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FINAL ASSESSMENT REPORT

Private Sector Participation in an Integrated Transport System in Lagos, Nigeria – The Mega Terminals (Interstate Bus Terminals) Project

Prepared for:

World Bank

Prepared by:

CPCS

In association with:

Benchmac & Ince

Osot Associates

Solutions for growing economies

CPCS 17447

December 28, 2018

Quality Assurance

Private Sector Participation in an Integrated Transport System in Lagos, Nigeria

CPCS Ref: 17447

Draft Assessment Report

Version	Date	Responsible	Approval
1.0	November 16, 2018	Vidhi Mohan	Philip Asante
2.0	December 28, 2018	Vidhi Mohan	Jean-Francois Arsenault

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December 28, 2018 CPCS Ref: 17447

To:
The World Bank Group
1818 H Street, NW
Washington, DC 20433 USA

Dear Sir/Madam,

Re: Private Sector Participation in an Integrated Transport System in Lagos, Nigeria
Mega Terminals Project - Submission of Assessment Report

We are pleased to submit the final assessment report for the above-referenced Project following comments from the World Bank Group.

We would be pleased to address any remaining comments or questions the World Bank may have following the Bank's Decision Meeting in February 2019.

Yours very truly,

CPCS Transcom Limited

Vidhi Mohan
Project Manager

Acknowledgements

CPCS would like to acknowledge the kind assistance granted to them by the World Bank Group, the Lagos State Government, including its agencies LAMATA, LASWA, and the Nigerian Ports Authority. We also wish to thank all other stakeholders consulted during the project mission. Any errors of fact or interpretation are ours.

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Acronyms/Abbreviations

ALBON	Association of Luxury Bus Owners of Nigeria
BOT	Build Operate Transfer
BPP	Bureau of Public Procurement
BRT	Bus Rapid Transit
CA	Concession Agreement
CMS	Christian Missionary Society
CPCS	CPCS Transcom Limited
DTIDCL	Delhi Transport Infrastructure Development Corporation Limited
FAAN	Federal Airports Authority of Nigeria
EBITDA	Earnings before Interest, Taxes, Depreciation and Amortization
EBIT	Earnings before Interest and Taxes
FGN	Federal Government of Nigeria
FMEnv	Federal Ministry of Environment
FMOT	Federal Ministry of Transport
FMPWH	Federal Ministry of Power, Works and Housing
GIF	Global Investment Facility
GIS	Geographic Information System
Ha/hA	Hectares
HSV	Hourly Service Volume
IA	Implementing Agencies
ICD	Inland Container Depot
ICRC	Infrastructure Concession Regulatory Commission
IR	Inception Report
ISBT	Interstate Bus Terminals Project (Mega Terminals Project)
IoT	Internet of Things
KL1	Kirikiri Lighter Terminal Phase I
KL2	Kirikiri Lighter Terminal Phase 2
Km	Kilometer
LAGBUS	LAGBUS Assets Management Company Limited
LAMATA	Lagos Metropolitan Area Transport Authority
LASTMA	Lagos State Traffic Management Authority
LASWA	Lagos State Waterways Authority
LASG	Lagos State Government
LBSL	Lagos Bus Services Ltd
LMA	Lagos Metropolitan Area
LOS	Level of Service
LSPPA	Lagos State Public Procurement Agency
LSPPP	Lagos State Public Private Partnership
LSSC	Lagos State Safety Commission
LSWTP	Lagos State Water Transport Program
MU	Management Unit of Global Investment Facility
N4P	National Policy on Public Private Partnerships
NPA	Nigerian Ports Authority

NRC	Nigerian Railway Corporation
NSC	Nigerian Shippers Council
O&M	Operation and Maintenance
OD	Origin Destination
Pphpd	Persons per hour per direction
PPIAF	Public Private Infrastructure Advisory Facility
PPP	Public Private Partnership
PSP	Private Sector Participation
PT	Public Transport
RfP	Request for Proposals
RoW	Right of Way
Sqm	Square meters
STMP	Strategic Transport Master Plan
TEU	Twenty Foot Equivalent Unit
TPPAF	Truck Parking and Port Access Facility
WP	Working Paper
WB	World Bank

Key Take-Away

The purpose of this report is to identify and evaluate the feasibility of establishing mega terminals (interstate bus terminals) bordering the State of Lagos in order to rationalize public transport in the Lagos Metropolitan Area (LMA) - an important element of LAMATA's overall vision to address road congestion in the LMA. LAMATA's vision is for mega terminals to be developed with PSP. Specifically, LAMATA envisages providing land for the terminals while potential private sector partners would develop and operate the terminals on a Build-Operate-Transfer basis[1]. To make such a PSP structure viable, pairing the mega terminals with commercial developments is essential.

There is a great deal of complexity regarding the optimal PSP structure to develop mega terminals in Nigeria, especially as it relates to regulations and enforcement. Regulations accompanied with strong enforcement will be required to ensure patronage at the terminals (and thus, the terminal operator's ability to collect access charge revenues). In the absence of regulation with enforcement, it would be difficult to engage PSP in any meaningful way (i.e., through significant risk transfer). However, the Federal Government's commitment to enforce regulations regarding the use of the on-site parking facility at the Murtala Muhammed Airport, where there is a 500 Naira access charge, should be considered as a strong precedent.

Five mega terminal locations were identified for this mandate. This report provides an in-depth analysis of the potential traffic that can be expected at each of the proposed terminals which, in turn, informs the ideal configuration of each terminal. This is followed by an assessment of terminal development costs, operating costs and potential access charges.

Based on a conservative estimate of access charges (varying between 1,500 and 6,000 Naira depending on the type of passenger vehicle), each of the five terminals is operationally profitable. Furthermore, all but the Epe terminal have scope for PSP with significant risk transfer, including revenue risk. As such, we recommend that the Epe terminal be excluded until traffic prospects improve while the others can be developed as Design-Build-Operate-Maintain-Transfer (DBOMT) with the private sector financing the development. Though, in some cases, there may be scope for the private sector to also finance land acquisition, we recommend that this remain with Government as envisaged by LAMATA. The next steps are:

1. As an immediate priority, Government should start consulting with private bus operators and their unions, explaining to them the mega bus terminals initiative, and how this will be of benefit to them. This will assist in quelling anticipated resistance and showcase to potential domestic and international investors the seriousness of Government in developing the terminals with PSP.
2. Commence detailed and targeted market sounding once the above is sufficiently underway. The aim of this task is to receive valuable feedback on (1) relative attractiveness of terminals, (2) terminal configuration, (3) access charges and regulations, and (4) commercial potential at each of the terminals
3. Secure public funding for land acquisition (as necessary).
4. For those terminals where there is strong interest, prepare tender documents towards a DBOMT type of PPP with revenue risk transferred to the private sector.

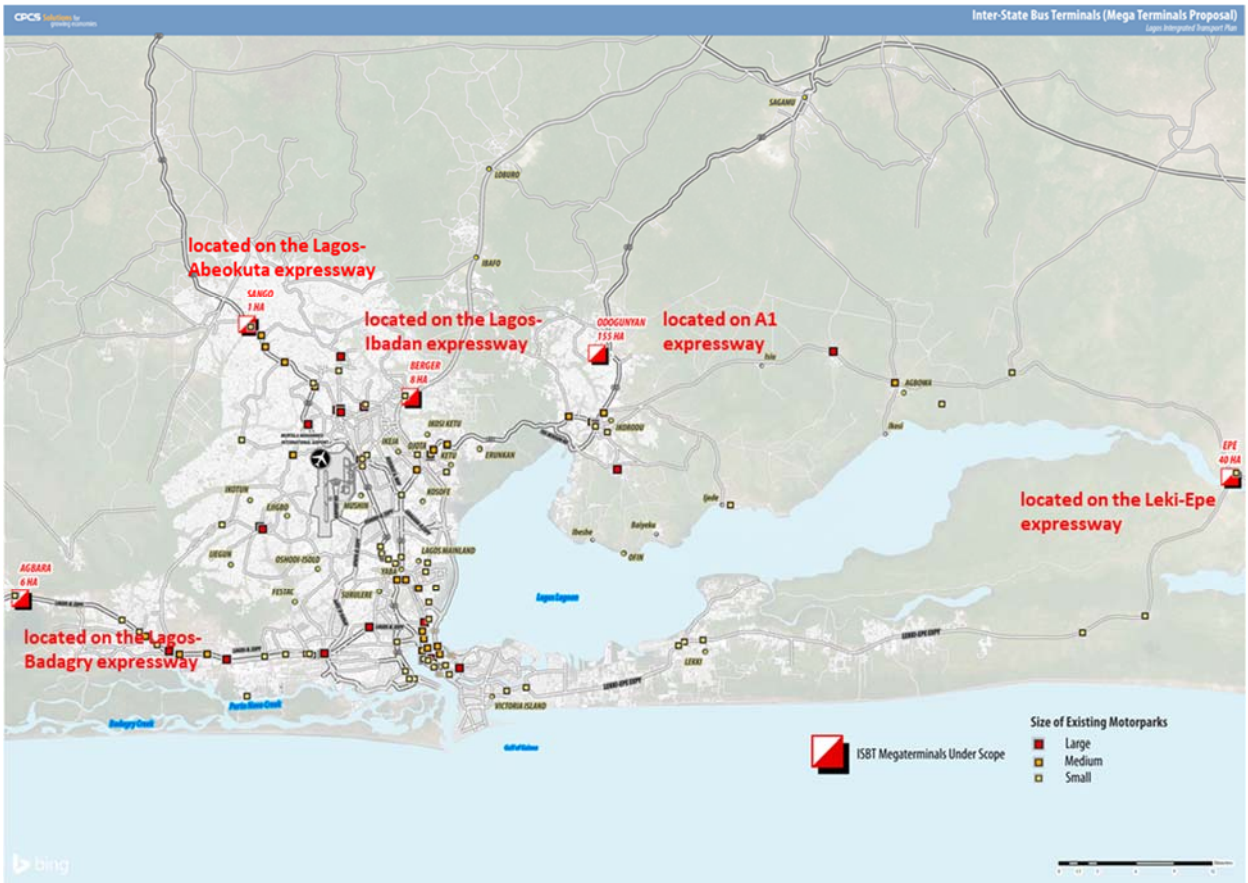
[1] *Concept Note – Establishing Gateway Interstate Mega Bus Terminals*

Executive Summary

This assignment "Private Sector Participation (PSP) in an Integrated Transport System in Lagos" is intended to assist the Lagos State Government (LASG) for three identified transport sector initiatives with potential for private sector participation: the Interstate Bus Terminals Project (Mega Terminals/ISBT Project), the Lagos State Water Transport Program (LSWTP), and the Truck Parking and Port Access Facility (TPPAF) using information and communication technologies. The overall objective of three projects is to reduce road congestion in the Lagos Metropolitan Area (LMA).

The Mega Terminals project is an important element of LAMATA's overall vision to address the road congestion in LMA, driven by the Strategic Transport Master Plan (STMP). With average travel speeds during peak morning and peak evening being less than 19 miles per hour in most parts of LMA, this project assesses initiatives to reduce road congestion through the pursuit of integrated transport projects. The focus of this workstream is to create connectivity hubs (Mega Terminals) at gateway locations where most interstate bus traffic enters LMA. The purpose of the Mega Terminals is to permit the transfer of passenger between interstate buses to Lagos State (or city) buses, and restrict movement of interstate buses within LMA and thus reduce road congestion. LAMATA identified the following 5 potential locations where such terminals may be located:

Figure ES - 1: Potential locations for Mega Terminals



Existing Bus Parks catering to inter-state buses

Inter-state buses coming into and departing from Lagos city use a network of parking sites and garages most of which are privately owned to drop off and pick up passengers. These sites are located all over the city, contributing to traffic congestion and gridlock, as well as being a safety hazard. Some of these buses park illegally on the side of the road, adding to the problem.

There exists no official baseline for inter-state buses. An internal survey conducted by LAMATA identified over 80 interstate operators currently utilizing privately owned bus parks across 20 locations within Lagos. Another survey conducted by a private company Planet Projects (2017) identified over 145 private bus parks clustered across 39 locations, and the number of operators to be over 150. In most cases, there are no definite boundaries or fencing at these bus parks.

There are over 5,600 bus trips per day to and from these parks, with close to 65,000 passengers using these services daily. Furthermore, the number of bus trips varies significantly by area. While Oshodi and Ojota account for over 700 bus trips per day, others like Ishaga, PPL and Alaba account for less than 10 trip a day. Similarly daily passenger numbers also show great variation with Oshodi, Ojota, and Ikorodu having over 5,000 inter-state bus trips and some areas having less than 100 trips.

In terms of origin and destinations of the interstate bus passengers, a sub-component of all passengers, the highest number travel to and from the neighbouring states of Ogun and Oyo, with over 13,000 passengers per day each. These two states account for 45% of the total passenger demand. Other popular destinations are FCT and Edo state, but they only average around 4,000 passengers daily.

Key Issues

- As inter-state bus network is informal and unorganized and in private hands, enforcement and incentives to use Mega Terminals will be key.
- Last mile connectivity to ensure a positive transit experience for passenger will be fundamental;
- The Bus reform agenda envisages a transformative approach to Intra-city bus operations; integration with Mega Terminals will be key; and
- Identification of heavy traffic corridors and estimates of inter-state bus trips are pre-requisites to identify the best locations and terminal capacity for the Mega Terminals.

Stakeholder Concerns

Some of the bus parks/garages are owned/operated by larger owners of bus fleets and used to park their own buses with some of the spare capacity being rented out to smaller bus operators. With the advent of Mega Terminals, the movement of the inter-state buses will be restricted to the outskirts of LMA which may have the following impact on the bus owners and bus park operators:

- All Bus Operators - Bus revenue may decrease as the passenger trip will now terminate earlier (and therefore serve a shorter distance) for the passenger and therefore the fares may also decrease (from the mega-terminal, passengers will be expected to transfer to intra-city buses or other rail/water based transport or private taxis)

- Bus park owners who are also bus fleet owners –will now have land or a facility which they will no longer be able to use for the purpose it was intended for and will now have to find an alternative use for that land. Moreover, as our financial analysis will show, they would need to pay the Mega Terminal operator some form of user fees for parking their buses.
- Bus park owners who rent space to other smaller or solo bus owners - they would now have to forgo the parking fees which they charge for buses to park on their land. They will have to find an alternative use.
- Small bus operators who currently rent space at private bus parks – they will likely have access to better facilities, but will also likely face a small decrease in revenue.
- Passengers – The passengers would now have to transfer to another public or private mode of transport for commuting from the Mega Terminal to (from) their eventual destination (origin) within Lagos, which could lead to higher cost and journey time.

To this extent, we can expect resistance to the project from various quarters including passengers, bus operators and bus park owners. There needs to be a large scale awareness creation and sensitization programme to build consensus among stakeholders.

Traffic Modeling and Forecast

Macroeconomic Factors

The key macroeconomic factor driving the demand for inter-state bus services in Lagos will be growth in GDP (for Nigeria as a country as a whole and the state of Lagos in particular), population and the rate of urbanisation.

Apart from a review of secondary data (LAMATA survey and Planet Projects' data), the team also undertook primary survey.

Primary Survey data

To validate and enhance the existing data, the project team undertook surveys of interstate bus service providers and passengers at various locations. In total, surveys were conducted at 25 locations which have a high concentration of inter-state bus parks in Lagos. Some key observations are summarised below:

- Majority of buses are 14-18 seater capacity, with most running at full capacity. These are combined with many smaller vehicles and some larger luxury buses;
- Many of the bus parks are just open spaces at the side of the road with no or little facilities available for passengers and drivers (sometimes not even public conveniences);
- Bus parking fees is unregulated and varies across parks and type (and capacity of bus); it ranges from Naira 200-1,000 per trip or per day for a 7- 18 seater bus to Naira 2,800 for a bus plying on an international route. Some luxury buses are charged as much as Naira 15,000 per trip at some parks;
- Security at the parks was very lax; and
- Last mile connectivity is poor.

Traffic Modelling Methodology

The combination of the CPCS survey data, which also correlates with the Planet Projects data, indicates that there are approximately 6,200 interstate bus services to and from Lagos every day, carrying approximately 71,000 passengers.

We mapped the existing bus parks to determine what the most common origins/destinations are of the buses using the motor parks. Each of these motor parks were then allocated to one or more of the 5 mega terminal locations, based on their location on the key highways in and out of Lagos. The five gateway corridors connects Lagos to other parts of the country and other West African countries. Based on anecdotal evidence, the Lagos-Ibadan (E1) expressway accounts for the largest share of traffic in and out of Lagos and it followed by the Lagos-Abeokuta (A5) expressway. While there are no recent bus traffic data across these five gateway corridors, a 2016 study of freight traffic in Lagos provides an indication of the distribution of travel demand across the corridors and confirms that the Lagos-Ibadan (E1) expressway is the main gateway corridor in the city.

Given historic demand, macroeconomic factors, future development plans and the location of the individual mega terminals, Table ES-1 outlines our assumed growth rates of passengers for each individual mega terminal in the base case scenario:

Table ES - 1: Interstate Bus Traffic Annual Growth by Mega Terminal

	2018-28	2029-37
Agbara	6%	4%
Sango	7%	5%
Berger	7%	5%
Odogunyan	5%	3%
Epe	6%	4%

Source: CPCS Analysis

With respect to the terminal location at Epe, given the plans for new city development along the Lekki/Epe corridor, as well as new Dangote oil refinery, there will potentially be additional passengers using the Epe mega terminal from 2020 onwards. To reflect these additional passengers, the forecasts for Epe have been increased by 5% in 2020 and 5% in 2021.

Traffic Projections

The traffic projections are provided in Table ES - 2 and a Map is presented in Figure ES - 2.

The traffic forecasts indicate that there is a significant variance in the number of buses to be handled daily between individual parks. In 2018, Epe will handle around 330 inter-state buses per day, Agbara will have to handle nearly 3 times that volume at around 981 buses a day, while Berger, which is expected to be the largest Mega Terminal, will handle over 3,000 interstate buses and over 40,000 passengers per day.

While the figure for number of buses to be handled appears high, it must be noted that the majority of these buses have a capacity of less than 20 passengers. Moreover, as the number of passenger grows, the number of buses is expected to remain within a narrow range as the average vehicle capacity will increase as the composition of the bus fleet is adjusted.

Global Comparisons

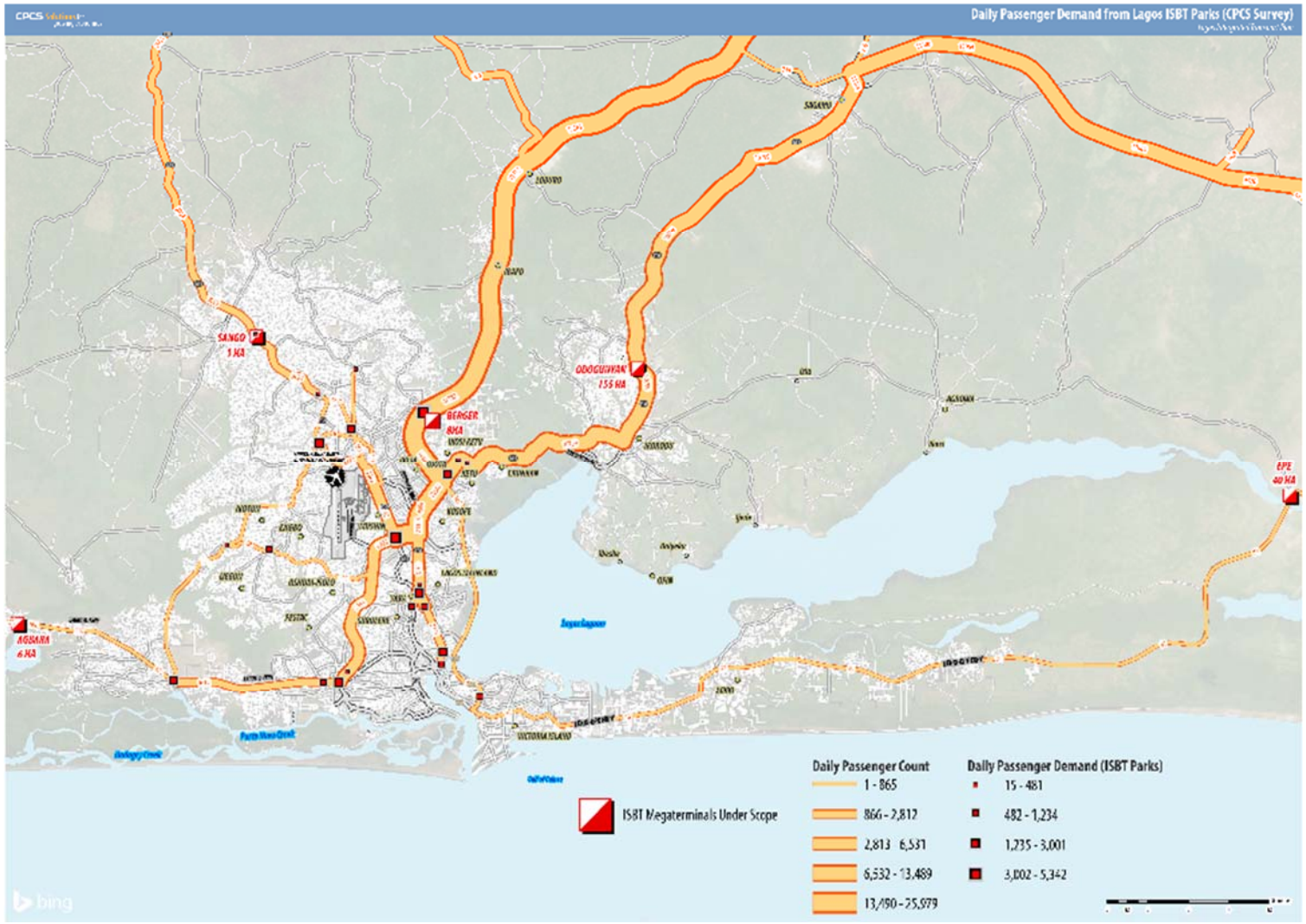
Based on the number of buses handled per day, the proposed terminals are not significantly larger than similar terminals in other developing countries. For example:

- Swami Vivekanand Inter State Bus Terminus (New Delhi, India) handles between 1,800 to 2,000 interstate buses a day, and a similar number of intra-city buses, with an average capacity of over 70 passengers per bus aggregating to 280,000 passengers daily.
- Mien Dong and Mien Tay Bus Terminals (Ho Chi Minh City, Vietnam) currently handle around 750 buses a day, though they are being expanded to each handle around 1,800 buses on a daily basis, with average capacity of over 60 passengers per bus.
- Mo Chit Bus Terminal (Bangkok, Thailand) currently serves 90,000 to 100,000 passengers per day. It is being expanded to handle 150,000 passengers per day.

Table ES - 2: Traffic Forecasts

	2019		2023		2028		2033		2037	
	Vehicle Trips	Passengers	Vehicle Trips	Passengers	Vehicle Trips	Passengers	Vehicle Trips	Passengers	Vehicle Trips	Passengers
Agbara										
Base	767	8,158	822	10,299	928	13,783	866	16,769	589	19,617
High	789	8,389	945	11,841	1,227	18,219	1,259	24,382	923	30,781
Low	745	7,927	712	8,922	697	10,343	590	11,419	371	12,361
Berger										
Base	4,102	43,630	4,564	57,190	5,402	80,212	5,287	102,373	3,733	124,435
High	4,217	44,853	5,241	65,670	7,122	105,761	7,661	148,336	5,833	194,438
Low	3,987	42,407	3,959	49,610	4,065	60,358	3,614	69,971	2,363	78,753
Epe										
Base	368	3,917	395	4,945	446	6,617	416	8,051	283	9,418
High	379	4,028	454	5,685	589	8,747	605	11,706	443	14,779
Low	358	3,806	342	4,284	334	4,966	283	5,483	178	5,935
Odogunyan										
Base	867	9,223	895	11,211	964	14,309	857	16,588	560	18,670
High	892	9,487	1,030	12,907	1,277	18,965	1,250	24,204	883	29,420
Low	842	8,960	774	9,699	721	10,708	581	11,254	351	11,711
Sango										
Base	1,017	10,819	1,132	14,181	1,339	19,890	1,311	25,385	926	30,856
High	1,046	11,122	1,300	16,284	1,766	26,226	1,900	36,783	1,446	48,215
Low	989	10,516	982	12,302	1,008	14,967	896	17,351	586	19,528
Total										
Base	7,121	75,747	7,808	97,826	9,079	134,811	8,737	169,166	6,091	202,996
High	7,323	77,879	8,970	112,387	11,981	177,918	12,675	245,411	9,528	317,633
Low	6,921	73,616	6,769	84,817	6,825	101,342	5,964	115,478	3,849	128,288

Figure ES - 2: Daily Passenger Demand for Mega Terminal Sites



Facility Configuration and Service Design

Determinants of Terminal Capacity and Design

The following factors were considered in determining the size, capacity and infrastructure to be provided at each Mega Terminal site:

- Bus Types and Capacities: Average capacity of Inter-state buses is anticipated to rise from the current 19 passengers to 60 passengers in 2037 as the sector becomes more organized and consolidation of operators occurs. Two bus types (60 and 76 seat capacities) are expected for Lagos state buses, with a gradual transition to more higher-capacity buses over time.
- Flow Patterns of inter-state bus passengers: Based on the survey conducted, flow of inbound passengers peaks between 6am to 11am while that for outbound passengers peaks between 4pm to 9pm.
- Dwell Times: We used ½ hour on average per passenger between arriving and departing the terminal.
- Peak Bus Frequency: Each of the facilities is designed to accommodate the number of buses in the terminal during the time period with the highest number. This occurs between 8am and 9am for Lagos State buses and between 6pm and 7pm for interstate buses.

Based on the above, we projected the maximum hourly bus frequency for each Terminal for Base, High and Medium scenarios.

Terminal Design Criteria and Capacity

We recommend that terminals be designed to accommodate the number of buses in revenue service based on the 2037 base case traffic scenario. The Lagos State buses will be a mix of 76 and 60 seater buses and will require parking space of 100 m^2 and 90 m^2 per bus. The interstate buses will be 60 seater buses and will require parking space of 90 m^2 per bus.

Table ES - 3: Design Capacity and requirements

	Design Capacity (buses)	
Terminal	Lagos State Buses	Interstate Buses
Agbara	14	19
Berger	88	121
Epe	7	9
Odogunyan	13	18
Sango	22	30

Table ES - 4: Requirements for Parking for Buses Not in Revenue Service

Terminal	Cycle Time (hours)	Non-revenue Bus Parking Spots required
Agbara	6	64
Berger	6	404
Epe	10	41
Odogunyan	8	69
Sango	8	115

We provide estimates for land requirements based on the above requirements, assuming additional land requirements of 50% (of parking requirements) for drive lanes and passenger walkways.

Table ES - 5: Land requirement (Operational Use)

Terminal	Site Land Requirements (hA)	Available Land (hA)
Agbara	1.7	6
Berger	10.6	8
Epe	1.0	40
Odogunyan	1.7	155
Sango	2.9	1

While the above land requirements are for operational purposes, based on the attractiveness of the particular sites, land maybe developed on a commercial basis for expanding revenue base. Based on our analysis, land requirements in 2037 (under base case scenario) will exceed land availability. This is best dealt with in future years when required by moving Lagos State bus non-revenue parking (or stabling) off-site.

Core Infrastructure Facilities

Key principles on which we have based our site design include:

- Segregation of passenger and vehicle traffic by physical barriers where possible and with painted crossing marks otherwise;
- Separate parking areas as well as entrances and exits for Lagos State and Interstate buses;
- One way bus flow (except in exceptional cases) with saw tooth parking;
- Terminal buildings at the centre of the parking areas for Lagos State and Interstate buses;
- Site perimeter secured by chain link fence; and separation of non-revenue from revenue areas by chain link fence;
- Controlled access into the terminal at all entry/exit points; and

- Disabled friendly.

Services and Revenue Sources

- Parking spots for Lagos State buses and interstate buses to collect and discharge passengers (Gate-to-gate time of 45 minutes for collecting and 15 minutes for discharging) for an access fees
- Parking for Lagos State buses when not in revenue service (sufficient number of spaces for all Lagos State buses serving the terminal) for a lease fee.
- Stabling, cleaning and light maintenance facilities for Lagos State buses when not in revenue service for lease fees.
- Terminal Building with space at a lease rental for:
    - ticket sales (by operators or third parties)
    - passenger amenities
    - retail and dining
- Park-and-ride and Kiss-and-ride facilities (some terminals).

Transit Oriented Development

Terminals are largely designed as connection hubs for interstate travellers to connect between interstate and Lagos State buses. Larger terminals will include park-and-ride facilities. All ISBT will permit entry by pedestrians. We analyze the possibility of developing ISBT into transportation hubs by using the sites for stations for LRT lines and BRT.

Commercial Development

Based on permissible land use and building regulations, the following are the potential avenues for commercial development that could accompany the proposed terminals in order to take advantage of increased traffic:

- Concession stands;
- Leasing of retail/commercial space; and
- Advertising.

Conceptual Design of Interstate Bus Terminals

Based on the above, we present conceptual layouts for the terminals. The summary of the major design components is presented in Table ES - 6.

Table ES - 6: Terminal Design Components

	Berger	Sango	Agbara	Epe	Odogunyan
Passengers per Day (2037 base case)	124,435	30,856	19,617	9,418	18,670

	Berger	Sango	Agbara	Epe	Odogunyan
Total Parking Areas (spaces)	613	166	96	57	100
Terminal Area Requirements (hA)	10.58	2.87	1.67	0.98	1.74
Paved Area (SM)	75,560	20,506	11,912	6,992	12,407
Landscaped Area (SM)	26,220	6,666	3,229	1,261	3,427
Terminal Builiding (SM)	1,800	500	500	500	500
Maintenance Depot (SM)	2,000	900	900	900	900
Guard Houses (No.)	6	4	4	4	4
Vehicle Access Points (No.)	6	4	4	4	4
Passenger Access Points (No.)	2	1	1	1	1
Fencing (LM)	1,500	407	236	139	246

Economic and Financial Analysis

Economic Analysis

One of the main justifications for this project is to reduce the traffic congestion caused by having numerous bus parks in the centre of the LMA, which are served by cars, Danfos and city buses. Moving these bus parks out of the centre of Lagos will significantly improve travel times for other road users. The primary benefit of this project is therefore the journey time savings accruing to road users. The result of our economic analysis is presented in Table ES - 7.

Table ES - 7: Economic Valuation

Mega Terminal	ENPV (USD 000)	EIRR
Agbara	-5,915	-1.9%
Berger	48,636	24.9%
Epe	1,549	15.9%
Odogunyan	25,976	52.7%
Sango	-11,044	-8.1%
All Terminals	16,641	14.8%

Tariffs

We modelled the planned land acquisition, construction and operations by terminal using the costs estimates determined during the study. The main activity of the terminal is to act as a gateway for interstate buses to Lagos where passengers will link to and from the state buses

network covering the city. Buses will be required to pay fees to the terminal operator for access to the terminal and facilities.

The base tariffs in Naira used for vehicle access to the terminal are presented in Table ES - 8. **These tariffs would be charged to each vehicle entering the terminals**.

Table ES - 8: Vehicle Terminal Charges per Entry (US$)

Vehicle Type	Terminal Access Charge (2.0% of Passenger Trip Costs) – Base Case	Terminal Access Charge (1.0% of Passenger Trip Costs) – Sensitivity Case
Interstate Minibus	1,500	750
Interstate Luxury Bus	6,000	3,000
Marco Polo High Capacity Bus	4,363	2,181
Marco Polo High Capacity Bus	3,444	1,722

It must be stressed that regulation and strict enforcement will be required in order to ensure patronage (and related access revenues) at each of the terminals. Without this, the economics of the project would suffer, making it very difficult to attract private sector participation in the project. Thus, our financial analysis assumes that regulations and enforcement will be put in place so that passenger vehicles are directed to the terminals. Noting the difficulty in regulating the flow of cars that carry passengers into the proposed terminals, we have not included terminal access charges from cars in our analysis[2].

Other revenue streams that were modelled include:

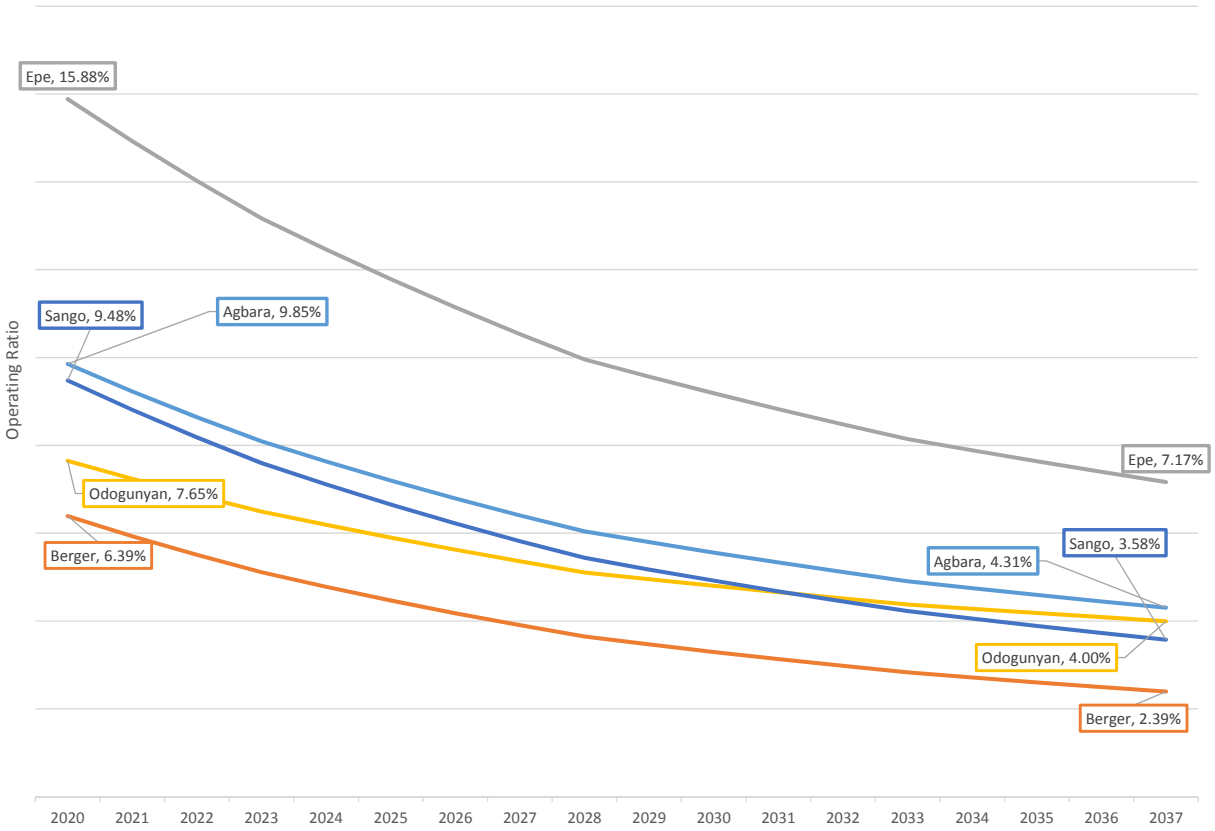
1. Lease of areas for transit ticket sales;
2. Lease of facilities for stabling, cleaning and maintaining Lagos State buses and;
3. Revenues from overnight parking.

Operating Ratio

To inform the level of financial participation from both the public and the private sectors to make the mega terminals project viable, an important first step is to analyze the **operating ratio** of each terminal. The operating ratio is defined as a company's operating expenses as a percentage of revenue. It determines how much of terminal revenues cover operating costs (staff, cleaning and security, terminal maintenance, etc.). The lower the operating ratio (usually expressed as a percentage), the better the financial performance.

[2] In our view, though cars that carry passengers should technically be subject to the same regulations as minibuses, luxury buses, etc. Practically, our view is that it would be difficult to law enforcement to different car operators carrying passengers from personal vehicle usage. Additionally, we expect the mega terminals to bring some degree of scale in bus operations and assume that over time, smaller capacity vehicles will be replaced with higher capacity vehicles. This is reflected in our traffic forecasts.

Figure ES - 3: Operating Ratio Summary Per Mega Terminal



Unlevered Financial Analysis

With the understanding that operations can be sustained by terminal revenues, the unlevered financial analysis seeks to understand the level of upfront financial participation between the public and private sectors for each of the proposed bus terminals.

Table ES - 9: Unlevered Valuation Summary per Terminal

Terminal	Net Present Value with (USD 000)	Net Present Value with (Naira 000)
Agbara	2,846	1,024,560
Berger	14,750	5,310,000
Epe	-777	-279,720
Odogunyan	4,607	1,658,520
Sango	4,755	1,711,800

Source: CPCS Analysis

Except for the proposed mega terminal at Epe, all other terminals generate sufficient terminal access and leasing revenues to cover capital (including land acquisition) and operating costs.

Introduction of PSP

Based on the results of the unlevered analysis, we recommend that the private sector be engaged in a **Design-Build-Operate-Maintain-Transfer (DBOMT) PPP scheme** towards developing **4 of the proposed mega terminals – Agbara, Berger, Odogunyan and Sango.** Furthermore, based on the results in the preceding section, we are also of the view that the private sector can take up revenue risk.

On the issue of land acquisition, we are of the view that for all 4 mega terminals, land should be financed and provided by Government. Not only would this confirm the seriousness of Government's desire to develop these proposed mega terminals, but would also alleviate pressures on the local capital markets' ability to privately finance a fairly significant Naira-based acquisition (estimated at over N9.3 billion).

Next Steps

Following on from our recommendation that the LASG take forward the development of the terminals on a PSP basis (accept for the proposed terminal at EPE which should be developed at this stage given the economics of the project), the following are next steps that need to be pursued.

1. As an immediate priority, Government should start consulting with private bus operators and their unions, explaining to them the mega bus terminals initiative, and how this will be of benefit to them.

2. The initiative should be well publicized, through newspaper, radio and television advertisements. The main purpose of this will be to convey to the domestic and international investor community the seriousness of Government in developing the terminals with PSP.

3. Commence detailed and targeted market sounding once (1) and (2) are sufficiently underway to confirm interest in a DBOMT model. Targeted market sounding should be formalized and structured towards gaining valuable and focused feedback from the private sector. Government should be prepared to present information in the following areas during the event:

    a. General guidelines of the access charge regime;
    b. The strong desire to marry terminal development with commercial development;
    c. Government will provide the land (as necessary).

    At the market sounding event(s), Government should seek information in the following areas:

    a. Ranking of terminals in terms of commercial attractiveness;
    b. Anticipated terminal configurations;

c. How the private sector would exploit the anticipated commercial potential at each terminal; and
d. Any other viability or bankability issues.

4. Secure public funding for land acquisition (as necessary).

5. For those terminals where there is strong interest, prepare tender documents towards a DBOMT type of PPP with revenue risk transferred to the private sector.

1 Introduction

Key Messages

With average travel speeds during peak morning and peak evening being less than 19 miles per hour in most parts of LMA, this project assesses initiatives to reduce road congestion through the pursuit of integrated transport projects. The focus of this workstream is to create connectivity hubs (Mega Terminals) at gateway locations where most interstate bus traffic enters LMA. The purpose of the Mega Terminals is to permit the transfer of passenger between interstate buses to Lagos State (or city) buses, and restrict movement of interstate buses within LMA.

The tasks and major activities followed for the execution of the assignment and preparation of the Draft Assessment Report are enumerated in this chapter.

This includes field missions, conduct of primary surveys, review of secondary data, extensive stakeholder consultations and field reconnaissance, and finally market sounding to provide feedback on project structure.

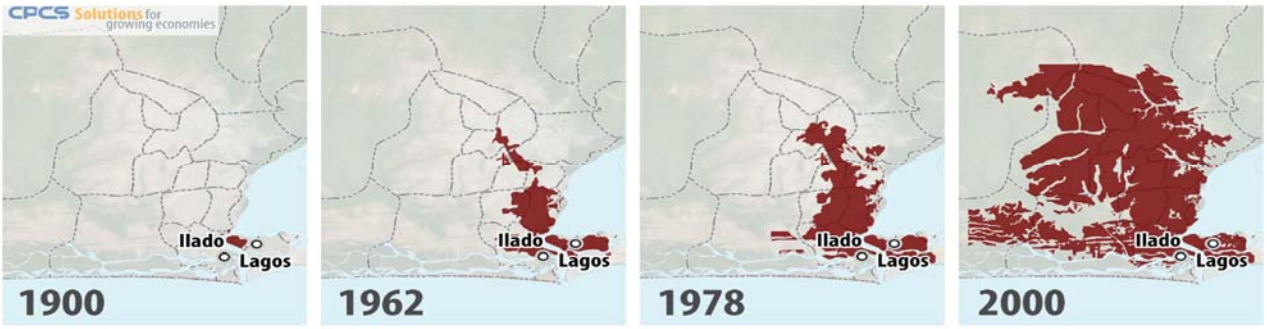
As part of the assignment, we adopted an approach of submitting Working Papers (WPs) on key tasks of the assignment with objective to continuously seek feedback on our analysis and outputs, address comments and receive suggestions which have been fed into this Assessment Report.

1.1 The Project Context

1.1.1 Background

Over the years, Lagos, the commercial capital of Nigeria, has witnessed a rapid increase in population amid tremendous urbanization and expansion. The transport system has not grown adequately to meet this demand. The city is congested with transport services dominated by informal service providers and privately owned cars. Over a century of growth in Lagos State has resulted in an urban sprawl along the main north to south transport corridor, and more recently along the western corridor.

Figure 1-1: Time Series of Urban Growth in Lagos (1900 - 2000)



Source: Ministry of Physical Planning/Environment (1900, 1963) LAMATA (2000). Data from the Global Human Footprint Dataset's Human Influence Index – HII (2005).

This sprawl has resulted in growing traffic congestion in Lagos with peak morning and peak evening speeds at 0 – 19 miles in most sections[3]. The congestion along the primary north to south transport corridor is so acute that, on the Lagos to Jibiya (the border town in Northern Nigeria) trade route, the short segment from the Apapa or Tin Can Island Port to a warehouses outside the port footprint in Lagos (2% of the total distance) costs shippers $434, representing 22% of the total land transport price[4]. Extra costs[5] related to transport from the Ports to Lagos warehouses represent 94% of the total cost, driven mostly by congestion and poor road conditions.

1.1.2 Mega Terminals Project

The Mega Terminals project is an important element of LAMATA's overall vision to address the road congestion in Lagos Metropolitan Area (LMA), driven by the Strategic Transport Master Plan (STMP). The objective is to create connectivity hubs (Mega Terminals) at gateway locations where most interstate bus traffic enters LMA. The inter-state buses would terminate (for incoming traffic)/originate (for outgoing traffic) at the Mega Terminals and passengers would transfer to/from Lagos State buses, other public transport modes or private vehicles as the case may be.

Currently inter-state buses coming into and departing from Lagos city use a network of parking sites and garages, most of which are privately owned, to drop off and pick up passengers. These sites are located all over the city, contributing to traffic congestion and gridlock, as well as being a safety hazard. Some of these buses park illegally on the side of the road, adding to the problem. As per LAMATA's internal estimate, there are over 80 interstate operators within Lagos, with buses coming in from most other states of Nigeria including the federal capital Abuja.

Figure 1-2: Oshodi Bus Park

The purpose of the Mega Terminals is to permit the transfer of passengers between interstate buses to Lagos State (or city) buses, and restrict movement of interstate buses within LMA and thus congestion. Lagos State buses will be high capacity, regularly scheduled buses, operated under licence and regulated by LAMATA. We expect that interstate buses will continue to be less organized with services provided on an informal basis with a mix of vehicles providing services (at least in the early years). Terminals will require capacity to permit the parking of both city buses and interstate buses for short periods to enable passengers to embark/disembark. In

[3] Frederic Oladeinde. Presentation on the Lagos Strategic Transport Master Plan. Lagos Metropolitan Area Transport Authority (LAMATA). 2017

[4] As per the Nigeria Expanded Trade and Transport Program (NEXTT) Lagos-Kano-Jibiya (Lakaji) Corridor Performance: Baseline Assessment Report On The Time And Cost To Transport Goods, 2015

[5] Ibid. Extra costs include all informal charges and all indirect financial costs of delay, and any other observed costs deemed unnecessary, unjustified, or too expensive, in comparison to international benchmarks; quantified over and above transport costs

addition, terminals will be used for stabling Lagos State buses overnight and for undertaking light maintenance and cleaning of the buses.

1.2 Authority of the Assignment

As part of the Lagos State Government (LASG) commitment to the continued improvement of transport connectivity in the Lagos metropolitan area, it has identified three transport sector initiatives with potential for private sector participation (PSP): the Interstate Bus Terminals Project (Mega Terminals Project), the Lagos State Water Transport Program (LSWTP), and the Truck Parking and Port Access Facility (TPPAF) using information and communication technologies. The TPPAF is being implemented by the Nigerian Ports Authority, an agency of the Federal Government, but in close collaboration with Lagos State.

The World Bank, alongside the Management Unit of GIF (MU) and PPIAF (the three are collectively termed as the 'Client'), have engaged with the Lagos Metropolitan Area Transport Authority (LAMATA), the Lagos State Waterways Authority (LASWA), and the Nigerian Ports Authority (NPA) to assess the options available for attracting private sector investment and participation into the three transport initiatives.

The objectives of the assignment are to:

- → identify the legal, regulatory and institutional opportunities and bottlenecks and formulate recommendations to solve these within the framework of each of the three projects;
- → assess feasibility of the three projects; and
- → build consensus regarding the options presented and identify necessary next steps.

This Draft Assessment Report has been prepared under the authority of the contract signed between the World Bank Group (WB) and CPCS Transcom Limited (CPCS) on December 21, 2017, for the Project, "Private Sector Participation in an Integrated Transport System in Lagos" (Selection No. 1248779).

1.3 Scope of this Report

This Report consolidates all of our analysis, findings and recommendations, addressing the entire scope and the work undertaken for the Mega Terminals project. The major tasks as defined in the Terms of Reference (ToR) include:

Workstream A: Cross-cutting institutional, legal and regulatory framework diagnostic

- Task A1: Review of cross-cutting institutional, legal and regulatory framework (PPIAF).

Workstream B: Lagos Gateway Bus Terminals

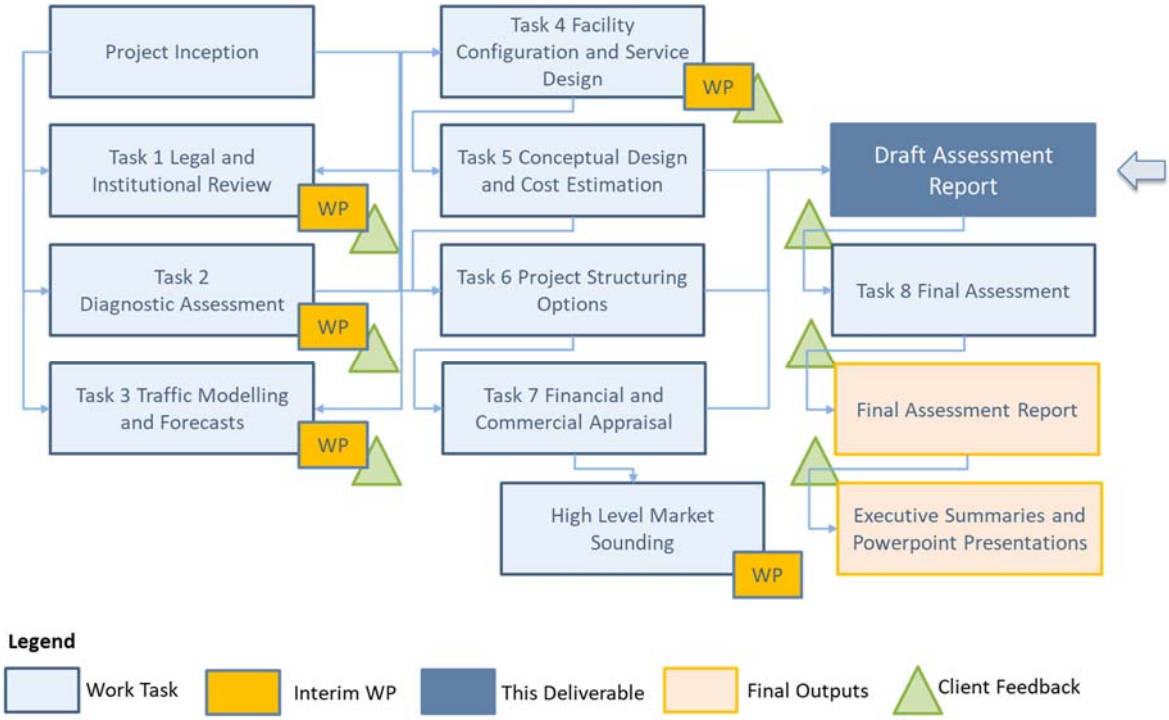
- Task B1: Review existing long-distance bus stations/intermodal facilities [PPIAF]. Review LAMATA data/reports to identify existing key facilities where long-distance (inter-urban) services currently interact with city services.
- Task B2: Assessment/estimation of existing and future passenger demand for intermodal facilities (GIF). Review of any existing passenger demand data on long-distance bus travel held by LAMATA (including historical/time-series data).
- Task B3. Produce conceptual engineering designs considering the traffic flow around and into the bus terminal for the alternative project options and associated capital cost estimates. The total capital expenditure (CAPEX) must be broken down into major cost items with supporting details on quantities of materials and technical specifications.
- Task B4: Capital Investment Plan (GIF) – based on Tasks 1 - 3, Consultant will assess the likely capital investment required to develop the mega terminals. This will essentially be an outline specification and costing of the different terminals.
- Task B5: High-Level Project Structuring Options Appraisal (GIF) – based on Task 1-3, the Consultant will assess potential project structuring options to deliver the proposed facilities.
- Task B6: Financial and commercial analysis of Preferred Structuring Option (GIF) – financial modeling of preferred option to assess likely private sector investment in project.

1.4 Task Organization

1.4.1 Task Organization

Figure 1-3 enumerates the task organization followed for the execution for the assignment.

Figure 1-3: Task Organization



1.5 Major activities

1.5.1 Inception Mission

We undertook a joint field mission with the World Bank team to Lagos, Nigeria, over the course of five days from January 15 - 19, 2018, followed by meetings in Abuja, Nigeria, on January 22 and 23, 2018.

During the mission, we undertook:

- Discussions with the key Implementing Agencies (IAs) viz. LAMATA, LASWA and NPA;
- Site visits[6] to potential project sites for the Mega Terminals[7]; and
- Consultations with other stakeholder including:

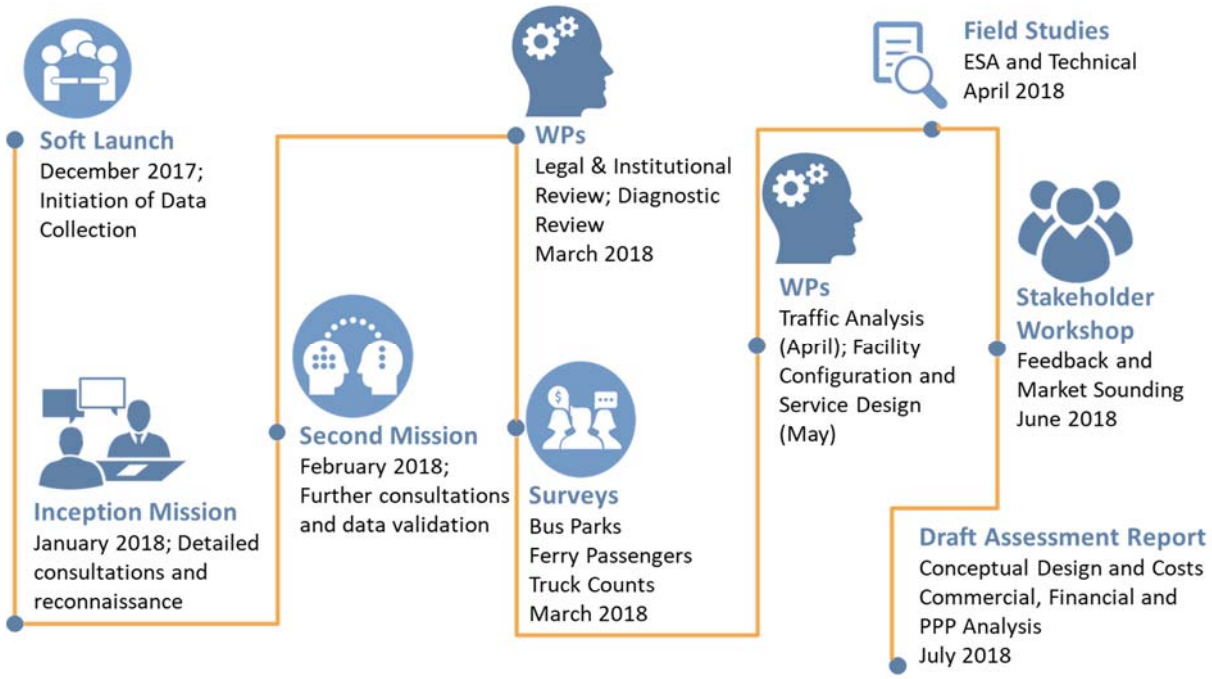
[6] During the Inception Mission, the team visited three of the total five potential sites. The three sites visited include Ojodu Berger, Lagos – Ibadan Expressway; Sango, Lagos - Abeokuta Expressway; and Agbara, Lagos – Badagry Expressway. The remaining sites were surveyed during the field visits held on April 17-18, 2018.

[7] In July 2018, the Lagos Ministry of Transport provided us with a list of 8 additional sites for potential mega terminals. Given that these were received towards the very end of this assignment, they have not been considered as part of the analysis.

- Lagos Global[8];
- Planet Projects[9]
- Association of Maritime Truck Owners (AMTO);
- Association of Corporate Fleet Owners (ACFO);
- Tarzan Marine Enterprise Ltd.;
- Seacoach Ferry Service; and
- Key ministries at the Federal level.

The findings of the Inception Mission were documented in our Inception Report submitted on February 3, 2018. A revised Inception Report, after addressing comments received from the World Bank team, was submitted on February 23, 2018.

Figure 1-4: Timeline for major activities



1.5.2 Stakeholder consultation and second field mission

A consultative process was the cornerstone for the execution of the assignment. We conducted a second field mission during the during the week of February 12-16, 2018, with the purpose of

[8] Office of Overseas Affairs and Investment, known as Lagos Global, Lagos Global is a creation of the present administration to make Lagos an investment destination of choice, by creating a favourable environment for local and Foreign Direct Investment (FDI) to thrive.

[9] Planet Project is one of the prominent Nigerian companies operating in construction, operation and consulting for transportation infrastructure in the country. The intra-city Ikeja Bus Terminal facility was constructed by Planet Project under World Bank financing. The CPCS team consulted with Planet Projects to gauge their interest as a potential private sector partner and also to seek their views on the sector as a whole. They shared data with the CPCS team as a matter of courtesy, and have been given due credit in the report.

holding further consultations with stakeholders, addressing information gaps and collecting further data.

A complete list of stakeholders consulted as part of this study is presented in Appendix A.

1.5.3 Document/ data review

The three agencies and other stakeholders have been generous with sharing of information and past studies/data, which has aided our analysis. Key among these with respect to the Mega Terminals project reviewed by the team were:

- Consultancy Services for the Extension of the Strategic Transport Master Plan (STMP) and Strategic Travel Demand Model (STDM) to Cover the Mega City Region, ALG and euro praxis, December 2014;
- Development of Bus Route Network for Lagos State - Final Report, integrated transport planning, Ibis Transport Consultants & AEC, April, 2015;
- Value of Time and Transport Elasticity Study for the Mega City Region - Final Report, Leigh Fischer, May 2015;
- An in-house survey conducted by LAMATA which identified over 20 major locations with over 80 operators across Lagos with high concentration of inter-state bus operators; and
- Survey conducted by Planet Projects – a survey of inter-state buses as part of a previous Mega Terminals study undertaken in December 2017[10]. The data identified 145 bus or motor parks across Lagos which are being used by inter-state operators. These bus parks were classified into 39 areas of the city.

A comprehensive list of secondary data/documents reviewed for this project is presented in Appendix B.

1.5.4 Survey

Although there was overall data to provide context to the problem of traffic congestion in the Lagos Metropolitan Area (LMA), there was no official baseline specifically of inter-state buses including, their numbers, routes and capacity of such buses. As part of this project, we undertook a survey of inter-state bus services/operators at around 40 locations[11] in Lagos. These locations are currently being used as bus parks for inter-state services. The objective of the survey was be to obtain the following information required for the traffic modelling as well as designing the terminal layouts:

- Number of inter-state buses and passengers;

[10] The CPCS team consulted with Planet Projects to gauge their interest as a potential private sector partner and also to seek their views on the sector as a whole. They shared data with the CPCS team as a matter of courtesy, and have been given due credit in the report.

[11] Even though the survey was conducted at 40 individual parks, clusters of parks in close proximity to one another with the boundaries often being seamless have been treated as 1 park. Therefore, this data has been grouped under 25 locations.

- Origin- destination of these services;
- Types and capacity of buses; and
- Charges paid at existing bus parks.

The survey which involved observations and questions to the bus operators, was undertaken on weekdays in March 2018.[12] The questionnaire template used for the purpose of the survey is presented in Appendix C.

1.5.5 Submission of Interim Deliverables

Working Papers

As part of the assignment, we adopted an approach of submitting Working Papers (WPs) on key tasks of the assignment with objective to continuously seek feedback on our analysis and outputs, address comments and receive suggestions which have been fed into this Assessment Report. We submitted the following working papers:

Table 1-1: List of WPs submitted

S.No.	Working Paper	Submission date	Date of receipt of Comments	Revision date
1	WP1: Legal and Institutional Review	March 14, 2018	April 5, 2018	April 17, 2018
2	WP2: Diagnostic Review	March 13, 2018	April 5, 2018	April 13, 2018
3	WP3: Traffic Modelling and Forecasts	April 24, 2018	May 23, 2018	June 6, 2018
4	WP4: Facility Configuration and Service Design	May 16, 2018	June 11, 2018	Responses submitted on June 15, 2018

Engagement with Implementing Agencies

A presentation on WPs 1 and 2 was held via videoconferencing on April 5, 2018, with a view to seek feedback from the respective IAs.

Progress Reports

These were submitted every two weeks, after the submission of the Inception Report, for the information of the World Bank team, with an update on the activities conducted and progress of the assignment. The reports also flagged delays and challenges encountered during the execution of the assignment.

1.5.6 Reconnaisance Visits for site verification and ESA review

Our team of Engineers and the Environment and Social Expert conducted site reconnaissance of the proposed sites (5) during the month of April, 2018, with the objective of preparing

[12] After commencement on February 27, 2018, our teams faced resistance at several of the bus parks which they visited, with bus park operators and fleet owners refusing to cooperate with the surveyors in the absence of an introduction letter from National Union of Road Transport Workers (NURTW) addressed to bus park operators and fleet owners. The survey was temporarily suspended. It resumed after intervention from LAMATA and discussions with NURTW, the survey was completed on March 13, 2018.

designs and layout for the propose sites, and flagging any issues with respect to environment and social assessment.

1.5.7 Market Sounding Exercise

We commenced the market sounding exercise in the week of June 4, 2018, soliciting feedback from a variety of stakeholders including:

- industry associations;
- boat operators (present, past and potential),
- terminal operators; and
- banks and FIs.

The feedback received is presented in Section 7-7 of this report.

1.6 Structure of this Report

The remainder of this report is structured as follows:

- Chapter 2: Diagnostic Review – this presents the findings from our as-is review of existing transport facilities as they pertain specifically to inter-state bus services;
- Chapter 3: Traffic Analysis – the chapter presents long term traffic forecasts which have been used to determine the size and specifications of each of the facilities to be built or transport services to be provided;
- Chapter 4: Facility Configuration and Service Design – this presents an implementation blueprint for the Mega Terminals including configurations for the various infrastructure facilities, based on the traffic forecasts and potential for optimization of revenue for the project;
- Chapter 5: Conceptual Design and Layouts – this summarises assumptions for design and layout development for each of the Mega Terminals;
- Chapter 6: Commercial, Financial and PPP Analysis – presents findings from our economic analysis, commercial analysis and financial modelling of various project/PPP structures;
- Chapter 7: Recommendation on Way Forward – summarises our key recommendations and documents immediate next steps.

1.7 Limitations

This report is intended to inform the way forward on the assignments. It is not a detailed feasibility study for the projects, but identifies (at a high level) potential options which may be pursued. If they are approved to be procured using PSP, it is assumed that a consultant would be hired for Transaction Advisory who would validate the feasibility of the projects in detail.

2Diagnostic Review

Key Messages

Existing Bus Parks catering to inter-state buses

Inter-state buses coming into and departing from Lagos city use a network of parking sites and garages most of which are privately owned to drop off and pick up passengers. These sites are located all over the city, contributing to traffic congestion and gridlock, as well as being a safety hazard. Some of these buses park illegally on the side of the road, adding to the problem.

There exists no official baseline for inter-state buses. An internal survey conducted by LAMATA identified over 80 interstate operators currently utilizing privately owned bus parks across 20 locations within Lagos. Another survey conducted by a private company Planet Projects (2017) identified over 145 private bus parks clustered across 39 locations, and the number of operators to be over 150. In most cases, there are no definite boundaries or fencing at these bus parks.

Trip and Passenger Volume

There are over 5,600 bus trips per day to and from these parks, with close to 65,000 passengers using these services daily. The number of bus trips varies significantly by area. While Oshodi and Ojota account for over 700 bus trips per day, others like Ishaga, PPL and Alaba account for less than 10 trips a day. Similarly daily passenger numbers also show great variation with Oshodi, Ojota, and Ikorodu having over 5,000 inter-state bus trips and some areas having less than 100 trips. The data indicate that for most areas there is a strong correlation between the number of bus trips to and from the motor parks and the number of passengers arriving and departing.

In terms of origin and destinations of the interstate bus passengers, the highest number travel to and from the neighbouring states of Ogun and Oyo, with over 13,000 passengers per day each. These two states account for 45% of the total passenger demand. Other popular destinations are FCT and Edo state, but they only average around 4,000 passengers daily.

There seems to be a reasonable correlation between the number of bus trips and revenue generated in individual areas. The area where the motor parks generate the highest revenue is Mile 2, with a daily revenue of over N21 million, as they serve international destinations like Benin and Ghana.

Competitive and Complimentary projects

Rail Transport

Current inter-city rail service operations by NRC are characterized by frequent service disruptions and long delays which are largely a result of poor operational capabilities of the NRC and lack of adequate rolling stock and resources. Notwithstanding its relatively low fares, the current inter-city rail service operated by the NRC does not present a significant threat to the competitiveness of the bus transport.

However two key factors could significantly affect the competitiveness of inter-city rail services in Nigeria. The first being the concession of the Narrow Gauge Lines of the NRC. Secondly, The FGN is proposing to construct a new standard gauge line from Lagos to Kano with a sovereign loan from the Chinese government. The commencement of the gauge line concession programme and completion of the standard gauge line would significantly increase the competitiveness of inter-city rail transport and potentially drive a modal shift from current road transportation as long distance passengers in Nigeria are often price sensitive and would easily switch to cheaper and potentially more reliable mode of transportation.

Key Messages (contd.)

Air Transport

The demand for local air transport is considered low compared to inter-state bus transport in Nigeria based on the significant high fares in comparison to inter-city bus transport. For instance, recent data from the National Bureau of Statistics show that that the average price for domestic flights from Lagos is NGN 40,500.0 compared to NGN 2,535 for an average bus fare for inter-city trip from Lagos. Thus, the domestic air transport sector does not present a competitive threat to inter-city bus transport and by extension the viability of the proposed mega-terminals.

Other STMP projects

The STMP envisions a network of bus, rail and water based rapid transport systems serving strategic activity centers across the state. A review of the proposed locations for the inter-state mega terminals show that the Agbara, Ojodu Berger and Sango locations are within existing public transport network while the Odoguyan and Epe locations are within the planned bus network.

Key Issues

- Inter-state bus network is Informal and unorganized with existing bus parks serving this demand being in private hands, enforcement and incentives to use Mega Terminals will be key.
- Last mile connectivity to ensure a positive transit experience for passenger will be fundamental;
- Bus reform agenda envisages a transformation approach to Intra-city bus operations; integration with Mega Terminals will be key;
- Identification of heavy traffic corridors and estimates of inter-state bus trips are pre-requisites to identify the best locations and terminal capacity for the Mega Terminals

Stakeholder Concerns

Some of the bus parks/garages are owned/operated by larger owners of bus fleets and used to park their own buses with some of the spare capacity being rented out to smaller bus operators. With the advent of Mega Terminals, the movement of the inter-state buses will be restricted to the outskirts of LMA which may have the following impact on the bus owners and bus park operators:

- All Bus Operators - Bus revenue may decrease as the passenger trip will now terminate earlier (and therefore serve a shorter distance) for the passenger and therefore the fares may also decrease (after mega-terminal, the passengers will be expected to transfer to the intra-city buses or other rail/water based transport or private taxis)
- Bus park owners who are also bus fleet owners –will now have land or a facility which they will no longer be able to use for the purpose it was intended for and will now have to find an alternative use for that land. Moreover, they may need to pay the Mega Terminal operator some form of user fees for access for parking of their buses.
- Bus park owners who rent space to other smaller or solo bus owners - they would now have to forgo the parking fees which they charge for buses to park on their land. They will have to find an alternative use.
- Small bus operators who currently rent space at private bus parks – they will likely have access to better facilities but will also likely face a decrease in revenue for reasons stated in point a.
- Passengers – The passengers would now have to transfer to another public or private mode of transport for commuting from the Mega Terminal to (from) their eventual destination (origin) within Lagos, which would apply higher cost and journey time.

To this extent, we can expect resistance to the project from various quarters Including passengers, bus operators and bus park owners. There need to be a large scale awareness creation and sensitization programme to build consensus among stakeholders.

2.1 Overview

This section reviews the existing interstate bus parking facilities, most of which are informally organised by private bus operators. It outlines the existing facilities and the services provided, estimates of number of buses and passengers using these facilities, and the operational and commercial revenue accruing to LAMATA and the operators.

Data for the existing inter-state bus parking facilities was received from the following sources:

- Planet Projects[13]; and
- In-house survey carried out by LAMATA.

2.2 Review of Existing Facilities and Market Structure

Inter-state buses coming into and departing from Lagos city use a network of parking sites and garages most of which are privately owned to drop off and pick up passengers. These sites are located all over the city, contributing to traffic congestion and gridlock, as well as being a safety hazard. Some of these buses park illegally on the side of the road, adding to the problem. There are over 80 interstate operators within Lagos, with buses coming in from most other states of Nigeria including the federal capital Abuja. Prominent amongst the states are Ogun, Oyo, Ondo, and Ekiti.

2.2.1 Bus motor parks and services

As per data received from Planet Projects, there are 39 areas in Lagos from where inter-state buses arrive and depart. Each of these areas has numerous bus motor parks, most of which are owned and served by individual operators. There are also some publicly owned areas which are used as motor parks. A total of 145 bus parks have been identified in these areas, though there could be more parks which have not been identified.

Table 2-1 outlines all the areas and the number of motor parks in each.

Table 2-1: Number of Motor Parks per Area

No.	Area in Lagos City	No. of Motor Parks
1	Oshodi	13
2	Ojota	6
3	Mile 2	8
4	Ketu	1
5	Badagry	1
6	Ikorodu	12
7	Iyana Ipaja	6
8	Jibowu	8
9	7Up	1

[13] Planet Project is one of the prominent Nigerian companies operating in construction, operation and consulting for transportation infrastructure in the country. The intra-city Ikeja Bus Terminal facility was constructed by Planet Project under World Bank financing.
The CPCS team consulted with Planet Projects to gauge their interest as a potential private sector partner and also to seek their views on the sector as a whole. They shared data with the CPCS team as a matter of courtesy, and have been given due credit in the report.

No.	Area in Lagos City	No. of Motor Parks
10	Ajah	12
11	Ebute Ero	1
12	Yaba	3
13	Ajegunle	7
14	Cele/Okota Road	13
15	Berger	1
16	Ijora	3
17	Oyingbo	4
18	Ikotun	8
19	Coker	1
20	Ojuelegba	6
21	Maza-Maza	3
22	Palmgrove	1
23	Volks	3
24	Epe	1
25	Agege	1
26	Pen Cinema	1
27	Iyana Iba	1
28	Abule Egba	1
29	Obalende	1
30	Amuwo Kuje	3
31	Adeniji Adele	1
32	Idumota	1
33	Iyana Ejigbo	4
34	Iyana School	4
35	Mowo	1
36	Ishaga	1
37	Oluwole	1
38	PPL	1
39	Alaba	1
	TOTAL	**145**

Source: Planet Projects

The number of motor parks[14] vary by area, with some areas including Oshodi, Ikorodu, Ajah, and Cele/Okoto Road having 13-14 motor parks each. A majority of areas though have only 1-3 motor parks. Several of the motor parks which are currently operated by private sector have no defined boundaries and in most cases multiple entry/exits, with buses often spilling over to the roads. They usually exist in clusters and the areas referred to have a high concentration of motor parks.

Figure 2-1 Oshodi Bus Park

It is uncertain whether this is the definitive list of all motor parks, but we believe that this list is adequate enough for us to scope out the mega terminals.

The LAMATA survey data identified over 20 major locations with over 80 operators across Lagos with high concentration of interstate operators. Details of the types of vehicles[15] each location and the number of operators at is given in Table 2-2.

Table 2-2: Details of Vehicles at Locations and Operators

No.	Location	Minibuses	Cars	Luxury Buses	No. of Operators
1	Abule Egba	40	10	0	1
2	Agege	50	15	0	1
3	Fadeyi/Jibowu	345	97	37	21
4	Iju Ishaga	30	10	0	1
5	Ikotun	65	10	0	3
6	Iyana Iba	60	0	31	4
7	Iyana Ipaja	242	0	0	6
8	Ketu	340	110	0	1
9	Mazamaza	242	0	0	3
10	Mile 12	9	5	14	2
11	Mile 2	80	0	0	2

[14] The terms bus park/motor park/garage are used interchangeably and refer to any piece of land or area used to park buses (inter and/or intra city buses) before/after completion of the trip. This has been clarified as a footnote. This is different from a Bus stop which refers to an earmarked station where passenger board/de-board the bus.

[15] The capacity of the vehicles deployed in and around Lagos ranges from 7 to 60 seater's buses (with variations of 15, 25, 30, 42 and 56 seats). In this case, mini-bus refers to a bus with a capacity of 15 seats and a luxury bus having 60 seats.

No.	Location	Minibuses	Cars	Luxury Buses	No. of Operators
12	Ojota New Garage	377	11	0	3
13	Ojota	668	136	0	6
14	Ojuelegba	105	8	0	8
15	Oshodi	396	46	72	6
16	Oyingbo	70	5	47	6
17	Toll gate	60	0	0	2
18	Yaba	1,552	1	24	4
19	Ajah				
20	Ikorodu				
21	Berger	250	0	0	1
	TOTAL	**4,986**	**464**	**215**	**81**

Source: LAMATA

Some of the bus parks/garages are owned/operated by larger owners of bus fleets and used to park their own buses with some of the spare capacity being rented out to smaller bus operators. With the advent of Mega Terminals, the movement of the inter-state buses will be restricted to the outskirts of LMA which may have the following impact on the bus owners and bus park operators:

a. **All Bus Operators -** Bus revenue may decrease as the passenger trip will now terminate earlier (and therefore serve a shorter distance) and therefore the fares charged may also decrease (from the mega-terminal, the passengers will be expected to transfer to the intra-city buses or other rail/water based transport or private taxis where the relevant connections exist)
b. **Bus park owners who are also bus fleet owners** –will now have land or a facility which they will no longer be able to use for the purpose it was intended for and will now have to find an alternative use for that land Moreover, they may need to pay the Mega Terminal operator some form of user fees for access for parking of their buses.
c. **Bus park owners who rent space to other smaller or solo bus owners** - they would now have to forgo the parking fees which they charge for buses to park on their land. They will have to find an alternative use.
d. **Small bus operators who currently rent space at private bus parks** – they will likely have access to better facilities but will also likely face a decrease in revenue for reasons stated in point a.
e. **Passengers** – The passengers would now have to transfer to another public or private mode of transport for commuting from the Mega Terminal to (from) their eventual destination (origin) within Lagos, which would apply higher cost and journey time.

To this extent, we can expect resistance to the project from various quarters Including passengers, bus operators and bus park owners.

2.3 Market Structure

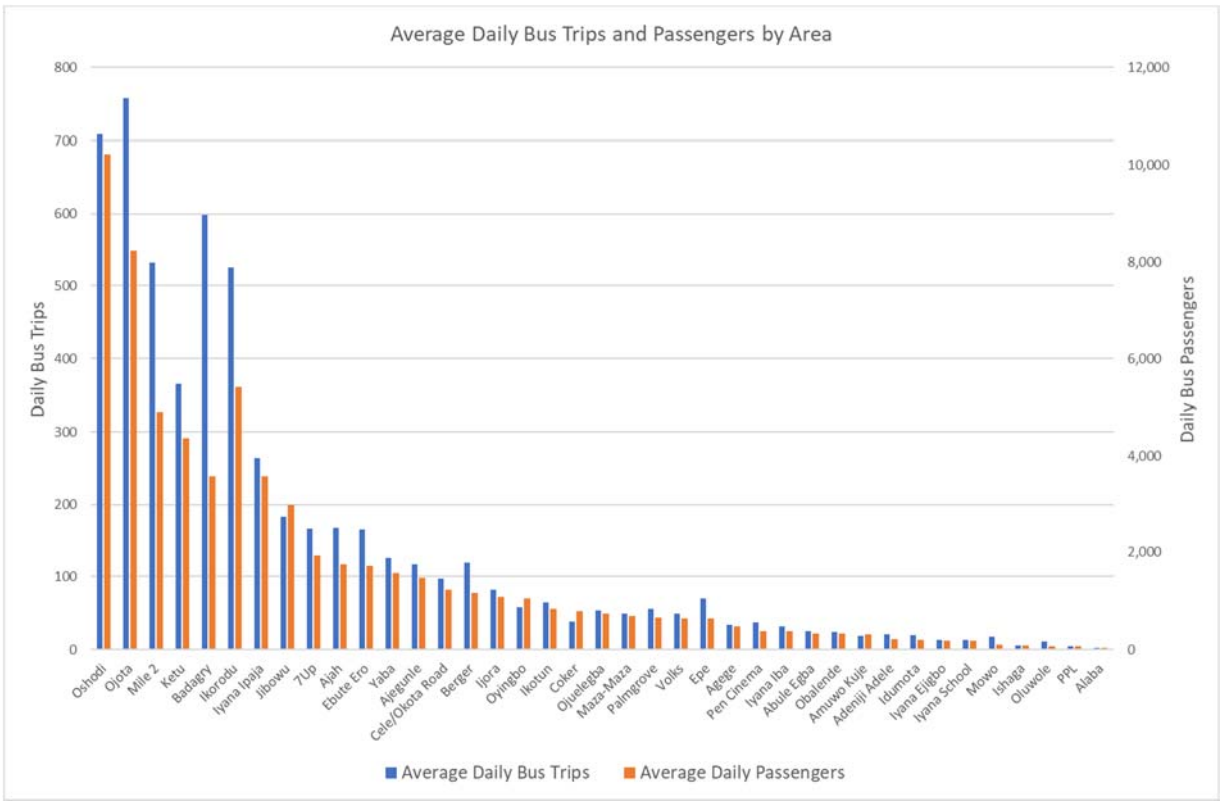
2.3.1 Number of Operators

While an exhaustive estimate of the exact number of interstate bus operators in Lagos is not available, the current number of operators is estimated to be around 80, as per the survey conducted by LAMATA. The data shared by Planet Projects however estimates that there are around 150 such operators. What seems apparent is that there appears to be a diverse market with a few large operators with large fleets of buses and several small operators having anywhere between 1-50 buses.

2.3.2 Trip and Passenger Volumes for Inter-state Bus Operations

The data from Planet Projects also outlined the 'Average Daily Trip Volumes' and the 'Average Daily Passenger Volume' per Motor Park. It has been assumed that these refer to the number of bus trips and passengers arriving/departing respectively. This data for each of the areas has been consolidated and presented in Figure 2-2.

Figure 2-2: Average Daily Bus Trips and Passenger Volumes per Area



Source: Planet Projects

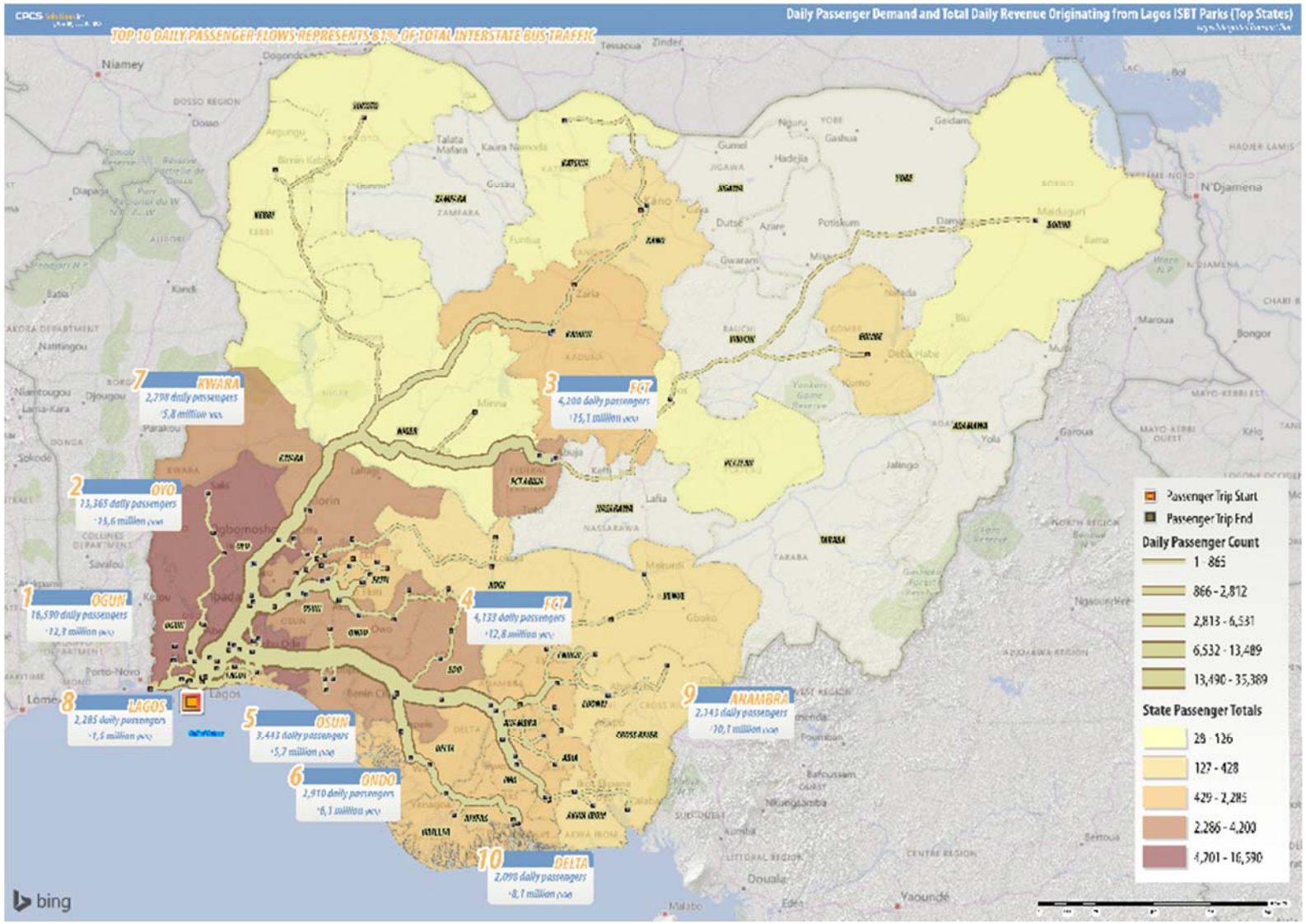
The number of bus trips varies significantly by area. While Oshodi and Ojota account for over 700 bus trips per day, others like Ishaga, PPL and Alaba account for less than 10 trip a day. Similarly daily passenger numbers also show great variation with Oshodi, Ojota, and Ikorodu having over 5,000 inter-state bus trips and some areas having less than 100 trips.

The data indicate that for most areas there is a strong correlation between the number of bus trips to and from the motor parks and the number of passengers arriving and departing. Those areas that have a high number of bus trips also see high numbers of bus passengers. However,

there are a few exceptions like Ojota, Mile 2, Badagry and Ikorodu, which have a high number of bus trips but relatively lower passenger numbers. This would indicate that buses to these areas are not operating at full capacity, or that there are far too many operators serving these areas. The more buses that serve an area only increases local traffic congestion, further justifying the need to build the mega terminals.

In terms of origin and destinations of the interstate bus passengers, the highest number travel to and from the neighbouring states of Ogun and Oyo, with over 13,000 passengers per day each. These two states account for 45% of the total passenger demand. Other popular destinations are FCT and Edo state, but they only average around 4,000 passengers daily. Details of the daily passenger flow to all states is shown in Figure 2-3.

Figure 2-3: Daily Bus Passenger Flows to and from Lagos

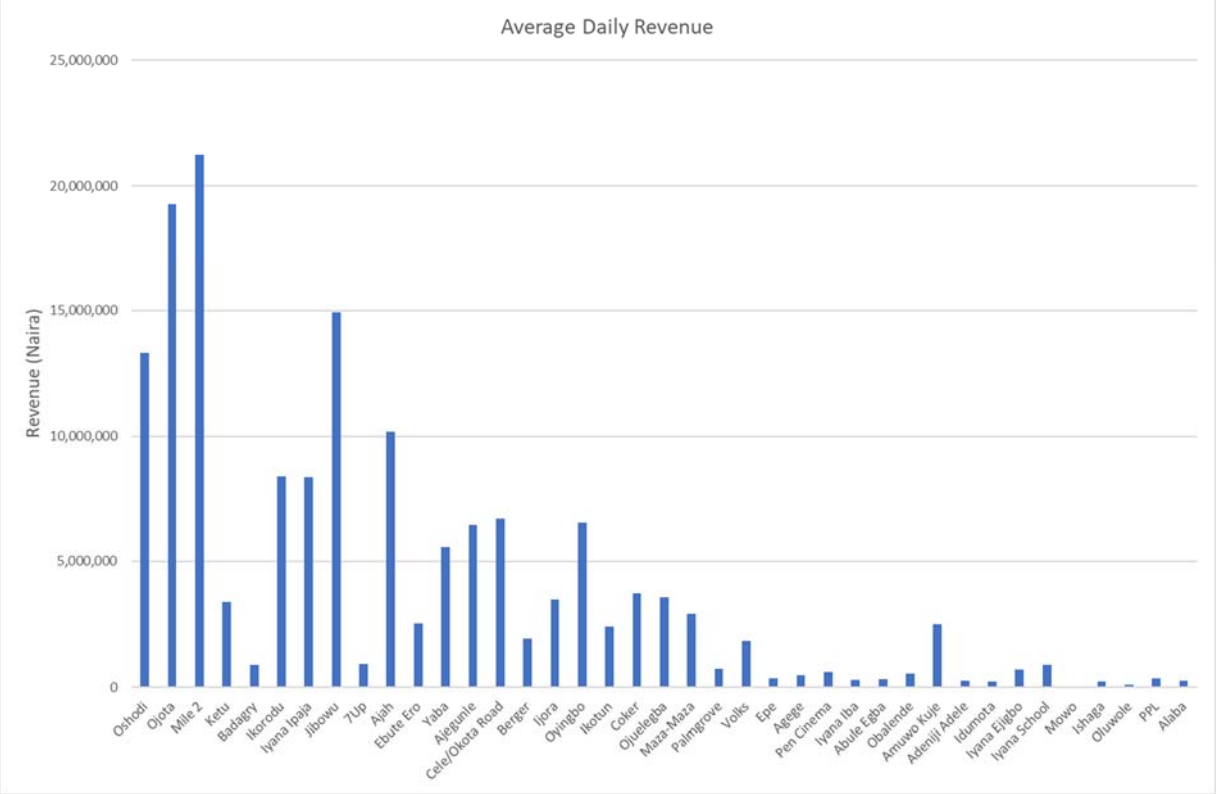


Source: Planet Projects data

2.3.3 Operational and commercial revenue

The Planet Project data did provide estimates of 'Average Daily Revenue' by motor park. These have been consolidated by area and are given in Figure 2-4.

Figure 2-4: Average Daily Revenue by Area



Source: Planet Projects

There seems to be a reasonable correlation between the number of bus trips and revenue generated in individual areas. The area where the motor parks generate the highest revenue is Mile 2, with a daily revenue of over N21 million. This is primarily due to the fact that motor parks in this area serve international destinations like Benin and Ghana, where bus fares are higher. Other areas with high daily revenue include Oshodi, Ojota, Jibowu and Aja.

No data is available on the payments made by bus operators to LAMATA or the bus terminal operators[16]. Data on these payments was obtained as part of our data collection exercise.

Though opportunities exist for the commercial exploitation of the motor parks, including informal trading, commercial leasing, on-street and off-street parking within and in the vicinity of the facility, advertising, concessions, etc., no data on this is currently available. Data on other commercial revenue sources was obtained as part of our data collection exercise.

[16] Some large bus operators (i.e. owners of large fleets) also happen to own/operate bus terminals. At the same time, there are bus terminal operators who happen to have access to pieces of land (e.g. Defunct or out of use facilities) on which they allow buses to park for a fees.

2.3.4 Scenario envisaged under Bus Reform program[17]

Following comments from the World Bank, the Consultant requested additional information on the bus reform initiative, but this has not been received. The team carried out some desk research to complement our understanding of the proposals of the bus reform program. The Bus Reform Initiative (BRI) was introduced by the Lagos State Government in 2017 as a strategy to formalize the transport sector. Fundamentally, the program aims to:

- Renew the public road based moveable infrastructure
- Formalize operations in the sector by brining informal workers into the formal economy
- Introduce modern intelligent transport system into Lagos State

The anchor for the bus reform program will be the development of 13 new bus terminals across the LMA. These new terminals will replace existing commercial car parks that use ad hoc locations, including side roads, undercarriage ways, etc. as drop-off and pick-up locations for passengers. Lagos State has planned for all existing commercial buses to relocate to these new terminals once construction is complete and services operational.

These terminals will feature intelligent transport systems that allow commuters to know of the arrival and departure of buses. Complementing the 13 bus terminals will be a network of 300 modern bus stops across the metropolitan area. These bus stops will provide the vital last mile service connecting the 13 anchor terminals.

It is the Consultant's understanding that the new bus terminals will complement the Mega Terminals. The Mega-Terminals will mostly serve as inter-change points for travelers coming from outside Lagos State, whereas the 13 bus terminals will be serving intra-state traffic.

It is our understanding that funding for the ambitious program has been challenging, and this challenge could delay some of the project components.

Lagos State Government has appointed specialist consultants to develop and implement the reform. The following are the key elements to the program:

- Replacing 75,000 existing *Danfos* (mini buses) with high capacity buses;
- Developing route and service plans based on demand and ensuring operators stick to defined routes;
- Licensing operators for assigned routes. The plan is to have 5 major bus operators in Lagos;
- Development of an automated fare collection system;
- Deployment of intelligent transport systems;
- Infrastructure provision including bus depots, park and ride, and bus stops;
- Fares will be collected by the Government and distributed amongst the operators. The Government will take the revenue risk;

[17] Information on bus reform programme based on the Lagos State Transport Bill

- Government is initially buying 820 buses (300 medium capacity and 520 high capacity), the first 20 buses arrived in Lagos in June 2018;
- These buses are Marco Polo buses from Brazil, and will be maintained by the manufacturer under a maintenance contract. The operators will lease the buses from the Government, and after 5 years they will transfer to the operators; and
- In the long-term they are looking at buying 5,000 new buses.

This program will be implemented by the newly created Lagos Bus Services Limited (LBSL), which in collaboration with the government will regulate and enforce the program.

The implications of the bus reforms program on the mega terminals project can only be positive. A demand driven bus timetable and schedule will ensure that these terminals are properly served by public transport, ensuring connectivity and interchange for passengers using interstate bus services.

2.4 Analysis of Competing and Complementary modes of PT

The mega terminals are expected to significantly improve the travel experience of inter-state travelers in Lagos. The terminals would provide better access to the city's public transport system as well as improved on-site facilities. These improvements at the mega terminals would likely further increase the share of passengers using inter-state bus transport in Lagos.

This section of the report explores the other modes of inter-state public transport available to passenger and their relative competitiveness in comparison to an improved bus transport system in the State.

2.4.1 Rail transport

The main rail network in Nigeria consisting of about 3,500km of narrow gauge lines is largely dilapidated. The network is operated by the Federal Government vertically integrated railway agency, Nigerian Railway Corporation (NRC). Current inter-city rail service operations by NRC are characterized by frequent service disruptions and long delays. The suboptimal rail transport operations of the NRC are largely a result of poor operational capabilities of the NRC and lack of adequate rolling stock and resources.

In Lagos, the NRC operates an intra-city rail system and two main inter-city routes. The 26km intra-city rail service from Iddo to Agbado with 10 station stops as listed in Table 2-3:

Table 2-3: List of NRC Rail Stations within Lagos

S/N	NRC Rail Stations within Lagos	Distance	Cumulative distance
1	Iddo - Ebute-Metta	2km	2km
2	Ebute-Metta - Ebute-Metta Junction (EBJ	1km	3km
3	EBJ - Yaba	2km	5km
4	Yaba - Mushin	3km	8km
5	Mushin - Oshodi	2km	10km
6	Oshodi - Shogunle	3km	13km
7	Shogunle - Ikeja	1km	14km

S/N	NRC Rail Stations within Lagos	Distance	Cumulative distance
8	Ikeja - AGEGE	4km	18km
9	Agege - Iju Junction	5km	23km
10	Iju Junction - Agbado	3km	26km

Source: Transport Statistics, 2016. Lagos Bureau of Statistics

As of 2016 (the latest year with available information) the intra-city service runs about 16 times per day during peak hours (from 0540 hours to 1020 hours and 1300 hours to 1940 hours) with an average passenger volume of 16,000 per day. Although the trains are supposed to operate per schedule, they are often delayed. Current passenger tariff is NGN 750 for premium service (new coaches) and NGN 230 for standard coaches.

The NRC operates two inter-city rail service from the Lagos main terminal in Iddo. These are routes are highlighted in the Table 2-4:

Table 2-4: List of NRC Inter-City Routes

S/N	Track route	Distance	Trips per Week	Average passengers per week
1	Lagos – Kano	1,125 km	2	2500
2	Lagos – Ilorin	338 km	2	4000

Source: Nigerian Railway Corporation Statistics

The tariff rates for the inter-city rail service operated by NRC are regulated and subsidized by the government. The NRC sets the prices but requires the approval of its supervising ministry, the Federal Ministry of Transportation (FMOT) to amend the tariffs. Current rates were last adjusted and approved in 2013 and are in the presented in Table 2-5:

Table 2-5: NRC Approved Passenger Fare Rates

S.No.	Service Type	Rate (NGN per passenger –km)	Fare for Lagos to Kano Trip (NGN)
1	Standard Class Service	2.55	2870
2	First Class Service	4.00	4500
3	First Class Sleeper (ordinary) Service	5.10	5750
4	First Class Sleeper (A/ C) Service	6.12	6890

Source: Nigerian Railway Corporation Statistics

Notwithstanding its relatively low fares, the current inter-city rail service operated by the NRC does not present a significant threat to the competitiveness of the bus transport (and hence the viability of the proposed private sector-operated mega terminals) within the country given the NRC's poor service, limited routes and frequent delays.

However two key factors could significantly affect the competitiveness of inter-city rail service in Nigeria:

Concession of the Narrow Gauge Lines of the NRC

Nigeria's main rail network comprises of 3,505 route km of narrow gauge (1,067mm) track which can be divided into two corridors. The Western Line from Lagos to Nguru in Yobe State, measuring 1,805 km of narrow gauge track and 348 km of secondary track (including passing loops and yard tracks) extends into one of the most important port complexes in Nigeria, the Lagos Port Complex, and provides rail access to several bulk, break bulk and liquid bulk terminals, as well as the Apapa Container Terminal. The line however, stops short of the other

major port terminal in Lagos, the Tin Can Island Port Complex. The Western Line is along a major trade corridor connecting Lagos to major trade hubs including; Ibadan, Ilorin Kaduna, and Kano.

A parallel line in the eastern part of the country, the Eastern Line, runs from Port Harcourt to Maiduguri. The Eastern Line is also linked to the major sea port at Port Harcourt, the Rivers Port Complex. A 19km narrow gauge extension is proposed to connect Rivers Port to the second port in Port Harcourt, the Onne Deep Sea Port, though this has yet to be built. The Eastern Line measures 1,700km of narrow gauge track.

The Federal Government of Nigeria (FGN) is currently exploring options around concessioning the narrow gauge network of the NRC to a private sector consortium led by General Electric (GE)[18]. The government and the consortium are presently negotiating the terms and conditions of the concession programme that is expected to include an investment of about USD4.6 billion in the rail network over the 30-year term of the concession.

Although the negotiations have been prolonged and the concession programme delayed, the handover of the rail network to the GE-led consortium and the expected investment in the sector is expected to significantly increase the quality of inter-city passenger rail service in the country. The FGN has recently approved[19] an interim phase for the concession program whereby the GE-led consortium will invest up to $45 million to rehabilitate the critical areas of the track infrastructure, acquire some rolling stock and commence operations. It is uncertain when an agreement for the interim phase period will be finalized to enable the concessionaire commence operations.

Construction of the Lagos to Kano Standard Gauge line

The FGN is proposing to construct a new standard gauge line from Lagos to Kano with a sovereign loan from the Chinese government. The construction works for the first phase (Lagos to Ibadan) of the new rail has started and expected to be completed by January 2019[20]. The funding for the next phase (Ibadan to Kaduna) of the new line has also been recently approved by the government. This new rail line is part of FGN's rail modernization program and include the construction of new standard gauge lines to connect every State capital in the country.

When completed, the new rail line will significantly increase effectiveness of rail service in the country in comparison to inter-city bus transit.

The commencement of the narrow gauge line concession programme and completion of the standard gauge line would significantly increase the competitiveness of inter-city rail transport and potentially drive a modal shift from current road transportation as long distance passengers in Nigeria are often price sensitive and would easily switch to cheaper and potentially more reliable mode of transportation.

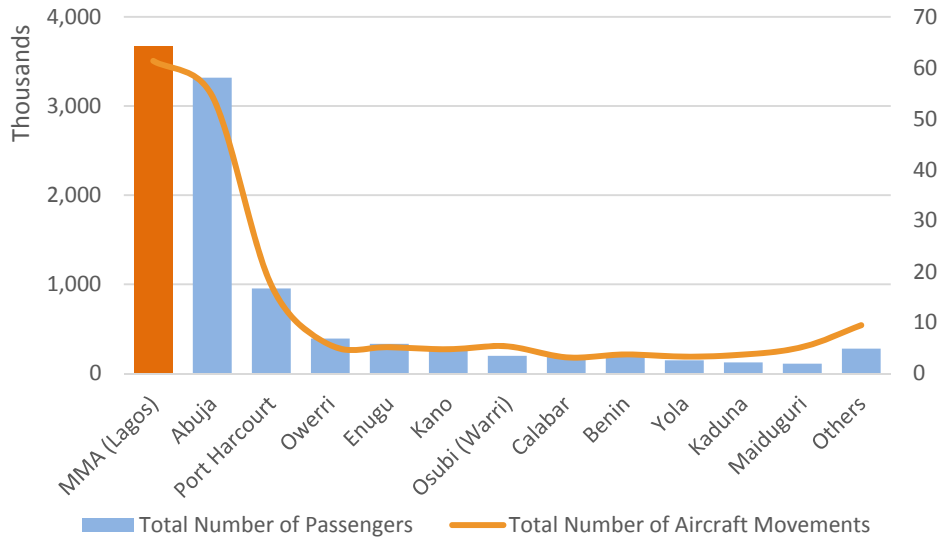
[18] https://www.thisdaylive.com/index.php/2017/05/25/fg-concessions-rail-lines-to-ge-multinational-to-invest-over-2-2bn/ accessed February 25, 2018.
[19] https://www.vanguardngr.com/2017/11/ge-2-7bn-proposed-rail-concession-senate-cttee-quizzes-minister-transport/ accessed April 8, 2018
[20] Source: http://www.tribuneonlineng.com/fg-complete-lagos-ibadan-standard-gauge-rail-line-jan-2019-amaechi/ accessed February 26, 2018

2.4.2 Air Transport

The local aviation industry in Nigeria is poorly developed in comparison to other similar sized economies. The aviation industry is facing multiple challenges including: (i) high cost of operations, including multiple taxation and levies; (ii) safety and security issues; (iii) inadequate financing; and (iv) poor airport infrastructure. These issues have resulted in the Federal Government's recent acquisition of two leading domestic airlines in the country, Arik Air and Aero Contractors, due to the airlines' inability to repay loans from local banks.

The demand for local air transport is considered low compared to inter-state bus transport in Nigeria. As presented in the chart below, Lagos airport (MMA[21]) accounted for about 36% of all passenger demand for air transport and about 34% of aircraft movements in 2016.

Figure 2-5: Number of Domestic Air Transport Passengers and Aircraft Movements in 2016



Source: Air Transportation Data. Q2 2017. National Bureau of Statistics. September 2017. Other airports

The relatively low demand for air transportation is based on the significant high fares charged in comparison to inter-city bus transport. For instance, recent data from the National Bureau of Statistics show that that the average price for domestic flights from Lagos is NGN 40,500.0 compared to NGN 2,535 for an average bus fare for inter-city trip from Lagos[22]. Our desktop research for some of the more popular origin and destinations from Lagos suggest fares between NGN 4,000 – NGN 8,000 per trip. Thus, the domestic air transport sector does not present a competitive threat to inter-city bus transport and by extension the viability of the proposed mega-terminals.

2.4.3 Lagos Mega City Strategic Transport Master Plan

As stated earlier, the mega terminals project is an important element of Lagos State's overall vision to address the road congestion in Lagos Metropolitan Area. The State's overall vision and long-term plans for public transport have been articulated clearly in the Strategic Transport Master Plan (STMP). Currently, LAMATA is actively implementing the STMP, with various

[21] All local terminals of the domestic airport
[22] Transport Fare Watch. National Bureau of Statistics. January 2018.

schemes at differing states of development. The STMP envisions a network of bus, rail and water based rapid transport systems serving strategic activity centers across the state. The STMP recommends the development of the following new public transport corridors:

- 14 new BRT routes in Lagos with staggered implementation through 2032;
- 6 new LRT lines – of these 2 lines (Blue and Red Lines) are currently being developed;
- 1 new Monorail line serve the well-built urban centre of Victoria Island; and
- 5 new Cable Car projects mainly on Lagos island.

The proposed mega terminals will fully integrate with these proposed new transport corridors, and will form a key part of the STMP strategy. For example, the proposed mega terminal at Odogunyan will provide an interchange with the LRT Orange Line, the mega terminal at Sango will provide an interchange with the LRT Red Line, and Agbara with the Purple Line. There is also potential for integration between the mega terminals and the proposed BRT routes. Connectivity with the proposed public transport network will greatly enhance the use of the mega terminals.

LAMATA has further conducted a detailed study and delineated the future bus network in the State[23]. The bus network study identifies the main bus corridors as follows:

- Mass Transit Bus Routes –bus corridors with a demand greater than 6,000 pphpd
- Standard Bus Routes – bus corridors with a demand generally between 6,000 and 2,000 pphpd
- Feeder Bus Routes – bus corridors with a demand between 2,000 and 1,000 pphpd (or 500 pphpd for minibuses)

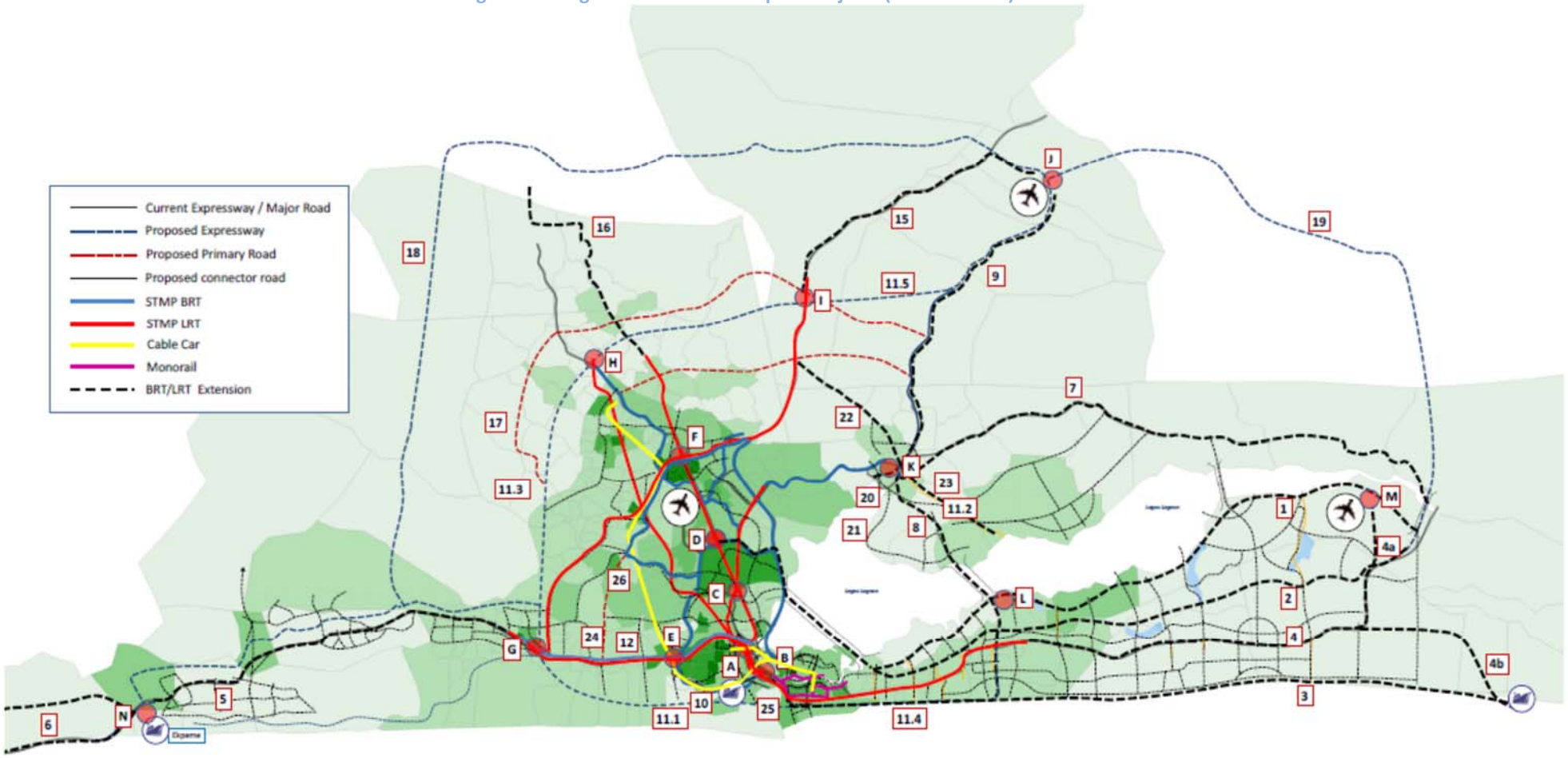
These bus corridors are served by a number of bus transit hubs and nodes including four strategic bus interchanges “super-hubs” locations which collectively accounts for 25% of the public transport capacity in the state. These locations are: CMS, Ikeja, Mile 2, and Oshodi. The LASG has commenced the re-construction of intra-city mega bus terminals at Ikeja and Oshodi.

A review of the proposed locations for the inter-state mega terminals show that the Agbara, Ojodu Berger and Sango locations are within the existing public transport network while the Odoguyan and Epe locations are within the planned bus network.

The map of proposed STMP and the planned bus network are provided in Figure 2-6 and Figure 2-7.

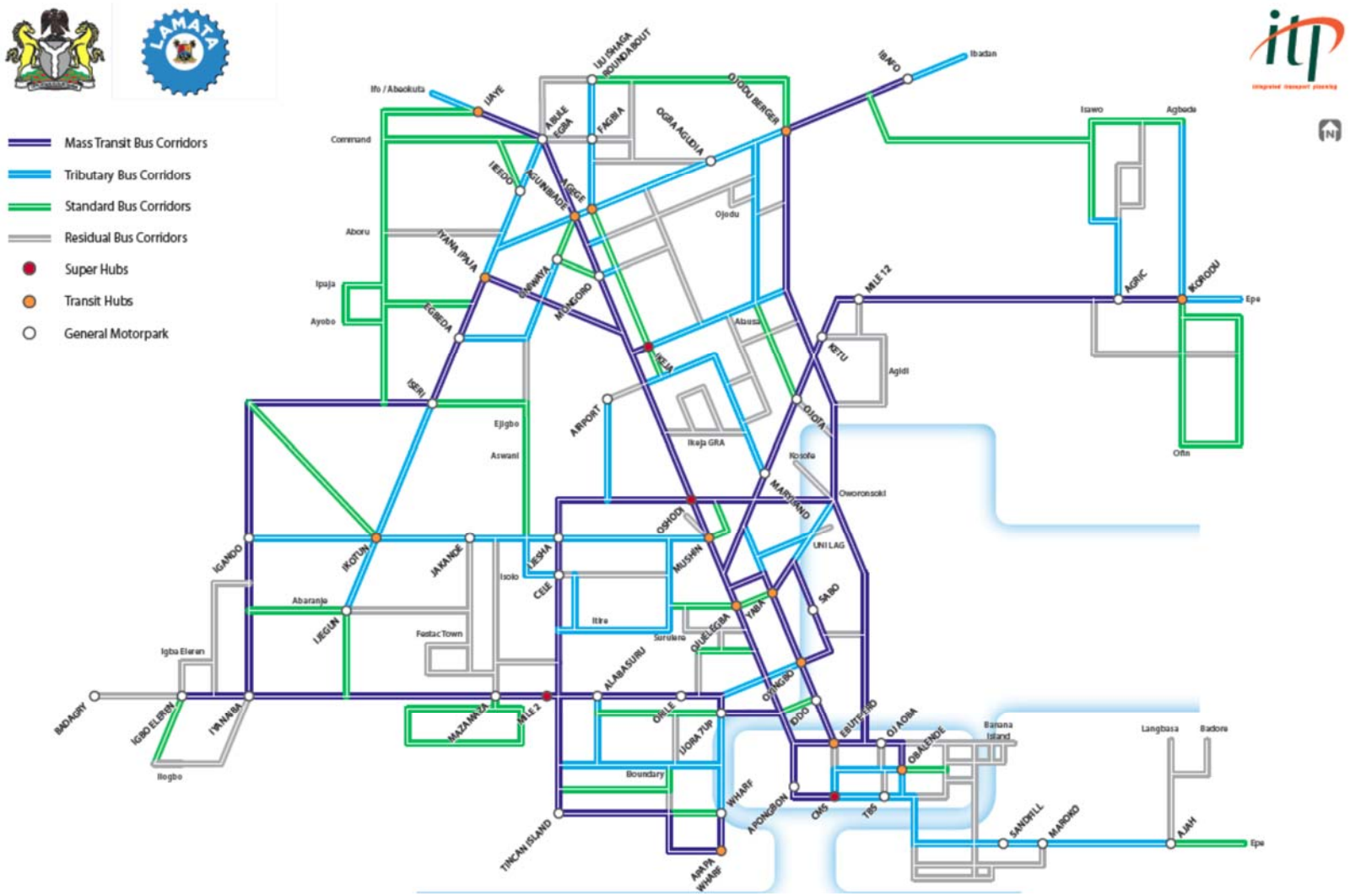
[23] Development of Bus Route Network for Lagos State – Final Report. Integrated Transport Planning, IBIS Transport Consultants & AEC. April 2015

Figure 2-6: Lagos STMP Land Transport Projects (2032 Horizon)



Source: STMP (Strategic Transport Master Plan (STMP) and Strategic Travel Demand Model (STDM) to Cover the Mega City Region, ALG and europraxis, December 2014)

Figure 2-7: Future Lagos Bus Network Showing Locations for Super Hubs and Other Transit Hubs



Source: STMP (same as above)

2.5 Case Studies

The following case studies have been chosen to illustrate examples of cities/agencies facing similar problems as Lagos and the possible solutions. While it is not intended to replicate these exactly, they have been highlighted to drive home key points or weak links which need attention during planning of the projects.

2.5.1 Swami Vivekanand Inter State Bus Terminus (New Delhi, India) – Multi-Modal Transit Center to facilitate passenger transfers

Background

This is one of the 3 ISBTs in New Delhi, India. Developed in 1993, it is located over an area of 25 acres in East Delhi serving inter-state bus traffic between the National Capital Territory of Delhi and two of the neighboring states of Uttar Pradesh and Uttarakhand (this state does not share a border with Delhi). It is under the jurisdiction of Delhi Transport Infrastructure Development Corporation Limited (DTIDCL), a state government public sector entity.

Table 2-6: Swami Vivekanand ISBT Facts

Parameter	Specification
Built-up Area	99,500 square meters
Inter-state bus traffic	1,400 – 1,500 per day
Intra-state bus traffic	1,800 – 2,000 per day (includes buses operated by Delhi Transport Corporation, a wholly owned state government bus corporation, and cluster buses operated under a PPP arrangement by Delhi Integrated Multi-Modal Transit System (DIMTS) Ltd., an equal equity joint venture of Govt. of NCT of Delhi and IDFC Foundation.

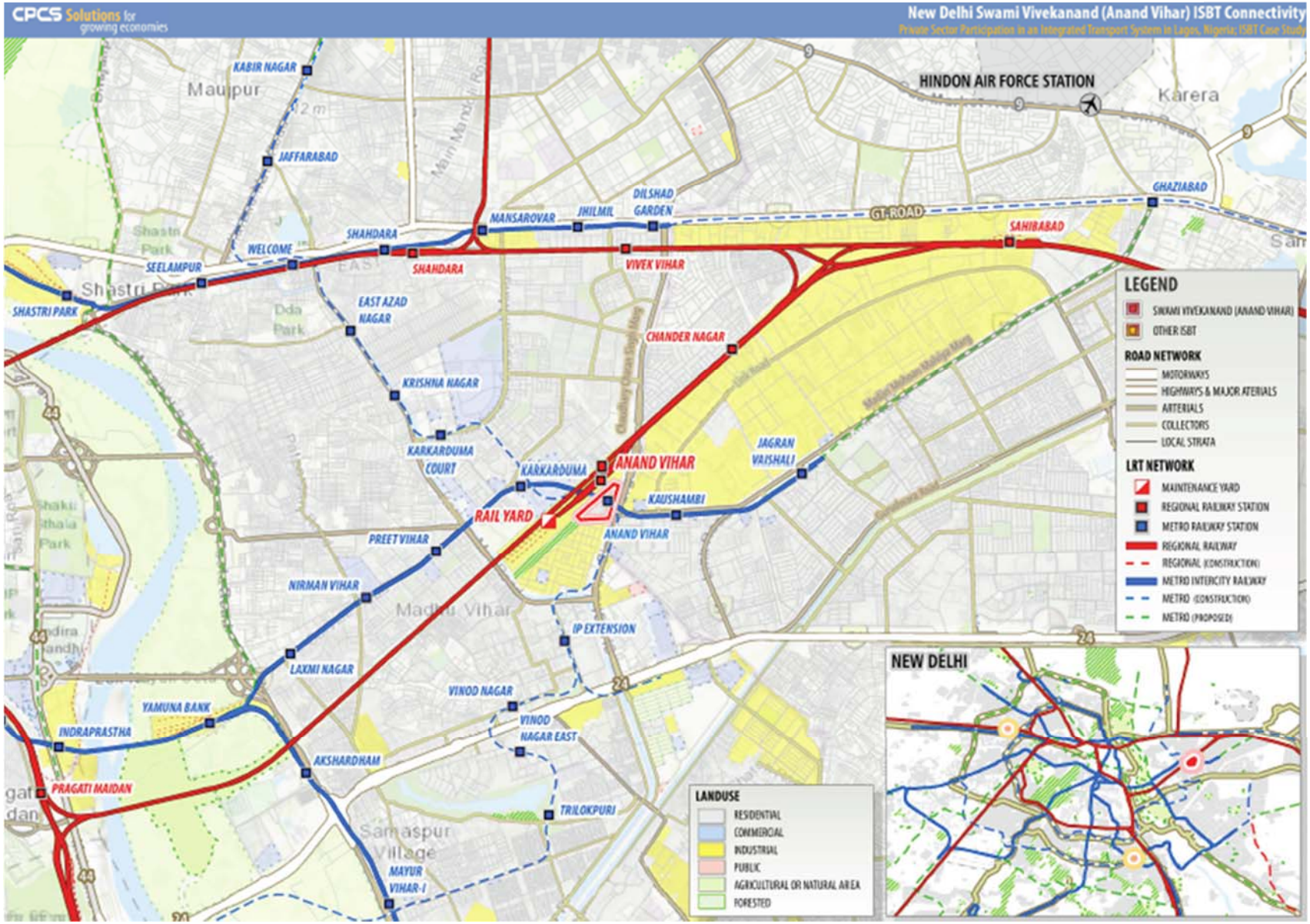
Inter-Modal Connections

The ISBT is located adjacent to the Anand Vihar Terminal railway station (one of Delhi's major railway stations catering to short distance and long distance rail traffic) and Anand Vihar metro station, and is flanked by National Highway 56 (a major arterial multi-state highway in Northern India). Detailed map is shown in Figure 2-8.

Issues

Despite the locational advantages of the site, the ISBT is plagued by a plethora of problems which has prevented it from providing smooth and hassle-free connectivity to passengers. The narrow exits and entries to the ISBT are common for buses, private vehicles and pedestrians, which cause severe congestion. While bus passengers can access the neighbouring Metro station, commuters cannot directly access the Anand Vihar railway station without first exiting the ISBT after which they need to climb to a pedestrian skywalk. Similarly, entry to the ISBT remains a challenge as the main road is usually clogged by rickshaws, commercial vehicles, and hawkers.

Figure 2-8: Swami Vivekanand ISBT at Anand Vihar, Delhi, India



Redevelopment Plan[24]

Recognising these issues, DTIDCL has prepared an innovative plan to renovate the ISBT which includes redeveloping it as a transit orientation location with the following features:

- Parking In Basement: 64 buses, 88 taxis, 100 two-wheelers and 1400 cars;
- Parking at Surface: 236 buses, 44 taxis, 100 two-wheelers, 80 cars & 171 Auto-Rickshaw;
- Separate entrances and exits for the buses, autos and taxis are planned in order to avoid clash between the different modes of transport;
- Network of foot-over bridges, escalators and elevators will allow easy and safe movement of pedestrians between the terminal, metro and railway station;
- Design is differently-abled friendly;
- Green building using energy, water and other resources to protect the health of the public, reduce wastage, increase productivity and of course protect the environment; and
- Landscaping of the open space to beautify the entire area and provision of suitable heat, ventilation and air conditioning system.

This is an example where similar Mega Inter-State Bus Terminal was planned with inadequate focus on passenger commute experience for last mile connectivity and traffic circulation within and integration with outside traffic. Despite locational advantages, the bus traffic and passengers suffered for years due to poor emphasis on inter-modal transit. The terminal is now being redesigned with emphasis on inter-modal access and passenger transfers.

Key takeaway – Emphasis on passenger transfers for last mile connectivity, inter-modal integration with other Public and Private Transport and Traffic Management plan are critical for Mega Terminals.

2.5.2 Mien Dong and Mien Tay Bus Terminals (Ho Chi Minh City, Vietnam)

Background

Ho Chi Minh City is served by two long distance inter-regional bus terminals – Mein Dong in the east of the city and Mein Tay in the west. While Mien Dong bus Terminal serves passengers traveling to provinces in the southeast region, the central highlands and northern Vietnam, Mien Tay bus terminal serves passengers traveling to the Mekong Delta provinces from Tien Giang, Ben Tre, to Ca Mau.

[24] http://www.delhi.gov.in/wps/wcm/connect/doit_dtidc/DTIDC/Home/Redevelopment+Plan/

Figure 2-9: Mein Dong Bus Terminal

Source: The Voice of Vietnam (www.english.vov.vn)

Source: www.vietnamonline.com

Inter-Modal Connections

The Mein Dong terminal is located around 7km from the city center and is one of the busiest bus terminals in the city. It is linked to the local city bus network with around 11 bus routes terminating there. However, the terminal is not linked to any other form of public transport, apart from taxis.

The Mien Tay bus terminal is much smaller than Mein Dong. Every day around 750 buses arrive and depart at this terminal, serving around 13,000 passengers. This terminal is also connected to the local city bus network, with around 7 bus routes serving it. It is also not linked to any other form of public transport apart from taxis.

Issues

Both the Mein Dong and Mien Tay terminals are located in the crowded Binh Thanh district of the city, and have been blamed for causing significant traffic congestion in the area. To alleviate this problem the Saigon Municipal Transport Corporation (SAMCO) has decided to construct a new Mein Dong bus terminal in the outlying District 9 of the city.

Redevelopment Plan

The new Mein Dong terminal will be nearly three times as big as the current one, covering a total of 16 hectares. The bus terminal will serve about 21,000 passengers per day, with 1,200 buses arriving and departing. On peak days, this will increase to 52,000 passengers and over 1,800 buses.

The terminal will include convenient services including high-rise car park, repair areas, refueling stations, transit and cargo trade, and commercial and service areas. The terminal was designed and developed as a Transit-Oriented Development (TOD), and is due to open in 2018.

The city authorities are also looking to move the Mien Tay terminal to a new larger site further away from the center of the city, to ease traffic congestion.

This is an example where similar Mega Inter-State Bus Terminal planned for decongesting the city became a cause for congestion due to inadequate capacity and lack of inter-modal integration.

Key takeaway – Size of Mega Terminal should be for a long-term planning horizon and have potential for expansion overtime. Passenger transit should be a central focus.

2.5.3 Mo Chit Bus Terminal (Bangkok, Thailand)

Background

The Mo Chit bus terminal is the largest bus station in Bangkok connecting the Northern, Central, Eastern and North-Eastern provinces of Thailand to the city, as well as linking the city to neighbouring countries including Cambodia and Laos. Also knows as the Northern bus terminal or Chatuchak, the Mo Chit bus terminal is primarily operated by the Government Transport Company. The terminal currently serves 90,000 to 100,000 passengers per day.

Inter-Modal Connections

The Mo Chit bus terminal is well connected to the local bus network, with 15 bus routes terminating there. The terminal is also connected to the Mo Chit BTS Sky Train station, one of the busiest stations on the network, and the MRT Chatuchak station. There is a park and ride facility nearby, while private taxis also serve the bus terminal. These interchange facilities make the Mo Chit bus terminal an excellent transport hub in Bangkok.

Issues and Redevelopment Plans

The terminal is located in the Chatuchak area of Bangkok. There were proposals to relocate the terminal to Rangsit in Bangkok's northern outskirts. However this proposal has been dropped in favour of expanding on the current site to accommodate 150,000 passengers a day from 90,000-100,000 currently being served.

This is an example of a Mega Bus Terminal serving as a transport hub with limited capacity. After evaluation of options to shift the terminal to the outskirts of the city, the decision was made in favour of expanding the terminal at the current location (in a high cost real estate market) in light of passenger convenience.

Key takeaway – Size of Mega Terminal should be for a long-term planning horizon and have potential for expansion overtime. Passenger transit should be a central focus.

2.5.4 Bus Terminal and Park Station Precinct (Joburg Park Station), Johannesburg, South Africa

Joburg Park Station is a major public transport interchange where passengers from all over Africa, South Africa and Joburg transfer from trains to buses, buses to minibus taxis and more. Park Station, situated in Braamfontein, bordered by Rissik, Wolmarans, Wanderers and Noord Streets is the largest station in Africa. Even though it is not strictly an inter-state bus terminal, it is a good example of multi-modal passenger transit, developed by Joburg Development Authority (JDA) based on transit-oriented development approach.

Figure 2-10: Integrated Transport Options at Joburg Park Station

Source: http://www.jda.org.za/index.php/whatwedo/programmes/inner-city/parks-station-precinct

Public Transport Options

The station connects the following major public transport modes:

- Shosholoza Meyl - a long distance train;
- Gautrain – a rapid rail system;
- Metrobus – various bus routes within Joburg;
- Inter-Provincial / Cross Border Buses: Various private operators such has Greyhound provide long distance trips; and
- Minibus taxis and Commuter Minibus Taxis

Inner City Commuter Links project

The purpose of the Inner City Commuter Links project was to create a pedestrian friendly and walkable urban environment through setting up a network of public spaces, and improved circulation around and access to formal taxi, bus and rail facilities. The intention was to build an inner city that is functional and liveable, create a safer and more walkable inner city, and improve continuity and connectivity for pedestrians towards and between places of work, public transport and other facilities in a legible and effective way. It also sought to optimise the use of existing facilities; improve the quality of the public realm, contributing to enhanced safety and perceptions of safety; and complement urban management initiatives to clean up and maintain the inner city. The project was implemented in four phases with separate areas being take up for development and redesign.

Real estate development

The Park Station Inn offers budget accommodation located just 50m from the Greyhound/Translux Bus Terminal in Johannesburg's CBD. It offers flexible check-in times to facilitate in-transit passengers.

This is a good example of transit oriented development and leveraging of existing public spaces for enhancing not just passengers' but also quality of citizen life.

Key takeaway – Transit hub development coupled with creation of public spaces to provide enhanced experience for passengers and city's citizens.

2.5.5 San Borja Bus Terminal (Santiago, Chile)

Background

San Borja Bus Terminal, located in Santiago de Chile Central Station, is the largest and most modern bus station in Chile. Locally referred to as North Terminal, historically, this station housed buses with principal destinations mainly at cities in the north and the Valparaíso Region, and at Countries such as Argentina and Peru. However, in recent times companies have started offering buses services that terminate at the southern regions (Chillán, Concepción, Los Ángeles, Temuco, Valdivia, Osorno, Puerto Montt).

Intermodal Connection

San Borja Bus Terminal is situated a walking distance from: two intercity bus stations, the Estacion Alameda; the cities train station, and the Metro Station; the intercity underground railway system. These interchange facilities make Santiago de Chile Central Station a convenient transport hub for commuters in Santiago.

Issues and Redevelopment Plan

The Central Station area is very busy, due to the significant human traffic from commuters, although there are security guards, the area can be dangerous, especially if wait periods for buses are long. A solution was to expand the terminal and improve infrastructure to make the system more efficient and thus to reduce commuter waiting time and irregularities of departures. In 2007, with an investment of $8 million made by the Yaconi-Santa Cruz group in an effort to expand the Paseo Estación Mall and to promote economic activity in the city, the terminal was completely remodeled. It was expanded to house;

- 80 platforms, with two levels of parking
- Underground (1,000 vehicles), access ramps and
- The terminal, located in a completely roofed second floor of the complex

The redeveloped terminal also includes a modern Information technology (IT) system that allows the automatic identification of each bus through a barcode that is read by a specially designed mechanism. This mechanism serves to keep track of data with respect to the departure and arrival times of the buses, as well as regulating the bus supply at certain times during the day and periods of the year. This mechanism replaced a manual system, in which papers were physically delivered at the entrances of the complex. This innovation optimized the times of exit and has improved the efficiency of the bus service, making it safer and more convenient for passengers.

2.6 Conclusions

2.6.1 Key Findings

There are currently around 150 interstate bus companies operating services to and from Lagos. However, they all operate to and from an informal network of parking sites located all over the city, rather than designated mega bus terminals. These are privately owned sites, where access, egress and public transport connectivity is all done on an ad-hoc unregulated basis. All this adds to the traffic congestion in and around these parks, and to the city as a whole.

There are over 5,600 bus trips per day to and from these parks, with close to 65,000 passengers using these services daily. This volume of traffic coming in and out of the city on an unregulated basis is one of the factors behind the traffic congestion in Lagos.

The analysis of interstate bus traffic volumes clearly indicates the need for mega interstate bus terminals at strategic locations on the outskirts of Lagos city, to ensure that buses do not add to the city's traffic congestion. To be effective, however, these locations need to be connected to public transport services including city buses and taxis, as well as any future planned BRT and LRT routes.

2.6.2 Data Gaps and Survey

The data received from LAMATA and Planet Projects has given an overall picture about interstate bus services to and from Lagos, along with passenger numbers and revenue earned. However, there are still data gaps including the total number of bus operators, fares charged, facilities at bus parks, and charges paid by operators to park owners, etc. In an attempt to gather this data, as well as validate existing data, surveys were conducted by the CPCS teams during February and March. The results of this data collection are presented in Chapter 4.

3 Traffic Analysis

Key Messages

Drivers of Growth

Over the last 5 years, bus and other public transport ridership in Lagos has grown by over 10% annually, and are expected to do so over the coming years. While national GDP is expected to grow around 2% per annum over the next 10 years, the Lagos State economy is expected to grow significantly faster at around 8% per annum. Population in Lagos and Nigeria as a whole is expected to grow at 3% per annum, according to official estimates. Finally Nigeria is experiencing a rapid rate of urbanization, especially in Lagos State where new urban development schemes are being planned.

Apart from a review of secondary data (LAMATA survey and Planet Projects' data), the observations from which have been presented in Chapter 2, the team also undertook primary survey.

Primary Survey data

To validate and enhance the existing data, the project team undertook surveys of interstate bus service providers and passengers at various locations. In total, surveys were conducted at 25 locations which have a high concentration of inter-state bus parks in Lagos. Some key observations are summarised below:

- Majority of buses are 14-18 seater capacity, with close to 95% running to full capacity;
- Many of the bus parks are just open spaces at the side of the road with no facilities available for passengers;
- Security at the parks was very lax; and
- Last mile connectivity is poor

Traffic Modelling Methodology

The combination of the CPCS survey data, which also correlates with the Planet Projects data, indicates that there are approximately 6,200 interstate bus services to and from Lagos every day, carrying approximately 71,000 passengers.

We mapped the existing bus parks to determine what the most common origins/destinations are of the buses using the motor parks. Each of these motor parks were then allocated to one or more of the 5 mega terminal locations, based on their location on the key highways in and out of Lagos. The five gateway corridors connects Lagos to other parts of the country and other West African countries. Based on anecdotal evidence, the Lagos-Ibadan (E1) expressway accounts for the largest share of traffic in and out of Lagos and it followed by the Lagos-Abeokuta (A5) expressway. While there are no recent bus traffic data across these five gateway corridors, a 2016 study of freight traffic in Lagos (as shown in the map below) provides an indication of the distribution of travel demand across the corridors and confirms that the Lagos-Ibadan (E1) expressway is the main gateway corridor in the city.

We developed 3 scenarios with the following annual growth rates in traffic:

- Base case: 2018-28: 5% ; 2029-37: 3%
- High growth: 2018-28: 8% ; 2029-37: 5%
- Low growth: 2018-28: 2% ; 2029-37: 1%

With respect to the terminal location at Epe, given the plans for new city development along the Lekki/Epe corridor, as well as new Dangote oil refinery near Epe, there will potentially be additional passengers using the Epe mega terminal from 2020 onwards. To reflect these additional passengers, the forecasts for Epe only have been in increased by 5% in 2020 and 5% in 2021 (10% overall).

Key Messages (contd.)

Traffic Projections

For the bus parks the traffic forecasts indicate that there is a significant variance between the number of buses to be handled daily between individual parks. In 2018, Epe will handle around 330 inter-state buses per day, Agbara will have to handle nearly 3 times that volume at around 981 buses a day, while Berger which is expected to be the largest Mega Terminal will handle over 3,000 interstate buses and over 40,000 passengers per day.

While the figure for number of buses to be handled appears high, it must be noted that the majority of these buses have a capacity of less than 20 passengers.

Global Comparisons

Based on the number of buses handled per day, the proposed terminals are not significantly larger than similar terminals in other developing countries. For example:

- Swami Vivekanand Inter State Bus Terminus (New Delhi, India) handles between 1,800 to 2,000 interstate buses a day, and a similar number of intra-city buses, with an average capacity of over 70 passengers per bus aggregating to 280,000 passengers daily.
- Mien Dong and Mien Tay Bus Terminals (Ho Chi Minh City, Vietnam) currently handle around 750 buses a day, though they are being expanded to each handle around 1,800 buses on a daily basis, with average capacity of over 60 passengers per bus.
- Mo Chit Bus Terminal (Bangkok, Thailand) currently serves 90,000 to 100,000 passengers per day. It is being expanded to handle 150,000 passengers per day.

3.1 Approach to Traffic Analysis

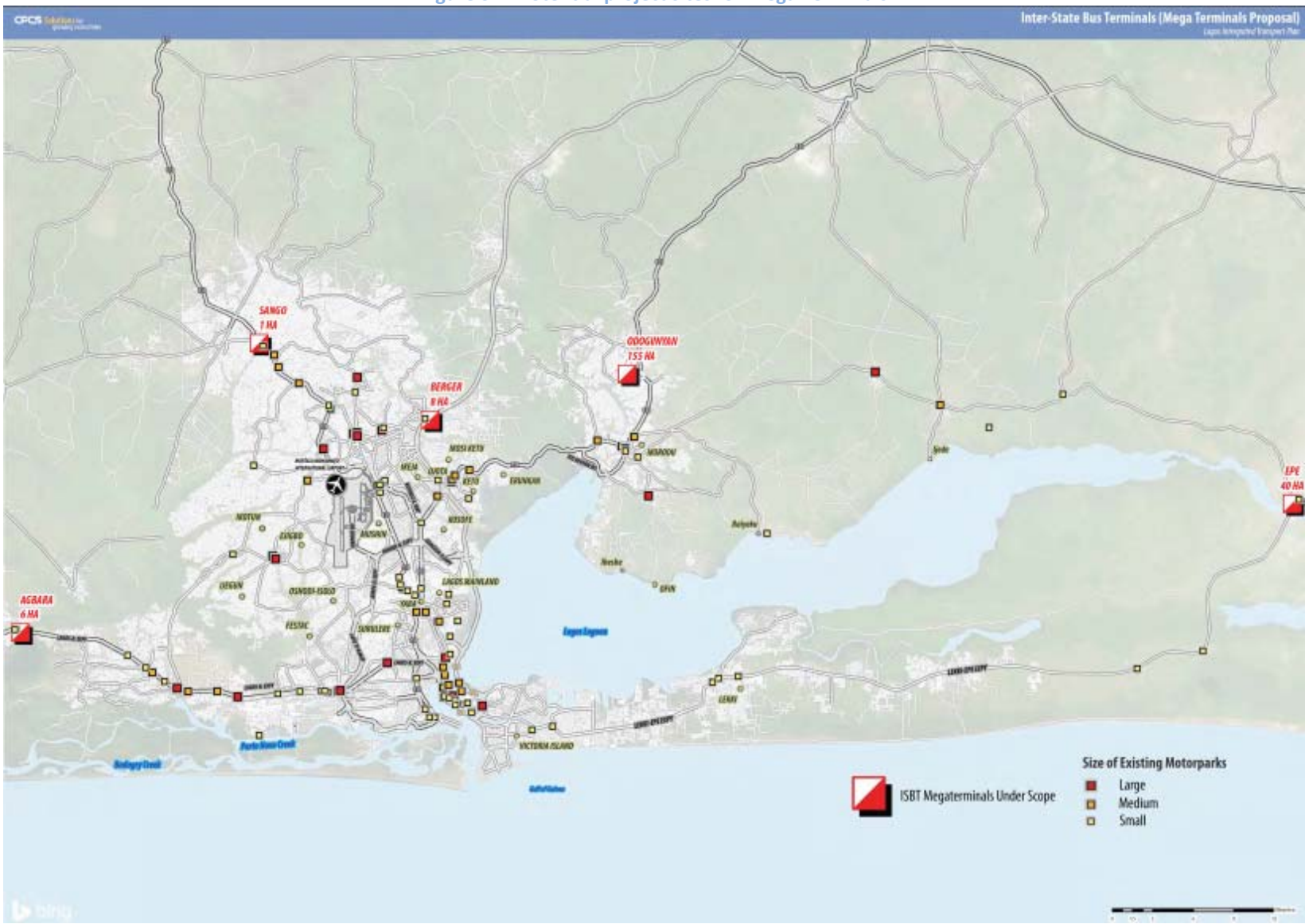
This section outlines the methodology and results of the traffic forecasting exercise undertaken to help determine the size and configuration of the mega terminals required to handle future traffic flows.

LAMATA identified 5 potential locations where interstate bus terminals could be located. These are as follows:

- Ojodu Berger – estimated 8 hectares located off the Lagos-Ibadan expressway
- Sango – estimated 1 hectare located on the Lagos-Abeokuta expressway
- Agbara – estimated 6 hectares located on the Lagos-Badagry expressway
- Odogunyan – estimated 155 hectares located on A1 expressway
- Epe – estimated 40 hectares located on Lekki-Epe expressway

The potential sites are presented in Figure 3-1.

Figure 3-1: Potential project sites for Mega Terminals



The forecasts have been developed using the following key steps:

- Macroeconomic and historical demand analysis: A review was undertaken of published socio-economic profiles as well as the demographic characteristics of Nigeria and the Lagos metropolitan area. We analysed the relevant economic trends, including employment, Gross Domestic Product (GDP) and population growth, and urbanization, to determine how these would drive future transport demand.
- Published data: Since there exists no official baseline for inter-state buses other that LAMATA's internal study which identified bus operators (80) operating from 20 locations within LMA, we used material obtained from a private company - Planet Projects –based on a study conducted in 2017, wherein they mapped major bus parks and passenger flows for inter-state buses.
- Data collection and surveys: CPCS conducted survey at 25 major locations (40 bus parks which service inter-state buses) – with the objective of estimating traffic pertaining to Inter-state buses, their Origin/Destination, bus capacities, etc., the details of which are outlined in Section 4.3.2.
- Traffic modelling and projections: These were developed for three scenarios:
  - Base case;
  - High growth scenario; and
  - Low growth scenario.

It should be noted that these are high-level forecasts designed to enable us to undertake the facility design and service configuration for the infrastructure proposed to be built or services that need to be operated. The high growth scenario reflects unconstrained demand, while the base case and low growth scenarios normally reflect some kind of constrained demand. It should be noted that these forecasts are not meant to be investment grade forecasts.

3.2 Macroeconomic and Historical Demand Analysis

3.2.1 Macroeconomic factors

The key macroeconomic factor driving the demand for inter-state bus services in Lagos will be growth in GDP (for Nigeria as a country as a whole and the State of Lagos in particular), population and the rate of urbanisation. The following are the key macroeconomic factors that have been considered:

- As per IMF forecasts[25] GDP in Nigeria is expected to grow between 1.5%-2% per annum up to 2023;
- As per the Lagos State Development Plan[26], the Lagos Sate GDP has grown at 8% annually between 2010 and 2017, and is expected to grow at 9% per annum to 2015;

[25] http://www.imf.org/external/datamapper/NGDP_RPCH@WEO/OEMDC/ADVEC/WEOWORLD/NGA
[26] Lagos State Development Plan 2012-2025, Ministry of Economic Planning and Budget, Lagos State Government

- According to an Investor's Guide published by Lagos Global based on research undertaken by PwC[27], the GDP of the formal economy of Lagos State was estimated to be $136.6 billion in 2015, rising to $355 billion by 2025 – an estimated annual growth rate of 10%;
- According to World Bank projections[28], Nigeria's population is expected to grow by around 3%-3.5% annually to 2050;
- According to the Lagos State Government's Bureau of Statistics[29], the state's population was 17.6 million in 2006, which increased to 23.3 million in 2015, representing an annual growth of 3.5%; and
- According to the CIA World Factbook[30], the urban population of Nigeria was 49.4% of the total in 2017, and is expected to grow by 4.3% per annum to 2020.

The growth in national GDP, growth in local and national population, and the rate of urbanization, will be the principal factors that contribute to the growth in inter-state bus traffic.

3.2.2 Historical demand

While historical data of inter-State bus passenger numbers to and from Lagos is not available, data was available for other public transport modes as well total number of vehicles. These are summarized below:

- Number of passengers using intra-city bus services in Lagos (LAGBUS) grew at an average of 11% per annum between 2011 and 2015[31];
- Number of passengers using rail services in Lagos grew by an average of 15% per annum between 2011 and 2014[32], though there was a significant fall in numbers in 2015; and
- As per data provided by LAMATA, the number of vehicles in Lagos grew by an average of 4.3% per annum between 2007 and 2016. This can be taken as a proxy for the growth in traffic in Lagos.

3.2.3 Urban developments

While the rate of urbanization is Lagos and the surrounding States is expected to increase significantly in the future, there are also certain specific housing and industrial developments which are expected to impact on the inter-city bus passenger ridership. These include:

- Lagos Sate Government plans to develop new Model Cities in Ikeja, Ikorodu, Lepe, and Oshodi-Isolo;
- There are plans to build a new airport for Lagos at Lekki; and

[27] Lagos: City of Opportunities, An Investor's Guide, PwC, September 2015 (https://lagosglobal.org/wp-content/uploads/2016/05/Lagos-Investors-Guide.pdf)
[28] https://data.worldbank.org/indicator/SP.POP.TOTL?locations=NG
[29] Digest of Statistics 2016, Lagos State Government, Lagos Bureau of Statistics, Ministry of Economic Planning and Budget
[30] https://www.cia.gov/library/publications/the-world-factbook/fields/2212.html
[31] Transport Statistics 2016, Lagos Bureau of Statistics, Lagos State Government
[32] ibid

- Dangote is building a new oil refinery near Epe that is expected to be operational by 2019.

3.3 Data Collection and Surveys

3.3.1 Published data

There exists no official baseline for inter-state buses. Therefore, we relied on two main sources of data for secondary review including:

- LAMATA's internal study identified bus operators (80) operating from 20 locations within LMA
- Surveys undertaken by Planet Projects[33] in 2017, as part of a previous Mega Terminals study undertaken. The data identified 145 bus or motor parks across Lagos which are being used by inter-state operators. These bus parks were classified into 39 areas of the city. The number of motor parks vary by area, with some areas including Oshodi, Ikorodu, Ajah, and Cele/Okoto Road having a cluster of 13-14 motor parks each. A majority of areas though have only 1-3 motor parks.

The Planet Projects and LAMATA data have been analysed in greater detail under section 2.2.1. The number of bus trip and bus passengers per location from the Planet projects data is summarised in Table 3-1.

Table 3-1: Summary of Planet Projects Data (Daily Values)

S.No.	Name of Location	Number of Bus Trips	Number of passengers
1	Abule Egba	25	329
2	Agege	34	481
3	Alaba	3	37
4	Berger	119	1,158
5	Jibowu	184	3,001
6	Obalende	24	329
7	Mile 2	533	4,910
8	Ikotun	65	841
9	Iyana Iba	32	384
10	Iyana Ipaja	264	3,577
11	Ketu	365	4,361
12	Mazamaza	49	688
13	Ojota	757	8,251
14	Oju Elegba	54	734
15	Oshodi	709	10,217

[33] Planet Project is one of the most prominent Nigerian companies operating in construction, operation and consulting for transportation infrastructure in the country. The intra-city Ikeja Bus Terminal facility was constructed by Planet Project under World Bank financed LUTP-2 project.
The CPCS team consulted with Planet Projects to gauge their interest as a potential private sector partner and also to seek their views on the sector as a whole. They shared data with the CPCS team as a matter of courtesy, and have been given due credit in the report.

S.No.	Name of Location	Number of Bus Trips	Number of passengers
16	Oyingbo	58	1,044
17	Yaba	126	1,572
18	Badagry	599	3,591
19	Ikorodu	527	5,415
20	7Up	167	1,927
21	Ajah	169	1,758
22	Ebute Ero	166	1,724
23	Ajegunle	117	1,482
24	Cele/Okota Road	97	1,234
25	Ijora	82	1,087
26	Coker	38	788
27	Palmgrove	56	663
28	Volks	49	645
29	Epe	70	634
30	Pen Cinema	37	373
31	Amuwo Kuje	19	307
32	Adeniji Adele	21	217
33	Idumota	20	205
34	Iyana Ejigbo	13	187
35	Iyana School	13	179
36	Mowo	17	97
37	Ishaga	6	79
38	Oluwole	11	76
39	PPL	4	61
	Total	**5,697**	**64,641**

Source: Planet Projects

3.3.2 Survey data

To validate and enhance the existing data, the project team undertook surveys of interstate bus service providers and passengers at various locations. In total, surveys were conducted at 25 locations. Counts were undertaken of the buses arriving at and departing from these locations and the following data was collected:

- Origin/destination of the service;
- Intermediate stops;
- Time of arrival/departure;
- Journey time;
- Fare paid;
- Number of passengers boarding/alighting;
- Type and capacity of the bus; and

- Parking fees paid.

The surveys were conducted during weekdays, and it was observed that buses tended to depart Lagos from early morning till around 11 am. After this there was a lull in traffic, which picked up again after 4.30 pm when buses begun to arrive[34]. This indicates that operators prefer to operate services during the day rather than overnight, most likely driven by security concerns on the highways at night. Further due to security concerns, our survey team was advised not to be at the parks after 6 pm.

A summary of our survey results is given in Table 3-2.

Table 3-2: Summary of CPCS Survey Results (Daily Values)

S.No.[35]	Name of Location	Number of Bus Trips	Number of passengers
1	Abule Egba	93	1,110
2	Agege	21	239
3	Alaba	15	183
4	Berger	175	2,081
5	Fadeyijibowu	89	1,304
6	Iddo	50	742
7	Jibowu	34	494
8	Obalende	50	587
9	Mile 2	237	2,799
10	Ijushaga	13	387
11	Ikotun	39	485
12	Iseri Olofin	5	68
13	Iyana Iba	84	1,248
14	Iyana Ipaja	190	2,728
15	Ketu	57	608
16	Mazamaza	59	788
17	Mile 12	4	60
18	Oja Oba	10	100
19	Ojota	109	1,244
20	Oju Elegba	68	880
21	Oshodi	215	2,933
22	Otto	16	164
23	Oyingbo	68	1,145

[34] During the presentation on WP#1 and WP#2 made on April 5, 2018, Engr. Abiodun Dabiri (M.D., LAMATA) commented on this observation stating that in case of neighbouring states of Ogun and Oyo where the journey time is estimated to be 1-2 hours, arrivals into bus parks would be expected throughout the day, especially pre noon. We have taken cognizance of this.

[35] Even though the survey was conducted at 40 individual parks, clusters of parks in close proximity to one another with the boundaries often being seamless have been treated as 1 park. Therefore, this data has been grouped under 25 locations.

S.No.[35]	Name of Location	Number of Bus Trips	Number of passengers
24	Toll Gate	21	277
25	Yaba	70	803
	Total	**1,792**	**22,347**

Source: CPCS Survey

Other observations from the survey:

- Majority of buses are 14-18 seater capacity, with close to 95% running to full capacity;
- Many of the bus parks are just open spaces at the side of the road with little facilities available for passengers and drivers (sometimes not even public conveniences);
- Bus Parking fees is unregulated and varies across parks and type (and capacity of bus); ranges from Naira 200-1,000 per trip or per day for a 7- 18 seater bus to Naira 2,800 for a bus plying on an international route. Some luxury buses are charged as much as Naira 15,000 per trip at some parks;
- Security at the parks was very lax; and
- The main public transport to and from the parks were danfos (mini buses) or private taxis. No designated car parking facilities were available.

3.4 Traffic projections

3.4.1 Modelling methodology

To get an overall estimate of the number of inter-state bus services going to and from Lagos as well as the total number of passengers, a combination of the Planet Projects data and the CPCS survey data was used. This gave a total of 47 bus/motor park locations. At each of these locations, the data reviewed to determine what the most common origins/destinations are of the buses using the motor parks. Each of these motor parks were then allocated to one or more of the 5 mega terminals, based on their location on the key highways in and out of Lagos. This was done based on our knowledge of interstate bus traffic and passenger movements in and out of Lagos. Most of the buses from an existing bus park were allocated to a single mega terminal, though some were allocated to two terminals.

For each of the 5 proposed mega terminals, Table 3-3 describes how many passengers and bus trips they are expected to serve along with the list of major bus parks which currently cater to this demand. The daily bus trips and passenger numbers were based on a combination of the Planet Projects data and the CPCS survey data.

Table 3-3: Expected Demand Assignment for each of the Mega Terminals (current bus trips and passengers)

S.No.	Daily Bus Trips	Daily Passengers	Mega Terminal	Current Motor Parks serving this demand
1	981	7,696	Agbara	Badagry Iyana Iba Mowo Amuwo Kuje (20%)

S.No.	Daily Bus Trips	Daily Passengers	Mega Terminal	Current Motor Parks serving this demand
				Cele/Okota Road (32%) Ebute Ero (20%) Mile 2 (40%)
2	3,310	40,776	Berger	7Up Adeniji Adele Ajegunle Berger Coker Idumota Ijora Ishaga Iyana Ejigbo Jibowu Mazamaza Obalende Ojota Oju Elegba Oluwole Oyingbo Palmgrove PPL Yaba Amuwo Kuje (80%) Cele/Okota Road (68%) Ebute Ero (80%) Ketu (60%) Mile 2 (60%) Oshodi (70%) Volks (80%)
3	328	3,695	Epe	Ajah Epe Fadeyijibowu
4	796	8,784	Odogunyan	Alaba Iddo Ikorodu Iseri Olofin Iyana School Mile 12 Oja Oba Otto Ketu (40%) Volks (20%)
5.	740	10,111	Sango	Abule Egba Agege Ijushaga Ikotun Iyana Ipaja Pen Cinema Toll Gate Oshodi (30%)
	6,154	**71,062**	**Total**	

The combination of the CPCS survey data and the Planet Projects data, indicates that there are approximately 6,200 interstate bus services to and from Lagos every day, carrying approximately 71,000 passengers. Over half the bus trips and passengers will use the mega terminal at Berger, and hence this will have to be the largest of the five facilities. These are taken to be the current year bus and passenger numbers, and have been taken as the base for our traffic forecasts.

3.4.2 Traffic projections

The proposed locations are strategically located at the outskirts of the Lagos city, adjacent to the five main gateway corridors out of Lagos. The establishment of the mega terminals at the outskirts of the city will assist in reducing the congestion on Lagos roads by stopping inter-city bus operators from extending their services into the city. Thus, passengers travelling from other States will disembark at the mega stations and utilise the Lagos intra-city transport services (local buses, rail and inland water transport services, where available) to final destinations within the city.

The five gateway corridors connect Lagos to other parts of the country and other West African countries[36]. Based on anecdotal evidence, the Lagos-Ibadan (E1) expressway accounts for the largest share of traffic in and out of Lagos and it followed by the Lagos-Abeokuta (A5) expressway. While there are no recent bus traffic data across these five gateway corridors, a 2016 study of freight traffic in Lagos provides an indication of the distribution of travel demand across the corridors and confirms that the Lagos-Ibadan (E1) expressway is the main gateway corridor in the city.

To develop the forecast growth in interstate bus traffic, the following broad factors have been considered, as outlined on Section 3.2.

- Macroeconomic factors;
- Historic transport demand;
- Urbanisation and urban development plans and;
- The destinations/routes served by individual mega terminals.

Over the last 5 years, bus and other public transport ridership in Lagos has grown by over 10% annually, and are expected to do so over the coming years. While national GDP is expected to grow around 2% per annum over the next 10 years, the Lagos State economy is expected to grow significantly faster at around 8% per annum. Population in Lagos and Nigeria as a whole is expected to grow at 3% per annum, according to official estimates. Nigeria is experiencing a rapid rate of urbanization, especially in Lagos State where new urban development schemes are being planned.

Based on their locations in Lagos, the individual mega terminals will serve a slightly different combination of regions, states and cities in Nigeria, with services operating along different routes. This will lead to differences in passenger growth rates for each of the mega terminals, as the macroeconomic factors influencing traffic will vary based on the regions served. Broadly we have assumed the individual mega terminals will serve the following regions:

[36] The Lagos – Badagry Expressway is expected to be a component of the Lagos – Abidjan Highway corridor and expected to be a part of the proposed Trans-West African Coastal Highway from Lagos to Dakar, Senegal.

- Agbara: Will serve regions and cities to the West of Lagos as well as international destinations;
- Sango: Is located on the main Lagos-Abeokuta (A5) expressway, and will serve regions and cities to the north of Lagos. This expressway is expected to see a significant increase in traffic in the future;
- Berger: Is located on the Lagos-Ibadan (E1) expressway, which accounts for the largest share of traffic in and out of Lagos, is expected to see a significant increase in traffic in the future. The mega terminal will serve passengers travelling to most other major regions and cities in Nigeria;
- Odogunyan: Is expected to serve some of the traffic going to northern cities in Nigeria including Kano and Sokoto; and
- Epe: Is expected to serve regions and cities to the east of Lagos.

Given the historic demand, macroeconomic factors, future development plans and the location of the individual mega terminals, Table 3-4 outlines our assumed growth rates of passengers for each individual mega terminal in the base case scenario:

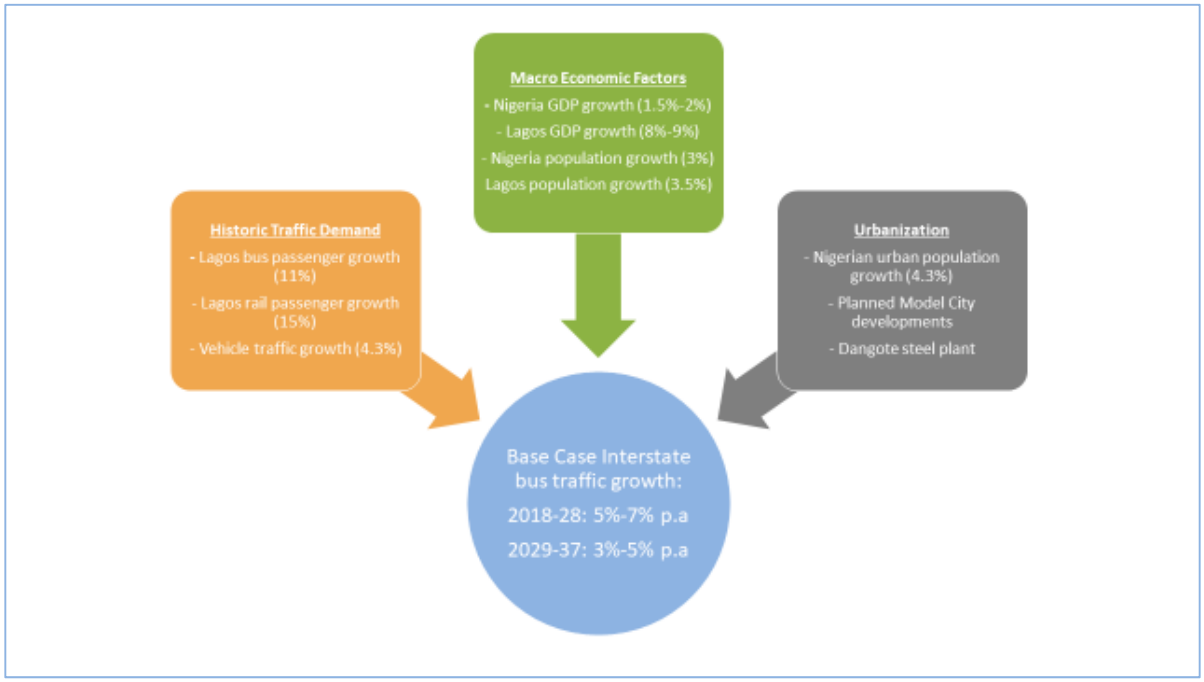
Table 3-4: Interstate Bus Traffic Annual Growth by Mega Terminal

	2018-28	2029-37
Agbara	6%	4%
Sango	7%	5%
Berger	7%	5%
Odogunyan	5%	3%
Epe	6%	4%

Source: CPCS Analysis

The derivation of these growth rates are described in Figure 3-2.

Figure 3-2: Derivation of Traffic Growth Rates



In the high growth scenario, it has been assumed that improved service levels, the impact of the proposed Lagos bus reform program, and better passenger facilities at the mega terminals, will all lead to additional induced demand for interstate bus services. The traffic growth assumptions under the 3 scenarios are given in Table 3-5.

Table 3-5: Interstate Bus Traffic Annual Growth (3 Scenarios)

	2018-28	2029-37	2018-28	2029-37	2018-28	2029-37
	Base Case		High Growth		Low Growth	
Agbara	6%	4%	9%	6%	3%	2%
Sango	7%	5%	10%	7%	4%	3%
Berger	7%	5%	10%	7%	4%	3%
Odogunyan	5%	3%	8%	5%	2%	1%
Epe	6%	4%	9%	6%	3%	2%

Source: CPCS Analysis

There are plans for a whole new Model City developments along the Lekki/Epe corridor, as well as new Dangote oil refinery near Epe which is expected to be operational by 2019. These developments mean that there will potentially be additional passenger using the Epe mega terminal from 2020 onwards. To reflect these additional passengers, the forecasts for Epe only have been in increased by 5% in 2020 and 5% in 2021 (10% overall).

It should be noted that the number of buses operating (i.e. daily bus trips) for the base year are based on medium size buses with a capacity of 14-18 passengers each. This bus size reflects our survey observations and should not be confused with bus capacities used in chapter 4 (specifically table 4-1) to estimate terminal infrastructure requirements. The number of vehicle-trips for future years do take into account the changing composition of buses over time reflected in the assumption detailed in Chapter 4.

The 20-year traffic forecasts (both in terms of number of buses operating and passenger numbers) for each of the mega terminals under each of the scenarios is given in Table 3-6.

Table 3-6: Forecast of Daily Bus Trips and Passengers at the Proposed Terminals

	2019		2023		2028		2033		2037	
	Vehicle Trips	Passengers	Vehicle Trips	Passengers	Vehicle Trips	Passengers	Vehicle Trips	Passengers	Vehicle Trips	Passengers
Agbara										
Base	767	8,158	822	10,299	928	13,783	866	16,769	589	19,617
High	789	8,389	945	11,841	1,227	18,219	1,259	24,382	923	30,781
Low	745	7,927	712	8,922	697	10,343	590	11,419	371	12,361
Berger										
Base	4,102	43,630	4,564	57,190	5,402	80,212	5,287	102,373	3,733	124,435
High	4,217	44,853	5,241	65,670	7,122	105,761	7,661	148,336	5,833	194,438
Low	3,987	42,407	3,959	49,610	4,065	60,358	3,614	69,971	2,363	78,753
Epe										
Base	368	3,917	395	4,945	446	6,617	416	8,051	283	9,418
High	379	4,028	454	5,685	589	8,747	605	11,706	443	14,779
Low	358	3,806	342	4,284	334	4,966	283	5,483	178	5,935
Odogunyan										
Base	867	9,223	895	11,211	964	14,309	857	16,588	560	18,670
High	892	9,487	1,030	12,907	1,277	18,965	1,250	24,204	883	29,420
Low	842	8,960	774	9,699	721	10,708	581	11,254	351	11,711
Sango										
Base	1,017	10,819	1,132	14,181	1,339	19,890	1,311	25,385	926	30,856
High	1,046	11,122	1,300	16,284	1,766	26,226	1,900	36,783	1,446	48,215
Low	989	10,516	982	12,302	1,008	14,967	896	17,351	586	19,528
Total										
Base	7,121	75,747	7,808	97,826	9,079	134,811	8,737	169,166	6,091	202,996
High	7,323	77,879	8,970	112,387	11,981	177,918	12,675	245,411	9,528	317,633
Low	6,921	73,616	6,769	84,817	6,825	101,342	5,964	115,478	3,849	128,288

Source: CPCS Analysis

For the bus parks the traffic forecasts indicate that there is a significant variance between the number of buses to be handled daily between individual parks. In 2018, Epe will handle around 330 inter-state buses per day, Agbara will have to handle nearly 3 times that volume at around 981 buses a day, while Berger which is expected to be the largest Mega Terminal will handle over 3,000 interstate buses and over 40,000 passengers per day. While the figure for number of buses to be handled appears high, it must be noted that the majority of these buses have a capacity of less than 20 passengers.

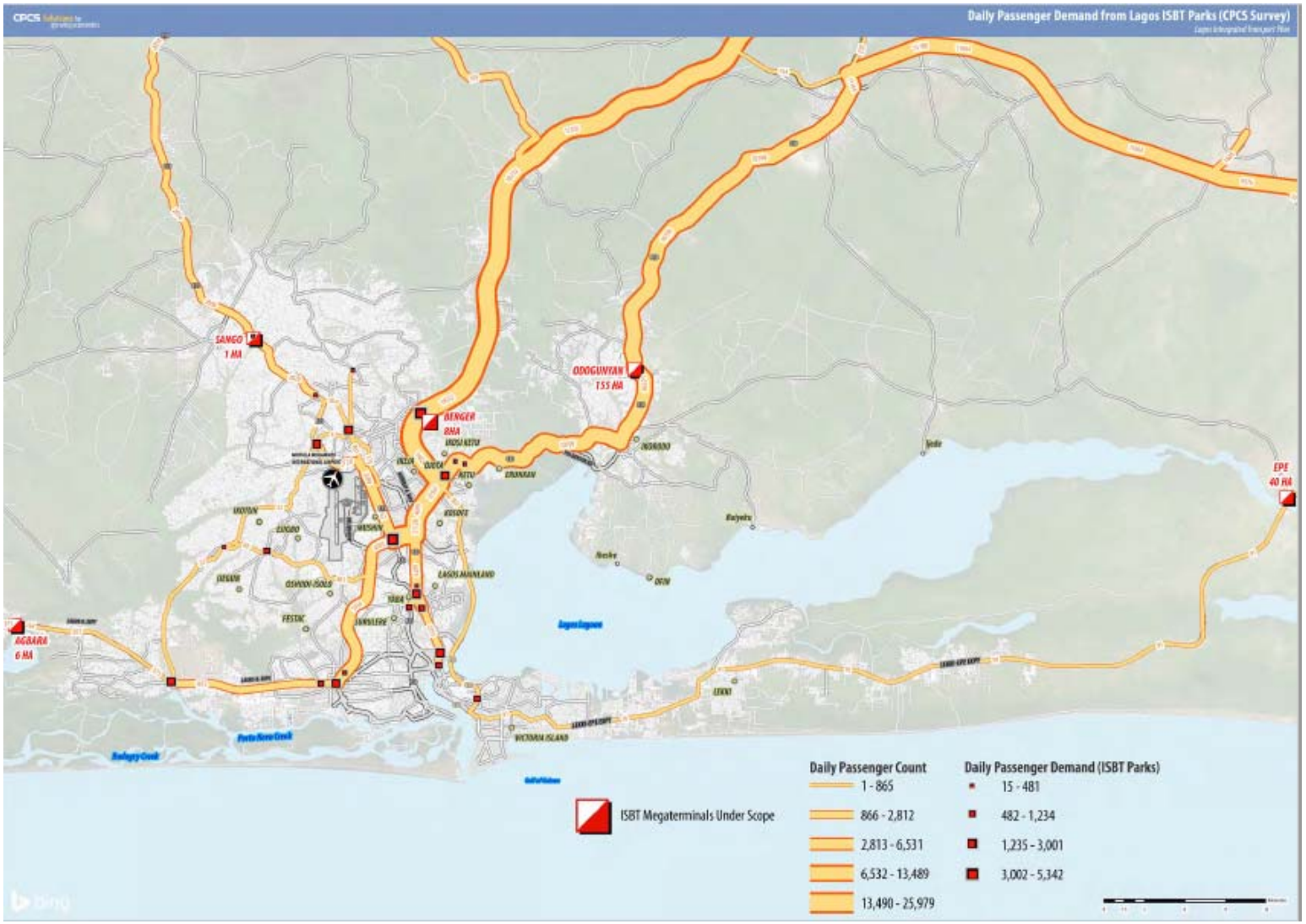
3.4.3 Global Comparison

To put this in perspective, based on case studies discussed in Chapter 3, the following are examples of traffic handled at similar bus terminals internationally:

- Swami Vivekanand Inter State Bus Terminus (New Delhi, India) – Handles between 1,800 to 2,000 interstate buses a day, and a similar number of intra-city buses, with an average capacity of over 70 passengers per bus aggregating to 280,000 passengers daily.
- Mien Dong and Mien Tay Bus Terminals (Ho Chi Minh City, Vietnam) – These terminals currently handle around 750 buses a day, though they are being expanded to each handle around 1,800 buses on a daily basis, with average capacity of over 60 passengers per bus.
- Mo Chit Bus Terminal (Bangkok, Thailand) – The terminal currently serves 90,000 to 100,000 passengers per day. It is being expanded to handle 150,000 passengers per day.

Based on the number of buses handled per day, the proposed terminals are not significantly larger than similar terminals in other developing countries.

Figure 3-3: Daily Passenger Flow at Mega Terminals based on CPCS Survey



4Facility Configuration and Service Design

Key Messages

Determinants of Terminal Capacity and Design

This chapter provides an implementation blueprint for the Mega Terminals based on assessment of the following factors based on which the size, capacity and infrastructure to be provided at each Mega Terminal site has been determined:

- Bus Types and Capacities: Average capacity of Inter-state buses is anticipated to rise from the current 19 passengers to 60 passengers in 2037 as the sector becomes more organized and consolidation of operators occurs. Two bus types (60 and 76 seat capacities) are expected for Lagos state buses, with a gradual transition to more higher-capacity buses over time.
- Flow Patterns of inter-state bus passengers: Based on the survey conducted, flow of inbound passengers peaks between 6am to 11am while that for outbound passengers peaks between 4pm to 9pm
- Dwell Times: We used ½ hour on average per passenger between arriving and departing the terminal.
- Peak Bus Frequency: Each of the facilities is designed to accommodate the number of buses in the terminal during the time period with the highest number. This occurs between 8am and 9am for Lagos State buses and between 6pm and 7pm for interstate buses.

Based on the above, we project the maximum hourly bus frequency for each Terminal for Base, High and Medium scenarios.

Terminal Design Criteria and Capacity

We recommend that terminals be designed to accommodate the number of buses in revenue service based on the 2037 base case traffic scenario. The Lagos State buses will be a mix of 76 and 60 seater buses and will require parking space of 100 m2 per bus. The interstate Buses will be 60 seater buses and will require parking space of 90 m2 per bus. We provide estimates for land requirements based on the above requirements, assuming additional land requirements of 50% (of parking requirements) for drive lanes and passenger walkways.

Terminal	Site Land Requirements (hA)	Available Land (hA)
Agbara	1.7	6
Berger	10.6	8
Epe	1.0	40
Odogunyan	1.7	155
Sango	2.9	1

While the above land requirements are for operational purpose, based on the attractiveness of the particular sites, land maybe developed on a commercial basis for expanding revenue base.

Key Messages (contd.)

Core Infrastructure Facilities

Key principles on which we have based our site design include:

- Segregation of passenger and vehicle traffic by physical barriers where possible and with painted crossing marks otherwise;
- Separate parking areas as well as entrances and exits for Lagos State and Interstate buses;
- One way bus flow (except in exceptional cases) with saw tooth parking;
- Terminal buildings at the centre of the parking areas for Lagos State and Interstate buses;
- Site perimeter secured by chain link fence; and separation of non-revenue from revenue areas by chain link fence;
- Controlled access into the terminal at all entry/exit points; and
- Disabled friendly.

Transit Oriented Development

Terminals are largely designed as connection hubs for interstate travellers to connect between interstate and Lagos State buses. Larger terminals will include park-and-ride facilities. All ISBT will permit entry by pedestrians. We analyze the possibility of developing ISBT into transportation hubs by using the sites for stations for LRT lines and BRT.

Terminal Building

The main purpose of the terminal building is to facilitate ticket sales to passengers both via vending machines and sales counters; to provide real-time passenger information; and to provide basic passenger amenities such as washrooms and rest areas. They are to be aesthetically attractive to users and to provide them with a positive experience by including spacious and bright passenger areas with comfortable seating, as well as adequate facilities for the mobility impaired.

Services and Revenue sources

- Parking spots for Lagos State buses and interstate buses to collect and discharge passengers (Gate-to-gate time of 45 minutes for collecting and 15 minutes for discharging) for an access fees
- Stabling, cleaning and (possibly) maintenance facilities for Lagos State buses when not in revenue service for a lease rental
- Terminal Building with space for:
    - ticket sales (by operators or third parties)
    - passenger amenities
    - retail and dining
- Park-and-ride and Kiss-and-ride facilities

Commercial Development

Based on permissible land use and building regulations, the following are the potential avenues for commercial development:

- Concession stands;
- Leasing of retail/commercial space; and
- Advertising.

4.1 Background

In order to determine the number of interstate and the Lagos State (city) buses needed to handle this traffic, we need to anticipate the bus types, capacities, and load factors in future years.

4.1.1 Bus Types and Capacities

Based on data included the Inter-state Gateways Terminals prepared by LAMATA and the CPCS Bus Park surveys, Table 4-1 gives estimates of buses and bus capacities plying the terminals in the future years.

Table 4-1: Estimted Type and Capacity of Interstate and Lagos State Buses

	Bus Capacity	2018	2023	2028	2033	2037
Interstate Buses						
Minibuses	15	59%	60%	54%	42%	0%
Cars	7	28%	14%	7%	0%	0%
Luxury Bus	60	13%	26%	39%	58%	100%
Average Capacity		**19**	**26**	**32**	**41**	**60**
Lagos State Buses						
Marco Polo high capacity buses	76	15%	35%	55%	75%	95%
Marco Polo low capacity buses	60	85%	65%	45%	25%	5%
Average Capacity		**62**	**66**	**69**	**72**	**75**

Source: CPCS Analysis

4.1.2 Patterns of Flow

Daily distribution of passenger flows over a typical 24-hour day were modelled based on data collected through surveys, as given in Figure 4-1 and Figure 4-2:

Figure 4-1: Distribution of Inward Passengers on typical day

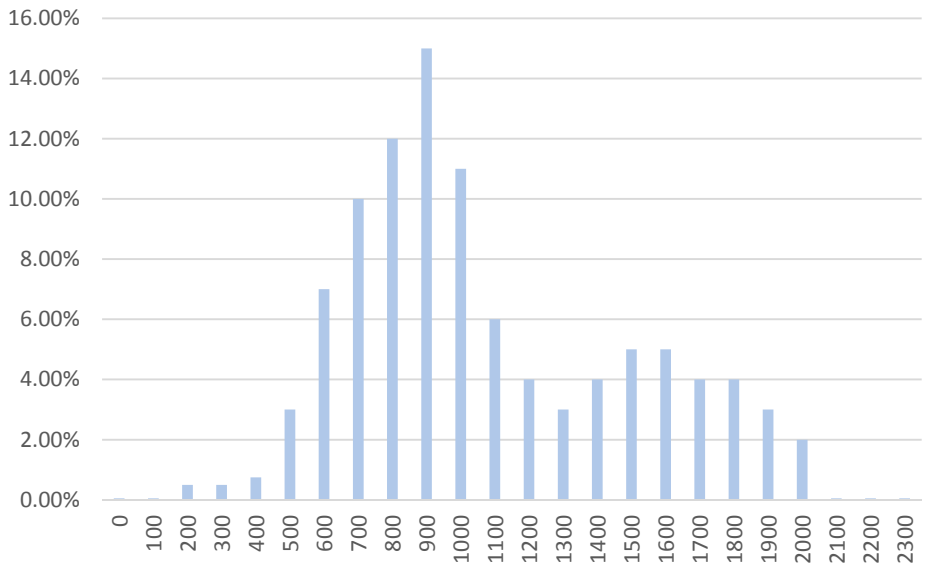
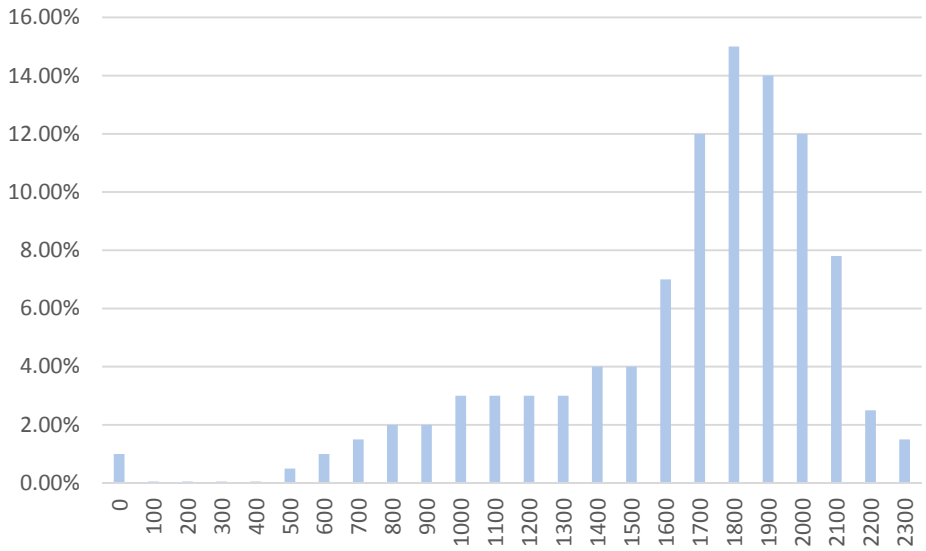


Figure 4-2: Distribution of Outward Passengers on typical day

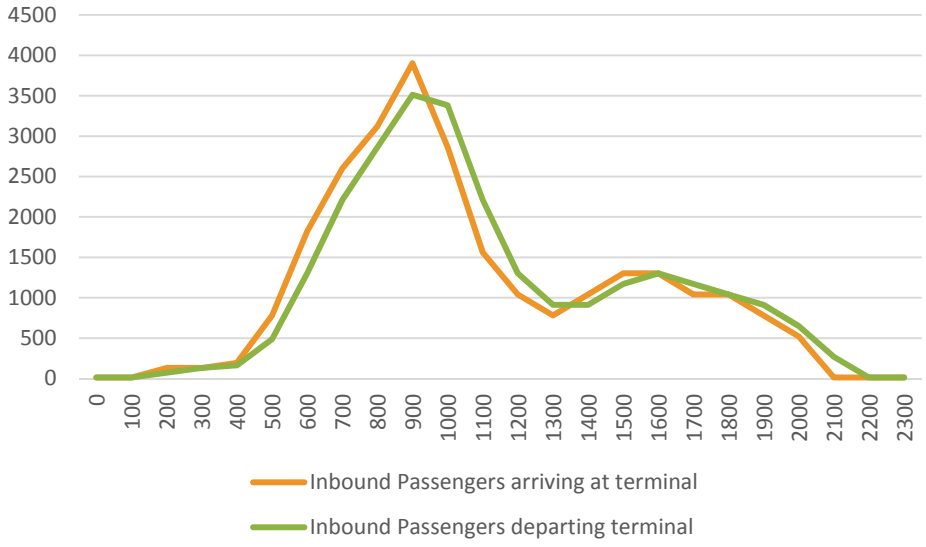


Source: CPCS Analysis

4.1.3 Dwell times

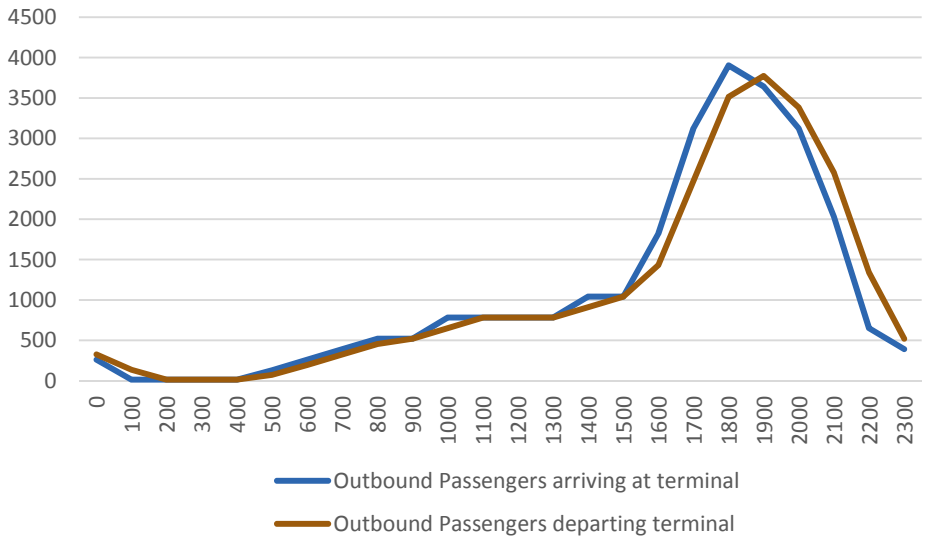
In our analysis, we used ½ hour on average per passenger between arriving and departing the terminal. Projected arrival and departure times are given in Figure 4-3 and Figure 4-4.

Figure 4-3: Projected Arrival and Departure Times of Inbound Passengers at Berger Interstate Terminal (2023, High Traffic Scenario)



Source: CPCS Analysis

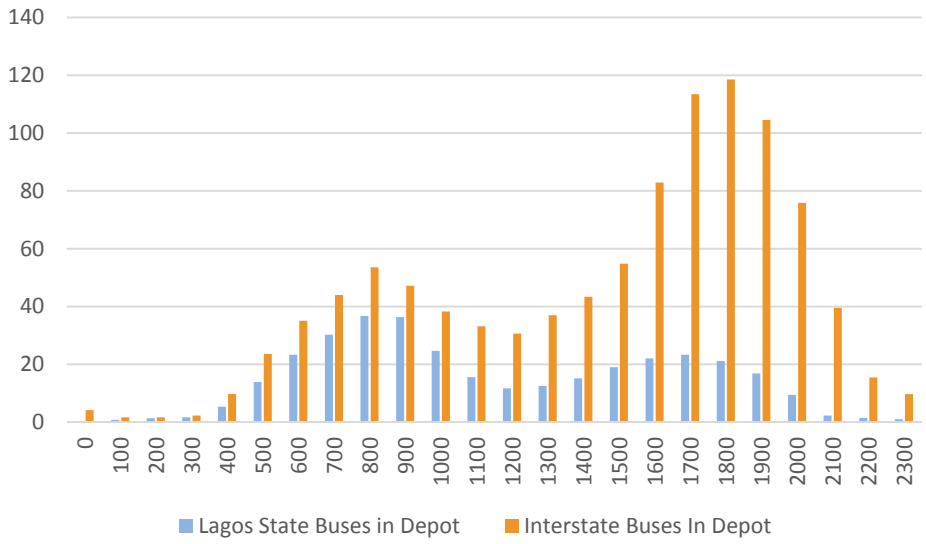
Figure 4-4 Projected Arrival and Departure Times of Outbound Passengers at Berger Interstate Terminal (2023, High Traffic Scenario)



Source: CPCS Analysis

In calculating the number of buses arriving and departing the terminal, we assumed load factors of 1 meaning that on average, both interstate and Lagos State buses arrive and depart the terminal at capacity. In addition, we assumed that interstate buses and Lagos State buses were parked for 15 minutes when arriving to deliver passengers to the terminal and 45 minutes when picking up passengers for departure. Figure 4-5 indicates estimates of the number of buses in revenue service parking at the Berger Terminal per hour through the day. (Berger Terminal has been used for illustrative purposes in this section).

Figure 4-5 Buses in Berger Terminal through typical Day (2023, High Traffic Scenario)



Source: CPCS Analysis

Each of the facilities will be designed to accommodate the number of buses in the terminal during the time period with the highest number. This occurs between 0800 and 0900 AM for Lagos State buses and between 1800 and 1900 for interstate buses. Within our calculations, we have allowed for 15 minutes in the terminal for buses with passengers disembarking and 45 minutes for passengers boarding.

It is our recommendation that terminals be designed to accommodate Lagos State buses until 2037 in the base scenario[37]. In addition, we recommend that terminals be designed to accommodate interstate buses based on 2037 base scenario traffic estimates and also the projected bus mix of 2037 (60-passenger capacity) as per Table 5-1. Given the transition to higher-capacity interstate buses, it will be necessary to reconfigure the bus parking over time. Clearly, if traffic develops as per base case projections, the terminal will have excess capacity until 2037. However, it is our belief that this is more economical than having to add capacity within the 15-year period.

4.2 Size and Location of Terminals

4.2.1 Size of terminals

Terminals will be designed to accommodate the number of buses in revenue service based on the 2037 base case traffic scenario. The Lagos State buses will be a mix of 76 and 60 seater buses and will require parking space of 100 m^2 and 90 m^2 per bus. The interstate Buses will be 60 seater buses and will require parking space of 90 m^2 per bus. The revenue bus parking requirements per terminal is given in Table 4-2.

Table 4-2: Revenue Bus Parking Requirements – 2037 base case

	Design Capacity (buses)	
Terminal	Lagos State Buses	Interstate Buses
Agbara	14	19
Berger	88	121
Epe	7	9
Odogunyan	13	18
Sango	22	30

In addition, we propose that there be additional parking for Lagos State buses when not in revenue service. Our analysis is based on providing sufficient parking in revenue and non-revenue parking lots for all Lagos State buses serving the terminal. In order to estimate the

[37] We considered designing the terminals as per 2037 high-scenario traffic levels instead of 2037 base case. However, given the time span of 15 years, we felt this was too much of a stretch. 2037 base case projects are the about the same as 2025-26 high scenario. So even if traffic grows in line with the high scenario, it will be 2025 or 2026 when bus parking capacity will need to be increased. All sites are of land area to permit future expansion beyond design capacity (based on 2037 base case traffic levels) except for the Sango site because of limitation of land availability. Terminals will be designed to facilitate the addition of parking for interstate and Lagos State buses if and when needed.

number of the buses serving each terminal, we assumed cycle times[38]as given in Table 4-3. Projections were based on 2037 base case traffic scenarios.

Table 4-3: Lagos State Bus Parking – Not in Revenue Service – 2037 base case

Terminal	Cycle Time (hours)	Non-revenue Bus Parking Spots required
Agbara	6	64
Berger	6	404
Epe	10	41
Odogunyan	8	69
Sango	8	115

4.2.2 Land requirements

Assuming additional land requirements of 50% (of parking requirements) for drive lanes and passenger walkways, the total land requirement for individual parking facilities are given in Table 4-4.

Table 4-4: Land Requirement (m^2) for Parking of Buses at each Terminal

Terminal	Revenue		Non-Revenue
	Lagos State buses	Interstate buses	Lagos State buses
Agbara	1,707	2,352	7,853
Berger	10,289	14,918	49,814
Epe	820	1,129	5,043
Odogunyan	1,625	2,238	8,544
Sango	2,685	3,699	14,121

Additional land will be required for terminal buildings and employee parking. Depending on local demand at each terminal, facilities could include kiss-and-ride[39], park-and-ride and local public transit parking. We have assumed between 33% (Berger) and 50% (Epe) of bus parking requirements for these facilities. The total land requirements per terminal is given in Table 4-5.

Table 4-5: Land requirements for Terminals

Terminal	Site Land Requirements (hA)	Available Land (hA)
Agbara	1.7	6
Berger	10.6	8
Epe	1.0	40
Odogunyan	1.7	155
Sango	2.9	1

[38] Cycle time is the between departure from and return to the terminal but does not include time in terminal awaiting passengers.

[39] Kiss and ride refers to facilities for the dropping off and picking up of passengers as opposed to park-and-ride where commuters drive to parking lots and park their cars for the day.

With the exception of Sango and Berger, there is more than ample land available at all proposed terminal sites. In the case of Sango, the size of the site may limit development of the site with all the required facilities. This is best dealt with in future years by converting non-revenue parking areas to revenue parking areas; and arrange for non-revenue parking (stabling off-site).

4.2.3 Suitability of identified locations

Listed below are some further observations on individual sites that require confirmation by LAMATA:

- All sites appear suitable and we have not come across any information which would preclude them from serving as bus terminals subject to successful land acquisition;
- Road access to all sites is good; access to Agbara and Berger will require grade separations for road and pedestrian access on account of buildup in the local areas;
- Utility access seems conducive at all sites;
- Agbara and Sango sites are prone to flooding and will require detailed study and likely significant measures to prevent flooding; and
- Please see Chapter 8, Section 8.3 for assessment of land ownership and estimates for acquisition costs.

4.2.4 Additional locations proposed by MOT

The Lagos State Ministry of Transport (MOT) provided us with 9 additional potential locations for mega terminals on August 2, 2018. These were at:

- Ojodu/Abiodun (Yakoyo Road)
- Ojodu-Berger (Inward Lagos)
- Ajegunle (At Abukan between Alakuko and Ajegunle)
- Ipaja/Ayobo (Located at Ayetoro)
- Ogijo
  - Option 1: Located at Ita Oluwu bus stop
  - Option 2: Located at Barrack bus stop
- Itoikin (Located at Idera)
- Mojoda (Located at Odo Ajagun)
- Agbara
- Mowo

No detailed assessment or site visits were undertaken at these locations due to the fact that information about them was received very late during the project. However, a preliminary assessments of the sites revealed that these sites are far too small to accommodate a mega terminal. They appear to be narrow strips (6-7m wide by 30m in length) by the side of the road.

4.3 Service Requirements and Passenger Amenities

4.3.1 Core Infrastruture requirements

A review of bus terminal projects from around the world suggests that the best practices in terminal planning and design are people centric. As such, the design of bus terminal infrastructure, its operation and maintenance should be guided by the vision of securing a high level of safety and comfort for passengers combined with efficient and organized operations of buses within the terminal. Key principles on which we have based our site design include:

- **Passenger Safety and Security**
  - Segregation of passenger and vehicle traffic by physical barriers where possible and with painted crossing marks otherwise
  - Entry into terminal permitted only to paid customers and bus and terminal staff with security assured by perimeter chain link fencing as well as gated and guarded vehicle, pedestrian and staff entrances.
  - Lighting designed to meet minimum illumination levels and quality standards for both indoor and outdoor application. With maximum use of natural lighting elements such as sky lights in terminal buildings.
  - Signage, including both dynamic and fixed signage, to assure safe and efficient movement of vehicles and passengers.
  - Public address system integrated into the design, at all terminal facilities to provide a robust, functional, and visually discrete system that can provide communicative information and also be linked to the security
- **Passenger Comfort**
  - Terminal buildings at the centre of the parking areas for Lagos State and Interstate buses with amenities such as ticket sales, waiting areas, washrooms, baggage storage, retail and restaurant areas.
  - Sufficient seating within the terminal to accommodate 20% of passengers during peak hour of operation. Seating will be located within terminal buildings and also located within the bus parking areas where it will be necessary to locate seating so as to avoid obstruction to the flow of passengers. Seating should be designed to combine comfort, ease of maintenance and resistance to vandalism.
  - Hardscape and landscaping: Outdoor passenger areas will be smoothly hardscaped and clearly marked to smooth passenger flow. The paving's surface quality will ensure durability as well as resistance against wear, walking comfort and usability by wheelchairs and baggage trolleys. Appropriate space within the terminal (approximately 10%) will be set aside for landscaped areas of grass, flowers and trees.
  - The intention is that all surfaces within each terminal will be on one single level. However, there may be requirements for stairs in some cases. Where so, designs will incorporate ramps of appropriate design to accommodate impaired person.

- **Operating Efficiency**

  - Terminal buildings will be located near the center of terminals with parking areas for interstate and Lagos State buses to load/unload passengers on either side so to facilitate passenger transferring directly between buses or having only a short diversion if they choose to pass with terminal buildings.

  - Areas for Lagos State buses will be separate from those for interstate buses; each with their own gated entrances and exits.

  - Terminal buildings will be located with close access to park-and-ride and kiss-and-ride facilities (if terminals are so equipped[40]) and also accessible from public roads for passengers who arrive on foot. LAMATA should consider linking the terminals to the LRT network, when lines close to the terminals become operational.

  - Drive lanes within parking will be one directional and parking will saw-tooth.

4.3.2 Terminal Buildings

The main purpose of the terminal building is to facilitate ticket sales to passengers both via vending machines and sales counters; to provide real-time passenger information; and to provide basic passenger amenities such as washrooms and waiting areas. However, it is recommended that the commercial potential of the terminal building should be exploited by including commercial space for restaurants and retail outlets. It is also recommended that the station buildings be designed to be aesthetically attractive to users and to provide them with a positive experience by including spacious and bright passenger areas with comfortable seating, as well as adequate facilities for the mobility impaired.

4.3.3 Lagos State and Inter-State bus parking areas

Parking layout in the Lagos State bus areas should be designed to meet the physical characteristics of each site and the operational requirements of the terminals. However, it is recommended that if site layout permits, saw tooth parking sites be utilized. Unlike the Lagos State buses, it is expected that there will be various vehicle types plying interstate services including cars, minibuses and luxury buses. The layout of these parking facilities will depend on the type of interstate buses using the terminal, which are expected to change over time.

A key factor in designing bus parking areas is to ensure the physical separation of pedestrian walkways from bus parking and driving surfaces. This can be done by use of curbs, fencing, bollards and grade separated footpaths. Signage needs to be clear, logical and well-placed and as required, paint marks and lighting should be used to illustrate and illuminate the routing. Pedestrian areas will need to be sufficient for passenger queuing for buses, and these areas will need to be clearly set out and positioned so that they do not restrict the movement of other passengers. At key locations, it is recommended to include benches with at least some of them covered.

[40] Determination of whether these facilities should be included at each terminal is beyond the scope of this study and is subject to more analysis. We have included for park-and-ride facilities in the Berger Terminal for illustrative purposes.

Road access to and from the parking areas will be separated from each other to avoid congestion around the areas impeding bus movements. All parking and walking areas in the revenue areas should be paved with concrete or tarmac. The perimeter of revenue areas should be secured with chain-link fencing and all pedestrian and vehicle access points should have the facility to be closed and secured. Facilities will have to be installed to control vehicular access into parking areas.

4.3.4 Non-revenue areas

The parking site for Lagos State buses in non-revenue service will be separate from the rest of the station terminal site but be connected to the Lagos State bus revenue parking areas to enable easy access for buses and employees. The main purpose of these areas are to permit parking of all Lagos State buses serving the terminal when not in service. We have designed capacity so there is sufficient in revenue and non-revenue areas to park all buses serving the terminal (based on 2037 base case traffic scenario).

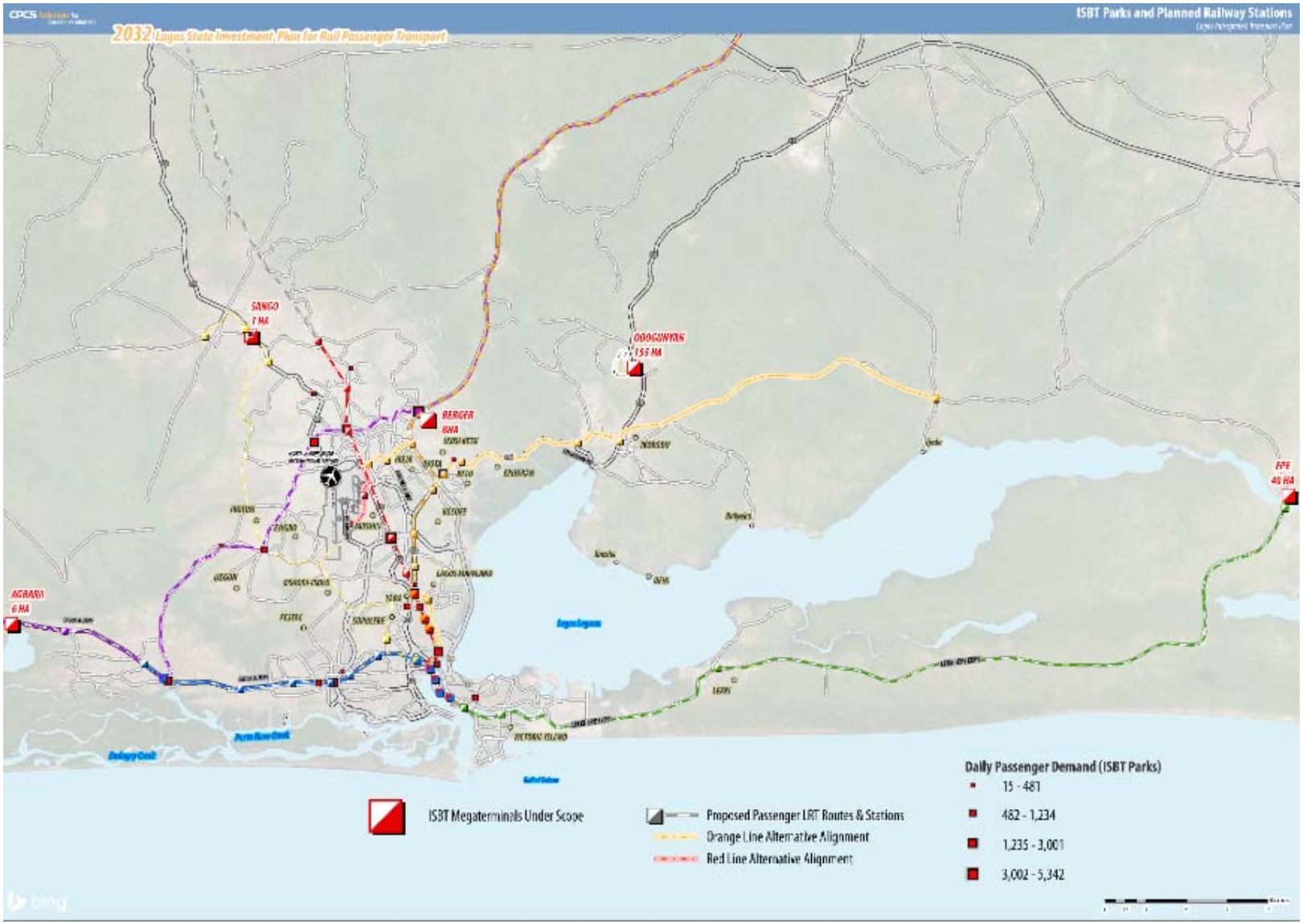
These non-revenue areas should will also include facilities for employees for booking in and resting, as well as any facilities for operations control and management. The larger terminals will include in-ground fuel tanks and fueling equipment. Terminals with fewer buses will include fueling sites where buses can be safely fueled from trucks. All terminals will include facilities for nightly exterior and interior cleaning of buses. In addition, larger terminals (such as Berger) will include one or more bays for routine and light maintenance (such as oil and tire changes). Staff parking should also be included within the facility. The perimeter of the non-revenue areas should be secured by chain-link fences, and the gates protected electronically or by guards. All parking and walking areas in the non-revenue areas should be paved with either concrete or tarmac.

4.3.5 Commercial Development

Some proposed ISBT sites hold more promise for commercial development particularly the Berger site on account of its location and size as well as significantly higher anticipated traffic levels. Although unprecedented in Nigeria and likely a number of years away from being seriously considered, the possibility does exists for development in a major transit hub consisting of major retail/restaurant space, commercial offices and lodging.

The addition of LRT stations to the terminals will go a long way to making any of the terminals a true transit hub. As indicated in Figure 4-6, the proposed locations for Berger and Agbara indicate promise as being locations for Purple Line stations and Epe holds promise as the eastern terminus for the Green Line.

Figure 4-6: Mega Terminals and Linkages with Planned LRT Lines



5 Conceptual Design and Layout

Key Messages

Based on the above, we present conceptual layouts for the terminals. The summary of the major design components is presented below.

	Berger	Sango	Agbara	Epe	Odogunyan
Passengers per Day (2037 base case)	124,435	30,856	19,617	9,418	18,670
Total Parking Areas (spaces)	613	166	96	57	100
Terminal Area Requirements (hA)	10.58	2.87	1.67	0.98	1.74
Paved Area (SM)	75,560	20,506	11,912	6,992	12,407
Landscaped Area (SM)	26,220	6,666	3,229	1,261	3,427
Terminal Building (SM)	1,800	500	500	500	500
Maintenance Depot (SM)	2,000	900	900	900	900
Guard Houses (No.)	6	4	4	4	4
Vehicle Access Points (No.)	6	4	4	4	4
Passenger Access Points (No.)	2	1	1	1	1
Fencing (LM)	1,500	407	236	139	246

5.1 Concept Drawings

5.1.1 Layout Drawings

In the Figure 5-1 and Figure 5-2, we present the terminal layouts for the Sango and Berger terminals designed in accordance to principle presented in the prior chapter.

Figure 5-1: Sango Terminal

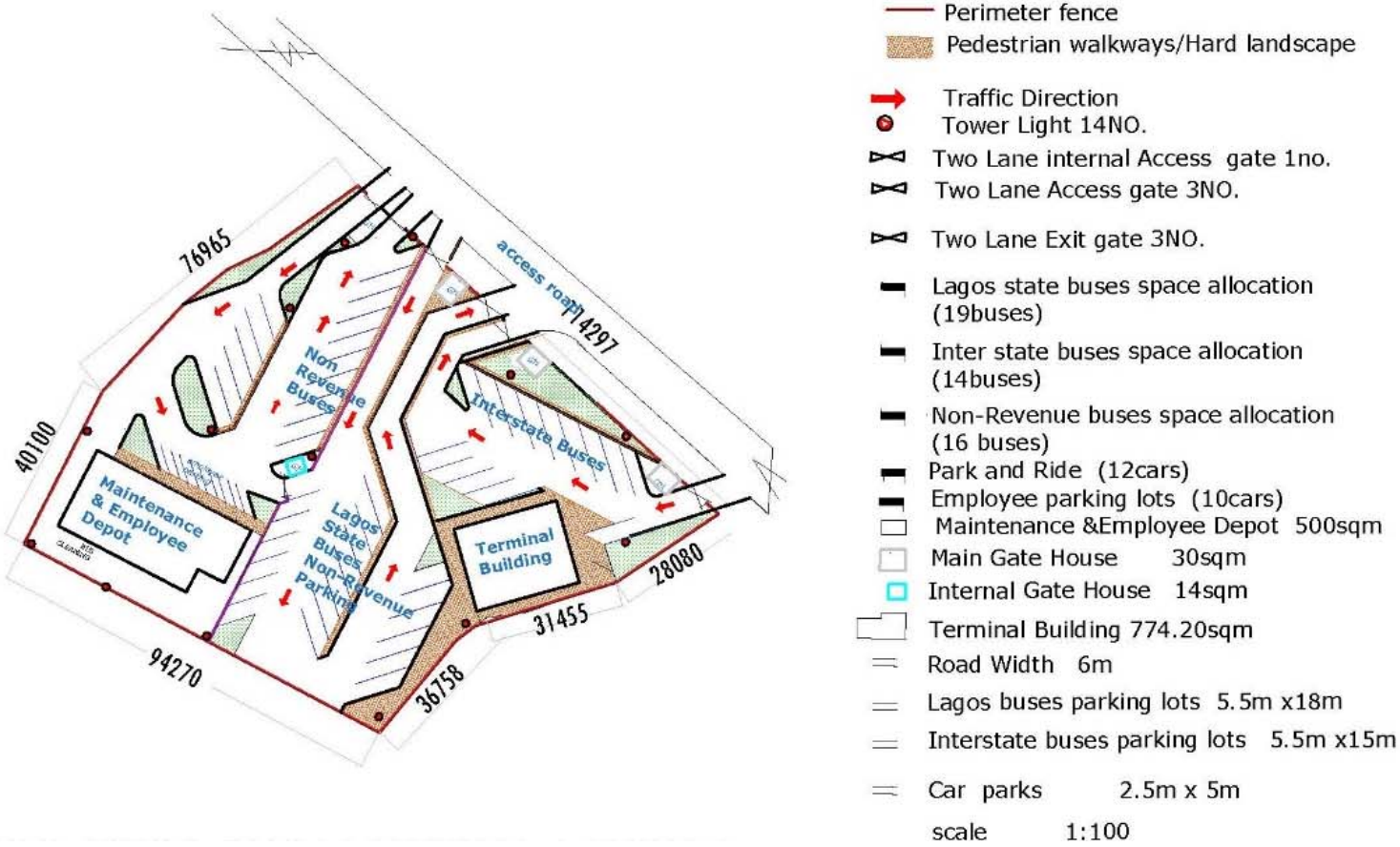
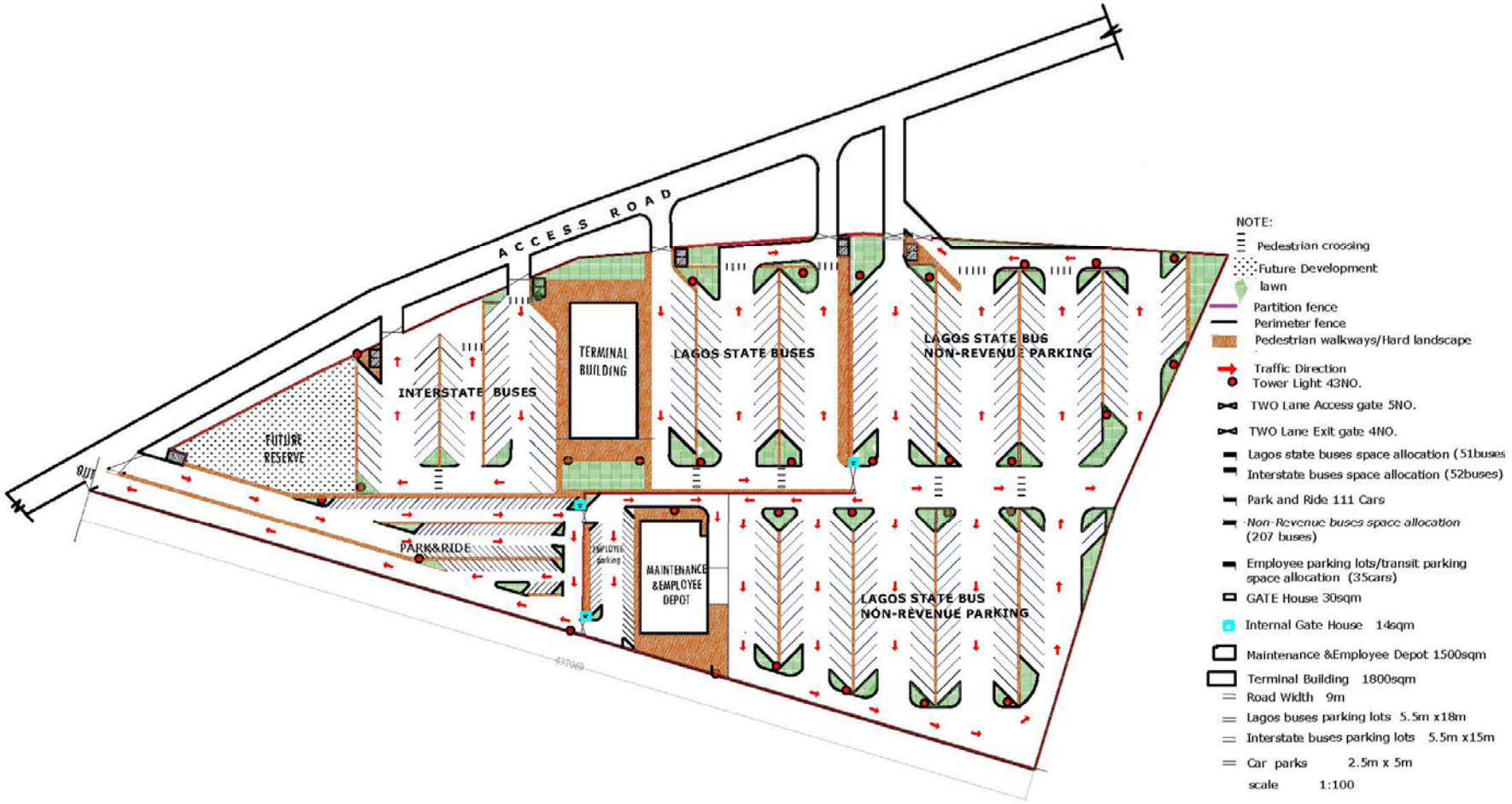


Figure 5-2: Berger Terminal



5.1.2 Terminal Buildings

Figure 5-3 to Figure 5-6 present the terminal and maintenance building layouts for the Berger and Sango terminals designed in accordance to principles presented in Chapter 4.

Figure 5-3: Berger Terminal Building

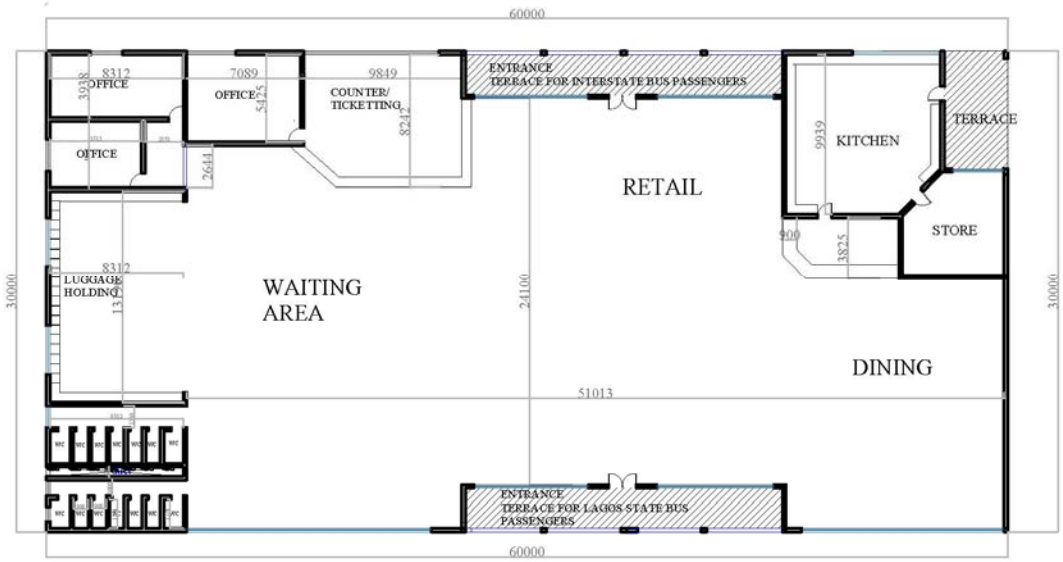
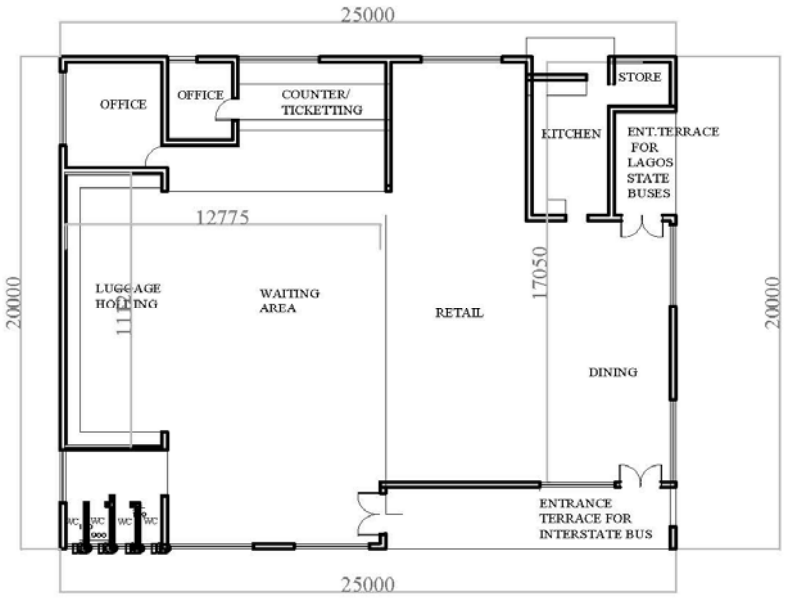


Figure 5-4: Sango Terminal Building



5.1.3 Maintenance Depots

Figure 5-5: Berger Maintenance Depot

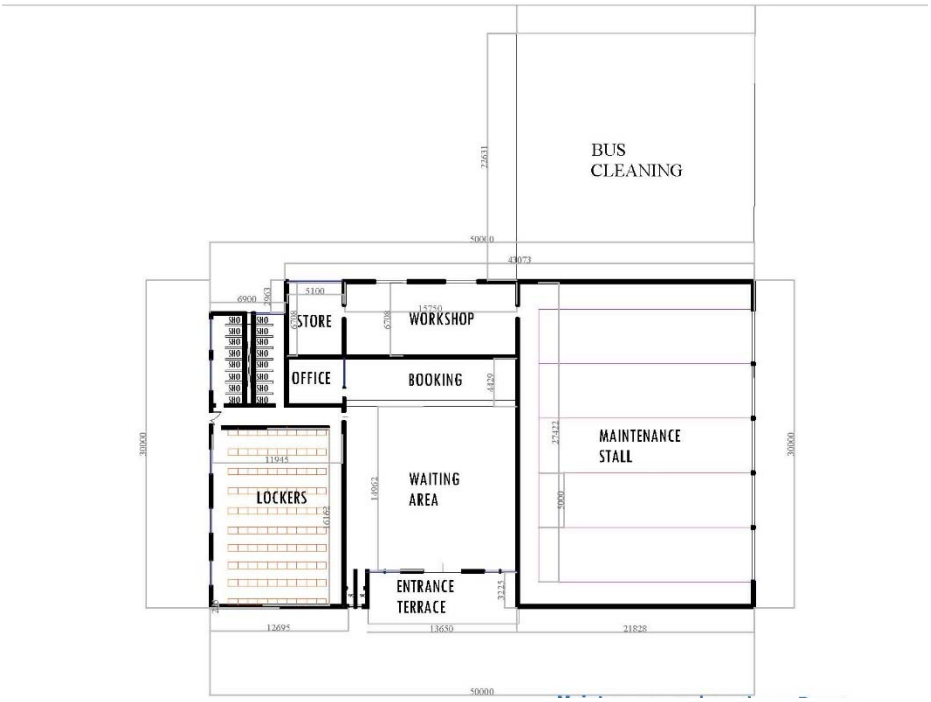
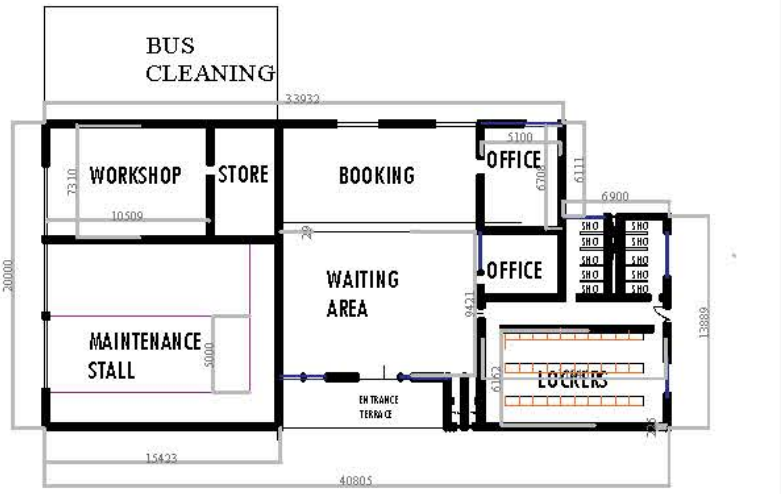


Figure 5-6: Sango Maintenance Depot



5.2 Capital Cost Estimates

5.2.1 Land acquisition

Table 5-1 presents the land acquisition costs for each of the proposed mega terminals.

Table 5-1: Land Acquisition Costs for Terminals

Terminal	Site Land Requirements (hA)	Site Acquisition Cost (US$ 000)	Site Acquisition Cost (Naira 000 000)
Agbara	1.7	579	208
Berger	10.6	22,773	8,198
Epe	1.0	476	171
Odogunyan	1.7	844	304
Sango	2.9	1,396	502

Source: CPCS Estimate based on Market Consultations

5.2.2 ISBT design and construction

Capital costs of design and construction were estimated in two ways:

- A bottom approach based on detailed unit costs and quantities as developed by the project engineers;
- A top down approach based on broad quantities and application of unit costs as deduced from cost on designs and capital cost estimates as prepared by Project Planet for the Ikeja Bus Terminal.

As there was a wide gulf in estimates using the two approached, we developed estimates using a hybrid. Quantities used are given in Table 5-2:

Table 5-2: Quantities used per Terminal

	Berger	Sango	Agbara	Epe	Odogunyan
Passengers per Day (2037 base case)	124,435	30,856	19,617	9,418	18,670
Total Parking Areas (spaces)	613	166	96	57	100
Terminal Area Requirements (hA)	10.58	2.87	1.67	0.98	1.74
Paved Area (SM)	75,560	20,506	11,912	6,992	12,407
Landscaped Area (SM)	26,220	6,666	3,229	1,261	3,427
Terminal Building (SM)	1,800	500	500	500	500
Maintenance Depot (SM)	2,000	900	900	900	900
Guard Houses (No.)	6	4	4	4	4
Vehicle Access Points (No.)	6	4	4	4	4
Passenger Access Points (No.)	2	1	1	1	1
Fencing (LM)	1,500	407	236	139	246

Source: CPCS Estimate

Units costs applied and cost estimates are provided in Table 5-3:

Table 5-3: Unit Costs Applied

Item	Unit Costs (USD)	Unit
Category 0 - Mobilization	250,000	lump sum
Category 1 - Site Prep	40	sqm

Item	Unit Costs (USD)	Unit
Category 2 - Parking, Roads, Walks and Landscape	200	sqm
Category 3 - Terminal Building	750	sqm
Category 4 - Maintenance Depot	700	sqm
Category 5 - Gate & Gate Houses	100,000	entrance
Category 6 - Fence	250	m
Category 7 - Electrical and Mechanical	1,500,000	lump sum
Category 8 – Traffic Management System	25	lm
7.5% Contingency	7.5%	percentage
5% Local Tax	5.0%	percentage

Source: CPCS Estimate

The estimated capital costs are given in Table 5-4:

Table 5-4: Capital Cost Estimates per Terminal (USD '000)

Item	Berger	Sango	Agbara	Epe	Odogunyan
Category 0 - Mobilization	2.5	2.5	2.5	2.5	2.5
Category 1 - Site Prep	42.3	11.5	6.7	3.9	6.9
Category 2 - Parking, Roads, Walks and Landscape	203.6	54.3	30.3	16.5	31.7
Category 3 - Terminal Building	13.5	3.8	3.8	3.8	3.8
Category 4 - Maintenance Depot	14.0	6.3	6.3	6.3	6.3
Category 5 - Gate & Gate Houses	6.0	4.0	4.0	4.0	4.0
Category 6 - Fence	3.8	1.0	0.6	0.3	0.6
Category 7 - Electrical and Mechanical	15.0	15.0	15.0	15.0	15.0
Category 8 - TMS	18.9	5.1	3.0	1.7	3.1
Sub-total	**319.5**	**103.5**	**72.1**	**54.1**	**73.9**
7.5% Contingency	24.0	7.8	5.4	4.1	5.5
5% Local Tax	16.0	5.2	3.6	2.7	3.7
TOTAL CAPITAL COST (Operational Side of Mega Terminals)	**359.5**	**116.5**	**81.1**	**60.8**	**83.1**

Source: CPCS Estimate

5.2.3 Phased Development

There are limited opportunities for cost-effective phased development of the ISBT's for the next 25 years. We recommend that terminals and maintenance buildings be built from the outset based on anticipated 2037 traffic projections. Stations can be outfitted for retail and dining facilities and maintenance buildings can be outfitted with equipment and systems for maintenance, cleaning and management of buses as need arises but we anticipate that this will be in the first few years of operation. In addition, we recommend that the entire site be prepared and fencing installed around the perimeter and between revenue and non-revenue areas from the outset. In addition, security gates and structures should be installed before the start of operation in order to assure safe and efficient flow of passengers and vehicles.

We do see an opportunity to construct paved parking and driving areas in a phased manner. As such, we have budgeted for incrementally adding parking spaces and road access to them at five year increments. We do not see the same opportunity to developed landscaped areas in the same manner given their close proximity to terminal buildings. Table 5-5 identifies the cost distribution of category 2 costs (*Parking, Roads, Walks and Landscape)* that has been used in our financial analysis.

Table 5-5: Category 2 – Parking, Rods, Walks and Landscape Phasing over Project Period

Timing of Expenditure	Berger	Sango	Agbara	Epe	Odogunyan
Jan 1, 2019	59.9%	59.2%	62.6%	59.8%	68.7%
Jan 1, 2024	13.7%	14.0%	14.0%	15.0%	13.0%
Jan 1, 2028	13.2%	13.4%	12.0%	12.9%	9.6%
Jan 1, 2034	13.2%	13.4%	11.4%	12.3%	8.7%

Source: CPCS Estimate

5.3 Operating Cost Estimates

Operating cost estimate are provided below based on cost category.

5.3.1 Terminal Staffing Costs

Based on industry research and consultations, Table 5-6 summarizes staff requirements and personnel costs per annum. It should be noted the salaries are for the base year 2018.

5.3.2 Terminal Infrastructure Maintenance Costs

Yearly terminal infrastructure maintenance costs are estimated to be 1% of upfront infrastructure development costs.

5.3.3 Commercial Infrastructure Maintenance Costs

Yearly commercial infrastructure maintenance costs are estimated to be 1% of upfront development costs to account for the maintenance of circulation spaces within the commercial areas.

5.3.4 Other Costs

Other costs include utilities, insurance, and the like and are estimated to be 15% of all other operating costs.

Table 5-6: Staffing Requirements and Costs at each Terminal

Staffing Cost per Terminal:	Terminal Manager (# of Personnel)	Terminal Manager (US$ Salary/person)	Leasing Officer (# of Personnel)	Leasing Officer (US$ Salary/person)	Area (in Ha) requiring Cleaning	Cleaning Staff for Public Areas (US$ Cost/ha)[1]	Park Control (# of Personnel)	Parking Control (US$ Salary/person)	Area (in Ha) requiring Security	Security Staff for Public Areas (US$ Cost/ha)[1]	Total Cost (US$ 000)
Agbara	1	15,000	1	9,000	1.67	1,130	6	1,700	1.67	420	39
Berger	1	15,000	1	9,000	10.58	1,130	10	1,700	10.58	420	57
Epe	1	15,000	1	9,000	0.98	1,130	6	1,700	0.98	420	38
Odogunyan	1	15,000	1	9,000	1.74	1,130	6	1,700	1.74	420	39
Sango	1	15,000	1	9,000	2.87	1,130	6	1,700	2.87	420	40

1. It is assumed that cleaning and security services would be subcontracted to a third party in order to control costs

Source: CPCS Estimate based on Industry Research and Consultations

5.4 Terminal Access Charges

Imposing a reasonable terminal access charge on passenger vehicle operators that patronize mega terminals is common around the world. In the context of LAMATA's vision to develop mega terminals with PSP, access charges will be required to ensure viability. In parallel, regulations accompanied with strong enforcement will be required to ensure patronage (and thus, the terminal operator's ability to collect access charge revenues). In the absence of regulation with enforcement, it would be difficult to engage PSP in any meaningful way (i.e., through significant risk transfer).

With regulation, all bus operators will be subject to the access charge and so, operators will likely to pass this onto the passengers. Thus, it is really the passengers' ability to pay the access charge that will determine the access rate.

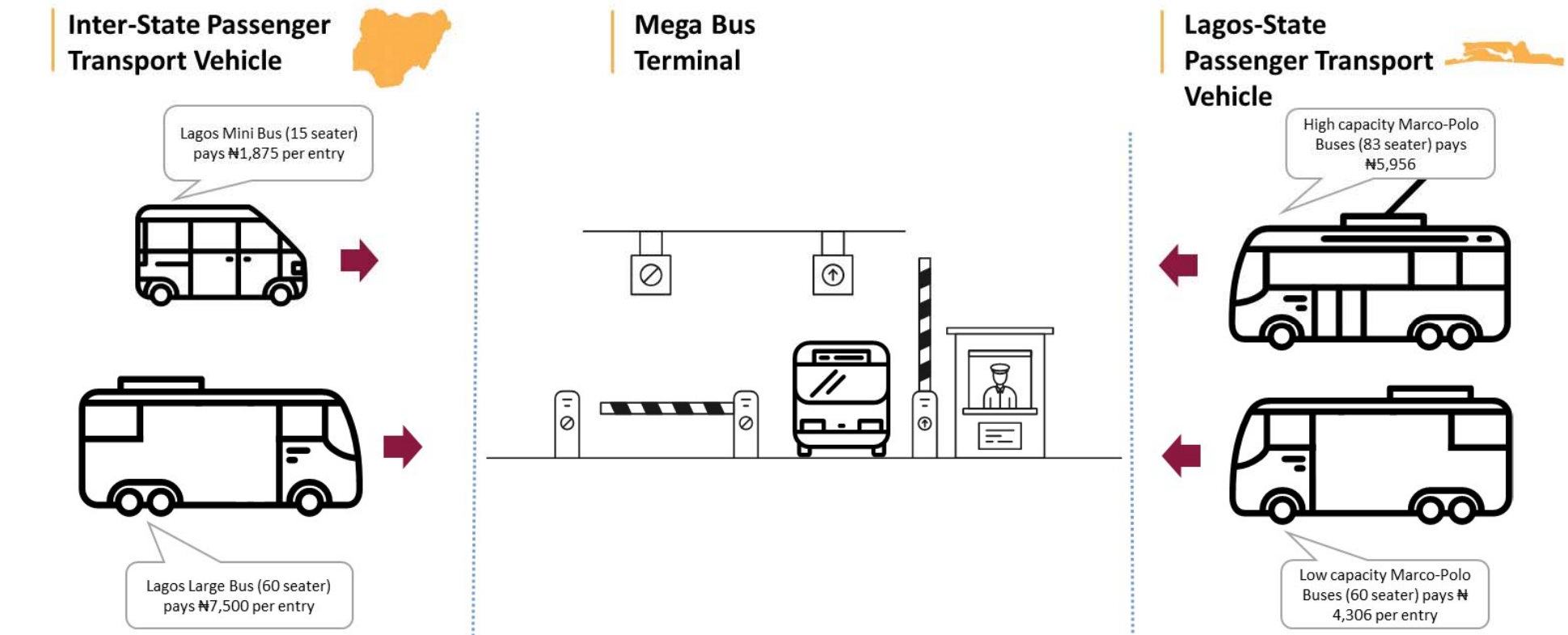
Based on desktop research, we note that the trip cost for inter-State trip (i.e., from any state in Nigeria to Lagos) is, on average, 5,000 Naira. Similarly, the average trip cost from the proposed terminal locations to the Lagos Metropolitan Area (assuming an average of 43km and 103 minutes) is approximately 2,870 Naira. Noting that access charges would likely be passed onto passengers, we are of the view that passengers could absorb an access charge that is between 1.0% and 2.0% of related trip costs. Based on this, the table below summarizes terminal access charges per passenger vehicle type along with the additional implied transportation cost per passenger (Figure 5-7 presents a conceptual illustration of the proposed terminal access charges).

Table 5-7: Summary of Terminal Access Charges per Vehicle Type and Implied Additional Transport Cost per Passenger (all Figures in Naira)

Vehicle and Capacity	Vehicle Operating Category	Bus Operator Transport Tariff Revenue assuming 100% Capacity Utilization[1]	Terminal Access Charge per Vehicle (2.0% of Transport Tariff Revenue)	Terminal Access Charge per Vehicle (1.0% of Transport Tariff Revenue)	Average Implied Additional Transportation Cost per Passenger at 2.0% of Transport Tariff	Average Implied Additional Transportation Cost per Passenger at 1.0% of Transport Tariff
Minibuses (15 seats)	Inter-State	75,000	1,500	750	100	50
Luxury Bus (60 seats)	Inter-State	300,000	6,000	3,000	100	50
Marco Polo High Capacity (83 seats)	Lagos State	238,255	4,363	2,181	57	29
Marco Polo Low Capacity (60 seats)	Lagos State	172,233	3,444	1,722	57	29

1. 100% is reasonable in our view as bus operators typically wait till vehicles are full before departing

Figure 5-7: Conceptual Summary of Terminal Access Charges per Vehicle



We recommended that access charges be levied on a per seat basis (instead of a per passenger basis) towards incentivizing high capacity utilization. Furthermore, the terminal access charges should be varied between vehicle types, with lower capacity vehicles facing a higher charge. This would move the industry towards using higher capacity vehicles, in-line with our traffic forecast.

For modelling purposes, the base case where passengers can absorb 2.0% of transport costs as terminal access charges is assumed. However, a sensitivity analysis is conducted to assess how changes in this percentage interact with the project valuation (and resulting implications).

We have also assumed that bus operators pay for access charge upon entering the facility. Even though operator

6 Financial and PPP Analysis

Key Messages

Economic Analysis

One of the main justifications for this project is to reduce the traffic congestion caused by having numerous bus parks in the centre of the LMA, which are served by cars, Danfos and city buses. Moving these bus parks out of the centre of Lagos will significantly improve travel times for all road users. The primary benefit of this project is therefore the journey time savings accruing to road users.

Mega Terminal	ENPV (USD 000)	EIRR
Agbara	-5,915	-1.9%
Berger	48,636	24.9%
Epe	1,549	15.9%
Odogunyan	25,976	52.7%
Sango	-11,044	-8.1%
All Terminals	16,641	14.8%

Commercial and Financial Analysis

The overall project is economically viable, and all terminals deliver a positive operating ratio.

The unlevered cash flow profile and net present value per terminal shows that except for the proposed mega terminal at Epe, all other terminals generate sufficient terminal access and leasing revenues to cover capital (including land acquisition) and operating costs.

Based on the results of the unlevered analysis, we recommend that the private sector be engaged in a Design-Build-Operate-Maintain-Transfer (DBOMT) PPP scheme towards developing 4 of the proposed mega terminals – Agbara, Berger, Odogunyan and Sango.

On the issue of land acquisition, we are of the view that for all 4 mega terminals, land should be provided by Government.

6.1 Introduction

The preceding chapters have outlined a concept for developing and operationalizing the five proposed mega terminals. This section presents an analysis to determine the economic and financial viability of the proposed terminals, and to ultimately identify the best option to introduce private sector risk-sharing in the sector. The analysis is achieved with a financial appraisal model, developed solely to evaluate the terminal development and operations.

This section outlines our analysis, including the methodology adopted, results, and recommendations. The conclusions inform a practical PSP strategy and accompanying roadmap for developing the proposed mega terminals.

Chapter 2 (Diagnostic Review), highlighted potential challenges that can be expected when introducing private sector risk-sharing into the proposed mega terminals. At a stakeholder roundtable organized by the Lagos State Government and attended by industry associations,

private sector companies and potential investors, participants raised the following concerns with respect to PSP in the development of the proposed mega terminals.

6.2 Financial Model Assumptions and Structure

This chapter outlines the financial and economic analysis undertaken on the mega terminals project to determine its commercial viability. Based on these results we have outlined the options for Private Sector Participation (PSP) in this project, and the level of Government investment required to make the project financially viable, as well as undertaken a risk analysis.

The purpose of financial modeling at this stage of project preparation is to provide a strategy for operationalizing LASG's overall bus reform agenda and specifically, the development of mega bus terminals at pre-determined gateway locations in the LMA with PSP. The aim of this chapter is to develop practical steps that can be taken to develop the proposed mega bus terminals.

1. A major challenge to developing mega terminals in Nigeria is the type of financing available. There is currently asymmetry between the private sector's payback period (typically 10 – 15 years)[41] and the short-term nature of financing that is currently available in the country (usually 5 – 7 years);

2. Enforcement of terminal usage is also a concern. Stakeholders questioned if regulations would be robustly enforced to ensure patronage at the proposed mega terminal[42]; and

3. As it currently stands, the scope for commercial development to subsidize terminal operations is limited given the locations of the proposed terminals.

The above themes would suggest that there is a great deal of complexity regarding the structuring of State-sponsored bus terminals in Lagos. This complexity impacts on how the private sector views the proposed project. However, with Government taking the necessary steps to address private sector concerns, especially as it relates to regulations and strong enforcement, we are of the view that there should be scope for meaningful PSP in developing the proposed terminals.

6.2.1 Model structure

A discounted cash flow model developed in Microsoft Excel was used to undertake the financial and economic appraisal. The model took into consideration key assumptions that are discussed in the next section. The model is structured to analyse the commercial viability of all the terminals jointly or on a terminal-by-terminal basis. Part of the model's outputs are estimates of Lagos State's potential financial participation and resulting liabilities for each proposed

[41] Based on feedback from Planet Projects during consultations that were held on July 12th, 2018 in Lagos, Nigeria.
[42] Based on feedback from Cross Country during consultations that were held on July 12th, 2018 in Lagos, Nigeria. Specifically, representatives from Cross Country explained the case of Akwa-Ibom State where a bus terminal was established six years ago. Bus operators were issued an executive order to move to the terminal, but unfortunately some operators were given permission to operate in town.

terminal. The State's financial participation is driven by risk and return benchmarks[43] of the private sector. The model is designed to generate the investment required from Lagos State in order for the private sector ROI to meet a minimum threshold expectation.

6.1 Model Assumptions

Table 6-1 outlines the key assumptions that were used to develop the valuation analysis.

6.1.1 Key Model Assumptions

Table 6-1: Key Model Assumptions

Assumptions	Input
Model Currency	USD
Start Date	January 1, 2019
Construction Period[44]	1 year
Maximum Modelled Operating Period	18 years
Concession Period	19 years
Current Exchange Rate	360 Naira/USD
Operating Days per Year	295
US Inflation	2.00% per annum
Nigeria Inflation	12.00% per annum
Nigeria Corporate Tax Rate	30%

6.1.2 Capital Costs

Modelled capital costs have been detailed in Section 5.2 of this report.

6.1.3 Working Capital Assumptions

Operational costs have been detailed in Section 5.3 of this report. Table 6-2 summarizes the remaining operation cost assumptions reflected in the model.

Table 6-2: Operating Parameters and Cost Assumptions

Cost Assumption	Rate
Accounts Receivable Turnover	30 days
Inventory Turnover	30 days
Accounts Payable Turnover	30 days

Source: CPCS Experience and Industry Research

6.1.4 Financing Costs

Conducting a PSP valuation requires assumptions on financing parameters both from the perspective of the private and the public sector. These parameters and related assumptions are summarized in Table 6-3 and Table 6-4.

[43] These benchmarks are informed by market sounding as well as the Consulting Team's experience based on prior, similar mandates.

[44] As we are testing PPP schemes with significant risk transfer to the private sector, we are of the view that the private sector will not waste time developing the necessary infrastructure and will aim to start operations as fast as possible (to start generating a return). Furthermore, as the infrastructure itself is not highly complex, we believe that a one year construction period is achievable.

Table 6-3: Private Sector Financing Assumptions

Financing Parameter	Assumption	Commentary
6-month USD LIBOR Rate	2.75%	Based on a review of current 6-month LIBOR rates from the Federal Reserve Bank of St. Louis
Private Lending Spread on US Denominated debt	6-month USD LIBOR + 7.85%	The spread and tenor estimate is based on a review of confidential term sheets (as available) for Build-Operate-Transfer type transport projects in West Africa in the past ten years
Private Lending Tenor on US Denominated debt	15 years	
Private Lending Rate on Naira Denominated debt	23%	The Naira denominated lending rate is based on a review of the June 29, 2018 publication made by the Central Bank of Nigeria on lending rates obtainable in all Deposit Money Banks in Nigeria. The review is specific to lending rates in "Transportation and Storage"
Private Lending Tenor on Naira Denominated debt	7 years	This is based on feedback from the World Bank
Gearing Assumption	65% - 70%	The low-end estimate (65%) is assumed under a PPP structure whereby the private sector is engaged on a Build-Operate-Transfer type of basis, whether it is 'at-risk' or backed by Government Subsidy The high-end estimate (70%) is assumed under a PPP structure whereby the private sector is engaged on an O&M concession type of basis and thus, the private sector's upfront capital commitments are limited to items such as furniture, fixtures and equipment.
Private Sector Leveraged Hurdle Rate (Return on Equity Benchmark)	16% to 18%	The low-end estimate (16%) is assumed under a PPP structure whereby the private sector is engaged on an O&M concession type of basis and thus, the return on equity benchmarks do not include premiums related to large private capital outlays The high-end estimate (18%) is assumed under a PPP structure whereby the private sector is engaged on a Build-Operate-Transfer type of basis and thus, the return on equity benchmarks include premiums related to large private capital outlays
Private Sector Unlevered Hurdle Rate (Weighted Average Cost of Capital Benchmark)	10% - 11%	Derived based on above return on equity benchmark and gearing assumptions

Source: CPCS Experience, Market Consultations and Industry Research

Table 6-4: Public Sector Financing Assumptions

Financing Parameter	Assumption	Commentary
6-month USD LIBOR Rate	2.75%	Based on a review of current 6-month LIBOR rates from the Federal Reserve Bank of St. Louis

Financing Parameter	Assumption	Commentary
Public Lending Spread on US Denominated debt	6-month USD LIBOR + 1.50%	This is based on the IBRD Flexible Loan Pricing Basics note (Updated April 2018) and specifically, the fixed spread loan with an average repayment maturity of 18 to 20 years (see page 2).
Public Lending Tenor on US Denominated debt	20 years	
Public Lending Rate on Naira Denominated debt	Central Bank of Nigeria (CBN) Prime Lending Rate (16.6%) + 1.40% spread	The Public Lending Rate on Naira denominated debt is based on a review of the CBN's prime lending rate (as at September 2018). Added to this is a 1.40% concessional premium. Furthermore, it is assumed that such a concessional loan would be made available from the Federal or Lagos State Government.
Public Lending Tenor on Naira Denominated debt	7 years	This is based on feedback from the World Bank

Source: CPCS Experience, Market Consultations and Industry Research

Naira/USD Exchange Rate Forecast

Noting that the modeled currency is USD while the acquisition currency of capital items is to be in Naira and USD (see Table 6-5 for related assumptions), a Naira/USD exchange rate forecast is required to account for exchange rate gains and losses as part of debt servicing. Or Naira/USD forecast is provided in Table 6-6.

Table 6-5: Acquisition Currency for Capital Outlay Items

Capital Outlay Item	Currency of Acquisition
Mega Terminal Infrastructure including Pre-operating Expenses	USD
Infrastructure for Commercial Development (Building Core & Shell)	USD
Land Acquisition	NGN
Terminal Furniture, Fixtures and Equipment	NGN

Source: CPCS Estimate

Table 6-6: Naira/USD Exchange Rate Forecast

Year	Naira/USD Forecast
2019	370
2020	385
2021 onward	390

Source: Trading Economics Nigerian Naira Forecast (reviewed on October 22, 2018)

6.1.5 Revenue from Mega Terminal Operations

Access Charge Revenues

The estimate of access charge revenues is discussed in Section 5.4. The results are presented again in Table 6-7 and Table 6-8. We have adopted a 2% yearly escalation on quoted tariffs (in line with US Dollar currency inflation). Note that the 2.0% charge per the table below forms the base case in our analysis with the 1.0% informing a sensitivity analysis with resulting implications.

Table 6-7: Terminal Access Charge Estimate (Naira)

Vehicle Type	Terminal Access Charge (2.0% of Passenger Trip Costs) – Base Case	Terminal Access Charge (1.0% of Passenger Trip Costs) – Sensitivity Case
Interstate Minibus	1,500	750
Interstate Luxury Bus	6,000	3,000
Marco Polo High Capacity Bus	4,363	2,181
Marco Polo High Capacity Bus	3,444	1,722

Source: CPCS Estimate

Table 6-8: Terminal Access Charge Estimate (USD)[1]

Vehicle Type	Terminal Access Charge (2.0% of Passenger Trip Costs) – Base Case	Terminal Access Charge (1.0% of Passenger Trip Costs) – Sensitivity Case
Interstate Minibus	4.17	2.08
Interstate Luxury Bus	16.67	8.33
Marco Polo High Capacity Bus	12.12	6.06
Marco Polo High Capacity Bus	9.57	4.78

1. Assumes a 360 Naira/USD exchange rate

Source: CPCS Estimate

Lease of Areas for Transit Ticket Sales

Table 6-9 summarizes the annual lease charges that can be collected from vendors selling transit tickets. It should be noted that per m^2 rental estimates are based on commercial rents currently charged in the location of the terminals which were gathered from market consultations. Furthermore, it is assumed that lease rates will increase by 2% per annum (adopting US Dollar currency inflation).

Table 6-9: Lease Estimate for Transit Ticket Sales at Terminals

	Dedicated Area m2	Annual Rent per m2 (N)	% of Dedicated Area that is Leasable	Annual Rental Yields (NGN)	Annual Rental Yields (US 000)
Agbara	500.00	6,000	50.0%	1,500,000	4
Berger	1800.00	9,000	75.0%	12,150,000	34
Epe	500.00	6,000	50.0%	1,500,000	4

	Dedicated Area m2	Annual Rent per m2 (N)	% of Dedicated Area that is Leasable	Annual Rental Yields (NGN)	Annual Rental Yields (US 000)
Odogunyan	500.00	6,000	50.0%	1,500,000	4
Sango	500.00	6,000	50.0%	1,500,000	4

Source: CPCS Estimate based on Market Consultations

Lease of Faciliites for Stabling, Cleaning and Maintaining Lagos State Buses

Table 6-10 summarizes the annual lease charges that can be collected from leasing facilities within the terminals for stabling, cleaning and maintaining Lagos State buses. It should be noted that per m^2 rental estimates are based on commercial rents currently charged in the location of the terminals which were gathered from market consultations.

Table 6-10: Lease Estimate for Stabling, Cleaning and Maintaining Lagos State Buses at Terminals

Leases:	Dedicated Area m2	Annual Rent per m2 (N)	% of Dedicated Area that is Leasable	Annual Rental Yields (NGN)	Annual Rental Yields (US 000)
Agbara	900.00	6,000	100.0%	5,400,000	15
Berger	2000.00	9,000	100.0%	18,000,000	50
Epe	900.00	6,000	100.0%	5,400,000	15
Odogunyan	900.00	6,000	100.0%	5,400,000	15
Sango	900.00	6,000	100.0%	5,400,000	15

Source: CPCS Estimate based on Market Consultations

We have modelled a 2% lease escalation per year in the model in-line with inflation of the modelled currency (US$).

Lease Revenues from Commercial Activities

Table 6-11 summarizes the areas designated for commercial development and related leasing revenues. Such commercial activities include shopping malls, office space, and hotel accommodation. We note that typically, the owner-operator of the mega terminals would offer basic “core & shell” space to tenants for various commercial use. Prospective tenants would then further develop the space for their own needs (for example, a shopping mall tenant would fit his/her space according to the specifications of a shopping mall) and pay a lease fee (per m^2) to the owner-operator of the mega terminals.

Table 6-11: Lease Estimate from Commercial Development and Related Activities

Leases:	Dedicated Area m2	Annual Rent per m2 (N)	% of Dedicated Area that is Leasable[1]	Annual Rental Yields (NGN)	Annual Rental Yields (US 000)
Agbara	500.00	6,000	80.0%	2,400,000	7
Berger	1,800.00	9,000	80.0%	12,960,000	36
Epe	500.00	6,000	80.0%	5,400,000	7

Leases:	Dedicated Area m2	Annual Rent per m2 (N)	% of Dedicated Area that is Leasable[1]	Annual Rental Yields (NGN)	Annual Rental Yields (US 000)
Odogunyan	500.00	6,000	80.0%	2,400,000	7
Sango	500.00	6,000	80.0%	2,400,000	7

1. 20% accounts for circulation space
Source: CPCS Estimate based on Market Consultations

We have modelled a 2% lease escalation per year in the model in-line with inflation of the modelled currency (US$).

Revenues from Overnight Parking

As outlined in Section 4.2, there are provisions for Lagos State buses to park their buses when not in revenue service (e.g., overnight parking of buses). Table 6-12 gives the number of parking bays available for buses that are not in revenue service.

Table 6-12: Lagos State Parking Bays for Buses not in Service

Terminal	Parking Spots required for Buses not in Revenue Service
Agbara	43
Berger	232
Epe	31
Odogunyan	57
Sango	65

Source: CPCS Analysis

Parking fees can be charged for those bus operators wishing to park their buses for extended periods of time when not in service. Table 6-13 summarizes our parking fee estimates.

Table 6-13: Lagos State Bus Parking Fee

Currency	Rate per Day (for the Base Year 2018)
Naira	5,000
US	13.89

Source: CPCS Estimate

The total parking revenue to be collected depends on the utilization rate of the parking bays. For all terminals, we have assumed that utilization at the start of operations will be 75% and grow to 95% by the end of the operating period (growing at approximately 1.2% per year).

We have modelled a 2% parking fee escalation per year in the model in-line with inflation of the modelled currency (USD).

6.2 Economic Analysis

A high level economic assessment of the project was undertaken. While the financial analysis focuses on the financial costs and revenues of the project (i.e. those which affect the project

cash flow), the economic analysis focusses on the wider economic costs and benefits. These are non-financial benefits and many of them are not realized in cash terms. The economic appraisal was based on international best practice, using a standard approach normally applied by the World Bank and other multi-lateral institutions.

While the primary economic benefit delivered by this project will be in terms of time savings to both existing and new road users, our analysis have also assessed other social benefits that the project will deliver including increase in employment and an increase in rental incomes and land values in the areas adjoining the mega terminals. All these benefits can justify any public investment (i.e. subsidy) that is required for the project.

The economic appraisal consists of the following elements:

- Economic costs – capital and operating costs
- Economic benefits
- Economic assessment parameters – ENPV and EIRR

6.2.1 Social Discount Rate

The choice of an appropriate Social Discount Rate (SDR) for use in an economic analysis can be quite controversial, as it can have a significant impact on the results. Unlike the financial discount rate, which reflects the opportunity cost of capital, the economic discount rate (or social discount rate) should reflect how society values current costs and benefits versus future costs and benefits.

There are significant variations in public discount rate policies practiced by countries around the world, with developing countries in general applying higher SDRs (8%-15%) than developed countries (3%-7%). The divergence reflects differences in the perceived social opportunity cost of public funds across countries and in the extent to which the issue of intergenerational equity is taken into consideration in setting the SDR.

Up to 2015 the Nigerian economy grew at a steady rate of 6%-7% per annum. After the economic downturn in 2015, the GDP growth rates fell and are now expected to grow at around 2% per annum. However, economic appraisal of projects in developing countries are normally undertaken using a SDR of 12%, and hence this is the value we have used for this analysis.

6.2.2 Economic Costs

The financial costs (as described in Chapter 5) consist of capital and operating costs. These have been adjusted to reflect their actual economic value (i.e. the social opportunity cost of the resources), rather than their market price. Markets often incorporate significant price distortions created, for example, by market barriers (e.g. tariffs or subsidies), social policies (e.g. minimum wages) or simply due to market imperfection, macroeconomic unbalances or rigidities (e.g. wage rigidities); these distortions have been removed where encountered. Financial estimates are transformed into economic values by applying appropriate conversion factors.

For the purpose of this high-level analysis, a uniform conversion factor of 0.9 has been applied to all financial costs (both capital and operating costs) to arrive at the economic costs.

6.2.3 Economic Benefits

One of the main justifications for this project is to reduce the traffic congestion caused by having numerous bus parks in the centre of the LMA, which are served by private cars, Danfos and city buses. Moving these bus parks out of the centre of Lagos will significantly improve travel times for other road users. The following economic (non-financial) benefits have been estimated for this project:

- Journey time savings;
- Employment benefits; and
- Increase in rental income.

Journey Time Savings

The principal benefit from this project will be the reduction in congestion in the LMA, resulting in faster journey times for existing and future road users. There could potentially also be journey time savings for interstate bus passengers, as an efficient and well organized bus terminal will deliver more reliable services as well as reductions in transfer and interchange times. However, passengers will now have to travel longer distances to reach the mega terminals located at the outer edge of the LMA.

Journey time savings were derived using a typical Four Step Model (FSM) approach. The four model steps were: (i) define system demand (total daily number of vehicles), (ii) system capacity (daily number of vehicles that can accommodated by a road segment of a particular road class, number of lanes and grade), (iii) allocate system demand via network flow modelling, and (iv) calculation of congestion expressed in terms of a Volume to Capacity Ratio (VCR) and theoretical travel times.

Traffic volumes in the roads around the existing bus parks were taken from the Origin-Destination (O-D) matrices from the following studies:

- Private Vehicle Trips within the LMA: *ALG. Europraxis., 2014. Consultancy Services for the Extension of the STMP and STDM to Cover Mega City Region*
- Intra City Public Transit within the LMA: *ALG. Europraxis., 2014. Consultancy Services for the Extension of the STMP and STDM to Cover Mega City Region*
- Inter State Bus Movements: *CPCS, 2018. Current ISBT park count survey and interviews carried out in May-June 2018*
- Heavy Commercial Vehicles Movements: *Cambridge Systematics Inc., 2016. Lagos Region Freight Demand Study: Final Study Report, LAMATA*
- Truck queues (Number of parked heavy commercial vehicles vying for access at Apapa and Tin Can Island Ports): *CPCS, 2018. Truck queue survey and interviews carried out in May-June 2018*

These covered all vehicle types including cars, local buses, Danfos, trucks, and other vehicles. Based on the road types, existing VCRs were estimated for the roads near each of the bus park locations.

It was assumed that currently 60% of the total daily trips to the bus parks were by private vehicles and 40% of the trips were by intra city buses. With the development of the mega terminals, it was assumed that traffic currently servicing the bus parks would now not go the mega terminals. This would significantly reduce the level of traffic congestion around the bus parks, increasing journey times for all road users. Based on the new levels of traffic, VCRs were re-estimated, giving us the percentage change in congestion levels (i.e. VCRs) at each location.

Research in the UK has shown that elasticity of travel volume with respect to travel time ranges between 0.5 and 1.0[45]. An elasticity of 1 implies that in the long term a 10% reduction in volume on traffic on the roads (i.e. congestion), results in a 10% reduction in travel times. Given that the roads around the bus parks in Lagos are extremely congested and have a severe impact on traffic in the adjoining area, we believe that a reduction in congestion will have a high impact on journey time. Hence, we have assumed an elasticity of 1.

At each of the bus park locations it was therefore assumes that journey times will reduce in the same proportion as the reduction in congestion (i.e. VCRs). The Value of Time Study undertaken for LAMATA in 2015[46] estimated a Value of Time of N1,097 per hour per car in the Lagos CBD. This value was taken as a proxy to cover all vehicle types and was updated to 2018 values. Multiplying the value of time with the total journey time saved by all vehicles, gives us the annual value of journey time savings.

Employment Benefits

The project will generate two types of employment: one is that which will be directly required for the operation of ferry service and associated facilities; and the other which will be induced in the broader economy because of the various activities that will be effected by the investment in the sector. There will also be a slight reduction in employment as the existing bus parks close. However it is assumed that the new mega terminals will create sufficient jobs to overcome these job losses.

A report by the African Development Bank on job creation in Nigeria[47] estimates an employment multiplier of 5.8 for the transport sector in Nigeria. This means that for every 1 job created in the transport sector, a further 4.8 jobs will be created in the wider economy.

A fully operational ferry service on the designated route is expected to create around 850-900 jobs in total, which will increase as the service expands. Applying the transport sector employment multiplier gives us an estimate of the total number of jobs created in the wider economy. Based on an average wage rate, we estimate the additional income generated in the economy due to these jobs, which is taken as an estimate of the total economic benefits generated by the project.

Increase in Rental Income

Investment in the transport sector can have a significant impact on property values and rental incomes in the vicinity of transport facilities. In 2013, the New York City Economic Development

[45] Understanding Transport Demands and Elasticities, Victoria Transport Policy Institute, February 2017. http://www.vtpi.org/elasticities.pdf

[46] Value of Time and Transport Elasticity Study, Final Report, Leigh Fisher, LAMATA, May 2015

[47] The Challenge of Job Creation in Nigeria, Africa Economic Brief, African Development Bank, June 2015

Corporation (NYEDC) released its Citywide Ferry Study[48] which aimed to provide policymakers an increased understanding of the economic impacts of ferry services, among other things. The study analyzed over 50 sites, resulting from its commuter and leisure routes in all five (5) boroughs of the City. The study reports that residential property values within 1/8 mile (0.20 km)of East River Ferry stops in Brooklyn and Queens increased 8.0% over comparable property values further from the stops. Without comparable data from Nigeria and other similar economies, we have assumed that the same principles can be applied to the bus mega terminals as well.

Based on our field research, we were able to determine the average rents of properties in the vicinity of the proposed mega terminals. Our field observations suggested that about 50% of the area within 1/8th of a mile (0.20 km) from each mega terminal had rental properties. Given the current level of rental values in Lagos, it was assumed that the mega terminal developments would result in a 25% increase in property rents (both commercial and residential). This increase in rental values was considered a benefit to the wider economy.

It should be noted that there may also be a small drop in the rental incomes in the areas around the existing bus parks, but we believe that this loss will not be significant and will be more than made up by increases in rental incomes around the new mega terminals. Hence these losses have not been considered.

6.2.4 Economic Assessment

Based on the economic costs and benefits, and applying a 12% SDR, the economic appraisal results for each mega terminal, as well as for all terminals combined, are presented inTable 6-14.

Table 6-14: Economic Appraisal Results

Mega Terminal	ENPV (USD 000)	EIRR
Agbara	-5,915	-1.9%
Berger	48,636	24.9%
Epe	1,549	15.9%
Odogunyan	25,976	52.7%
Sango	-11,044	-8.1%
All Terminals	**16,641**	**14.8%**

The project as a whole (i.e. for all terminals combined) delivers a positive Economic NPV and an EIRR of close to 15%, and therefore is considered viable from an economic perspective. However, when we look at individual terminals, we find that Agbara and Sango are economically unviable, even though they deliver significant economic benefits. This is mainly due to the cost of land acquisition. The other 3 locations are economically viable, with Odogunyan delivering the highest EIRR of over 52%.

48 https://www.nycedc.com/sites/default/files/filemanager/Resources/Studies/2013_Citywide_Ferry_Study/Citywide_Ferry_Study_-_Final_Report.pdf

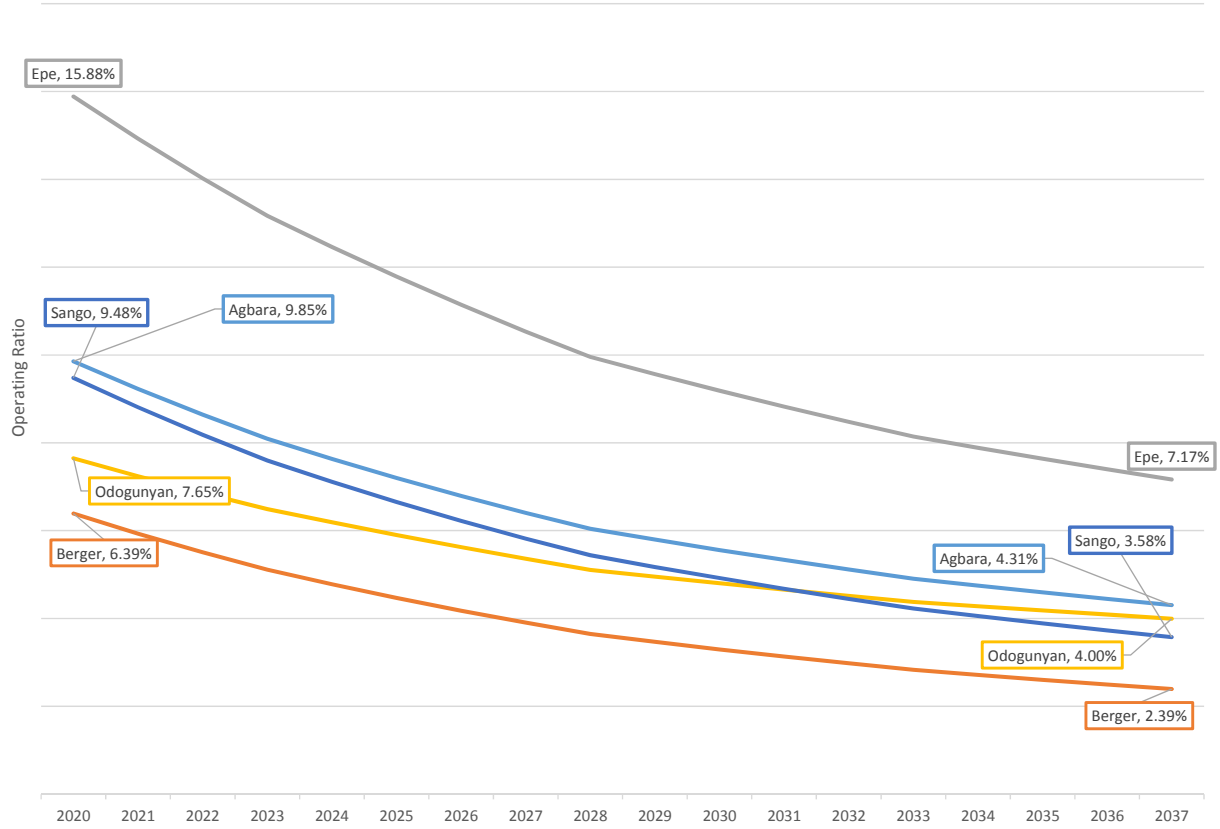
6.3 Financial Analysis

6.3.1 Operating Ratio

To inform the level of financial participation from both the public and the private sectors to make the mega terminals project viable, an important first step is to analyze the **operating ratio** of each terminal. The operating ratio is defined as a company's operating expenses as a percentage of revenue. It determines how much of terminal revenues cover operating costs (staff, cleaning and security, terminal maintenance, etc.). The lower the operating ratio (usually expressed as a percentage), the better the financial performance. The operating ratio (operating costs/terminal revenues) informs the following:

1. If the operating ratio is greater than 100%, a level of operational subsidies that may be required to be paid by Government to the terminal operator; and
2. If the operating ratio is less than 100%, there is potential for (1) the terminal operator to pay a concession fee to Government, and/or (2) the terminal operator to pay for some or all of the capital outlays (e.g., land acquisition, terminal development, etc.).

Figure 6-1: Operating Ratio Summary per Mega Terminal



Source: CPCS Analysis

Figure 6-1 summarizes the operating ratio per mega terminal over the forecast period. In all cases, terminal revenues sufficiently cover operating costs. Of the 5 terminals, Berger, Odogunyan and Sango deliver the best operating ratios. Furthermore, under the assumption that higher capacity passenger vehicles will replace lower capacity passenger vehicles over time

(see Table 4-1 for more information), total terminal access revenues are expected to grow faster than operating costs over time, thereby reducing the operating ratio. Two insights are drawn from the above analysis:

1. An operational subsidy would not be required to sustain operations at each of the terminals; and
2. Given that operating income is positive across all terminals, there may be a case for the private sector to financially participate in developing the terminals. This is further tested in Section 6.3.2.

6.3.2 Unlevered Financial Analysis

With the understanding that operations can be sustained by terminal revenues, the unlevered financial analysis seeks to understand the level of upfront financial participation between the public and private sectors for each of the proposed bus terminals. The unlevered financial analysis tests if cash flows (internally generated) from each of the proposed terminals are sufficient to provide a reasonable rate of return, prior to considering the following financial structuring issues:

1. Government's upfront subsidy and recurring financial participation in the project;
2. Commercial debt; and
3. Duration of the PSP.

What constitutes a reasonable level of return depends on who is making the investment (in this case, Government or the private sector) and if the return thresholds meet objective investment criteria and standards. For the purposes of this analysis, the return threshold is set at 10% (in US Dollar terms).

The goal of this analysis is to derive the project cash flows over the forecast period. The cash flows are calculated using a build-up approach. The steps taken to derive the cash flows are as follows:

1. Earnings before Interest, Taxes, Depreciation and Amortization (EBITDA) is calculated for each year of the forecast period;
2. Earnings before Interest and Taxes (EBIT) is calculated by deducting depreciation from each year's operating profit or loss;
3. Utilizing the EBIT figure, corporate taxes are calculated for each year in the forecast period. The total of corporate taxes are summed in order to reduce EBITDA commensurately for each period;
4. Changes in Working Capital are added back to EBITDA;
5. Capital Investment is deducted from EBITDA;

6. The Terminal value[49] (only applies for the final year of the forecast period) is added back to the respective EBITDA figure; and
7. A yearly cash flow figure is derived based on the above steps. The

results of each of the unlevered financial analysis undertaken for each of the mega terminals is given in Figure 6-2 to Figure 6-6.

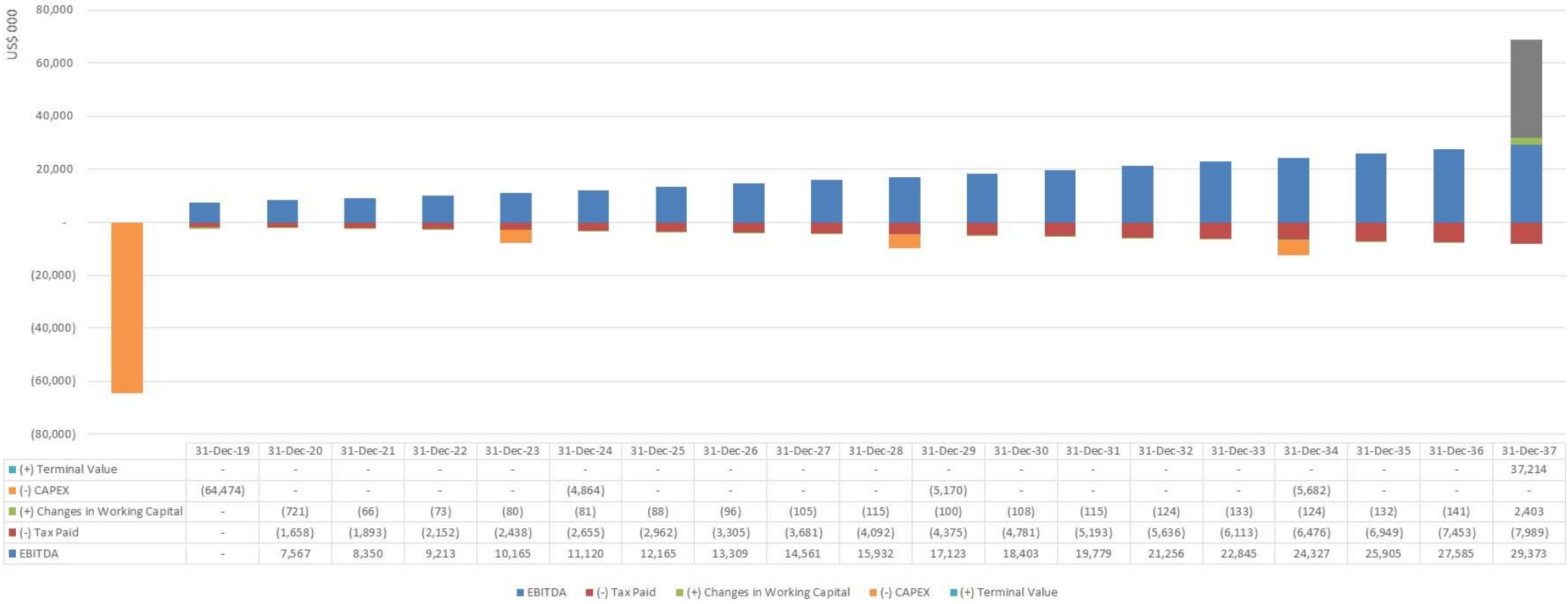
[49] The Terminal Value represents all cash flows that occur so far into the future (i.e. following the project period) that it would not be practical to forecast them. For the purposes of this analysis, the Terminal Value represents the value of the project at the end of the project period and is estimated as the net book value of assets.

Figure 6-2: Unlevered Cash Flow Summary for Agbara

	31-Dec-19	31-Dec-20	31-Dec-21	31-Dec-22	31-Dec-23	31-Dec-24	31-Dec-25	31-Dec-26	31-Dec-27	31-Dec-28	31-Dec-29	31-Dec-30	31-Dec-31	31-Dec-32	31-Dec-33	31-Dec-34	31-Dec-35	31-Dec-36	31-Dec-37
(+) Terminal Value	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4,096
(-) CAPEX	(11,331)	-	-	-	-	(959)	-	-	-	-	(1,019)	-	-	-	-	(1,120)	-	-	-
(+) Changes in Working Capital	-	(146)	(13)	(15)	(16)	(16)	(18)	(19)	(21)	(23)	(20)	(21)	(23)	(25)	(27)	(25)	(26)	(28)	482
(-) Tax Paid	-	(289)	(336)	(387)	(444)	(487)	(548)	(616)	(691)	(772)	(829)	(912)	(994)	(1,082)	(1,177)	(1,249)	(1,343)	(1,443)	(1,550)
EBITDA	-	1,474	1,629	1,800	1,989	2,179	2,386	2,614	2,862	3,135	3,371	3,625	3,898	4,192	4,507	4,802	5,115	5,449	5,804

Source: CPCS

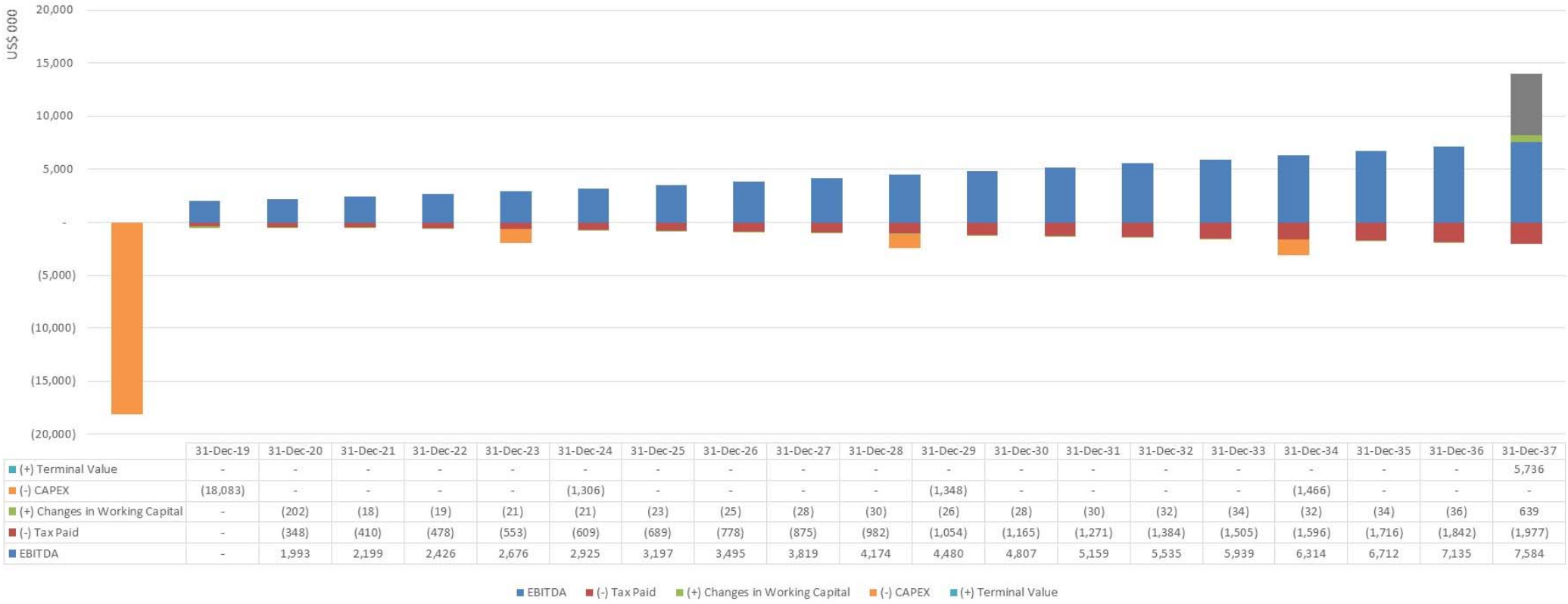
Figure 6-3: Unlevered Cash Flow Summary for Berger



	31-Dec-19	31-Dec-20	31-Dec-21	31-Dec-22	31-Dec-23	31-Dec-24	31-Dec-25	31-Dec-26	31-Dec-27	31-Dec-28	31-Dec-29	31-Dec-30	31-Dec-31	31-Dec-32	31-Dec-33	31-Dec-34	31-Dec-35	31-Dec-36	31-Dec-37
(+) Terminal Value	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	37,214
(-) CAPEX	(64,474)	-	-	-	-	(4,864)	-	-	-	-	(5,170)	-	-	-	-	(5,682)	-	-	-
(+) Changes in Working Capital	-	(721)	(66)	(73)	(80)	(81)	(88)	(96)	(105)	(115)	(100)	(108)	(115)	(124)	(133)	(124)	(132)	(141)	2,403
(-) Tax Paid	-	(1,658)	(1,893)	(2,152)	(2,438)	(2,655)	(2,962)	(3,305)	(3,681)	(4,092)	(4,375)	(4,781)	(5,193)	(5,636)	(6,113)	(6,476)	(6,949)	(7,453)	(7,989)
EBITDA	-	7,567	8,350	9,213	10,165	11,120	12,165	13,309	14,561	15,932	17,123	18,403	19,779	21,256	22,845	24,327	25,905	27,585	29,373

Source: CPCS

Figure 6-4: Unlevered Cash Flow Summary for Epe



	31-Dec-19	31-Dec-20	31-Dec-21	31-Dec-22	31-Dec-23	31-Dec-24	31-Dec-25	31-Dec-26	31-Dec-27	31-Dec-28	31-Dec-29	31-Dec-30	31-Dec-31	31-Dec-32	31-Dec-33	31-Dec-34	31-Dec-35	31-Dec-36	31-Dec-37
(+) Terminal Value	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5,736
(-) CAPEX	(18,083)	-	-	-	-	(1,306)	-	-	-	-	(1,348)	-	-	-	-	(1,466)	-	-	-
(+) Changes in Working Capital	-	(202)	(18)	(19)	(21)	(21)	(23)	(25)	(28)	(30)	(26)	(28)	(30)	(32)	(34)	(32)	(34)	(36)	639
(-) Tax Paid	-	(348)	(410)	(478)	(553)	(609)	(689)	(778)	(875)	(982)	(1,054)	(1,165)	(1,271)	(1,384)	(1,505)	(1,596)	(1,716)	(1,842)	(1,977)
EBITDA	-	1,993	2,199	2,426	2,676	2,925	3,197	3,495	3,819	4,174	4,480	4,807	5,159	5,535	5,939	6,314	6,712	7,135	7,584

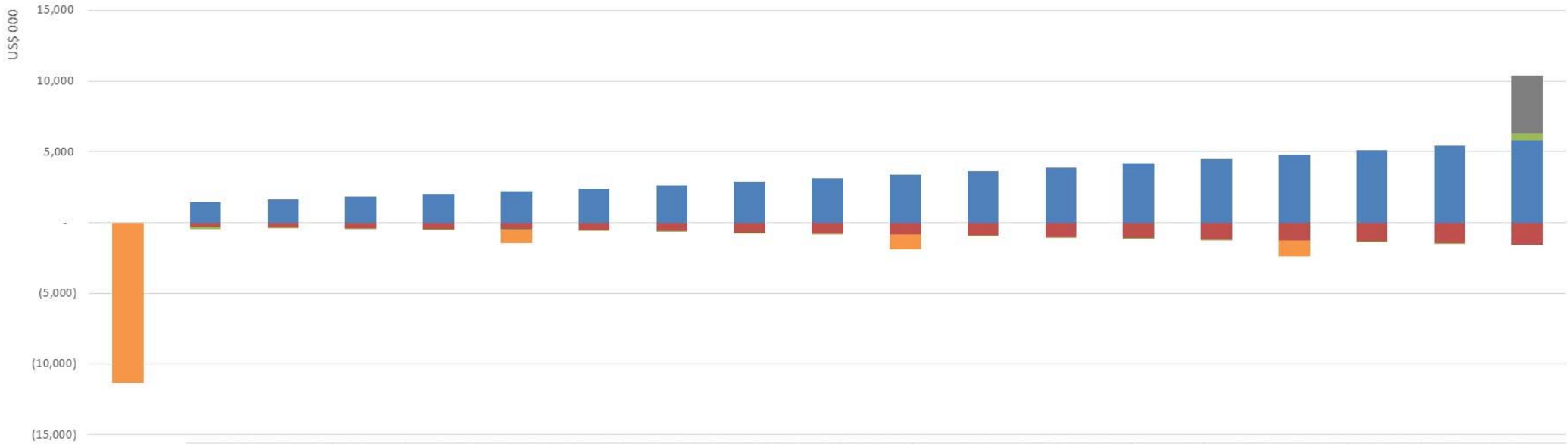
Source: CPCS

Figure 6-5: Unlevered Cash Flow Summary for Odogunyan

	31-Dec-19	31-Dec-20	31-Dec-21	31-Dec-22	31-Dec-23	31-Dec-24	31-Dec-25	31-Dec-26	31-Dec-27	31-Dec-28	31-Dec-29	31-Dec-30	31-Dec-31	31-Dec-32	31-Dec-33	31-Dec-34	31-Dec-35	31-Dec-36	31-Dec-37
(+) Terminal Value	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6,541
(-) CAPEX	(20,376)	-	-	-	-	(1,534)	-	-	-	-	(1,486)	-	-	-	-	(1,592)	-	-	-
(+) Changes in Working Capital	-	(284)	(23)	(26)	(28)	(28)	(30)	(32)	(35)	(38)	(32)	(34)	(36)	(39)	(41)	(38)	(40)	(42)	826
(-) Tax Paid	-	(601)	(684)	(774)	(872)	(947)	(1,051)	(1,166)	(1,290)	(1,426)	(1,518)	(1,652)	(1,781)	(1,918)	(2,065)	(2,176)	(2,317)	(2,467)	(2,626)
EBITDA	-	2,935	3,210	3,509	3,837	4,162	4,514	4,897	5,312	5,763	6,141	6,543	6,972	7,430	7,918	8,365	8,837	9,337	9,865

Source: CPCS

Figure 6-6: Unlevered Cash Flow Summary for Sango



	31-Dec-19	31-Dec-20	31-Dec-21	31-Dec-22	31-Dec-23	31-Dec-24	31-Dec-25	31-Dec-26	31-Dec-27	31-Dec-28	31-Dec-29	31-Dec-30	31-Dec-31	31-Dec-32	31-Dec-33	31-Dec-34	31-Dec-35	31-Dec-36	31-Dec-37
(+) Terminal Value	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4,096
(-) CAPEX	(11,331)	-	-	-	-	(959)	-	-	-	-	(1,019)	-	-	-	-	(1,120)	-	-	-
(+) Changes in Working Capital	-	(146)	(13)	(15)	(16)	(16)	(18)	(19)	(21)	(23)	(20)	(21)	(23)	(25)	(27)	(25)	(26)	(28)	482
(-) Tax Paid	-	(289)	(336)	(387)	(444)	(487)	(548)	(616)	(691)	(772)	(829)	(912)	(994)	(1,082)	(1,177)	(1,249)	(1,343)	(1,443)	(1,550)
EBITDA	-	1,474	1,629	1,800	1,989	2,179	2,386	2,614	2,862	3,135	3,371	3,625	3,898	4,192	4,507	4,802	5,115	5,449	5,804

Source: CPCS

Table 6-15: Unlevered Valuation Summary per Terminal

Terminal	Net Present Value with (USD 000)	Net Present Value with (Naira 000)
Agbara	2,846	1,024,560
Berger	14,750	5,310,000
Epe	-777	-279,720
Odogunyan	4,607	1,658,520
Sango	4,755	1,711,800

Source: CPCS

Table 6-15 summarizes the unlevered cash flow profile and net present value per terminal. Except for the proposed mega terminal at Epe, all other terminals generate sufficient terminal access and leasing revenues to cover capital (including land acquisition) and operating costs.

As a caveat, it should be noted that the unlevered analysis does assume an indefinite project period (and hence, the terminal value assumption per footnote 49). As a PPP contract is for a finite period, an important consideration will be how to handle asset handover at the end of the PPP contracting period and how the potential private partner could be compensated. This is discussed in Section 6.4.

6.3.3 Unlevered Financial Analysis Sensitivity

In Section 5.4 we noted that, (1) passengers would ultimately bare the terminal access charge and (2), we estimated that passengers could bare an access charge that was between 1.0% and 2.0% of their respective transport tariff.

The results in Table 6-15 are based on an access charge that is 2.0% of estimated passenger transport tariffs (see Section 5.4 for more information). Table 6-16 provides a sensitivity of the unlevered NPV of each proposed terminal based on an access charge of 1.0% and 1.5% of the transport tariff.

Table 6-16: Unlevered NPV Sensitivity Analysis Summary

Terminal	Currency	NPV (2.0%)	NPV (1.5%)	NPV (1.0%)
Agbara	US 000	2,846	476	-1,894
	Naira 000	1,024,560	171,360	-681,840
Berger	US 000	14,750	947	-12,857
	Naira 000	5,310,000	340,920	-4,628,520
Epe	US 000	-777	-1,915	-3,058
	Naira 000	-279,720	-689,400	-1,100,880
Odogunyan	US 000	4,607	1,759	-1,089
	Naira 000	1,658,520	633,240	-392,040
Sango	US 000	4,755	1,332	-2,091
	Naira 000	1,711,800	479,520	-752,760

Source: CPCS

What is immediately apparent is that the unlevered project NPV is fairly sensitive to the access charges. Though Epe is the only terminal that has a negative NPV at both 2.0% and 1.5% of the transport tariff, at 1.0%, all the terminals have a negative NPV.

In light of this sensitivity, and noting LAMATA's vision of developing these terminals as a PPP (specifically, under a Build-Operate-Transfer scheme where Government provides the land), the Table 6-17 recasts the sensitivity analysis conducted above excluding land acquisition as a project cost.

Table 6-17: Unlevered NPV Sensitivity Analysis Summary (excluding land acquisition)

Terminal	Currency	NPV (2.0%)	NPV (1.5%)	NPV (1.0%)
Agbara	US 000	3,286	916	-1,454
	Naira 000	1,182,960	329,760	-523,440
Berger	US 000	32,066	18,263	4,459
	Naira 000	11,543,760	6,574,680	1,605,240
Epe	US 000	-415	-1,553	-2,696
	Naira 000	-149400	-559,080	-970,560
Odogunyan	US 000	5,249	2,401	-447

Terminal	Currency	NPV (2.0%)	NPV (1.5%)	NPV (1.0%)
	Naira 000	1,889,640	864,360	-160,920
Sango	US 000	5,816	2,393	-1,030
	Naira 000	2,093,760	861,480	-370,800

Source: CPCS

With land acquisition costs removed from the project, the unlevered NPV improves across all access charge scenarios. At 1.0%, the proposed Berger Terminal exhibits a positive NPV whereas in the case of the private sector acquiring the land, at 1.0%, the NPV is negative.

6.4 Introducing Private Sector Participation in Mega Terminal

Based on the results of the unlevered analysis, we recommend that the private sector be engaged in a **Design-Build-Operate-Maintain-Transfer (DBOMT) PPP scheme** towards developing **4 of the proposed mega terminals – Agbara, Berger, Odogunyan and Sango.** Furthermore, based on the results in the preceding section, we are also of the view that the private sector can take up revenue risk. However, this is predicated on Government developing regulation with strong enforcement towards ensuring that all commercial buses use the mega terminals. Without regulation and evidence of enforcement, engaging the private sector in such a PPP scheme will not be viable as evidenced in the outcomes of the roundtable organized by the Lagos State Government on July 27th, 2018.

The Federal Government, for instance, has been able to enforce regulations to ensure that all visitors to the Murtala Muhammed Airport and Domestic Airport terminals utilize the on-site parking facility and pay the N500 access charge. This enforcement has successfully supported the financing and operation of the parking sites at the terminals. Finally, a contract duration of 11-16 years[50] (renewable) should be considered.

Based on these recommendations, Table 6-18 and Table 6-19 summarize, under a DBOMT scheme, Government's expected annual concession fees and the present value of Government's total financial contribution (net of concession fees) over an assumed contract duration of 16 years. Concession fees (gap funding) is based on the private sector's leverage rate of 65% and an equity hurdle rate of 18%. It should also be noted that in the below analysis, a terminal value (reflected as a cash inflow to the private operator at the end of the final year of operations) is not assumed.

[50] Assuming a one year construction period, the operating period would be between 10 and 15 years.

Table 6-18: Summary of Annual Concession Fees (Gap Funding) and Government's Financial Contribution (US$ 000)

Terminal	Scenario One – Government Provides Land		Scenario Two – Private Sector Acquires Land	
	Annual Concession Fee (+) / Gap Funding (-) Estimate	Present Value of Government's Financial Contribution (i.e. Land Acquisition net of Concession Fees) Discounted at 10%	Annual Concession Fee (+) / Gap Funding (-) Estimate	Present Value of Government's Financial Contribution Discounted at 10%
Agbara	+92	+99	-16	-113
Berger	+2,547	-3,505	-1,815	-12,551
Epe	-315	-2,617	-411	-2,839
Odogunyan	+360	+1,703	+202	+1,394
Sango	+601	+274	-13	-89
Total	**3,285**	**-4,046**	**-2,053**	**-14,198**

Source: CPCS

Table 6-19: Summary of Annual Concession Fees (Gap Funding) and Government's Financial Contribution (US$ 000)

Terminal	Scenario One – Government Provides Land		Scenario Two – Private Sector Acquires Land	
	Annual Concession Fee / (Gap Funding) Estimate	Present Value of Government's Financial Contribution (net of Concession Fees) Discounted at 10%	Annual Concession Fee / (Gap Funding) Estimate	Present Value of Government's Financial Contribution (net of Concession Fees) Discounted at 10%
Agbara	33,120	35,640	-5,760	-40,680
Berger	916,920	-1,261,800	-653,400	-4,518,360
Epe	-113,400	-942,120	-147960	-1,022,040
Odogunyan	129,600	613,080	72,720	501,840
Sango	216,360	98,640	-4680	-32,040
	1,182,600	-1,456,560	-739,080	-5,111,280

Source: CPCS

Based on the results outlined in Table 6-18 and Table 6-19, the following conclusions can be made:

6.4.1 PSP Conclusion

Based on the above tables, the following conclusions can be made:

1. Similar to the unlevered results in Section 6.3.2, the proposed mega terminal at Epe would not be viable even with a combination of (1) Government providing land and/or (2) gap funding. The major driver for this is that relative to other terminals, the Epe Terminal exhibits lower vehicle traffic per our traffic estimates. Thus, Epe should not be considered for a DBOMT PPP scheme (with significant risk transfer to the private sector) until the potential for traffic improves.

2. Without an assumed terminal value at the end of the PPP contract period, gap funding is required for the proposed terminals at Agbara, Berger and Sango in the case where the private sector acquires the related land. Though we recommend that Government provide the land as envisaged by LAMATA, there are a number of ways to minimize gap funding in the absence of providing a potential private partner with a final cash flow (funded by Government) that represents a terminal value (should the private partner acquire the land):

    a. The PPP contracting period could be extended to the point where gap funding is not required. However, this may be viewed as politically unviable.

    b. The PPP contract can be made renewable as another means of extending the contracting period though there would still be an issue of final compensation should the PPP contract not be renewed. To address this, a related clause could be placed in the contract such that any upfront fees that are received from the concessionaire that is to take over the mega terminal is paid directly to the previous concessionaire. With the infrastructure already and place, and a business case for mega terminals already developed, we are of the view that upfront fees are viable in a subsequent concessioning exercise.

On the issue of land acquisition, we are of the view that for all four mega terminals, land should be provided by Government. Not only would this confirm the seriousness of Government's desire to develop these proposed mega terminals, it would alleviate pressures on the local capital markets' ability to privately finance a fairly significant Naira-based acquisition (estimated at over N9.3 billion).

With Government acquiring the land, there are mechanisms for recouping some or all of these costs as land value uplift materializes from the development of mega terminals. Below are some examples that could be used in combination to recoup such upfront costs:

- Government could collect a royalty from the commercial development component of the mega terminals. The royalty would be based on the difference between current commercial lease rates and any rate increases should land value uplift materializes; and
- Impose a levy on further commercial developments within a given radius (e.g., 20 km) following the development of mega terminals. The assumption here is that should land

value uplift materialize from the development of mega terminals, this will spur further developments around the mega terminals.

6.5 Next Steps

Following on from our recommendation that the LASG take forward the development of the terminals on a PSP basis (accept for the proposed terminal at Epe which should be developed at this stage given the economics of the project), the following are next steps that need to be pursued.

1. As an immediate priority, Government should start consulting with private bus operators and their unions, explaining to them the mega bus terminals initiative, and how this will be of benefit to them. The economic analysis confirms the social benefits of the project, particularly around alleviation of congestion in the LMA. LASG must stress to existing bus terminal operators that they would be permitted to participate in the transactions, and that all bus operators would have access to the facilities. The operators must also be briefed on the regulation and enforcement that will be part of the project implementation. The importance of the mega terminals to the bus reform program and alleviating congestion in LMA needs to be clearly communicated to bus operators and other stakeholders who are likely to resist this initiative. Early engagement with all stakeholders will minimize resistance to the mega terminals after they are developed. It will also allow bus operators to start planning their future business in line with the mega terminals initiative.

2. The initiative should be well publicized, through newspaper, radio and television advertisements. The main purpose of this will be to convey to the domestic and international investor community the seriousness of Government in developing the terminals with PSP. The current experience of developing such bus terminals in Nigeria is mixed. In Port Harcourt, a bus terminals was developed but the required regulations were only loosely enforced. Hence it is important to convey to investors how serious the Government is about properly implementing this project.

3. Commence detailed and targeted market sounding once (1) and (2) are sufficiently underway to confirm interest in a DBOMT model. Targeted market sounding should be formalized and structured towards gaining valuable and focused feedback from the private sector. Newspaper, television and/or radio advertisements can be used to inform interested parties of the market sounding event. Government should be prepared to present information in the following areas during the event:

    a. General guidelines of the access charge regime as discussed in Section 5.4;
    b. The strong desire to marry terminal development with commercial development;
    c. Government will provide the land (as necessary).

    At the market sounding event(s), Government should seek information in the following areas:

    a. Ranking of terminals in terms of commercial attractiveness;

b. Anticipated terminal configurations;
c. How the private sector would exploit the anticipated commercial potential at each terminal; and
d. Any other viability or bankability issues.

Potential interested parties that should be targeted for this market sounding event include ABC Transport, Planet Projects, Neon Andani, SIFAX Group, Primero Transport Services Limited and GIG Group.

4. Secure public funding for land acquisition (as necessary).

5. For those terminals where there is strong interest, prepare tender documents towards a DBMOT type of PPP with revenue risk transferred to the private sector. The following need to be considered in the bid.

    a. Bidders should state the access charges they will propose and should be scored accordingly (with those proposing lower charges scoring higher);

    b. As far as possible, commercial developments should seek to minimize the level of access charges required to maintain a reasonable project payback period and rate of return. As such, commercial developments as part of bidders' terminal business plans should be requested and evaluated; and

    c. There should be a mechanism where the private sector is able to collect penalties from Government should regulations not be sufficiently enforced (the onus would be on the private sector to objectively prove that this has been the case). Though we do not envisage penalties ever being paid, given how serious LASG is about regulation and enforcement, it would add a degree of comfort and increase the attractiveness to those bidding for this project.

6.6 Risk Analysis

The project is heavily dependent and linked with a successful implementation and interface with LAMATA's bus reform programme. Table 6-20 highlights the key risks on the bus terminal projects and the potential risk allocation assuming some form of BOT type of arrangement for illustration.

Table 6-20: Bus Terminal Project Risk Matrix

No	Risk Heading	Definition	Public Sector	Private Sector	Shared	Ability to Transfer Risk
1	**Design Risk**					
1.1	Failure to adequately specify the employer's requirements	Employer's requirements not accurately translated into Tender Documents	*			No
1.2	Continuing development of design/design work not being completed on time	The detail of the design should be developed within an agreed framework and timetable. Failure to do so may lead to additional design and construction costs.		*		Yes, through Contract
1.3	Change in design requirements by the Government and (or) the bus terminal operator	The Government and(or) the bus terminal operator may require changes to the design, leading to additional design costs			*	
1.4	Failure to build to brief	Misinterpretation of design or failure to build to specification during construction could lead to additional design and construction costs		*		Yes, through the Contract, careful development of the project brief and ongoing liaison between the Government's agent, Operator's agent and the Contractor's designer will help remove the possibility of misinterpretation of the construction requirements
1.5	Governments' concession programme (Political expediency)	The speed of the Governments' programme leading to design inadequacies if Contractors are required to undertake the completion of the	*			This can be eliminated through adequate allocation of time and avoidance of delay at the initial stages and consideration of

No	Risk Heading	Definition	Public Sector	Private Sector	Shared	Ability to Transfer Risk
		works within a timescale that is unreasonable or shortened				the use of Early Contractor Involvement (ECI)
1.6	Inaccurate traffic forecasts	Inaccurate traffic forecasts may result in an inaccurate design/resourcing/operating plan	*			The Annual Availability payments will insulate the operator of traffic fluctuations, but will be linked to performance standards
1.7	Inadequate liaison with stakeholders	Inadequate liaison may lead to third party requirements or accommodation works being omitted from the employer's requirements			*	Yes, through the contract
1.8	Service objectives not met	Objectives set forth by the service may not be met at satisfactory levels	*			No, but can minimise through careful development of service proposals
1.9	Data availability	Information coming from the Government and their other key stakeholders might be slow		*		Make early contact with all parties; Be prepared to adjust presentation to address shortcomings
1.10	Tender Capacity	There may be lack of tender capacity, or collusion between tenders which may cause an annulment of the tender and time delays in the tender process	*			No
1.11	Construction Costs	Cost estimates to be based on preliminary design which would not be adequate		*		Conduct peer reviews or independent engineer reviews
1.12	Substandard design	The design may have shortfalls in terms of adequate engineering principles and its addressing of problem areas with cost effective engineering solutions		*		Conduct peer reviews or independent engineer reviews

No	Risk Heading	Definition	Public Sector	Private Sector	Shared	Ability to Transfer Risk
2	**Construction and Development Risks**					
2.1	Incorrect time estimate	The time taken to complete the construction phase may be different from the estimated one		*		Yes, ensure estimate is reasonable and control through the Contract
2.2	Delay in gaining access to the site	A delay in gaining access to the site may delay the entire project (land Acquisition planning & effective implementation)	*			No, but can be minimised through project management
2.3	Access to land not available for construction	Access to land for verification surveys or construction of the permanent works may not be available to the whole of the site by the Contract starting date.			*	No, but can be minimised through careful forward planning
2.4	Poor coordination with other works	Interference from other third party works may lead to a delay in starting some elements of the permanent works			*	No, but can be minimise through project management and careful liaison
2.5	"Compensation events"	An event of this kind may delay or impede the performance of the contract and cause additional expense			*	No, but can be minimise through Contract and project management
2.6	Force Majeure	In the event of Force Majeure, additional costs will be incurred	*			No
2.7	Contractor Default	In the case of contractor default, additional costs may be incurred in appointing a replacement, and may cause delay		*		Yes, through Contract compensation to the Employer can be defined
2.8	Poor project management	There may be a risk that poor project management will lead to additional costs			*	No but can minimise through careful selection of project management

No	Risk Heading	Definition	Public Sector	Private Sector	Shared	Ability to Transfer Risk
2.9	Contractor/sub-contractor industrial action	Industrial action may cause the project to be delayed as well as incurring additional management costs			*	No, but can minimise through careful election of reputable contractor and could seek to recover any costs incurred
2.10	Key subcontractor becomes bankrupt	Bankruptcy of a key contractor may lead to a delay until a replacement sub-contractor can be appointed		*		Costs associated with appointing a replacement will be borne by the principal EPC Contractor; Delay damages will be repaid to the Employer in the event of the works overrunning the allocated time
2.11	Abnormal weather conditions	Excessive periods of inclement weather are normally considered to be compensation events			*	The risk can be transferred with onerous Conditions of Contract but this may lead to higher than anticipated tender prices; Can seek Insurance against such conditions
2.12	Availability of terminal design meeting minimum specifications and other material supply difficulties	There may be difficulties in obtaining customized design or proprietary materials		*		Minimum Specifications to be proposed in generic terms so as to enable both customized design of terminals.
2.13	Material lead times	Estimated lead times on long-lead items may be underestimated		*		No, but may be minimised through careful planning
2.14	Interface with the Lagos State Bus Reform Programme	The move to five State bus concessions with modern buses may be delayed and affect the effectiveness of the Mega Terminals	*			No, but may be minimised through careful planning
2.15	Substandard construction methods	The contractor may use substandard methods of construction which may compromise delivery and quality of project		*		No but may be minimised through careful formulation of bidding documents and monitoring

No	Risk Heading	Definition	Public Sector	Private Sector	Shared	Ability to Transfer Risk
3	**Health and Safety Risk**					
3.1	Contractor does not adhere to current regulations	The Contractor may breach current Health and Safety legislation or accepted codes of practice		*		No, but could impose penalties and charges to the Contractor
3.2	Changes to regulations	Legislation or accepted codes of practice may change during contract period	*			No, but within control of Government
3.3	Responsibility for maintaining on-site security	Theft and/or damage to equipment and materials may lead to unforeseen costs in terms of replacing items, and delay		*		
3.4	Responsibility for maintaining site safety	The Construction, Design and Management Regulations and Occupational Safety Health and Safety at Work regulations must be complied with		*		
4	**Environmental**					
4.1	Mitigation does not match environmental objectives	Suggested mitigation measures to alleviate environmental impact of the proposals may not adequately protect the environment as intended and hence may need to be amended leading to time and cost implications			*	No, but can be minimised through careful planning of mitigation measures
4.2	Contamination of water	Accidental contamination of the water may lead to delay in the works during construction or due to leakage of fuel during operations			*	The risk can be transferred with Conditions of Contract; Can seek Insurance against such conditions
5	**Public Inquiry**					

No	Risk Heading	Definition	Public Sector	Private Sector	Shared	Ability to Transfer Risk
5.1	Number of objections greater than anticipated	Dealing with a greater than anticipated number of objections may lead to additional management costs and delay	*			No
5.2	Protester action	Protester action against the scheme may incur additional costs, such as security costs			*	Yes, can be transferred through the Contract
6	**Finance**					
6.1	Failure to obtain adequate funding	Failure to obtain adequate funding may lead to indefinite delay (no financial close)		*		Bidders to submit proof of financing as part of their bid packages.
6.2	Target cost exceeds budget (Budget to include optimism bias)	Tender prices may exceed the pre-tender estimate and allocated budget		*		
6.3	Change in volumes and controlled charges/fares	Traffic shortfalls and price control limit actual revenues.	*			Covered under the availability payments and performance regime in the contract
6.4	Currency / Foreign exchange	Unforeseen fluctuations in currency may change budget costs dramatically		*		This risk is typically priced in bidders' proposals
6.5	LAMATA may lack funds	LAMATA has seen its operating budget cut in recent years and may not be able to support the project.	*			This risk remains with the public sector
7	**Legislation**					
7.1	Legislative/regulatory change	A change in non-specific legislation/regulations taking effect during the construction phase, leading to a change in the requirements and variations in cost	*			No, but control rests with Government

No	Risk Heading	Definition	Public Sector	Private Sector	Shared	Ability to Transfer Risk
7.2	Changes in taxation	Changes in taxation may affect the cost of the project			*	No, but control rests with Government
7.3	Changes in the rate of Value Added Tax (VAT) or VAT legislation	Changes in the rate of VAT or VAT legislation may increase the cost of the project	*			No, but control rests with Government
8	**Performance Risks**					
8.1	Latent defects in new build	Latent defects to the new build, which require repair, may become apparent		*		Yes, can be transferred through the Contract
8.2	Change in specification initiated by both Government and Operator	There is a chance that, during the construction phase of the project, the Government and the Operator will require changes to the specification			*	No, but can minimise through careful project management and internal coordination
8.3	Lack of Enforcement of no on street stopping/access to Lagos beyond the Terminals re Inter State buses	Would mean that the Mega Terminal concept not attractive to and not used by Inter State buses and limits effectiveness of the terminal. With significant Revenue and congestion impacts.	*			Need to be planned in parallel for effective Mega Terminal start up.
8.4	Maintenance Risk	The risk of not maintaining the assets to the appropriate standards and specifications for the life of the project. Increased maintenance costs due to increased volumes. Incorrect estimates and cost overruns.		*		Contract reporting & monitoring. Performance Bond may be called upon to rectify maintenance shortfalls particularly towards the end of the contract period.
8.5	Meeting hand back requirements	The risk of not maintaining the concession assets, operations, staffing etc. in line with the transfer back requirements at the end of the contract		*		Sound monitoring & control of contract performance by the authority. Performance Bond may be called upon to rectify maintenance shortfalls

No	Risk Heading	Definition	Public Sector	Private Sector	Shared	Ability to Transfer Risk
						particularly towards the end of the contract period
9	**Termination Cost Risks**					
9.1	Termination due to default by Government	The risk that the Government defaults, leading to contract termination and compensation for the private sector	*			No
9.2	Default by external funding sources	The risk that the external funding defaults and the project is not completed		*		Yes, through Contract
9.3	Termination due to default by the bus terminal operator	The risk that the operator defaults and step in rights are exercised by the financiers, but they are unsuccessful, leading to contract termination		*		Government could recover costs for default but would incur additional costs associated with appointing another operator
10	**Technology and Obsolescence Risks**					
10.1	Technological change	Technical changes that require Government and Operator to revise their output specifications			*	No
11	**Land Risks**					
11.1	Cost of land	Land costs could be greater than expected	*			No
11.2	Protracted Land Acquisition process	Compulsory purchase/Negotiations/Compensation process delays project and prevents timely financial close	*			No
12	**Statutory Undertaker Risk**					

No	Risk Heading	Definition	Public Sector	Private Sector	Shared	Ability to Transfer Risk
12.1	Unforeseen STAT's apparatus	The possibility exists that statutory utilities apparatus may be found that will require diversionary works or changes to the design	*			Yes, can be transferred with onerous Conditions of Contract but this may lead to higher than anticipated tender prices
13	**Other project risks**					
13.1	Delayed planning approval	A delay in receiving planning permission may have broader cost implications for the project, as well as the loss of potential savings			*	No, but can be minimised through coordination with different agencies
13.2	Inadequate Resources	Human resources or allocated time may be inadequate for satisfactory project management		*		
13.3	Critical staff appointment / competencies / certification	Difficulty in obtaining the required number of critical staff for efficient operations, and/or inadequate certification obtained		*		
13.4	Insufficient project capacity	Possible fatalities or interruptions in operations, or damage to assets			*	No, but can be minimised through internal co-ordination
14	**Political Risk**					
14.1	Political risk	The risk of Government intervention, discrimination, seizure or expropriation of the project. Public sector budgeting.	*			The Contracting Authority typically bears responsibility for political events outside the Private Partner's control.
15	**Revenue Risk**					

No	Risk Heading	Definition	Public Sector	Private Sector	Shared	Ability to Transfer Risk
15.1	Interstate bus operators not using ISBT	Interstate bus operators will discharge/collect passengers outsider of ISBT or interstate buses will continue to operate into City Center	*			Regulation and enforcement Access fee set at a rate where it is equally (or more) profitable to use ISBT to continue journey into City Center Charging pedestrians access fee to enter terminal is an option Availability payments seek to address this though, such payments should be made so long as the operator meets a certain minimum performance standard
15.2	Lagos State Bus Company cannot pay access charges	Lagos State Bus Company is not profitable enough to sufficiently pay access fees which is a loss of revenue to the operator		*		Availability payments seek to address this though, such payments should be made so long as the operator meets a certain minimum performance standard
15.3	Service level decreases	Lagos State Bus Company reduces service frequency		*		Availability payments seek to address this though, such payments should be made so long as the operator meets a certain minimum performance standard
16 **Stakeholder Risks**						

No	Risk Heading	Definition	Public Sector	Private Sector	Shared	Ability to Transfer Risk
16.1	Unions may not approve of project	Bus operators unions may not buy into the project may try and block implementation			*	Need early and regular engagement with the Unions to ensure that they are fully supportive of the project.

Appendix A: List of Stakeholders consulted

S.No.	Name of Agency	Name of Person met	Date
1.	Lagos Metropolitan Area Transport Authority (LAMATA)	1. Abiodun Dabiri, MD, LAMATA 2. Frederic Oladeinde, Director, Corporate and Investment Planning 3. Desmond Amiegbebhor 4. Olasunlami Okusaga 5. Seun Sonoki 6. Atobatele Abidemi 7. Femi Faymbo 8. Omolara Kareem, GIS Specialist	January 15, 2018
2.	Office of Overseas Affairs and Investment (Lagos Global)	1. Dr. Kayode Oguntimehin, Permanent Secretary 2. Yinka Lawal, SA Foreign Affairs	January 18, 2018
3.	Federal Ministry of Power, Works and Housing	1. Fashola Babalola, Hon. Minister and some other top offcials in the Ministry	January 22, 2018
4.	Federal Ministry of Transport	1. Sabiu Zakari, Permanent Secretary 2. Anthonia A. Ekpa, Director, Road Transport & Mass Transit Administration 3. Sani Umar Galadanchi, Director Maritime Services 4. Alfred Agaba Abah, Deputy Director, Road Transport Administration 5. Gloria K. Ahmed, Deputy Director, Road Transport Administration 6. Okuboere S. Mukah, Assistant Director, Mass Transit Administration	January 23, 2018
5.	Federal Ministry of Finance	1. Ahmed Aliyu, Director, Directorate of International Economic Relations (DIER) 2. Abdulfatah Abdulsalam, Assistant Director, Infrastructure 3. Vivian Nwosu, Assistant Director, Policy 4. Adesoji Kayode, Senior Admin Officer, Infrastructure	January 23, 2018
6.	Office of the Vice President	1. Kolade Sofola, Senior Technical Adviser, TATI 2. Imeh Okon, Senior Special Adviser to President on Infrastructure, TATI 3. Dayo Alao, Senior Technical Adviser, TATI 4. Emmanuel Onwudi, Senior Technical Adviser, TATI	January 23, 2018
7.	Planet Projects	1. Biodun Otunola, MD/CEO 2. Sola Adepoju, Assistant Project Director 3. Ifeoluwa Afolayan, Assistant Project Director 4. Demola Olawepo, Assistant Project Director	January 18, 2018

S.No.	Name of Agency	Name of Person met	Date
8.	Nigerian Union of Road Transport Workers (NURTW)	Kabiru Ado	July 12, 2018

Appendix B: List of Secondary Data/reports reviewed

S.No.	Name of Document or Data Reference/Author/Year	Agency/Source
1.	Consultancy Services for the Extension of the Strategic Transport Master Plan (STMP) and Strategic Travel Demand Model (STDM) to Cover the Mega City Region, ALG and Europraxis, December 2014	LAMATA
2.	Development of Bus Route Network for Lagos State - Final Report, integrated transport planning, Ibis Transport Consultants & AEC, April, 2015	LAMATA
3.	Value of Time and Transport Elasticity Study for the Mega City Region - Final Report, Leigh Fischer, May 2015	LAMATA
4.	Lagos Bus Route Network Study, AEC Engineering and IBIS Transport Consultants Limited, 2014	LAMATA
5.	Study for Development of Public Transport Interchanges, LAMATA, 2018	LAMATA
6.	Lagos Non-Motorized Transport (NMT) policy, 2017	LAMATA
7.	Concept Note for Establishing Gateway Interstate Mega Bus Terminals, LAMATA	LAMATA
8.	Gateway Terminal Brief (LAMATA's internal survey for inter-state bus parks), LAMATA	LAMATA
9.	Lagos Mass Transit Alternatives Study, Systra, 2014	LAMATA
10.	Lagos State Transport Statistics, Lagos Bureau of Statistics, 2016	Secondary Research
11.	Lagos State Statistics, Lagos Bureau of Statistics, 2016	Secondary Research
12.	Overview of the Bus Reform and the Gateway Mega Terminal Project, LAMATA, 2018	LAMATA
13.	Lagos Investor's Guide, Lagos Global, 2015	Lagos Global/ Online
14.	Data/map collected on bus movement (inter-state and intra-state), Planet Projects, 2017	Planet Projects
15.	Map of potential bus terminals, Planet Projects, 2017	Planet Projects
16.	Data/Map of existing loading points, Planet Projects, 2017	Planet Projects
17.	Contract Agreement, Drawings and Cost Estimated of Ikeja Intra-State Bus Terminal	LAMATA

S.No.	Documents specific for Legal Review	Source
1.	Lagos State Transport Sector Reform Law of 2018	Online + LASWA
2.	Lagos State Urban and Regional Planning and Development Law 2010	Online
3.	Lagos State Development Plan 2012- 2025	Online
4.	Lagos State Public Private Partnership Law 2011	Online
5.	PPP Manual for Lagos State	Online
6.	Lagos State Public Procurement Law 2011	Online
7.	Lagos State Environmental Protection Agency Law 1996	Online

S.No.	Documents specific for Legal Review	Source
8.	Land Use Act 1978	Online
9.	Lagos State Safety Commission Law	Online
10.	Lagos State Arbitration Law 2009	Online
11.	Lagos Court of Arbitration Law 2009	Online
12.	Arbitration & Conciliation Act	Online

Appendix C: Questionnaire Template used for the survey

A	Bus Park Survey	
1	Name of location	
2	In bus arriving or departing the location	Arriving/Departing
3	Time of arrival/departure	
4	For buses Arriving at location	
a	Origin:	
b	Cities/towns stopped at:	
c	Fare from Origin (start):	
d	Estimated time of departure from Origin:	
5	For buses Departing location	
a	Final destination:	
b	Cities/towns stopped it will stop at:	
c	Fare to Destination (final):	
d	Estimated travel time to final destination:	
6	Type of bus & manufacturer	
7	Carrying capacity of the bus	
8	No. of passengers boarded/alighted from buss	
9	No. of Round Trips made by each bus	
10	Bus Registration Number	
11	Type and amount of Charges paid related to parking:	
	Bus Parking fees (per day/ per trip/ per month)	
	Other Charges (please specify)	

Appendix D: Key State/Federal approvals required for the project

	Nature of Approval	Agency/ Institution(s)	Mega Terminals
1.	Approval of PPP transactions	→ Lagos State Executive Council (Exco) and the Governor of Lagos State are the authorities for the final approval of PPP transactions.	✓
2.	User Fee	→ PPP Office with the approval of the Lagos State House of Assembly approve the user fees or toll to be charged by any concessionaire or private operator. → The Law did not provide for the approval of Lagos State Ministry of Finance (MoF) or Attorney-General of Lagos State. However, MoF will play a key role in assessing the budgetary implications of PPP projects.[51]	✓
3.	Permit to operate a private bus terminal and truck park	→ Lagos State Parking Authority	✓
4.	Planning Permit	→ Lagos State Ministry of Physical Planning and Urban Development	✓
5.	Environmental Impact Assessment (EIA) Report	→ Lagos State Environmental Protection Agency (LASEPA) → National Environmental Standards and Regulations Enforcement Agency (NESREA)	✓
6.	Safety Compliance Certificates	→ Lagos State Safety Commission (LSSC)	✓

[51] The MoF ensures that the forecasted costs for the LASG including any subsidies that may be required to make a project viable are affordable over the full life of the contract. Together with the relevant MDA, it also reviews the costs and contingent liabilities as the project design and risk valuations are refined during the project preparation and procurement phases

Appendix E: Market Sounding audience

#	Investor/ Association	Contact Person	Telephone	Email	
1.	Nigerian Union of Road Transport Workers (NURTW)	Stephen Okafor – GM, Special Services	08033360515	steveokafor2004@yahoo.com	NURTW HQ No 8, Plot 1236 Sapele street, Garki 2, Abuja Nigeria.
2.	Planet Projects	Biodun Otunola, Managing Director; Sola Adepoju	08058500892	biodun.otunola@planetprojectsltd.com; sola.adepoju@planetprojectsltd.com	Ayedun House, No. 19, Igbasan Street, Off Irewole Street, Opebi, Ikeja-Lagos.
3.	Catamaran Logistics Services Limited	Layi Are	+234 8022905272	layiare@yahoo.com http://catamaranng.com/	No 6. Shaffi Sule street off Akin Leigh street, off Admiralty Way Lekki Phase 1 Lagos State Nigeria.
4.	Skye Shelter Fund	Bolarinwa Odeyingbo	+234 (1) 280 1400	shelter@skyebankng.com	Skye Financial Services Plot 287, Ajose Adeogun Street, Victoria Island, Lagos | Nigeria
5.	Top Services Limited	Chief Tokunbo Omisore	01 774 9222		No. 63B, Marine Road, Apapa, Lagos, Nigeria
6.	Brains & Hammers	Albert White	08184462626	Albertwhite71@yahoo.com	Abuja Office Brains and Hammers Estate, African University of Science & Technology Complex, KM10, Airport Road, Galadimawa. Nigeria Lagos Office 112A Olabode George, Off Ajose Adeogun, Victoria Island, Lagos
7.	The Chrome Group Limited	Tope Borishade	0805 746 2656	topeborishade@gmail.com	No. 22, Lobito Crescent, Wuse II, Abuja, Federal Capital Territory (FCT) - Nigeria
8.	Actis	Funke Okubadejo	+234 1 448 5700	eadejuwon@act.is fokubadejo@act.is	Actis Heritage Place (10th Floor) 21 Lugard Road, Ikoyi ,Lagos
9.	Peace Mass Transit	Mr. Uche Collins	0805 509 1812	collinsuche001@gmail.com	No 8 – 10 Peace Factory Road, Emene Industrial Layout, Enugu State.
10.	Cross Country Limited	Jolomi Okorodudu	8056644963	jolomi_okorodudu@hotmail.co.uk	No. 345, Muritala Muhammed Way, Opposite Presbyterian Church Yaba, Lagos Nigeria.
11.	G.U.O Transport Ltd.	Ms. Doris	09053820359	doris.nzube@guotransport.com	36, Opere Street, Wema Bank Bus Stop, Coker, Lagos, Nigeria

#	Investor/ Association	Contact Person	Telephone	Email	
12.	UACN Property Development Company PLC (UPDC)		+234-08137513637	careline@updcplc.com	UAC House 1-5 Odunlami Street, Lagos
13.	ABC Transport PLC		08033389056	contact@abctransport.com	Head Office Owerri North(Ho) Km 5 MCC Uratta Rd Owerri, Imo State, Corporate Office Amuwo-Odofin Terminal, Lagos Plot 79, Oba Kayode Akinyemi way by Festac Bypass, Amuwo-Odofin, Lagos, Nigeria
14.	Cross Country Limited	Jolomi Okorodudu	08056644963		No. 345, Muritala Muhammed Way Opposite Presbyterian Church Yaba, Lagos, Nigeria.
15.	Chisco Transport Company		08113798985		No. 104, Funsho Williams Avenue, Iponri, Surulere, Lagos, Nigeria.
16.	E. Ekeson Bros Limited.		08033214388		No. 31, Ikorodu Road, Jibowu, Lagos Mainland, Lagos, Nigeria
17.	Efex Nigeria Limited		07035060003		N/A
18.	Ekene Dili Chukwu Transport				No. 1, Street, Off Ikorodu Road, Jibowu, Lagos, Nigeria.
19.	God Is Good Motors (GIGM.com)		08090204830		N/A
20.	Iyare Motors		08025774416 08055895927 07036168899		Head Office (Benin) No. 25, Urubi Street, Benin, Edo, Nigeria Lagos Office No. 181, Abeokuta express way Iyana Ipaja, Lagos, Nigeria
21.	Okeyson Motor		08060082209		No. 13, Ikorodu road, Jibowu, Lagos, Nigeria.
22.	Abia City Transport		07088354081		C.40 Ikenegbu Extension, Egbu Road, Owerri, Imo, Nigeria.
23.	Abiodun Ajayi Autos(Aaa)		08055475484		Abiodun AJAYI Autos - aaa jibowu, Lagos, Nigeria
24.	Africa Eagle Multitransport Services		08062103113		No. 1, Edmund Crescent, Jibowu, Lagos Mainland, Lagos, Nigeria
25.	G. Agofure Motors		08025735755, 08023547472 08067982890		No. 154, Pti Road Efurum, Effurun, Warri Central, Delta, Nigeria
26.	Chukwu Buikem Motor		08188025044		N/A
27.	Edegbe Transport		08033069826		Edo State

#	Investor/ Association	Contact Person	Telephone	Email	
					Plot 245, Ugbowo Lagos Road, Benin City, Edo State, Nigeria, West Africa Lagos State Plot 49, Adeyemo Akapo Street, Omole Phase 1,Off Isheri Road, Isheri, Lagos State, Nigeria, West Africa