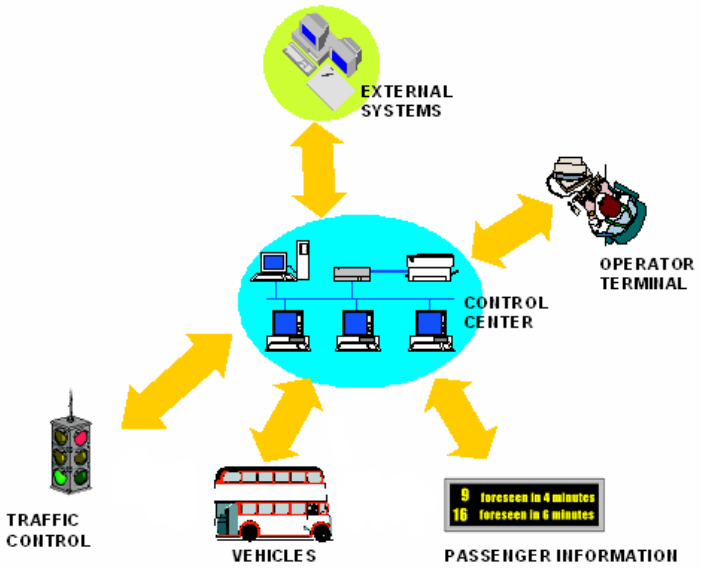


Figure 11.4: Software Architecture

The main advantages of the proposed software are the following:

- Reliable function of the public transport systems control.
- User friendly Interfaces.
- Reliable and dynamically updated services for the passenger's information (predictable arrival time of the bus at the stop).
- Integration with other traffic management and traffic lights systems.

FLASH software has been successfully installed for various bus schemes in different cities as shown in Table 11.1.

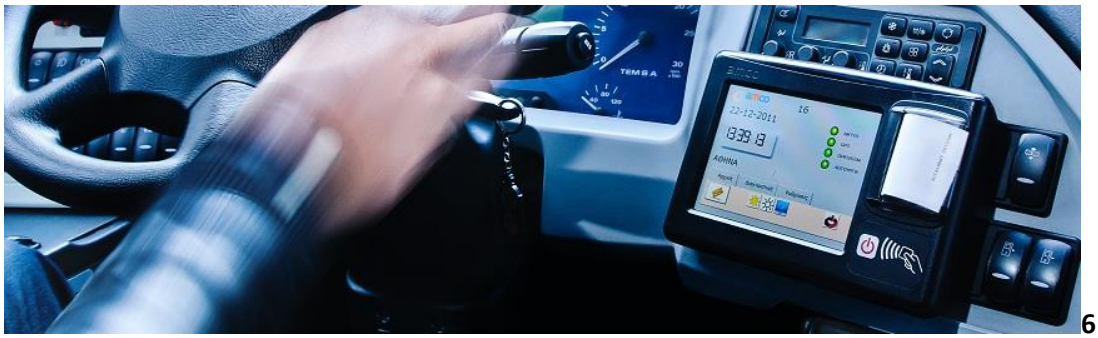
Table 11.1: Cities where Flash has been deployed for managing bus schemes

Towns	Number of Vehicles	Bus stop Stations
Barcelona (Spain)	1.100	30
Bucharest (Rumania)	300	
Oulu (Finland)	136	40
Dublin (Ireland)	42	72
Torino	1300	153
Naples	1000	140
Florence	400	15
Cagliari	294	157
Forli	295	49
Milan	256	
Brescia	240	64
Livorno	170	15
Ischia	70	49
Bergamo	30	10
Cremona	20	5

11.3 On-Board Unit (OBU)

By attaching the OBU to the windscreen and switching it on, it detects the longitude and latitude of the vehicle's position with the help of satellites, and matches this with a digital map stored in the OBU.

The proposed on-board unit is MT-300 manufactured by AMCO SA in Greece. Figure 11.5 shows an installed On-board unit



[6]

Figure 11.5: MT-300 On-board Unit

MT-300 combines the functionalities of a ticket printer with those of a pc-based on-board computer. It is a high-performance console for issuing and recharging tickets on board sales.

The MT-300 supports the driver to operate AVL, Passenger Information and Ticketing functions comfortably via a 6.4" color touch screen. Therefore, the driver interface for the handling of sales and AVL functions is designed according to customers' individual requirements.

The thermal printer operates at fast printing speed and features an "easy-paper-loading function" that allows drivers to change paper rolls simply by loading and closing paper tray.

The driver cash-up data and fare data transfer via WLAN, GSM/GPRS, USB flash drive, driver card, etc.

The MT-300 supervises all on-board equipment, including validators. It can also be connected to a GPS localization module and supply data to vehicle monitoring and passenger information systems.

The software and hardware architecture guarantee adaptability to future functional or technological needs.

Features include:

- Integrated, multifunctional central board computer for use in public transport vehicles
- Fast, accurate and reliable with a modern aesthetic design
- Combined ticket printer and on board computer
- Highest level of process data and payment data integrity
- Changes and enhancements to the MT-300 functionality can be realized without exchanging the unit by loading software via WLAN , GPRS or memory cards
- Simple to use and maintain
- Shock and vibration resistive device

The detailed technical specifications of the MT-300 are the following:

- Housing: Plastic ABS
- Dimensions : 230mm x 157mm x 34mm (WxHxD)
- Weight: Approx. 1.1 Kgr.
- Display: 6.4" TFT-LCD Touch Screen, resolution 640x480 pixels, 262K colors, brightness up to 500cd/m2, Anti-glare, LED backlight, Automatic brightness adjustment (optional)
- Processor: Ultra Low Power Intel Atom, 1.1 GHz Z510
- Operating System: Windows XP/ XP Embedded
- Memory: 1 GB RAM expandable to 2GB
- Storage: CompactFlash Type II
- Card Reader: ISO 14443 A & B and Mifare Proximity Card Reader
- Power Supply: 12—36 VDC, reverse polarity protection
- Printing Unit: Thermal printer , 58mm Paper Width, resolution 8 dots/mm (203 dpi), multiple character set, paper weight 80g/m, graphics & logos, printing speed 50mm/sec , easy paper loading function
- Interfaces: 2 x RS-232, 4 x USB2.0, 1 x Ethernet 10/100/1000 Mbps (RJ45), 8-bit Digital I/O (4 in / 4 out), PS/2 Keyboard and Mouse pin header, 1 x audio in / 1 x audio out 8-bit Digital I/O
- Operating Environment: -15oC to +60oC, 85% RH
- Standards: CE mark

11.4 Automatic Vehicle Location Systems

To ensure a real time monitoring of the vehicle location from the Operation and Control Centre (OCC), an automatic vehicle location system (AVLS) is important. This would be achieved by the installation of a telematics unit in the bus. The proposed vehicle telematics unit is AMTRACK-TB21 manufactured by AMCO SA in Greece and is shown in Figure 11.6

Figure 11.6: TB-12 Telematic Unit

Amtrack TB21 is the perfect choice for telematics applications, fleet management systems, asset management, etc. It has an Ethernet port and acts as a gateway to provide internet or access to the VPN for the connected devices. Features include:

- Position calculation using GPS (latitude, longitude)
- Calculation of vehicle speed and altitude
- Time synchronization with GPS
- Optional use of odometer and accelerometer
- Transmission of vehicle position
- Geo Fencing
- Built-in GSM modem
- Operation using static or dynamic IP address
- Online monitoring using GPRS network
- Safe Mode with Pin code
- Configuration & monitor through telnet and SMS
- Ethernet connection
- Deliver GPS data though the Ethernet connection to an OBU connected to it
- Port Forwarding

The detailed technical specifications are the following:

Table 11.2: Technical Specifications of Telematic Unit

GPS	**Communication**	**Interfaces**
22 tracking/66 acquisition channels Based on Mediatek MT3329 chipset Sensitivity -165 dBm Support for AGPS Accuracy: 3 meters, 2D RMS (Position), 0.1 meters/sec (Velocity), 1 microsecond (Time) Start Up Times: Hot start < 1.5 sec, Warm start < 34 sec, Cold start < 35 sec Protocol: NMEA-0183 v3.01 (input/output) Coordinate Frame: WGS-84 Support for WAAS, EGNOS, MSAS	EGSM, GPRS class 10, EDGE WCDMA 3G and HSxPA (optional) QuadBand: 850/900/1800/1900 MHz SIM interface (1.8V/3V) Supported codecs: FR-EFR-HR-AMR Mobile Station class B, CG, CC Support for PBCCH Codecs: CS1 - CS4 Communication Protocols: PPP, IP, UDP, TCP, ICMP, FTP, HTTP, POP3, SNMP, DNS	1 x RS232 1 x Ethernet (RJ45) Buses: 1-wire and CAN protocol 1 x External interrupt 1 x Odometer 2 x RF for GSM/GPRS and GPS 1 x Microphone/headset
Power Supply	**Operating Environment**	**Housing**
Power Supply: 8-48VDC 1000 mAh lithium battery (optional)	Operating Temp.:–20°C to +65°C Storage Temp: -40°C to +85°C	Material: Aluminum Dimensions: 140 x 80 x 30 mm Weight < 300gr
Certificates/Compliances		
CE Certificate ROHS Compliant		

Except from the AMTRACK-TB21, each vehicle should be equipped with a radio modem in order for the system to communicate with the traffic lights and send the appropriate commands.

11.5 Passenger Information System (PIS)

The proposed bus stop LED displays manufactured by AMCO in its own factory in Greece. Figures 11.7 – 11.10 depicts some indicative LED passenger information displays manufactured by AMCO.

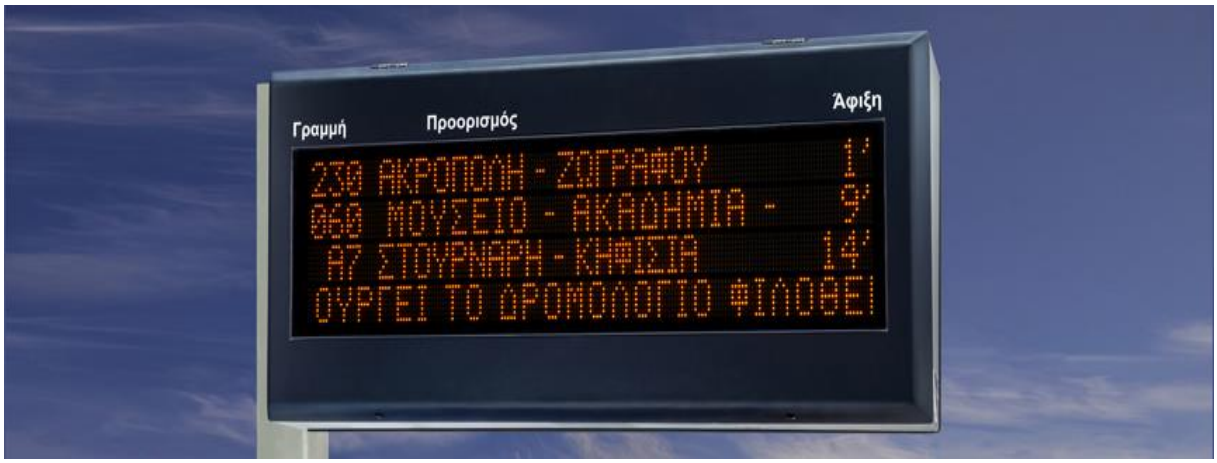


Figure 11.7: Indicative APID Series Bus Stop LED Display

Figure 11.8: Indicative APID Series Bus Stop LED Display

Figure 11.9: Indicative APID Series Bus Stop LED Display

Figure 11.10: Indicative APID Series Bus Stop LED Display

The proposed displays will be capable of presenting:

- Real time information about incoming buses in terms of estimated time of arrival, route number and name.
- Simultaneously information concerning up to (3) incoming buses
- Static information/messages with regards to PT service

The following table depicts the detailed technical specifications of the proposed bus stop LED display.

Table 11.3: Technical Specifications of Proposed Bus stop LED Display

APID42-A21-D3-L TECHNICAL SPECIFICATIONS	
MANUFACTURER	AMCO S.A.
FACTORY CERTIFICATION	ISO 9001:2008
DISPLAY TYPE	Single color line matrix outdoor LED display. The display supports Latin characters with scrolling text.
DISPLAY TECHNOLOGY	LED
LED TYPE	Surface Mount
SIDES	Two sides
LED COLOR	Yellow Amber (592nm)
LINE RESOLUTION	128 x 7 pixels
FRAME RATE	100 frames per second for scrolling text. Display will indicate (from left to right) route no, route name and expected time of arrival
LEDs PER PIXEL	1
LED VIEWING ANGLE	160° x 160° (Horizontal x Vertical)
LED DRIVING	Static 1:1. In case of pixel failure, the other LEDs will not affected. The display sends diagnostic information to the control centre in case of failure. The communication protocol allows bidirectional communication, data compressing and error correction.
MTBF	More than 100.000 working hours
LUMINOSITY	Ultra Bright: 6.000 cd/m^2 (nits)

SMART ECONOMY FEATURE	The display is equipped with a light sensor supports 256 ambient light levels and the display dims its luminosity automatically according to the measured ambient light level
CHARACTERS PER LINE	21 (more with scrolling text)
CHARACTER HEIGHT	42mm
LINES	3
VIEWING DISTANSE	More than 25 meters
DISPLAY CASE	Case Material: Extruded aluminium 3mm. Each side of the display has 4mm anti-reflective Lexan-polycarbonate transparent film for vandalism protection (IK 10). The display supports the capability to change individual faulty LEDs. Static information will be written on the display case
PROTECTION LEVEL	IP65 (according to IEC 60529)
INTERFACES	Ethernet 10/100, RS485, RS232, USB GPRS/3G modem
OPERATING TEMPERATURE	-20^{0}C to +60^{0}C. The display is equipped with internal fan with thermostat.
RELATIVE HUMIDITY	95%
POWER SUPPLY	230V ± 6%, 50Hz ± 2.5%
SAFETY MARKS	CE Marking (LVD and EMC Directives)

11.6 On Board LED Displays

The proposed on board LED displays manufactured by AMCO in its own factory in Greece. Figure 11.11 depicts an indicative on board LED passenger information display manufactured by AMCO.

Figure 11.11: On-board LED Displays

The following table depicts the detailed technical specifications of the proposed on board LED display.

Table 11.4: Technical Specifications of Proposed on-board LED Display

BLS76-A9616-S TECHNICAL SPECIFICATIONS		
1.	MANUFACTURER	AMCO S.A.
2.	FACTORY CERTIFICATIONS	ISO 9001:2008
3.	DISPLAY TECHNOLOGY	LED
4.	LED TYPE	Dot Matrix
5.	LED COLOR	Amber 592nm
6.	EXTERNAL DIMENSIONS (W x H x D)	820mm x 190mm x 60mm
7.	DISPLAY CASE	Case Material: Aluminium 2mm. The front side of the display has 3mm anti-reflective Lexan-polycarbonate transparent film for vandalism protection. The display supports the capability to change individual faulty LEDs.
8.	SIDES	One Side
9.	RESOLUTION	96 x 16 pixels
10.	PIXEL PITCH	7,62mm
11.	VIEWING ANGLE (H / V)	120º x 120º
12.	LINES	Two
13.	CHARACTERS PER LINE	16
14.	CHARACTER HEIGHT	50 mm
15.	VIEWING DISTANCE	>12 m
16.	SMART ECONOMY FEATURE	The display is equipped with a light sensor supports 16 ambient light levels and the display dims its luminosity automatically according to the measured ambient light level.
17.	OPERATING TEMPERATURE	-15 °C to +60 °C
18.	RELATIVE HUMIDITY	95%
19.	INTERFACES	RS232/RS485
20.	POWER CONSUMPTION	10W
21.	CERTIFICATES	EMC: CE mark SHOCK AND VIBRATION: IEC Standard 571-1
22.	LIFETIME	> 100.000 hours
23.	POWER SUPPLY	12-32V

11.7 Lagos Bus Reform ITS Test-Run

A test run of the operation of the Passenger Information System (PIS) was carried to ascertain the performance of the Intelligent Transport System (ITS) locally. This allowed a waiting passenger at a bus stop know what time a bus will arrive. It also entails the deployment of ITS equipment such as Passenger information system and Vehicle on board unit to facilitate communication between the vehicle and the passengers display equipment at the bus shelter.

The passenger information system (PIS) devices consists of the Bus stop display unit, telematics device and Transit Management System (TMS) cloud. The PIS devices were parameterized to ensure communication between the telematics device and the display unit along Ikeja – Iyana Oworo route.

The Display unit was mounted at Alapere Bus stop while the telematics device was installed in the bus. With all device powered ON, the bus was driven round the selected route and the estimated time of arrival is displayed on the display unit at Alapere Bus stop for Passenger consumption as shown in the Figures 11.12 and 11.13.

Figure 11.12: LED Display at Alapere Bus Stop

Figure 11.13: LED Display at Alapere Bus Stop

The location and activity of the bus was monitored real time from the cloud transit management system software as shown in Figure 11.14.

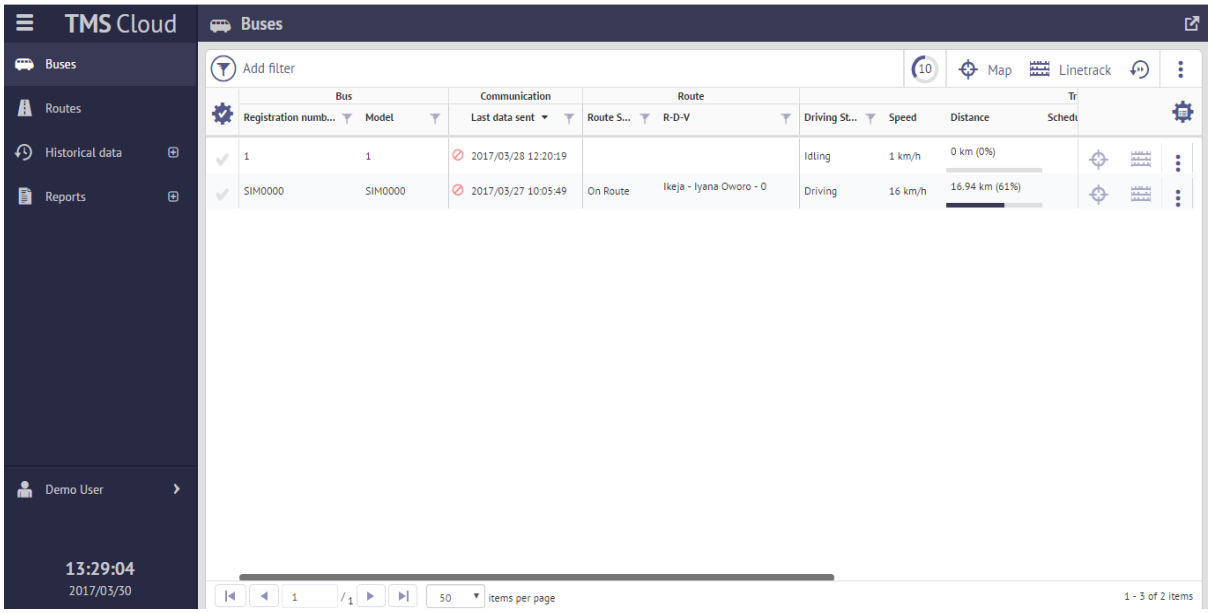


Figure 11.14: Cloud Transit Management System Software Interface

12.0 Institutional and Regulatory Framework

This chapter highlights the responsibilities of the various regulatory institutions /agencies providing legal and institutional framework to ensure the success of the Lagos Bus Reform Project. Major regulatory institutions/agencies are as follows:

- Lagos State Government (LASG);
- Ministry of Transport (MOT);
- Lagos Metropolitan Area Transport Authority (LAMATA);
- Lagos State Drivers Institute (LASDRI);
- Lagos Bus Services Limited (LBSL); and
- Lagos State Traffic Management Authority (LASTMA)

Major responsibilities and functions would include:

12.1 Lagos State Government (LASG)

The Lagos State Government (LASG) is responsible for the following:

- Political Will;
- Create enabling environment;
- Promote Bus Reforms Project;
- Ban/Restrict Danfos; and
- Funding.

12.2 Ministry of Transport (MOT)

In ensuring a successful implementation of the bus reform scheme, the **Ministry of Transport (MOT)** is expected to carry out the following responsibilities:

- Develop transport policy;
- Implement transport policy; and
- Co-ordinate all other agencies of the Lagos State Government having responsibilities for transport and traffic related issues, including Motor Vehicle Administration Agency (MVAA), Vehicle Inspection service (VIS), and Lagos State Drivers' Institute (LASDRI).

12.3 Lagos Metropolitan Transport Authority (LAMATA)

The Lagos Metropolitan Transport Authority (LAMATA) is saddled with the following responsibilities:

- Legal, planning, Institution and Regulatory Framework;
- Bus Master plan (route, operations & corridor infrastructure);
- Set standards for operators (LOS, bus type and specifications, etc);
- Regulate fare and define collection strategy;
- Monitoring and Evaluation;
- Capacity Building;
- Set up reform institute for public transport drivers and attendants;

- Grant franchise;
- Intelligent Transport System (ITS); and
- Provide required infrastructures such Bus shelters, Bus Terminals, and Bus Depots, etc.

12.4 Lagos Bus Services Limited (LBSL)

The **Lagos Bus Services Limited (LBSL)** is saddled with the responsibility of managing the entire bus operations to ensure cost recovery. This would include:

- Asset Management;
- Operations Management;
- Collection of equity contributions from franchise operators, franchise license fees and royalty;
- Manage fare collection processes;
- Bus Procurement;
- Manage Bus Operations;
- Manage Cost Recovery Problem;
- Manage sinking fund;
- Ticketing and Fare Collection
- From all collections, effect lease payments, maintenance cost etc.;
- Establish lease contracts with franchise operators to recover cost; and
- Enter into contracts with Bus OEM for maintenance etc.
- Oversight of Bus Operating Companies (BoC),
- Depot development and management.

12.5 Lagos State Traffic Management Authority (LASTMA)

The Lagos State Traffic Management Authority (LASTMA) being the traffic regulatory and enforcement agency in Lagos will perform vital roles that are key to the successful implementation of the Phase 1A and 1B implementation of the bus reform. These roles include:

- Enforcement of traffic measures and parking management; and
- Enforcement of Lagos Bus Reform laws.

12.6 Harmonization of Traffic Rules

Planet Projects Limited is aware that a committee has been set-up by the Lagos State Government to harmonize all the roles and functions of each of the regulatory agencies involved in the Lagos Bus Reform Project. We are also aware that the committee is about to submit its report to the Government.

13.0 Operations and Management (O & M) Framework

This chapter highlights the options for bus operations and also a framework for the selection of Bus Operating Companies (BOCs).

13.1 Options for Bus Operations

Two (2) options have been identified that could be deployed for the operations of the buses under the Lagos Bus Reforms Project. The option to be used for implementation will be selected after due considerations from all government stakeholders involved with the bus reform project.

Option 1: In this option, there is a separation between the parties involved in the ownership and the operations of the buses. While investors are brought on board to part-own the buses together with the Lagos State Government, bus operating companies (BOC) would be engaged to operate the buses only, and for this service, they would be paid an agreed fee. The investors are guaranteed a certain rate of return that is enough to pique their interest and thus invest in the buses to reduce the financial burden on government.

Operators thus just run the buses for a specified fee without taking any revenue risk. They would however be expected to run the buses based on the Service Level Agreement (SLA) and all other agreements that would be signed with the Lagos Bus Services Ltd or Lagos Metropolitan Area Transport Authority (LAMATA). A chart explaining this option and showing the relationship with other stakeholders is as attached as Figure 13.1.

Option 2: In Option 2, the BOCs are part-owners of the buses by reason of equity contributions. They would also operate the buses for a period of time under a lease agreement after which they acquire full ownership rights to the buses. These options are as shown in Figures 13.2.

13.2 Sectoral Responsibilities

As shown in Figures 13.1 and 13.2, the responsibilities of the major regulatory institutions/agencies – Ministry of Transport (MOT), Lagos Metropolitan Area Transport Authority (LAMATA), and Lagos Bus Services Limited (LBSL) – are as identified below:

- Ministry of Transport (MoT): Development and implementation of transport policies; coordination of all other Lagos State Government agencies responsible for transport and traffic related issues; etc.
- Lagos Metropolitan Area Transport Authority (LAMATA): Legal, planning, Institution and Regulatory Framework; Bus Master Plan (route, operations & corridor infrastructure); Set up reform institute for public transport drivers and attendants; Grant franchise; etc.
- Lagos Bus Services Limited (LBSL): Manages the entire bus operations; management of fare collection; manage Cost Recovery; enter maintenance contracts with Bus OEM; etc.

13.3 Framework for Selecting Bus Operating Companies (BOCs)

The objective of Lagos Bus Reform is to phase out the existing old and rickety mini-buses (popularly called Danfo) and to replace them with new high capacity and Midi buses to ensure commuters can enjoy comfortable, reliable and accessible bus service, improve public transport connections in Lagos, reduce traffic congestion and environmental pollution, improve safety and security of the commuting public; thereby enhancing the quality of life and travel experience of the commuting public in Lagos State.

Towards achieving this objective, BOCs with professional competence in Intra-city bus service operation with well-trained bus drivers will be appointed to operate the buses based on a Service Level Agreement (SLA). Consequently, the BOCs will be charged with the following roles and responsibilities;

i. Enter into a Lease Agreement with LBSL to provide the required number of buses for the scheme.

ii. Enter into a tripartite SLA with LAMATA and LBSL to provide the required number of service frequencies, quality and quantity of service, hours of operations, passenger management and retention strategy amongst others.

iii. Provide bus drivers who will undergo Biometric verification, training and certification with the LASDRI.

iv. Operate buses on specified route(s) through the franchise period.

v. Collaborate with existing operators to capture local experience.

A flowchart showing the entire selection process for BOCs is shown in figure 13.3 below.

13.4 Pre-Qualification Criteria

Expression of Interest (EoI) will be requested from eligible and highly competent BOCs with satisfactory experience in Intra-city Bus operation to express their interest in providing efficient bus services. Interested firms will be expected to submit the following information:

- Previous Experience;
- Technical Capacity; and
- Financial Capacity.

At the end of the pre-qualification process, successful BOCs will be appointed and granted Route Franchise License by the Lagos State Government (LASG) through Lagos Bus Service Limited (LBSL) to operate the required number of buses on the specified route(s) for an agreed period, subject to LAMATA's regulation and the terms of the SLA.

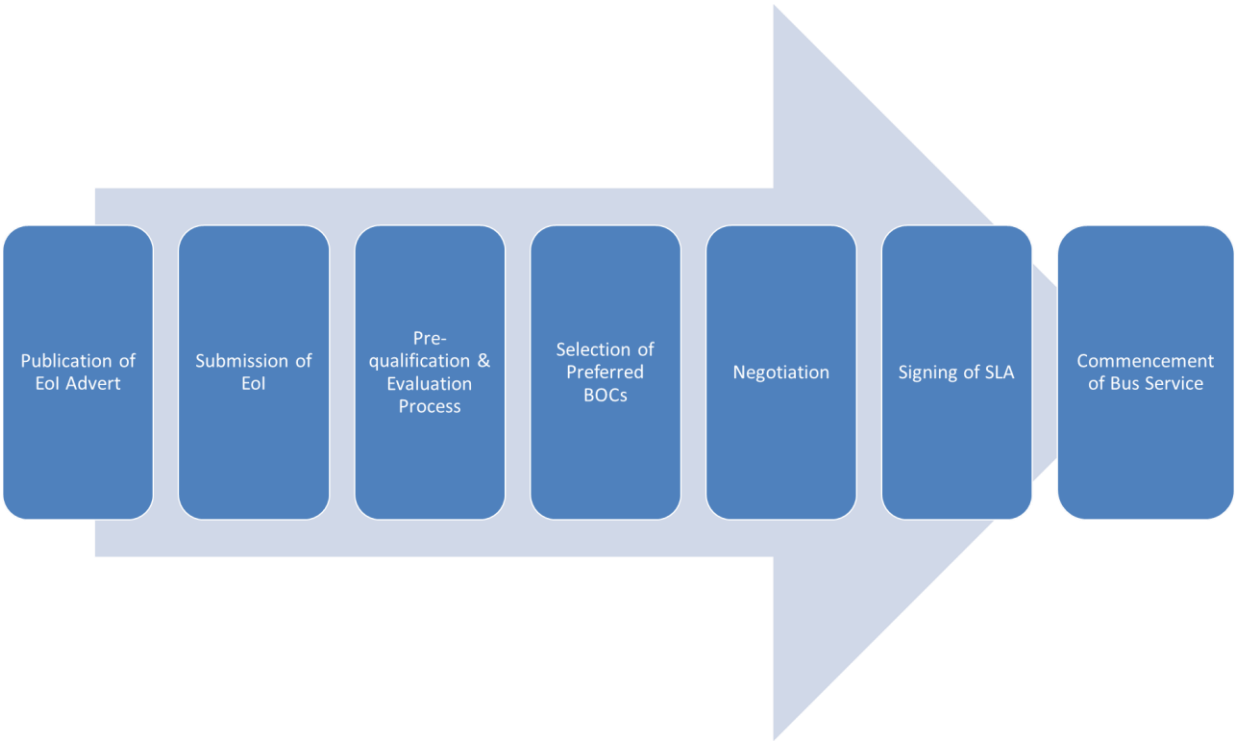


Figure 13.3: Selection Process Flow Chart for BOCs

13.5 Service Level Agreement (SLA)

The SLA sets out an agreed framework for the BOCs and LBSL to work together towards providing an efficient and reliable bus service along designated routes to the community for public building on the relative strengths and experience of the parties. The SLA will provide clear reference to service ownership, accountability, roles and/or responsibilities; present a clear, concise and measurable description of service provision to the commuters and match perceptions of expected service provision with actual service support & delivery.

13.6 Key Performance Indicators (KPIs) for BOCs

To guarantee effective bus services, a strict process of monitoring and evaluation would have to be designed to ensure that commuters are getting excellent services. This monitoring and evaluation process would be incentive with the BOCs receiving cash awards on meeting and/ or exceeding set KPIs. The following are some of the KPIs to be included in the SLA:

- Bus availability
- Condition of Buses (e.g., neatness, cleanliness, etc.)
- Hours of bus Operations
- Service Quality (e.g., Bus Frequency and Travel Times)
- Number of Passengers carried per day
- Number of kilometres covered per day
- No of Incidences (e.g., breakdown, etc.)
- Qualification of Drivers and Training Certification
- Drivers Violations of Traffic Rules (driving under the influence of alcohol, drugs, accidents, etc.)
- Staff Punctuality
- Employee Turnover
- Number of passengers complaints and issue resolution
- Submission of daily, weekly and monthly operational and other required Reports
- Attendance of periodic stakeholders meeting
- Communicate issues and request using laid down escalation hierarchy
- Resolution of conflicts using appropriate Conflict Resolution Mechanism
- Adopt a graduated approach to the Imposition of penalty where appropriate to BOCs whose SLA compliance is below 70%
- Set-up of a Customer Held Desk to attend to and resolve all customer complaints and issues in the course of provision of their bus service

13.7 Maintenance Framework

The Lagos Bus Reform is structured with an in-built maintenance plan, where the bus manufacturing companies/suppliers will have to designate a maintenance team or a representative maintenance team (dealership) to carry out periodic maintenance on the buses supplied, to cover the lifespan of the buses or for an agreed period of time. This will ensure longevity and sustainability of the buses and as well as the reform.

14.0 Information, Education and Consultation (IEC)

Information Education and Consultation (IEC) is an approach which attempts to change or reinforce a set of behaviour in a target audience regarding a specific problem in a predefined period of time. It combines strategies, approaches and method that enable individuals, families, groups, organisations, and communities to play active role in achieving, protecting and sustaining their own health

The reason why IEC is important is because it creates awareness, increase knowledge and change attitudes.

Lagos state, the most populous state in Nigeria and Africa as a whole has an exponential growth rate and a teeming population working and living within its Central Business Districts (CBDs) and suburbs. However, the transportation system of the state, as a core driver of its economy needs a seamless integration of all existing modes of transport to bring about a hitch-free transit of passengers from diverse origins to destinations. Hence, it is quite obvious that the complexity in the state's transport network requires swift solutions that can be tailored to address the current transport challenges, hitches and negative externalities experienced in the State.

In view of this, Planet Projects Ltd has developed an I.E.C implementation plan for the Lagos Bus Reform Project with the vision of ensuring the full benefit of the project is accrued for the good of the society at large. The vision basically, stands to support the economic development of the State and enhance the quality of life, safety and security of Lagosians while increasing transport connections and inter-modal connectivity.

14.1 IEC Plan

The Lagos Bus Reform project is regarded as an urgent solution needing swift implementation due to the fact that the midi-buses in question, constitutes 95% of the total Public Transport modes in Lagos which causes 35% of the congestion experienced. It is also highly uncomfortable, expensive, poorly regulated, unsafe and poses a poor public image for the State.

Reformation in details will transform every component of a standard bus transit system with regards to the drivers & bus attendants who must be dignified in well-tailored uniforms and identity badges, buses will be air-conditioned and road-worthy to ensure a comfortable ride, Intelligent Transport Service (ITS) that gives on-time updates to passengers for proper travel plans

Electronic ticketing will also be put in place to ensure fast boarding and quick queues, bus stop & shelter to protect passengers against adverse weather conditions, bus terminal for pooling and redistribution, route licensing for logistics efficiency, bus operating companies to provide professional operational framework. Passenger insurance plans will be implemented to strengthen safety and confidence, biometrics to ensure accurate data entry and training towards operational compliance.

The I.E.C plan is divided into six (6) basic components namely:

1. Communication Objectives – This is to ensure effective communication of different activities to stakeholders in order to enhance project outcomes and ensure full awareness of the benefits involved such as traffic safety promotion and incentive schemes to encourage ridership. Communication will entail delivery and management of project information with appropriate feedback strategies.
2. Stakeholder's Engagement – There are two major types of stakeholders namely Government Ministries, Departments and Agencies (MDAs) and other stakeholders. Stakeholders that are involved in the Lagos Bus Reform includes the Lagos State Government, Ministry of Transport, Lagos Metropolitan Area Transport Authority, Lagos Bus Service Limited, Bus Operating Company, Maintenance Firm, Ticketing Company, Traffic Enforcement Agencies, Security Agencies and so on.
3. Target Market – This basically includes the commuters which consist of the general public (students, children, disabled, adults, nursing mothers), road users and community outreach (Business Expos and Transport Fairs).
4. Communication Channels – Various communication channels that will be maximized are the electronic media (Media Chat / Press Conference, Television & Radio Jingles, Billboards, Website Presence,

Social Media), print media (Newspaper Advert, Newsletters, Fliers, Posters, Handbills, Brochures and Pamphlets) and others (Road Shows, Business Expos, Transport Fairs and Word of Mouth).

5. Customer Service – This involves a twenty-four (24) hours call centre service, customer help desk, Suggestion Box, Online Website, Customer Service Agent and Loyalty Programs for commuters.
6. Finance Sources – The Lagos State Bus Reform Project will be basically financed by the State Government and Private Sector Participation (Branding & Advert).

14.2 IEC Materials

The following materials have been produced to aid in the IEC

- Flyers
- Documentary
- Advert
- Radio Jingles
- Etc.

15.0 Socio-Economic Impact Assessment

15.1 Introduction

This chapter evaluates the socio-economic impact of the Lagos Bus Reform Project on all the road transport stakeholders including Passengers, LASG, NURTW Crew Members as well as other road users, with major focus on analysing its effect on the level of employment and/or disengagement.

Table 15.1 below displays net job loss for the scheme when considering the direct employment while a net job gain is projected for the indirect jobs like facility management, ICT, training, engineering, customer service, security and other support activities.

Table 15.1: Socio-Economic Assessment – Impact on Employment

S/N	Description	Employment	
		Danfo Bus	Reform Bus (HOV)
*	Vehicle Requirement	20,000	5,000
1	No. of Driver	20,000	10,000
2	No. of Attendant	20,000	10,000
3	No. of Mechanic	667	500
4	No. of Panel Beater	0	100
5	No. of Vulcanizer	0	50
6	No. of Painters	0	50
7	No. of Electrician	0	100
8	No. of Cleaners (Bus Depot, Terminal & Shelters	0	5,000
9	Bus Washing	0	5,000
10	No. of Admin. Staff	0	500
11	Facility Management	0	250
12	ITS Staff	0	500
13	Customer Service	0	250
14	Training & Certification	0	50
15	Security Staff	0	1,000
16	Support Services	0	2,000
17	No. of Ticketers	0	2,000
	Total	**40,667**	**37,350**
	Percentage (%)	**52%**	**48%**

Assumptions:

1 One HOV bus = Four Danfo buses
2 No. of Driver per Danfo = 1
3 No. of Attendant per Danfo = 1
4 No. of Driver per HOV bus = 2
5 No. of Attendant per HOV = 2
6 One Mechanic can repair 30 Danfos per month

15.2 Summary of Projection for Job Replacement:

1. Job Loss: 40,667 (Informal Sector)
2. Job Gains: 37,350 (Formal and Semi-formal)
3. **Net (Loss): 3,317 (Grossly Informal)**

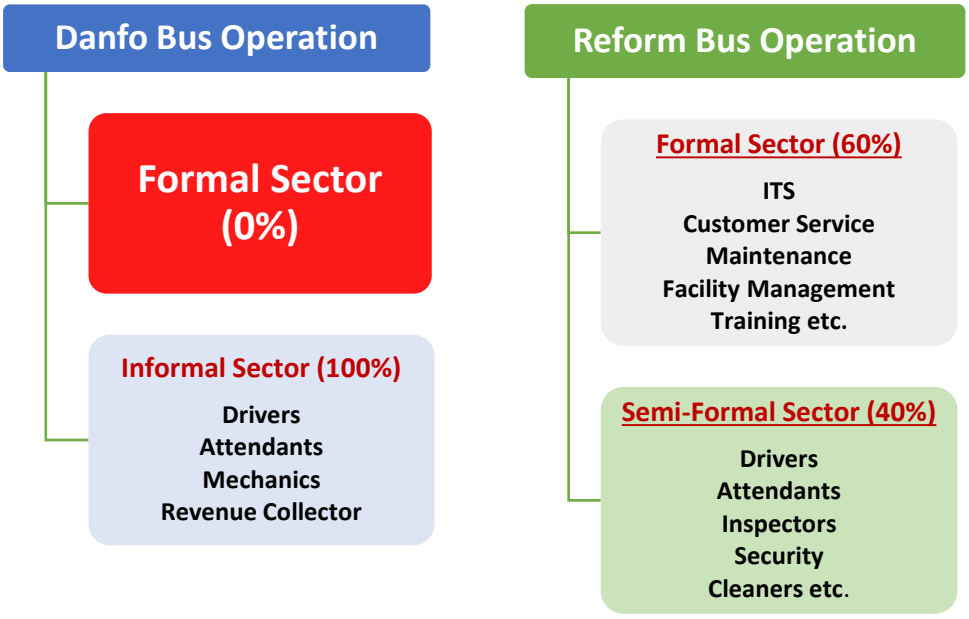


Figure 15.1: Comparative Analysis of Danfo Bus to LASG Reform Buses

Although, a projection for displacement of 3,317 informal employees representing 8.1% of the total number of employment currently on the Danfo Bus Operation is expected within this period, it is however imperative to note that these jobs are strictly informal and would be one-off.

It would be interesting to note, that the potential **job gains** would be enormous when integrating the bus assembling plant into the entire value chain, which is proposed to be established in Lagos to help drive local content and also become employment hub. Implementation of which would in turn employ minimum of 10,000 employees that would automatically be added to the pool of employment gains.

The employment-mix would mainly comprise of both skilled and semi-skilled labour, when considering the sensitivity and technicalities associated with the Operation and Maintenance (O&M) of the facility.

Table 15.2 highlights some of the differences between the operations of Danfo and LASG reform bus.

Table 15.2: Comparative Analysis of Danfo Bus to LASG Reform Buses

S/No.	Highlight	Danfo Bus	Reform Bus (HOV)
1	Employment Opportunities	Strictly driving, attendant, mechanic, fee collector and other informal services	Driving, Attendant, Bus Supervisors, Fleet Management Team, Security, Technical Team, ICT, Cleaners, Bus Washing, ticketing etc
2	Job Mix	Strictly Informal	Cuts across both formal and semi-formal sector
3	General Risk Assessment	High Risk with no insurance policy on passengers, crew members and assets	Low Risk with comprehensive insurance policy on passengers, crew members and assets
4	Environment Impact	High Level of pollution (Air, Noise etc.) due to low economy of scale	Relatively low pollution due to high economy of scale
5	Security	High level of insecurity, with high passenger exposure to one change/kidnapping etc	Highly secured
6	Comfortability	Very Low with no air-condition, poor sitting arrangement etc	Highly comfortable with Air Condition and befitting seats, gang way etc
7	Accessibility	Relatively Fair although with high irregularities	Very High with a high level of coordination
8	Affordability	Highly Expensive	Relatively Cheap
9	Reliability	Very Low with high level of disappointment arising from mechanical fault sue to old age as well as poor information system	Very high with effective Information and communication System ICT (ITS) system in place
10	Availability	Very low due to high level of down time arising from depreciation etc.	Highly available with little or no service down time high efficiency level of the buses
11	Maintenance Culture	Very poor maintenance culture and attitude with no several unskilled mechanics and inadequate tools	Highly technical with modern maintenance facilities and well trained personnel
12	Bus Operation	High unregulated and inefficient with a free entry and exit system	Highly regulated and efficient system
13	GDP/Income to LASG	Little or no income to LASG due to improper record keeping process which makes financial unverifiable	Highly professional with verifiable financial records for easy IGR calculations
14	Stress on Road Infrastructures	Very high due to high influx of rickety buses	Moderate with modern fixtures and high occupancy rate
15	Health & Safety Standard	Very low usually operating with expired tyres and no other safety gargets	Very High all safety gargets in place up to the emergency doors
16	Customer Service Level	Not existing as passengers are usually at the mercy of the drivers and bus attendants	Highly customer friendly with a centre monitoring systems both human and technological gargets
17	Aesthetics	Terrible and repulsive	Modern and highly attractive
18	Attractiveness to FDI/Local Investors	Little or no potential of attracting both local and FDI	Highly attractive to both local and foreign Direct Investment
19	Database	No existing form of database/record keeping (manual or automated)	High level of Database management

15.3 Strategies for Job Replacement:

The strategies that would be used in addressing this are as follows;

1. **Training and Re-training:** All interested employees under danfo bus operation after meeting up with all requirements for engagement would be subjected to a training which would cut across major areas of operations. Major areas would be cleaning, customer service, ITS, Inspection, maintenance etc.
2. **Re-alignment:** All danfo bus employees would be technically profiled to ascertain their area of strength and appropriately deploy them according to their befitting job functions with consideration to their area of competence. This would help optimize their potentials and foster high level of productivity.
3. **Offer of employment (Permanent):** Another area of focus would be to make all employment permanent with consideration for health care/insurance, pension and other staff benefits which would naturally make the scheme very attractive to all employees under Danfo bus operation. This would also reduce staff turnover and add confidence to all employees.
4. **Seamless Operational Process/Framework:** We intend to make all operational processes unambiguous and simply, while establishing appropriate control mechanism. This would cut across all areas of operation of the LASG bus reform.

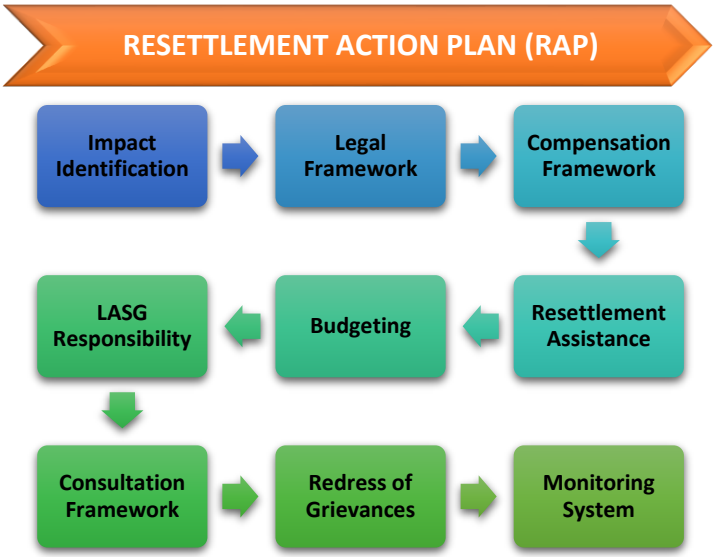
From the above investigation and the proposed strategies developed for job replacement, there is a clear indication that there may likely be "**no job loss"** for all the employees currently working under the Danfo bus arrangement. We believe that by the time several other investments (local and/or foreign) come in through the new bus reform, there would be very high job opportunities cutting across several sector like Mechanical, Health, Environment, Engineering (Mechanical, Electrical, Civil), Horticulture, Finance, Management, Taxation etc.

In conclusion, it has become more glaring that the over-riding positive impact of the LASG Bus Reform Project surpasses all the challenges that are already identified, hence the request for its immediately implementation for the overall benefits of the all residents of the state and for the country at large.

16.0 Resettlement Action Plan (RAP)

16.1 Introduction

This chapter examines the procedures to be followed and the actions to be taking to mitigate adverse effects, compensate losses and provide development benefits to persons/assets affected by the Lagos Bus Reform Project, whether physically or economically. This would strictly be based on the areas covered by the entire network of roads, the bus owners and operators as well as other affected road users.



Key focus would be in the area of;

16.2 Identification of project impact and affected populations:

The objective is to technically identify the number of people that would be affected by the LASG Bus Reform Projects and the impacts through carrying out a thorough mapping out of all features such as population settlements, infrastructures, and other land-use patterns, as well as carrying out a census that enumerates the number affected people/assets and register them according to location

16.3 Legal framework for Land acquisition and compensation:

This is the point at which we shall expressly define and summary all applicable laws, policies and regulations relevant to the resettlement activities associated with the LASG Bus Reform projects.

16.4 Compensation Framework:

This highlights the strategies to be adopted for compensating everyone affected with partial or complete loss during project implementation. This would involve description of the existing compensation guideline as well as the methodology to be used to value losses should there be no existing compensation guidelines already in place. This framework would also highlight the types and levels of compensation to be paid, compensation assistance eligibility criteria and how and when compensation will be paid.

16.5 Resettlement Assistance:

This would focus on the strategy that would be adopted in providing assistance to all affected people immediately all due processes are concluded. This we intend to conclude before land acquisition or displacement is done. In this plan, we shall have the relocation schedule and assistance for all affected, replacement of services and enterprises, livelihood restoration among other things.

16.6 Budgeting and Implementation Schedule:

We intend to carefully and technically estimate the cost of resettling all the people/assets that would be affected by the project development as well as an explicit source of funding the implementation of the resettlement plan, while considering all associated risks.

16.7 Organizational Responsibility:

In the case, we intend to identify and provide details on the roles and responsibilities of all stakeholders with major focus on the Lagos State Government. This will help in the development of this Resettlement Action Plan/Document suitable for the project.

16.8 Framework for Public consultation, Participation and Development Planning:

The Resettlement Action Plan will be developed to help in the identification of all stakeholders and ensure regular consultation with a wide range of project stakeholders that cuts across the entire road network covered by the LASG Bus Reform Projects, while promoting high level of public participation.

16.9 Grievance Redress:

This document will be developed to describe the grievance redress framework that should be implemented by the State Government in order to foster smooth implementation of the LASG Bus Reform Project. It will also describe management of all categories of all stakeholders to the project, which in this case are very huge in both numbers and capacity.

16.9 Monitoring and Evaluation:

This document will be developed to effectively monitor report and document the effectiveness of the entire process of implementation of the resettlement plan, including the physical progress of work done and rehabilitation activities, the disbursement of compensation, the effectiveness of public consultation, participation activities and the grievance redress.

17.0 Work Programme

A 12-month work programme has been developed to ensure the commencement of passengers operation of the Bus Reform Project.

The work programme contains activities with timeline targeted towards achieving the project objectives and ensuring smooth operations of the Lagos Bus Reform Project. Based on our planned timelines, the project is planned to be fully executed from in twelve months.

The tasks have been categories into Eleven (11) groups as follows:

- Transport Planning;
- Buses;
- Infrastructure;
- Intelligence Transport System;
- I.E.C;
- Bus Operations Companies;
- Drivers Training & Certification;
- Fare Collection System;
- Institutional & Regulatory Framework;
- Operation & Maintenance and
- Project Flag Off.

17.2 Activity A –Transport Planning

This work activity has been sub-divided into three different tasks to be achieved within the allocated time. The tasks that fall under this activity have been concluded, these include:

- Bus Route Planning;
- Transport Studies; and
- Bus Requirement (Routes, Zones).

Activity B – Buses: This entails the procurement of buses process for the bus reform project. The procedure for obtaining the buses is expected to have kick started in the third month and delivered through the months till the eleventh month.

Activity C – Infrastructure: This activity has three tasks divisions; two out which has been concluded. The construction of infrastructure is also expected to begin in the third month. This activity is scheduled to be completed by month 11.

Table 17.1: Activity C Tasks and Duration

S/No.	Task	Remark
1	Identification of Existing Infrastructure Location s	Concluded
2	Identification of New Infrastructure Locations	Concluded
3	Construction of New Infrastructures	March-December 2017

Activity D – Intelligence Transport System: This activity involves the test running of the ITS equipment on an agreed route to ascertain how the ITS will work within the system. The pilot scheme has been carried out by Planet Projects Limited and an operation control centre (OCC) has also been selected. The procurement of the other ITS equipment (Fleet Management Software, Passenger Information System etc.) is ongoing.

Table 17.2: Activity D Tasks and Duration

S/No.	Task	Remark
1	Pilot Scheme	Concluded
2	Selection of Operation Control Centre (OCC)	Concluded
3	Procurement Delivery, Installations and Test Running of Facilities & Equipment for the OCC, Passengers Information System, Fleet Management Software and Tracking Devices.	On-going

Activity E – I.E.C: This activity has four sub-divisions and adequate time period has been allocated to each task. The tasks under activity E include:

Table 17.3: Activity E Tasks and Duration

S/No.	Task	Remark
1	Stakeholders Meeting with Transport Union (NURTW)	Ongoing
2	Define the incentive for Transport union (NURTW) participation and set criteria to form a cooperative /BOC	Ongoing
3	Production of public communication material (EoL Concept, Flyers, Radio Jingles, Documentary, etc.)	To be concluded in Month 5
4	Stakeholders Engagement & Management	Ongoing

Activity F – Bus Operations Companies: This activity has been divided into three major tasks and adequate time period has been allotted to each task. The tasks under activity F and their durations are as follows:

Table 17.4: Activity F Tasks and Duration

S/No.	Task	Timeline
1	Expression of Interest (EoL) Advert for Bus Operating Companies (BoC)	Month 3 - 4
2	Selection of preferred BoCs	Month 5 - 6
3	Signing of SLA	Month 7

Activity G – Drivers Training & Certification: This activity has been divided into four major tasks and adequate time period has been allocated to each task. The tasks under activity G and their durations are as follows:

Table 17.5: Activity G Tasks and Duration

S/No.	Task	Timeline
1	Presentation of Proposed Drivers by BoCs	Month 5 - 7
2	Assessment and selection of Drivers	Month 8 - 9
3	Training and Certification of drivers by LASDRI (Biometric Verification, Eye/Vision Test, Practical Driving Test etc.)	Month 9 - 10
4	Training by Manufactures	Month 9 - 11

Activity H – Fare Collection System: This activity has been divided into two major tasks and adequate time period has been allocated to each task. The tasks under activity H and their durations are as follows:

Table 17.6: Activity H Tasks and Duration

S/No.	Task	Timeline
1	Define Ticketing option, Fare Collection System and Engagement of Service provider	Month 3 - 4
2	Procurement, Installation and Test Running of E-ticket Facilities and Equipment	Month 5 - 8

Activity I – Institutional & Regulatory Framework: This activity has been divided into three major tasks and adequate time period has been allocated to each task. The tasks under activity I and their durations are as follows:

Table 17.7: Activity I Tasks and Duration

S/No.	Task	Timeline
1	Grant Route Franchise to BoCs	Month 4 - 7
2	MoU with Traffic and security agencies (LASTMA, NPF, Task Force, etc.) to manage Traffic and Maintain law and Order.	Month 6 - 7
3	Enact Law to Ban & Restrict Danfo Buses from Operating along Bus Route.	Month 2 - 7

Activity J – Operation & Maintenance: This activity has been divided into four major tasks and adequate time period has been allocated to each task. The tasks under activity F and their durations are as follows:

Table 17.8: Activity J Tasks and Duration

S/No.	Task	Timeline
1	Financial Model/Cost Template	Months 5 - 9
2	Service and Operational Plan	Months 5 - 9
3	Maintenance Programme with bus for preventing and Corrective Maintenance	Month 11 -12
4	Project Monitoring and Supervision	Month 11 -12

Activity K – Project Flag Off: This is the last activity on the work program; it's the commissioning and flag off of the Project.

18.0 Project Risk

This chapter discusses and focuses on the various risk factors associated with each stage of implementing the Lagos Bus Reform Project from Planning, Infrastructure design and construction, acquisition of buses, Operations and Maintenance, etc.

The Lagos Bus reform Project like every other project will be affected by a number of risks. Towards effectively managing the risk associated with the project we would adopt four (4) steps, namely; Risk Identification, Risk Assessment, Risk Allocation and Risk Mitigation.

1. Risk Identification – This involves identifying all the possible risks that might affect this project looking at past experiences and thinking innovatively about what could go wrong in the future.
2. Risk Assessment – We need to assess all the possible risk that has been identified. Assessing the risk will enable us to prioritise, allowing us to determine the most serious hazards first. The risk has been assessed and measured in terms of High, Medium and Low risk.
3. Risk Allocation – The allocation of whose stakeholder's responsibility to deal with the risk in the event of likely occurrence is very critical.
4. Risk Mitigation – This involves the strategy that is been put in place to tackle this risk if and when the do occur.

Importantly, risk management needs to be an on-going process; therefore someone should be assigned the responsibility for monitoring the progress of controls listed in the Risk Register and for including new risk on the Register as they may arise.

Table 18.1 shows the summary all the possible project risks that could affect the actualization of the project and also discusses mitigation to these risks and possible contingency plans for immediate action.

18.1 Design & Infrastructure Risks

This includes risks that are associated with the infrastructure put in place for the efficient performance and easy accessibility of the buses by the passengers. These risks include the following:

- Infrastructure Facilities versus Passenger Demand Mismatch: This is the possibility of having over-zealous pessimistic and optimistic project assumptions. This could be a result of inaccurate traffic forecasts or inappropriate technical plan.

  Appropriate feasibility studies should be conducted using accurate methods with proper technical inspections and agreement of the project parameters between the relevant Stakeholders (LAMATA, LASG, and LBSL).

- Bus Depot Capacity: The designed bus depot for stalling the buses might eventually not be sufficient for the number of buses deployed on the project. This should be highly avoided through proper infrastructural planning and in the eventuality that this occurs, additional land spaces for siting the buses should be provided for immediate development of an additional bus depot.

- Bus Service not able to cover some existing bus destinations: This could be a very high project risk, this occurs when some routes are left out during the planning stage especially in a city like Lagos with a wide coverage. Alternative bus services should be developed to cushion this effect.

- Unstable power supply to guarantee uninterrupted ITS operations: The Control Centre, Passenger Information System, Bus Stop Display units etc are part of the Intelligent Transport System that requires a stable power supply system to function effectively. This is a very high risk as there is a high probability that the whole operations system will halt if there is a lack of power supply. It is therefore important to utilise a reliable power source such as an independent power supply to ensure that the operations of the Lagos Bus Reform Project is not distorted at any point.

- **Congestion due to poor traffic flow and internal circulation within the bus terminals parking space:** A proficient enforcement system with adequate TSM measures needs to be put in place at each of the terminal to make room for an easy flow of vehicular and passenger traffic. This risk is to be borne by the bus operating companies (BOCs).
- **Limited or no space provision to convey passenger goods and luggage:** This is a low project risk as it does not affect the revenue or operations of the bus reform directly. However, this could affect the way the scheme is accepted by the passengers if there is no means of conveying their goods from one commercial point to the other. To mitigate this, buses plying other routes should be allowed to convey passengers with luggage to their destinations.
- **Infrastructure cost forecast versus actual construction cost mismatch (cost over-run):** This could occur in the event that the proposed cost of construction is lower than the actual cost of construction as a result of exchange rate or price level fluctuation, the risk will be borne by the Lagos State Government. In other to evade this, appropriate provisions should be made for contingencies and additional works.

18.2 Operations and Maintenance (O&M) Risks

The risks associated with the operations and maintenance are risks that can directly terminate the bus reform project. If this is not properly planned, it can lead to the downtime and costs over-run of the bus operations. These risks include:

- **Revenue Mismatch**: This is the possibility of having disequilibrium between the forecasted revenue and actual revenue obtained during operations. A conservative business case model should be developed to reduce the risk of an over ambitious model.
- **Revenue Leakages:** This is a high risk as this can lead to revenue loss, the sources of outflows should be reduced as much as possible. A full proof ticket validating and cash reconciliations system should also be put in place for adequate monitoring of cashflows.
- **Demand Risks:** This is the possibility of having demand disequilibrium; the projected demand for the bus routes might be less than the supply. The proposed bus requirement can also be less than the passenger demand along the corridors which will lead to inefficient service. Inefficiency of the formulas used in calculating the bus requirement and traffic forecast mistakes could be possible causes for this. It is important to validate the forecast method and also carry out a post operation traffic survey.
- Delay in bus loading and dispatch due to inefficiency of operations
- Absence of bus service to interconnect and link all bus destinations at terminating points;
- **Poor Drivers behaviour**: Some drivers might violate traffic rules and regulations endangering the passenger's lives. A periodic training and re-training is imperative to alleviate this and strict sanctions should also be given to offenders.
- **Relocation of Motor parks**: Inability to relocate all existing motor parks within bus reform zones into their respective bus terminals; an effective stakeholder's engagement strategy to carry them along should be set-up to avoid this.
- Dissatisfied passengers have restricted choice to use other bus service;
- Sabotage of the scheme due to disagreement with some key stakeholders (e.g. NURTW);
- Lack of government commitment to continue to finance the required infrastructures to complement the scheme;
- **Poor Returns on Investment (RoI):** In the case that the returns on investment are not lucrative enough to entice private sector participation, it might lead to insufficient supply and non-refleeting of buses. This is a high risk as this can lead to overall failure of the entire project. In the event of this, the Lagos State Government should provide subsidy to make the project more attractive.

18.3 Safety and Security Risks

This has to do with security operations, emergency preparedness and planning. The risks that fall into this category include:

- Inadequate Safety & Security kits: Inadequate safety and security kits such as Fire Extinguisher, First Aid Box to respond to emergencies such as fire, motor accident, etc; is a risk that can lead to both infrastructural and human loss. It is important that the government should provide all the required safety and security kits according to global best practices.
- Security breaches: Security threats such as terrorism in any of the bus terminals, depots and buses, due to inadequate security apparatus for effective monitoring and surveillance. Installation of metal and bomber detectors in strategic locations in all the bus terminals, depots & buses is important to mitigate this risk.
- The occurrence of certain unexpected event that are beyond the control of the stakeholders (Force Majeure).

18.4 Legislation and Regulation Risks

These are risks associated with laws and regulations of the state which can materially impair the expected results of the project. They include:

- Political instability or change in government policy: A change in the tenure of the present regime might lead to lack of support from the incoming regime as well as unsustainability of the policies of the former regime. Provision a stringent termination clause to protect and guarantee investors funds in the event of change in policies is therefore important.
- Weak institutional capacity: This will result into inability to effectively plan, manage & regulate the system. Capacity building of weak government institutions and the staffs of Ministry of Transport (MoT) and LAMATA.
- Legal tussle arising from government restricting/banning of Danfo buses from operating within Bus Reform Zones. Lagos State Government should ensure that the Lagos Bus Reform project is backed by passage of bill in the Lagos House of Assembly.

18.5 Traffic Management & Enforcement Risks

- Inadequate capacity to effectively enforce restriction/banning of Danfo buses from operating within bus reform zones.
- Inadequate capacity to effectively prevent on-street parking and on-street trading along bus corridor within bus reform zones.

Table 18.1: Project Risk Register

S/N	Category	Risk Identification	Risk Assessment	Risk Allocation	Risk Mitigation
1	Design & Infrastructures	• Infrastructure facilities versus passenger demand mismatch	High	LASG & LAMATA	• Conduct appropriate feasibility studies using accurate method
		• Bus depot inadequate to stark the required number of buses	High	LASG & LAMATA	• Provide additional land spaces for siting bus depots
		• Bus service not able to cover some existing bus destinations	High	LASG & LAMATA	• Provide alternative bus service to cushion this effect
		• Unstable power supply to guarantee uninterrupted ITS operations (Control Centre, Passenger Information System, etc.)	High	LASG & LAMATA	• Utilize a reliable power sources (e.g. Independent power plant)
		• ITS technology does not perform well as expected in actual deployment	High	LASG & LAMATA	• Additional manufacturers guarantees in the event of equipment malfunction
		• Available Infrastructure facilities not able to keep pace with growing passenger demand in the future	High	LASG & LAMATA	• Develop an effective facility expansion plans
		• Congestion due to poor traffic flow and internal circulation within the bus terminals parking space	High	BOCs	• Develop effective TSM in the terminals with traffic personnel to manage and control traffic flow
		• Limited or no space provision to convey passenger goods and luggage	Low	LASG & LAMATA	• Allow some buses plying some routes to convey passenger goods and luggage
		• Infrastructure cost forecast versus actual construction cost mismatch (cost over-run)	High	LBSL	• Make appropriate provisions for contingencies and additional works
2	Operations & Maintenance	• Revenue forecast versus actual revenue during bus service mismatch	High	LBSL	• Develop conservative business case model
		• Revenue Leakages	High	LBSL	• Develop a full proof ticket validating system and cash reconciliations
		• Passenger demand versus vehicle supply disequilibrium	High	LASG & LAMATA	• Conduct appropriate feasibility studies

		• Delay in bus loading and dispatch due to inefficiency of operations	High	BOCs	• Develop a robust strategy for loading and dispatching of buses
		• No bus service to interconnect and link all bus destinations at terminating points	High	LASG & LAMATA	• To implement the project on a phase by phase basis
		• Poor drivers behaviour (e.g. violation of traffic rules)	Low	BOCs	• Periodic Training& Retraining
		• Inability to relocate all existing motor parks within bus reform zones into their respective bus terminals	High	LASG & LAMATA	• Adopt an effective stakeholders engagement strategy to carry them along
		• Dissatisfied passengers have restricted choice to use other bus service	Medium	BOCs	• Regulators to penalize BOCs who fall short of minimum bus service standards
		• Sabotage of the scheme due to disagreement with some key stakeholders (e.g. NURTW)	High	LASG & LAMATA	• Adopt an effective stakeholders engagement strategy to carry them along
		• Lack of government commitment to continue to finance the required infrastructures to complement the scheme	High	LASG & LAMATA	• Adoption of appropriate PPP models with incentives for private sector participation
		• Poor Returns on Investment (RoI) leading to low private sector participation and non-refleeting of buses	High	LASG & LAMATA	• Government subsidy in the event the scheme does not break-even
3	**Safety & Security**	• Inadequate safety & security kits (e.g. Fire Extinguisher, First Aid Box, etc.) to respond to emergencies such as fire, motor accident, etc.	Medium	MoT& LAMATA	• Provision of all required safety and security kits in line with global best practices
		• Security breaches (e.g. terrorism) in any of the bus terminals, depots and buses, due to inadequate security apparatus for effective monitoring and surveillance	Low	MoT& LAMATA	• Installation of metal and bomber detectors in strategic locations in all the bus terminals, depots & buses
		• The occurrence of certain unexpected event that are beyond the control of the stakeholders (Force Majeure)	Low	LASG, MoT, LAMATA, LBSL & PPL	• Provision in relevant clauses in the event of this occurrence
4	**Legislation & Regulation**	• Political instability or change in government policy	High	LASG & LAMATA	• Provision a stringent termination clause to protect and guarantee investors funds

		• Weak institutional capacity to effectively plan, manage & regulate the system	Medium	MoT& LAMATA	• Capacity Building of weak government institutions
		• Legal tussle arising from government restricting/banning of Danfo buses from operating within Bus Reform Zones	Low	MoT& LAMATA	• Ensure that the Lagos Bus Reform project is backed by passage of bill in the Lagos House of Assembly
5	Traffic Management & Enforcement	• Inadequate capacity to effectively enforce restriction/banning of Danfo buses from operating within bus reform zones	High	MoT& LAMATA	• Capacity of LASTMA with other additional traffic agencies to enforce the law
		• Inadequate capacity to effectively prevent on-street parking and on-street trading along bus corridor within bus reform zones	Medium	MoT& LAMATA	• Enforce relevant government laws (Lagos traffic law) prohibiting on-street parking & trading

19.0 Project Cost

20.0 Next Steps

20.1 Monitoring & Enforcement Framework

The next steps in the implementation of the Lagos Bus Reforms Project is as follows:

i. Procurement and ordering of buses;

ii. Award of contracts for the delivery of infrastructures – bus shelters, lay-bys, bus terminals, bus depot, etc.

iii. Decision on choice of operating model;

iv. Engagement of Bus Operating Companies (BoC);

v. Stakeholders' Engagement and Public Enlightenment;

vi. etc.