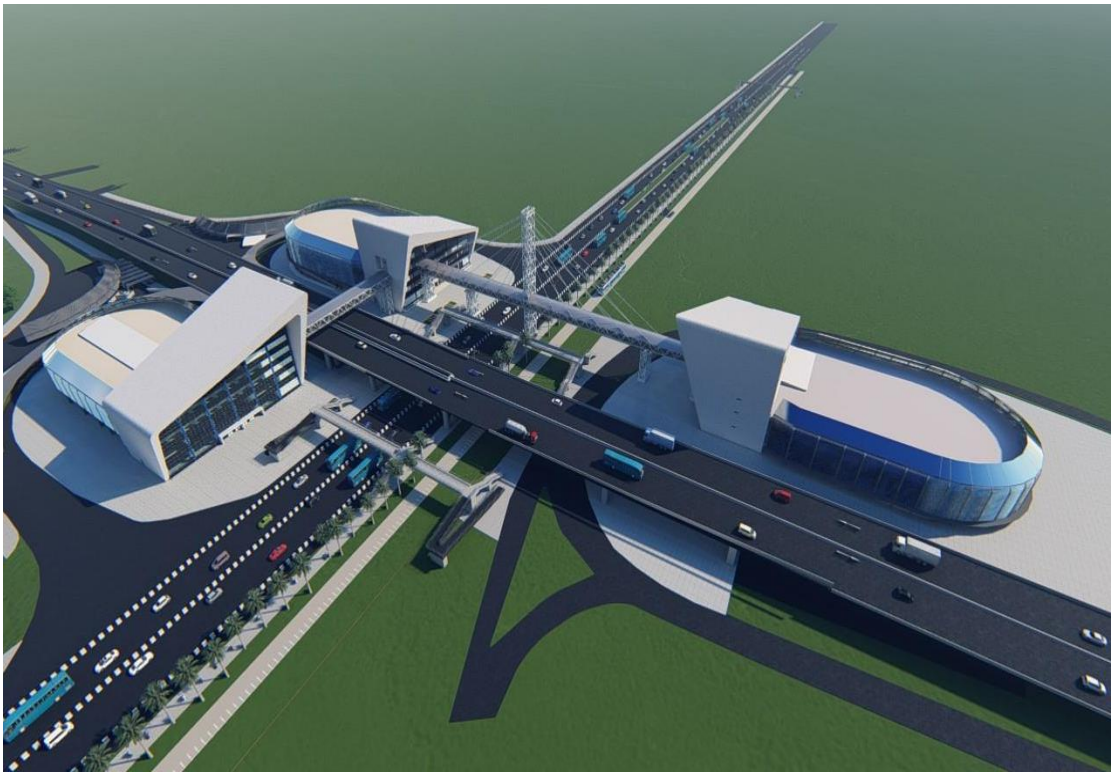
ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT

(DRAFT REPORT)

for

PROPOSED OSHODI TRANSPORT INTERCHANGE PROJECT AT OSHODI-ISOLO LGA OF LAGOS STATE



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JUNE 2020

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PREPARED BY

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Planet Projects Limited wishes to express her appreciation to the Lagos State for the opportunity to develop the world-class transport interchange project in Oshodi area in Oshodi Isolo Local Government Area. The project contractor also express gratitude to the Oshodi-Isolo LGA , the proposed project area. Planet Projects Ltd express appreciation to ESIA Consultant, Global Impact Environmental Consulting Ltd for undertake the Environmental and Social Impact Assessment (ESIA) Study for the Proposed Oshodi Transport Interchange Project. Planet Projects Ltd also recognizes the assistance received from all sources of data and information for this project, including Oshodi community, the Nigeria Union of Road Transport Workers(NURTW), Operator of LagBus and Yellow Buses at Oshodi parks within the project area, government agencies, and Lagos State Ministry of the Environment and Water Resources (LMEnv&WR).

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LIST OF ABBREVIATIONS AND ACRONYMS USED

AGO	=	Automotive Gas Oil (Diesel)
BAT	=	Best Available Technology
BOD	=	Biochemical Oxygen Demand
CBD	=	Central Business District
CO	=	Carbon monoxide
COD	=	Chemical Oxygen Demand
dB(A)	=	deciBel, A-weighted (unit of noise adjusted to human sensitivities)
DO	=	Dissolved Oxygen
DPR	=	Department of Petroleum Resource
E	=	East
EA	=	Environmental Assessment
EIA	=	Environmental Impact Assessment
EMO	=	Environmental Management Officer
EMP	=	Environmental Management Plan
EMS	=	Environmental Management System
FGD	=	Focus Group Discussion
FEPA	=	Federal Environmental Protection Agency
FMEnv	=	Federal Ministry of Environment
g	=	gram (gramme)
GIEC	=	Global Impact Environmental Consulting Limited
GIS	=	Geographic Information System
GPS	=	Global Positioning System
HSE	=	Health Safety and Environment
IFC	=	International Finance Corporation
ITD	=	Inter – Tropical Discontinuity
Kva	=	kilovolt ampere
kg	=	Kilogram
LASEPA	=	Lagos State Environmental Protection Agency
LGA	=	Local Government Area
LMEnvWR	=	Lagos State Ministry of the Environment & Water Resources
LRT	=	Light Rail Transit
MW	=	Megawatts
N	=	North
NAFDAC	=	National Agency for Food and Drug Administration and Control
NDHS	=	National Demographic Household Survey
NE	=	Northeast
NESREA	=	National Environmental Standards and Regulations Enforcement Agency
NL	=	Noise Level
NPC	=	National Population Commission
NURTW	=	Nigeria Union of Road, Transport Worker
NW	=	Northwest
NO_x	=	Oxides of Nitrogen

%	=	percentage
pH	=	Potential of hydrogen
PHCN	=	Power Holding Company Nigeria
PM_{10}	=	particulate matter less than 10.0 microns in diameter
PPL	=	Planet Project Limited
SO_2	=	Sulphur dioxide
SE	=	Southeast
SEP	=	Safety & environmental Protection
SPEB	=	State Primary Education Board
SW	=	South West
TCN	=	Transmission commission of Nigeria
TDS	=	Total Dissolved Solids
TFR	=	Total Fertility Rate
TN	=	Total Nitrogen
TOC	=	Total Organic Carbon
TSS	=	Total Suspended Solids
TSP	=	Total Suspended Particles
UNEP	=	United Nations Environmental Protection
USEPA	=	United State Environmental Protection Agency
VIDP	=	Ventilated Improved Double Pit Latrine
VIP	=	Ventilated Improved Pit Latrine
VOC	=	Volatile Organic Compounds
WHO	=	World Health Organization

EXECUTIVE SUMMARY

ES1.0 Introduction

Lagos is the largest city in Nigeria and is the country's most important commercial center. With an estimated population of over 17 million people, Lagos ranks among the most heavily populated cities in the world. From a small colonial town in the early 20th century, Lagos has now grown into a large metropolis. This dynamic city has experienced rapid urbanization and has lacked sufficient parallel infrastructure development. The vast number of motorized vehicles in the cities plagues the streets, causing tremendous congestion and increased air pollution.

The present State Government has continued to aggressively develop public infrastructure and improve security across the State so as to enable the organized Private Sector to actively participate in the State's economy. In a bid to take the effort further, the Lagos State Government is planning to development of a world-class transport interchange at Oshodi

The proposed world class Transport Interchange is to be located at the popular Oshodi in Oshodi Isolo Local Government Area of the State. Oshodi is located at the heart of the Lagos Metropolis and is the most strategic transport zone in Lagos, having a lot of markets and commercial activities and adjacent to the Ilupeju, Matori, Isolo and Ladipo Industrial Areas. Being at the junction of 2 very important routes in Lagos – Apapa - Oshodi Expressway & Agege Motor Road – Oshodi is a transport node and major interchange point, with 76% of the entire area being used for transport activities & bus parks. Oshodi has 13 parks (both interstate and intra-city) where about 500 vehicles are parked at any point in time. With over 5,000 buses loading daily, over 100,000 commuters boarding daily (over 40 million/year), about 1 million pedestrians and a railway station, Oshodi is arguably the largest transport interchange in West Africa.

Geographically, the proposed project is located between Longitude $3^0$10'00"E and $3^0$23'26"E and Latitude $6^0$29'18"N and $6^0$25'22"N. Administratively, the proposed Oshodi Transport Interchange project is located in Oshodi-Isolo Local Government Area of Lagos State. The proposed project will be situated in the recently demolished Owonifai market in Oshodi and some early shanties located within the interchange area. Being at the junction of two very important routes in Lagos – Apapa - Oshodi Expressway & Agege Motor Road, the proposed project is a transport node and major interchange point, with 76% of the entire area being used for transport activities & bus parks

As part of the World Bank requirements for such project and in fulfillment of the Federal Ministry of Environment (FMEnv) regulatory requirements, a project such as the proposed Oshodi Transport Interchange project requires an Environmental and

Social Impact Assessment (ESIA). To obtain the regulatory approval for the project development, the Lagos State Government through the project contract, Planet Project Limited (PPL) invited **Global Impact Environmental Consulting (GIEC) Limited** to prepare the Environmental and Social Impact Assessment for the proposed Oshodi Transport Interchange project.

This report relates to the ESIA for their proposed Oshodi Transport Interchange Project and will cover the assessment of planned project activities, the environment around the project area, and the associated and potential impacts of the proposed project as well as reasonable mitigation options for the negative impacts.

ES2.0 Project Justification and Alternatives

Transportation is crucial to both social development and economic growth of any nation. According to the World Bank Development Indicators (2009), most West Africans will live in urban areas by 2030 despite the prevailing situations in the urban cities. It is expected that urban population in this region will reach a staggering 270 million between 2010 and 2030. Lagos, as one of the fastest growing mega cities in the world, is not left out in this exponential population growth, presently over 20 million people are living in Lagos and this figure is expected to increase by about 30% in 2025.

The rapid urbanization will continue to put pressure on transportation demand as well as existing infrastructure in the State. It is estimated that the State loses 3 billion hours to traffic congestion each year costing about N25 billion (Ehingbeti 2012). The growth in demand for trips in Lagos metropolitan area by all mode of transportation is 20 million trips per day and this would increase to 30 million trips per day by the year 2020.

To address this challenge and take full advantage of the immense economic opportunity that come with it, there is need to implement an efficient and sustainable Strategic Transport Master Plan (STMP) and Travel Demand Model for the Inter Modal Transportation System put in place in the State. One major focus of this plan is to aggressively develop public transportation infrastructure and improve security across the State so as to enable the organized Private Sector actively participate in the State's economy.

The need for the proposed Oshodi world class Transport Interchange is premised on the need to take full advantage of the potentials of Oshodi as the largest transport interchange in West Africa presently with over 13 parks (both interstate and intra-city) where about 500 vehicles are parked at any point in time, over 5,000 buses loading daily, over 100,000 commuters boarding daily (over 40 million/year), about 1 million pedestrians and a railway station.

This is further strengthened by the desire of the current administration in the State to transform Oshodi into a world-class Central Business District (CBD) with business, travel and leisure activities conducted in a serene, secure, clean, orderly and hygienic environment, a concept that anchored is on a 3-pronged approach – Transportation, Security and Urban Renewal & Environmental Regeneration.

The Initial estimate of the total cost of the project has been put at 20 Billion Naira with well over 50 per cent of the cost injected into the local economy through procurement of Construction materials, Operational facilities and equipment, Civil engineering Services, Skilled and Unskilled labour etc. The project is to be funded by the Lagos State Government through government subvention, Equity and Debt.

The life span of the project is placed at 30 years and above, while return on investment is expected after 10 years.

The sustainability of this project leans on the fact that it is planned with utmost regards to economic and environmental sustainability. The project contractor Planet Projects Ltd is carrying out the planned project in line with the State Government policy framework on public-private partnership concept to achieve its expectations on public infrastructure development.

Various alternatives to this project were considered and these include the No project, delayed project, alternative site. At the end, it was decided that the most attractive alternative is that, which has been adopted by project proponents.

ES3.0 Process Description

The proposed Oshodi transport interchange project has the following components:

- Three (3) multi-storey terminal buildings.
- Three Standard (3) bus Parking Areas
- Two (2) covered pedestrian walkways/ bridges to link the three complex (building and bus parking)
- Shopping mall
- Associated Infrastructures, which include waste management facilities, fencing, lighting, dedicated security systems, surveillance tower, CCTV etc.

Each of the terminals contains four floors of 30,000sq.meter with other ancillary facilities. The details of the terminals are provided below:

Terminal 1 – comprises of the intercity bus parking and multi-storey parking on two floors. The terminal 1 will also have a shopping mall containing retail mall with anchor franchasie, food court and entertainment arcade.

Terminal 2 - comprises of the intercity bus parking and multi-storey parking on two floors. The terminal 2 will also have pedestrian walkway that links to

the major bus stop.

Terminal 3 - comprises of the intercity bus parking and multi-storey parking on two floors. In addition to the bus parks, the terminal 3 will also contain parking space for private car park.

ES4.0 Description of the Environment

Climate and Meteorology

The project area has an average temperature in Lagos is 28°C, and seldom drops below 18°C. The average daily humidity is approximately 70% during the afternoon in the dry season, and approximately 80% in the morning during the wet season, often resulting in precipitation in the afternoon.

Air Quality and Noise level

Ambient Atmospheric conditions studies

An atmospheric conditions assessment study has been carried out in support of Environmental Impact Assessment (EIA) of the proposed Oshodi Transport Interchange Project in Oshodi-Isholo Local Government Area of Lagos State, Nigeria. Parameters investigated include meteorological elements, air quality parameters, and ambient noise levels. They were all measured with on-line monitors while the airshed was classified using the World Bank Classification Guidelines.

Oshodi, the proposed project area in Lagos, has climate characterized by the dry and wet seasons with rain in every month of the year having annual level of about 2400 mm. Every other measured meteorological parameter during the fieldwork agrees with climatic data of the area. During the fieldwork, ambient air quality were Ammonia (NH_3), Methane (CH_4), Nitric Oxide (NO), Nitrogen Dioxide (NO_2), Carbon Monoxide (CO), Volatile Organic Compounds (VOCs), Sulphur Dioxide (SO_2), Hydrogen Sulphide (H_2S), Ozone (O_3) and Suspended Particulate Matter (SPM) but NO, CH_4 and SO_2 were not detected in all the sampling locations.

During the study CO was 1.2 – 7.5 ppm while NO_2 was 0.001 – 0.30 ppm with VOCs, H_2S, NH_3 and O_3 levels of 0.16 – 1.83 ppm, 0.01 – 0.08 ppm, 0.03 – 0.39 ppm and 0.01 – 0.02 ppm. The Daily equivalent of the measured CO was 0.62 – 3.85 ppm with NO_2 and VOCs levels of 0.01 – 0.15 ppm and 0.08 – 0.94 ppm respectively. While the measured H_2S and NH_3 were respectively 0.01 – 0.04 ppm and 0.02 – 0.20 ppm as daily equivalents, O_3 became 0.01 ppm. They are all within their respective limits except NO_2 at only one location. The measured $PM_{2.5}$ was 2.3 – 25.0 µg/m^3 with PM_{10} levels of 4.7– 72.7 µg/m^3 while TSP was measured to be 11.2 – 134.1 µg/m^3. In all the locations where detected, the 600 µg/m^3 1-hour FMEnv limit of TSP was not exceeded. Similarly their respective daily equivalents concentrations of 1.2 – 12.8 µg/m^3, 2.4 – 37.3 µg/m^3, and 5.7 – 68.8 µg/m^3 are all within their respective limits.

The daytime minimum noise levels (L_{min}) were 51.1 – 75.4 dB (A) with maximum levels (L_{max}) of 58.2 – 85.3 dB (A). The background noise levels (L_{90}) in the study were 56.2 – 79.0 dB(A) which all breached the 55 dB(A) day-time limit of the World Bank. Similarly the 70 dB(A) industrial area noise limit of the World Bank was breached in about 50% of the sampling locations. Vehicles were the major anthropogenic sources of noise observed during the study. The natural source includes wind, among others

Air Emission Dispersion Modeling

An independent air emission dispersion modeling carried out on the proposed Transport Interchange in Oshodi, Lagos State, Nigeria to determine its impact on the airshed is herein reported. Emission inventory was conducted to identify the sources of air pollutants in the facility. Air pollutants including Carbon Monoxide (CO), Oxides of Nitrogen (NO_X), Sulphur Dioxide (SO_2), Volatile Organic Compounds (VOCs) and Suspended Particulate Matter (SPM) associated with the identified sources were quantified and fed into the ISC-AERMOD View dispersion modelling tool. Two traffic flow scenarios were investigated for a comprehensive air quality impact assessment on the proposed project.

Vehicles are the major sources of air emissions in the proposed project site in its operation phase. The maximum ground level concentrations of CO, SO_2 and SPM associated with vehicular emissions in the operation phase of the project are within their respective limits. Both NO_X and VOCs from vehicular emissions breach their respective FMEnv and World Bank Group limits. Improved free flow of traffic in the area accompanying the proposed project will assist to achieve reduced air pollutants from the anticipated reduced traffic gridlock and associated reduced vehicular emissions. However, traffic appears heavier in the afternoon/evening that the morning period.

Noise Dispersion Modeling

The ambient noise associated with this project has been investigated using the Enterprise Edition of NoiseMap 2000 Version 2.7.1. Traffic flow into and out of the proposed facility during the morning period results in ambient noise levels of 52.5 – 107.8 dB(A) with the minimum levels in the Gbagada-Oworonsoki axis and the maximum in Isolo-Mile axis. In the afternoon/evening period, ambient noise levels associated with traffic flow in and out of the study area are 82.5 – 141.4 dB(A) within the investigated receptors locations. The minimum noise levels during this period are from the Agege axis while the maximum are from Mushin axis.

It is recommended that trading should be discouraged around the roads leading in and out of the proposed project site to reduce human exposures to ambient noise levels from traffic. Delivery date of the proposed facility project should be honoured to commence its noise reduction benefit on schedule. Periodic ambient noise levels

should be periodically surveyed around the proposed project area for continuous performance evaluation on noise reduction benefit

Geology and Hydrogeology

Field studies and geophysical investigations within the vicinity of the study area properly corroborated the known geology of the area and went further to indicate the occurrence of relatively well sorted, unconsolidated deposit of medium sized sandstone.

The quality of the groundwater in the study area is relatively good (i.e. clean water) with specific reference to the physicochemical and microbial characterization. Hydrocarbon concentrations in all cases were low with total petroleum hydrocarbon.

Soil Studies

Soils within and around the project area are very deep and poorly drained. They have dark gray, sandy clay loam to sandy clay surface over light brownish gray to light gray, sandy clay loam to sandy clay subsoils.

Wildlife and Endangered species

It should be noted that areas within and around the project location are all built-up part of Lagos State. Therefore, the commonest wildlife expected is birds and the reptiles. Various birds have been reportedly present in the project location and indeed Lagos, and these include aquatic species such as kingfishers, egrets; and garden and forest species such as the doves and weaverbirds.

Traffic Studies

Generally, the traffic volume is high in all the four directions surveyed. However, Isolo-Mile2-Apapa has the highest traffic volume from morning till evening hours. Trucks are also more frequent along the Mile2-Apapa and Gbagada –Oworonshoki directions. This is expected, as this is the route that connects the Lagos Apapa seaport where goods are imported and exported out of Nigeria. The traffic was observed to be free flow for most of the days; however it tends to build up in the evening hours in all directions particularly between 4pm and 6pm.

Social Impact Assessment

Project Site History

The project location is Oshodi transport terminus, which is located in Oshodi-Isolo Local Government Area (LGA). Oshodi is home to one of the oldest notable markets in Lagos State, the Oshodi Market, which was established in 1860. The centrality of Oshodi was instrumental to the rapid development and expansion of the market. The development of the market has been further aided by various factors, including the construction of a railway line for the transportation of people and goods from Lagos to

other parts of the country. Oshodi has also been a major terminus for road transportation from Lagos to other parts of Lagos (such as Badagry, Agege, Ikorodu, Lagos Mainland, Lagos Island, etc.), as well as from Lagos to other parts of the country through Abeokuta and Sagamu in Ogun State.

The project location is Oshodi transport hub – a major transport node, connecting four major transport routes in Lagos, namely: Apapa-Oshodi Expressway (leading on to the Lagos Island through the Third Mainland Bridge) the Lagos-Ibadan Expressway (through Gbagada and Ketu), the Lagos-Abeokuta road through Ikeja and Otta; and the transport route to other parts of the Lagos Mainland through Mushin and Surulere.

Project Background

Oshodi is noted to have thirteen inter-state and intra-city parks, with about 500 vehicles parked at any point in time. Over 5,000 buses are reported to load in Oshodi daily, carrying over 100,000 commuters daily (about 40 million per annum). It is also estimated that about 1 million pedestrians pass through Oshodi daily (Official document: Development of the Oshodi Transport Interchange). With these features, Oshodi is, arguably, the largest transport interchange in West Africa, with high human and vehicular traffic both day and night.

However, there have been various allegations and reports about criminal activities in Oshodi, endangering lives and property in the area, as well as complaints about the degradation of the community and environment, prompting the need to restructure the Oshodi environment. The plan of the state government is to remodel the transport hub by constructing a bus terminal in Oshodi, in line with the government's mission of turning Lagos into a megacity. It is believed that the transport interchange will solve the problem of crime and reduce traffic congestion, as well as beautify the area.

The planned Oshodi Transport Interchange proposes to consolidate all the 13 inter-state and intra-city parks into 3 multi-storey bus park and terminals (4 floors, 30,000 sq. m. for each terminal). The three terminals would have standard facilities, including waiting area, loading bays, ticketing stands, drivers' lounge, parking areas, rest rooms, malls, etc. There will also be accessible walkways and pedestrian bridges/sky-walks to link all three terminals and malls (Official document: Development of the Oshodi Transport Interchange).

The construction of this huge and ambitious transport interchange in an already fully-built up commercial centre is expected to have impact on various aspects of people's lives, businesses and activities in the project area, including social, economic and environmental impact.

RESEARCH METHODOLOGY

The study was conducted in selected areas of Oshodi and the market/motor garage area. Research information was collected using a combination of quantitative and qualitative methods.

Achieved Samples

The study covered 51 household respondents, 234 business operators/owners, 25 key informants, as well as two Focus Group Discussion panels.

Fieldwork

The fieldwork for the study was conducted between 7th and 12th March 2018, with respondents selected from within and around Oshodi market and bus terminus. In order to ensure a good distribution, specific households/individuals and business operators for interview were selected using the quota sampling technique, taking cognisance of gender, age and class differentials. The fieldwork process was conducted under close supervision.

Language of Interview

In order to enhance a good understanding of the survey issues and effective communication between the researchers and the respondents, interviews and interactions were conducted in languages that the respondents were most comfortable with. In this regard, most of the interviews were conducted in Yoruba language.

AWARENESS, ATTITUDE AND OPINION ABOUT THE PROPOSED OSHODI TRANSPORT INTERCHANGE PROJECT

Awareness about the Proposed Oshodi Transport Interchange Project

The SEIA showed that the level of awareness about the project was high. At the time of the study, most of the household respondents were aware of the Oshodi Transport Interchange project. An even higher proportion of the business operators was aware of the project, while all the Key Informants were aware of the project. Error! Not a valid link.

The respondents got to know about the project through various sources, including: during demolition exercise, through banners and leaflets; construction billboards; through the media (radio and television); advertisements, and information obtained through market associations, friends and CDA officials, although of the business operators said they got to know about the project when the actual demolition exercise commenced. Some of the male FGD discussants said they were given only seven days to vacate their shops before the demolition works started. However, the Key Informants had prior notice about the project, some as far back as 2016.

General Opinion about the Proposed Transport Interchange

Majority of the household respondents had favourable opinion about the project, noting that it will lead to further development of the area and the entire community, it will boost business, and reduce traffic congestion. However, some of the respondents had negative opinion about the project, complaining about demolition of structures, shops, etc. The business operators had more unfavourable opinions than both the individual household respondents and the Key Informants.

Possible Effects of the Project on People and Households

The respondents thought the project could affect them in various ways, both positive and negative, although more people thought it would have more positive than negative effects. The potential positive effects that were mentioned by some of the respondents include: increased business opportunities, improved transportation systems, cheaper transportation costs and generally better life. On the other hand, the negative effects mentioned include demolition of shops and structures, displacement of people from their houses and businesses, loss of customers, loss of sources of livelihood, reduction of sales/business, unemployment, loss of income and increased traffic.

Majority of the respondents also thought the project would have more positive than negative effects on the community.

Problems that the Proposed Transport Interchange Project Could Bring to the Community

The respondents mentioned various problems that they thought the Transport Interchange Project could bring to the community, including the return of the area boys, increase in house rent, destruction of public infrastructure, demolition of houses, displace of people (residents and traders/business people), loss of jobs for displaced traders and business people; increase in the cost of transportation, increased poverty, health hazards, community congestion as a result of the influx of more people; and increased traffic in the community.

Solutions to Problems the Project could cause for the community

Various solutions were proffered by the respondents to the identified problems, including: construction of shops, adequate compensation for project affected persons, provision of alternative accommodation for people affected, and that the construction works should be completed quickly in order to minimise the effects on people.

Possible effects of the project on women, children and youth

Most of the respondents thought the project would have positive effects on women and children, who they said would be able to walk safely on the streets without fear of being molested or attacked by the area boys and thieves. Some also said the transport interchange project has the potential of creating employment opportunities

for women, as well as young people in general, although some also talked about the possible negative impact on women who are family.

Benefits of the project for People and Households

Some of the benefits that the household respondents mentioned for people and households from the project include more accessible/improved roads, improved transportation, eradication of traffic jam, increased employment opportunities, increased business, and more income, although a few of the respondents did not mention specific benefits or simply said they did not know.

Benefits for Communities

For communities in general, the potential benefits of the project were said to include improved environment; development of the community; good roads, increased job and business opportunities; improved transportation system, and reduction in crime and violence in the community.

Particular Groups of people who may be affected by the proposed transport interchange

Particular groups of people that were likely to be affected by the project were mentioned to include: traders, landlords, community residents, transport workers, business owners and market people, small-scale and petty traders, as well as people whose houses and shops were demolished. These groups of people were believed to be vulnerable because of demolition of shops and houses, which could lead to unemployment, poverty, homelessness, rent increases, loss of income, reduction of sales (’market’), loss of properties, displacement and relocation.

Vulnerable Groups in the Community

About one-quarter of both the household respondents and business operators said there were some vulnerable or particularly disadvantaged people in the community, including the beggars, the homeless people, physically-challenged people, people with mental challenges, ‘osanle’ children (children who ran away from their homes), homeless children, area boys, the local thugs, and motor park touts.

Possible Conflict between the Project and People in the Community

The overwhelming majority of the respondents across all categories did not foresee any conflict between the residents and the project. The few respondents who thought there could be conflict mentioned issues about problems with the displacement of people from their businesses, increases in the rent for houses and shops, increases in the cost of transportation, parking of buses on the roads, rendering some people homeless and displacing people from their businesses. Some respondents simply heaved a sigh of resignation that there was nothing people could do, since they cannot fight the government.

Suggestions for Avoiding Conflict with People

It was noted that possible conflict could be avoided by the construction of houses for people; relocation of people and businesses who may be affected/provision of alternative business locations; compensation for people affected, and speeding up the project for early completion in order to minimise the negative effects on people.

Fears/Concerns about the Proposed Transport Interchange Project

Majority of the respondents did not have any fears or concerns about the Transport Interchange Project. Those who had concerns mentioned issues about adequate compensation for people who may be affected, increase in rent, increase in the price of goods, demolition of family houses, demolition of own shops and family members' shops, reduction of sales, loss of shops, reduced business opportunities, and loss of income.

Possible Resistance/Objection to the Proposed Transport Interchange Project

A high majority of the respondents did not think there would be any resistance or objection to the project. Those who thought there could be resistance/objection talked about possible resistance by people whose shops and businesses were affected, as well as non- compensation of project affected persons. Many of the people who did not think there could be resistance or opposition reasoned that 'nobody could fight the government'.

Solutions to Possible Resistance/Opposition to the Project

The solutions for overcoming possible resistance/opposition from people to the project include suggestions that the government should dialogue with people who may object to the project, re-train the danfo drivers to do other business, build alternative/affordable shops, pay compensation to people affected, create alternative places for the transporters to operate, and prevail on landlords not to increase rents arbitrarily. Some also advised that the government should fast-track and complete the project quickly, in order to reduce the time that people's businesses and livelihood will be affected.

Respondents' reaction if houses or premises were to be affected by the project

If respondents' houses or business premises were to be affected by the transport interchange project, many of the respondents said they would appeal to the government for compensation, appeal for relocation, or plead for provision of alternatives. A major positive indication in this regard is that most of the people would seek peaceful resolution of the conflict.

What could be done to assist people to reduce the effect of the project

On what could be done to assist them to reduce the effects of the project on them and their households, some of the respondents mentioned assistance with alternative accommodation, compensation, financial assistance to build another house,

construction of more low-cost houses and shops for people by the government, and ensuring that landlords do not increase rent.

Relocation
If their businesses were to be relocated because of the project, issues that will be of concern to the business operators include getting new shops, getting new customers, cost of relocation, and the challenges of starting their businesses all over.

Relocation Preferences
If they were to be relocated, majority of the individual household respondents would prefer relocation in or near Oshodi. Similarly, majority of the business operators would prefer relocation in or near Oshodi.

What can be done to reduce the effect of Relocation
In order to reduce the effects of relocation, the business operators suggested provision of affordable shops, construction of more shops, financial assistance to relocate, adequate compensation for relocation, giving loans with low interest, completing the project on time, and allowing enough time for people to relocate.

Socio-Cultural Artefacts in the Community
Some of the respondents reported the presence of some socio-cultural artefacts in Oshodi, including the Esu shrine, Igbale, Mosque, Ogun Ajobo shrine, Ojubo osa, Egungun shrine, and Isese shrine. A good observation in this regard is the belief that the socio-cultural artefacts can be relocated.

Local Organisations/Associations in Oshodi
Some of the respondents reported the presence of some organisations and associations in the community which can be used for community mobilization, coordination, and reaching out to various groups and categories of people in communities.

Membership of Trade Associations (Business Operators)
For traders, business owners, and workers, trade associations can also be used for mobilization purposes and for effective dissemination of information. Business activities and operations were to be organized plaza-by-plaza, with each plaza having its own leaders. The respondents noted that the traders and business owners can be reached through their trade associations and plaza executives.

Community Structures and Arrangements
The traditional leaders in Oshodi and its environs were also noted to be important for dispute/conflict resolution and community mobilization, as well as the Iyaloja, Babaloja, Alaje General, NURTW Chairman, leaders of Trade Associations, Plaza executives, the executives of the CDCs and CDAs, and religious leaders.

STAKEHOLDER ENGAGEMENT FORUM

A Stakeholders Forum was organised on 18th September 2018 to present a summary of the findings of the Socio-Economic Impact Assessment (SEIA) to the stakeholders, highlighting the opinions expressed by the respondents interviewed during the fieldwork about the project.

The Forum was attended by major project stakeholders, including community leadership, representatives of the Head of traders (Iyaloja General), other traders, transporters and business operators, residents of Oshodi and its environs, religious leaders, Vice-Chairman, Oshodi-Isolo LGA, as well as representatives of the Federal Ministry of Environment, and pertinent Lagos State ministries.

The Stakeholders Engagement Forum affirmed the generally positive disposition of members of the community and stakeholders to the project, together with suggestions on how possible conflicts could be avoided and how the government can assist the project affected persons in ameliorating the negative effects of the project on them.

RECOMMENDATIONS

Based on the findings of this Assessment, the following recommendations are made:

Recommendations for Avoiding Conflict between the Project and the People

- Assistance with the construction of alternative houses for people;
- Assisted relocation of people and businesses who may be affected
- Provision of alternative shops and business locations
- Payment of compensation for project affected persons;
- Dialoguing with people who may object to the project,
- Creation of alternative parks/garages for the transporters to operate,
- Dialoguing with/appealing to landlords to avoid arbitrary increases in rent;
- Fast-tracking and completing the project quickly, in order to reduce the time that people's businesses and livelihood will be affected.

Recommendations for Ameliorating the Negative Effects of the Project on People

- Re-training of the danfo drivers, conductors and other transport employees to engage in other business,
- Assistance with alternative accommodation,
- Construction of low-cost/affordable shops, especially for project affected persons;
- Adequate compensation for project affected persons;
- Compensation,
- Engaging some of the transport workers in the government transportation scheme;

- Dialoguing with/appealing to landlords to avoid arbitrary increases in rent;
- Fast-tracking the construction works for early completion in order to minimise the effects on people.

Recommendations for Assisting Vulnerable or Particularly Disadvantaged Persons

A special arrangement should be made for vulnerable or particularly disadvantaged persons in the community, including the beggars, the homeless people, physically-challenged people, people with mental challenges, 'osanle' children (children who ran away from their homes), homeless children, area boys, the local thugs, and motor park touts, by:

- Training those who may be amenable to training;
- Rehabilitating those who may not be trainable, especially those with serious physical and mental challenges;
- Providing homes for those who are homeless and can benefit from government assistance.
- Training and retraining motor park touts, thugs, area boys, etc. who may be amenable to training for positive engagement.

Recommendations for Reducing the Effects of Relocation

- Provision of affordable shops,
- Financial assistance to relocate,
- Adequate compensation for relocation,
- Completing the project on time,
- Allowing enough time for people to relocate.

Recommendation for Relocation of Socio-Cultural Artifacts

- Due consideration should be given for careful and proper relocation of socio-cultural artefacts in the community, if they will be affected by the project.

Recommendations for Community Mobilization, Dialoguing and Conflict Resolution

- The project coordinators should make good use of existing social and community organizations and structures, as well as trade associations, for reaching out to people, for mobilizing community support and for addressing possible conflicts and assuaging people's negative feelings about the project.

ES5.0 Associated and Potential Impacts

Environmental impacts of the proposed Oshodi Transport Interchange project have been examined through a number of processes. The report has identified the impacts of the developmental process, mainly on the atmosphere, land environment. Impacts on the atmosphere environment will be felt through the significant changes in the air quality and noise level due to construction activities and alteration of the surface water

in tertiary drainage in case of discharge of untreated wastewater from the transport interchange operations change. Impacts on the terrestrial environment will be felt as a result of alteration of natural topography of the project area due to transport interchange development.

ES6.0 Mitigation Measures

Mitigation measures are options that can be used to either completely eliminate or minimize identified negative impacts of a development project. The design of the Proposed Oshodi Transport Interchange project has gone beyond strict adherence to generic codes & standards, and developed a design basis customized for the project.

In addition to design mitigation measures a number of additional measures have been prescribed for the identified impacts ranked as having moderate and high significance. The mitigation measures ranged from simple practices such as the Appropriate measures (including watering or covering exposed areas) will be used to minimize or prevent air pollution and dust, the operation of piling machinery such as the crane will be operated at specific period to reduce the effect of the vibration and obstruction on the commuters and project site neighbors and shall be timed to coincide with low traffic hours in the area. The residual impact ranking of most of these impacts such as landtake and change in landform after mitigation is low. Together with in-built measures, the prescribed impact mitigation measures are expected to significantly improve the environmental sustainability of the project.

ES7.0 Environmental Management Plan

Planet Projects Limited places strong emphasis on maintaining safe and healthy working conditions for its personnel and minimizing the negative effects of its activities on the natural environment. Planet Projects Limited is genuinely committed to the attainment of these objectives through the implementation of its policy and mitigation strategies outlined in this report.

The EMP developed for the Proposed Oshodi Transport Interchange project ect has taken into consideration, all the specific project activities covering the site preparation, construction stage and the project operations phase. The EMP includes an Environmental Management System similar to the ISO 14001 Management System requirements, and an Environmental Monitoring Programme.

The environmental monitoring programme has two components. *Effects monitoring* involves the measurement of environmental parameters so as to detect changes in these parameters that can be attributed to the project, while c*ompliance monitoring* is the periodic or continuous measurements of environmental parameters or discharges to ensure that regulatory requirements and standards are met. Environmental monitoring will cover biophysical, socio-economic and health characteristics. Results

obtained will be benchmarked against the baseline data. The monitoring schedule prescribed by this ESIA shall be implemented as the Post-EIA Monitoring Programme.

The proponent intends to follow the monitoring programme proposed in this report and commits to make budgetary allocations from the planned project based on the prevailing market rate for consultancy of this nature.

ES8.0 Decommissioning and Abandonment Plan of the Proposed Oshodi Transport Interchange Project

The proposed project, as conceived, is not expected to have any significant long- term negative effects on the environment, especially after closure/de-commissioning. A number of safety measures/devices have been built into the project, such that it will operate at minimum risk. However, the following measures need to be planned for implementation after closure/de-commissioning:

1. The terminals and bus Station structures shall be dismantled and sold at scrap value;
2. Other infrastructural facilities within the proposed Oshodi Transport Interchange shall be dismantled and sold at scraps;
3. All pits and excavations shall be reclaimed and revegetated.

ES9.0 Conclusion

The development of the proposed Oshodi Transport Interchange at Oshodi will change the way people travel by public transport in Lagos State. The Lagos State community will realise substantial benefits from the wider program of works associated with the Urban Renewal and Transport Program, under the Strategic Transport Master Plan (STMP of which the proposal is a necessary precursor.

This is further strengthened by the desire of the current administration in the State to transform Oshodi into a world-class Central Business District (CBD) with business, travel and leisure activities conducted in a serene, secure, clean, orderly and hygienic environment, a concept that anchored is on a 3-pronged approach – Transportation, Security and Urban Renewal & Environmental Regeneration**.**

This impact assessment has identified environment and social impacts during construction and operation of the proposed project and proposes a range of mitigation measures to reduce identified impacts.

The key impacts identified are the deterioration of air quality and increase in noise level during the preconstruction and construction phase of the proposed project. Furthermore, increased pressure on support service and infrastructure around the project area, increase in travel time for commuters into and out of the project area as a result of the mode change requirement of the proposed project during construction phase. The assessment also identifies a number of risks and opportunities that would

be further considered prior to commencement of construction and during detailed design.

Given the detailed description of baseline environmental characteristics of the project area, and the exhaustive impact identification that have been presented in earlier sections of this report, we can conclude that the development will lead to a number of significant positive impacts if all recommended mitigations strictly adhere to:

- Provide a world-class transport infrastructure to the people of Lagos State
- Increase employment opportunities to the people of Lagos State, especially in transport sector since the proposed project is Public-Private initiative
- Increase internally generated revenue for the Oshodi Isolo Local Government Area and Lagos State Government
- Reduce pressure on the existing access roads such as Oshodi-Apapa express road and Agege motor. In addition, it will boost the interstate and intrastate transportation business in the state especially in the Oshodi axis
- The various stages of the infrastructure development (construction and operational phase) would affect the socio-economic development of the people within the project area.
- The associated and potential negative impacts of the project, as identified in Chapter Five of this report, are far outweighed by the anticipated positive impacts that could attend the project;

Based on the foregoing therefore, it is our expectation that if appropriate mitigation measures, particularly those recommended in chapter six of these report are implemented, and if the monitoring and management program for the environment are equally handled in proper perspectives, the entire project can be implemented in a sustainable manner.

Recommendation

In addition to the identified mitigation measures, it is expected that during the construction stage of the proposed Oshodi transport Interchange project activities, all precautionary measures applicable to construction works like dust suppression measures, noise pollution control, drainage and watercourse protection, control of dispersion of filling materials and consultation with relevant stakeholders especially the Oshodi community will be implemented before and during the construction phase

CHAPTER ONE

BACKGROUND INFORMATION AND INTRODUCTION

1.1 Background Information

Lagos is the largest city in Nigeria and is the country's most important commercial center. With an estimated population of over 17 million people, Lagos ranks among the most heavily populated cities in the world. From a small colonial town in the early 20th century, Lagos has now grown into a large metropolis. This dynamic city has experienced rapid urbanization and has lacked sufficient parallel infrastructural development. The vast number of motorized vehicles in Lagos plagues the streets, causing tremendous congestion and increased air pollution.

Some of the major transportation challenges in the State before the introduction of the Inter-modal transport system in the State include:

- Few number of high – capacity bus, less than 1,000, while about 3,000 buses are required;
- Traffic congestion, ambient air pollution and management have now become the hallmarks of life in Lagos;
- Transportation systems are not well interconnected to one another; and
- Urbanization that poses a great challenge to the State's transportation sector if the current situation is not urgently addressed.

The introduction of a Strategic Transport Master Plan (STMP) and Travel Demand Model for the Inter Modal Transportation System is one effort that has attracted commendation across the globe. These initiatives include the new Light Rail Transit (LRT), monorail, BRT, Water Ways Transport System, Private helicopter shuttle among others in a bid to meet up with the emerging transportation challenges in the State.

1.2 Introduction

Lagos is a mega city whose operations have extended to the neighbouring states. Its rapid growth in recent times has brought with it very considerable increases in demand for all forms of urban transport. However, this demand has not been matched by the supply of sufficient facilities and services. The result has been widespread road congestion, overcrowded buses and long delays for commuters. The cost to the community in terms of wasted time, excessive fuel consumption and rapid wear and tear of vehicles has been enormous. In response to this situation, considerable efforts have been made to find a solution. In particular over the years, much consideration has been given to the need for a mass transit system with a world-class public transport infrastructure (Dar Al-Handasah, 1994).

The State Government under the able leadership of Mr. Akinwunmi Ambode has continued to aggressively develop public infrastructure and improve security across the State so as to enable the Organized Private Sector to actively participate in the State's economy. In a bid to take the effort further, the Lagos State Government is planning to develop a world-class transport interchange at Oshodi, Lagos.

Oshodi market, the proposed project area was formerly the Mosafejo and Owonifai markets in Oshodi and some early shanties located within the interchange area, a suburb of Lagos state, Southwestern Nigeria. It is one of the largest markets in the Lagos metropolis. The market was demolished recently by the present government due to the claims that the area is blighted by criminal activity such as pickpocketing and bag snatching. Other concerns for the area are the gridlock arising from the traffic by the volume of cars in and around Oshodi, partly caused by the flow of visitors to the market on a daily basis. In view of the strategic importance of the area and the highlighted concerns of the Oshodi market area, the government has decided to embark on a Transport Interchange project that will take care of the traffic challenges in the area.

As part of the World Bank requirements for such project and in fulfillment of the Federal Ministry of Environment (FMEnv) regulatory requirements, a project such as the proposed Oshodi Transport Interchange project requires an Environmental and Social Impact Assessment (ESIA). To obtain the regulatory approval for the project development, the Lagos State Government through the project contractor, Planet Project Limited (PPL) invited **Global Impact Environmental Consulting (GIEC) Limited** to carry out the Environmental and Social Impact Assessment study for the proposed Oshodi Transport Interchange project.

The ESIA included well-planned site visits, field survey and environmental media samples' collection, laboratory analyses, and secondary data acquisition from existing reports and publications, as well as derivation of spatially referenced data using GIS and remote sensing technologies. This report relates to the ESIA for the proposed Oshodi Transport Interchange project and covers the assessment of planned project activities, the environment around the project area, and the associated and potential impacts of the proposed project as well as cost effective, practicable and reasonable mitigation options for the negative impacts.

1.3 Project Proponent

Project Planets Limited is an Advisory, Engineering, Procurement, Construction and Management firm. The firm is a leader in the fields of Public transportation and infrastructure firm providing expertise across all transport modes including

Roads/Bridges, Bus/BRT, Rail, Airports, Water Transport, Traffic Engineering Designs, Construction and Operations Management (O&M).

We are active in the field of transportation planning, traffic engineering, Urban Renewal and Infrastructure development. Our work in these fields covers all facet of public transport development from studies to project conception, transport planning, infrastructure and institutional development and Operations and Maintenance (O&M) across road, water and rail transportation modes.

Today, PPL has emerged as one of the leading and fastest growing construction companies in Nigeria, having successfully executed major engineering projects across Lagos, Delta, Rivers, Ondo and Kogi States amongst others.

1.4 Project Location

The proposed project is to be located at the junction of two important routes, Lagos – Apapa-Oshodi Expressway and Lagos- Agege-Abeokuta Expressway in Oshodi-Isolo Local Government Area (LGA), Lagos State. The two Expressways is a four-lane two-way divided road and has high movement of traffic flow comprising car, medium to long buses and trucks. The proposed project location is a transport node and major interchange point, with 76% of the area being used for transport activities and bus parks.

The location has several markets and other commercial activities. The project site shares boundary with Ilupeju, Matori and Isolo communities as well as host of several government establishment and industrial estates including National Food Drugs Law Enforcement Agency (NAFDAC), Federal Institute of Industrial Research (FIIRO), Nigerian Army Cantonment, Ikeja, Nigeria Armed Forces Resettlement Barracks and Ladipo Industrial Estate. **Figure 1.1 and 1.2** is a map of Nigeria, Lagos State and Oshodi-Isolo LGA showing the proposed project location. **Figure 1.3** shows the Oshodi Loop and neighborhood road network**,** while the satellite imagery of the project area and the site layout plan are contained in **Figures 1.4, and 1.5** respectively.

Geographically, the proposed project is located between Longitudes $3^0$10’00”E and $3^0$23’26”E and Latitudes $6^0$29’18”N and $6^0$25’22”N. Administratively, the proposed Oshodi Transport Interchange project is located in Oshodi-Isolo Local Government Area of Lagos State. The proposed project will be situated in the recently demolished Owonifai market in Oshodi and some early shanties located within the interchange area. Being at the junction of two very important routes in Lagos; Apapa - Oshodi Expressway & Oshodi - Agege Motor Road, the proposed project is a transport node and major interchange point, with 76% of the entire area being used for transport activities & bus parks.

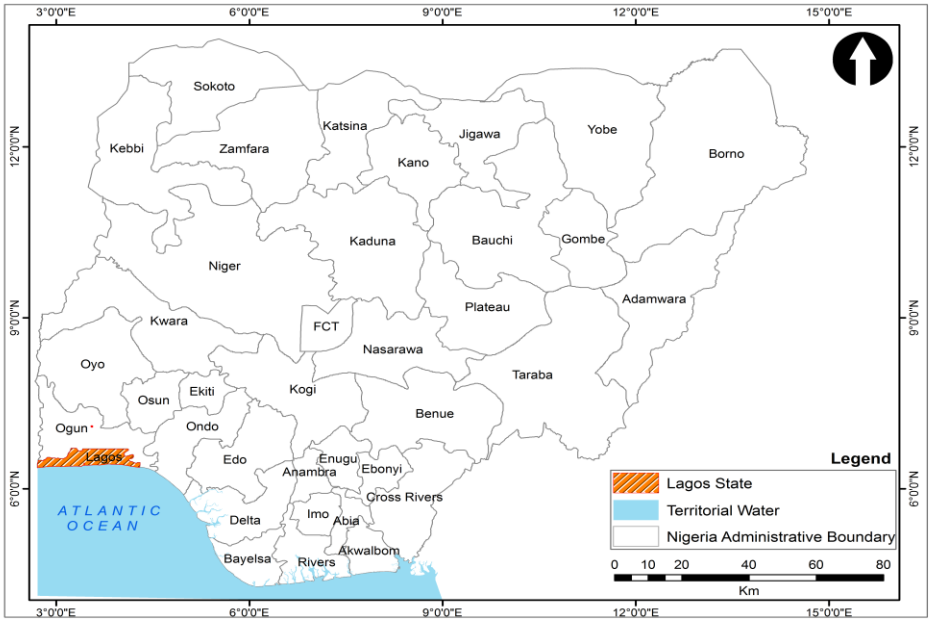

Figure 1.1: Administrative Map of Nigeria Showing Lagos State

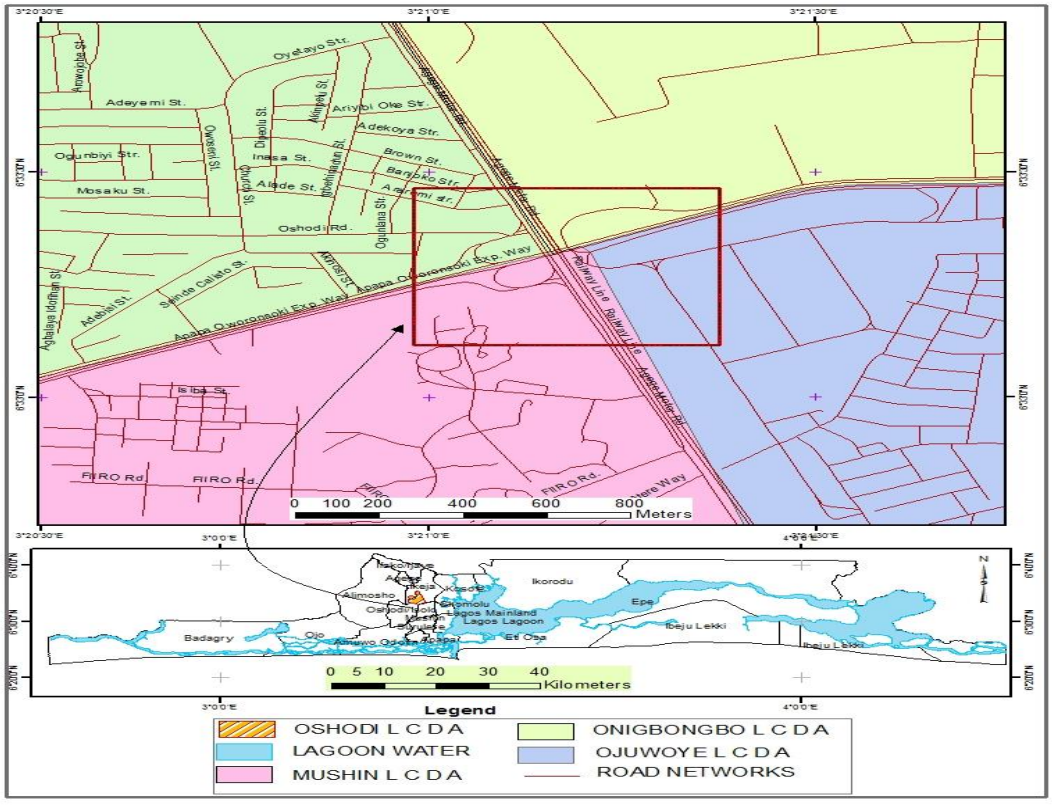

Fig. 1.3: Lagos State Map showing the Project Site in Oshodi Loop with Neighboring Road Network

Fig 1.4: Satellite Imagery View of Oshodi Loop – the Project Location and Its Surrounding

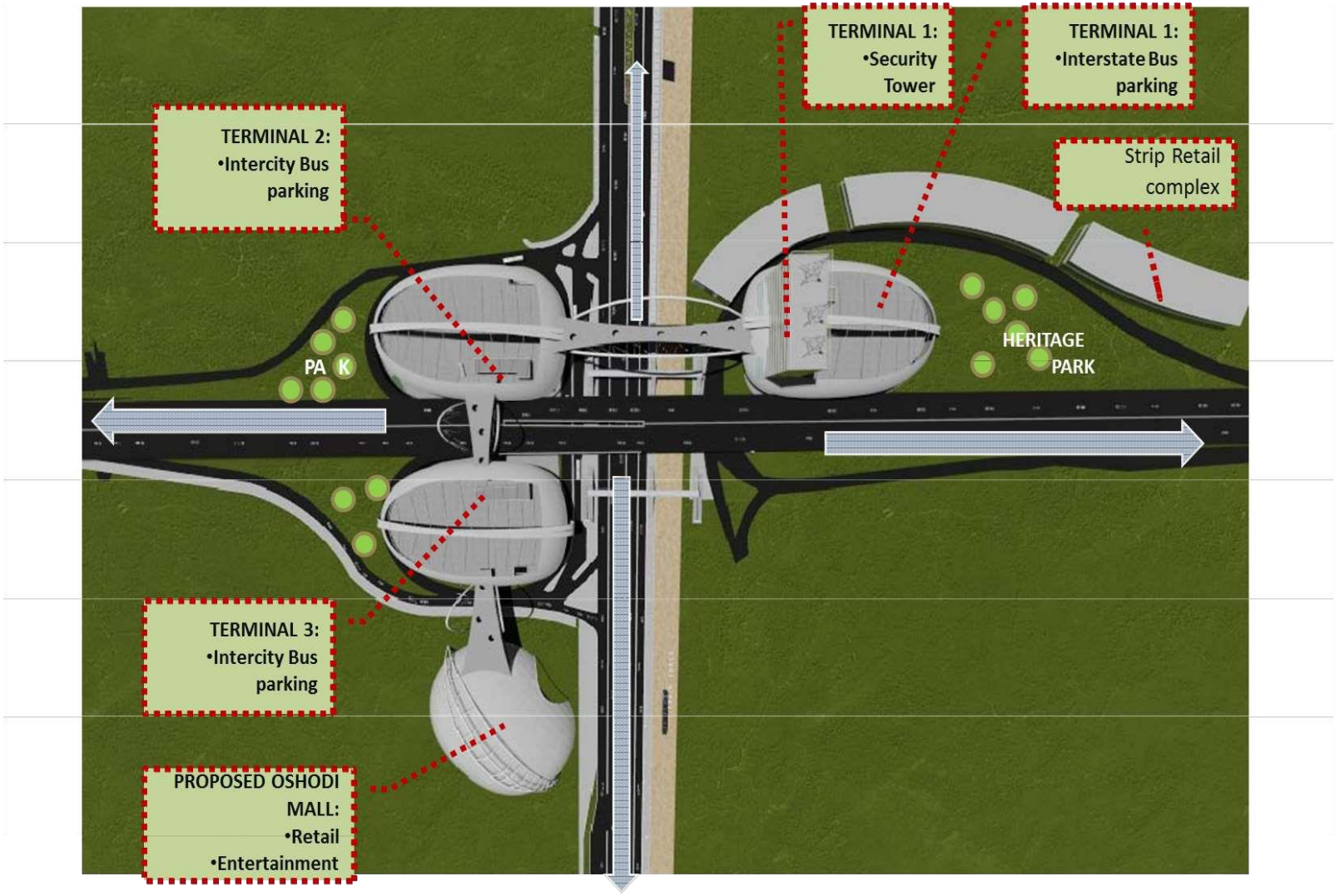

Fig 1.5: Overall Site Layout Plan of the Proposed Oshodi Transport Interchange Project

The proposed project site is divided into three segments, which will accommodate three (3) different terminals (buildings and parks) as well as associated infrastructure. It occupies a total land take of 90,000 square meters with each terminal to occupy 30,000sq.m area of land (see **Plates 1.1- 1.3** for the pictures of the site).

Plate 1.1 – 1.3: View of the proposed project area prior to proposed project

The Terminal 1 is to be located adjacent to NAFDAC, Terminal 2 site is to be located at the former Owonifari Market while Terminal 3 is to be located at the former site of Mosafejo Market, which is adjacent to Ikeja Military Cantonment. Part of the proposed Terminal 1 and the whole of Terminal 2 site were formerly used as motorpark for transport activities. The existing Oshodi flyover (popularly known as Oshodi-Oke Bridge) is sandwiched between Terminal 1 and Terminal 2 and in between Terminal 2 and Terminal 3 is Lagos- Abeokuta Expressway and Nigeria Railway Corporation (NRC) rail track.

In the proposed project, a skylink bridge, passenger concourses and pedestrian bridges shall connect all three terminals. These will also be connected in future to the existing Nigeria Railway Corporation (NRC) rail track passing in front of the terminal 3 site. The location of the terminal and the geographic coordinates are provided in **Table 1.1.**

Table 1.1: Location of the terminal and the geographic coordinates

Sample Code	Location	Northing	Easting
Terminal 1	Adjacent NAFDAC office	003° 21.079’	06° 33.292’
Terminal 2	Former Owonifari Market	003° 21.061’	06° 33.349’
Terminal 3	Former Mosafejo Market	003° 21.168’	06° 33.392’

1.5-EIA Objectives

The overall objective of the EIA study is to proactively identify and assess the potential environmental and social (including health and safety) risks and impacts associated with the proposed Project throughout its life cycle and to put in place appropriate mitigation measures and management actions to address and monitor the identified risks and impacts. This is to ensure that the project is planned, constructed and operated in a sustainable manner and to promote its environmental and social performance.

Specifically, the objectives of the EIA are to:

- Assist Project design and planning by identifying those aspects of location, construction, operation and decommissioning, which may cause adverse environmental, social, health and safety effects.
- Establish the existing state of the Project environment (biophysical, social, economic and cultural) and identify any sensitive components of the environment.
- Recommend appropriate and practicable measures during construction, commissioning, operations and decommissioning to avoid and mitigate adverse effects and enhance beneficial impacts.
- Develop an appropriate Environmental Management Plan (EMP) for the Project including monitoring programme.
- Provide the basis for engagement with potentially affected communities and other stakeholders, including the relevant regulatory authorities.
- Prepare a detailed report presenting clear and concise information on the findings of the EIA.

1.6. EIA Terms of Reference

In line with the National EIA Procedural Guidelines, a detailed scoping report including Terms of Reference (ToR) was prepared and submitted to the FMEnv. The ToR section highlighted the general scope of the EIA including the overall data requirements on the proposed Project environment. The FMEnv-approved ToR for the EIA study is provided in **Annex 1**.

1.7. EIA Process

This EIA study has been carried out in line with the Federal Ministry of Environment EIA Procedural Guidelines as well as the relevant International Standards and Guidelines. The EIA process flowchart is summarized in **Figure 1.6**.

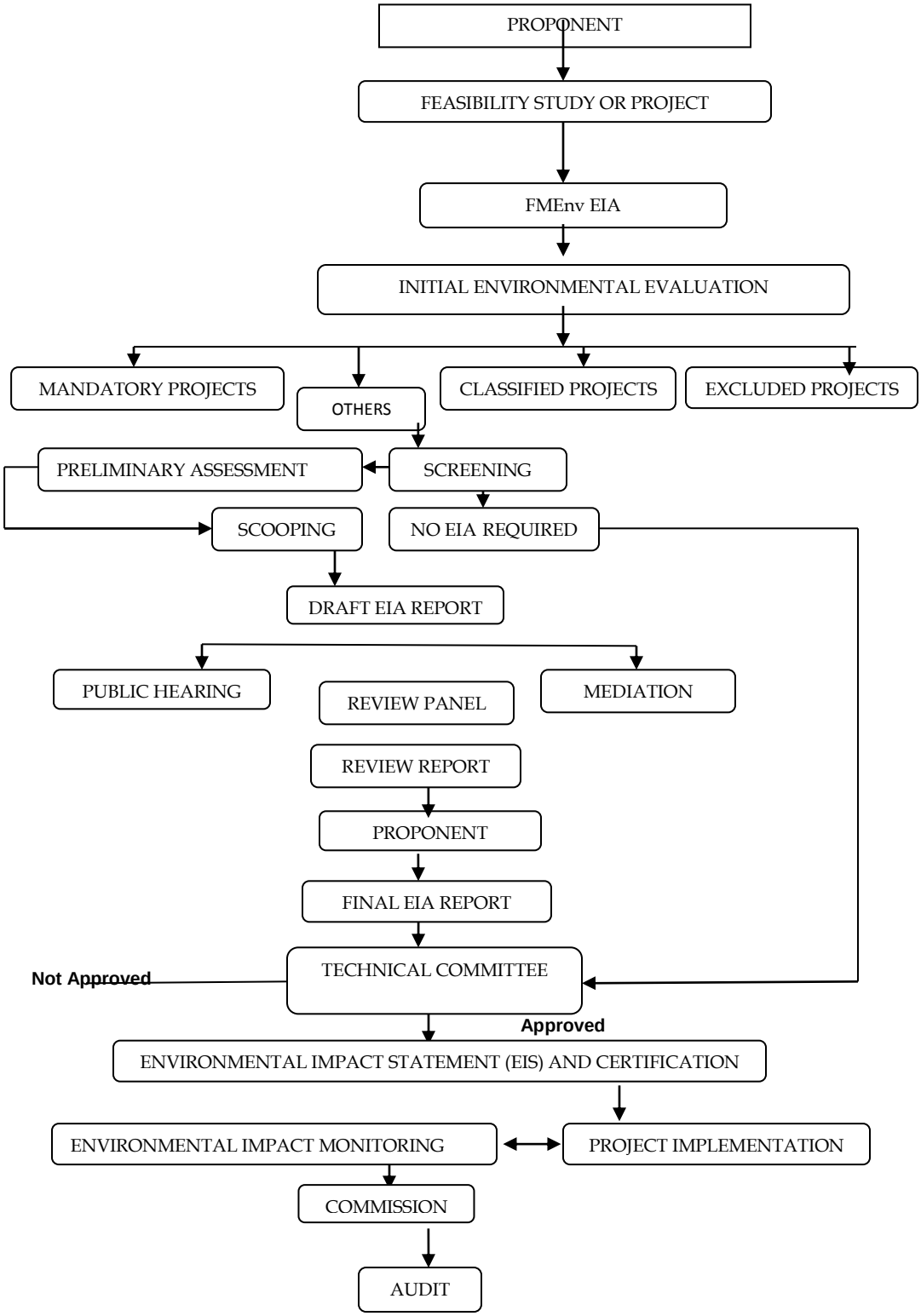

Figure 1.6 : Flow Chart of FMEnv EIA Procedure

1.8 Legal and Administrative Framework

A number of national and international environmental regulations guide developmental projects in Nigeria. Regulations relating specifically to the proposed Oshodi Transport Interchange Project are as follow:

1.8.1 National Policy, Guidelines and Regulations

1.8.1.1 Federal Ministry of Environment (FMEnv). The FMEnv is the primary authority for the regulation and enforcement of environmental laws in Nigeria. The Act establishing the Ministry places on it the responsibilities of ensuring that all development and industry activity, operations and emissions are within the limits prescribed in the national guidelines and standards, and comply with relevant regulations for environmental pollution management in Nigeria as may be released by the Ministry.

In furtherance of her mandate, the FMEnv developed laws, guidelines and regulations on various sectors of the national economy. The specific policies, acts, guidelines enforced by FMEnv that are applicable to the proposed project are summarized below:

- ***National Policy on the Environment***
  Environmental management in Nigeria is based on the National Policy on the Environment (1989), revised in 1999 and 2017. The Policy states that Nigeria is committed to safeguarding the country's natural and built environment for the use of present and future generations. This commitment demands that efficient resource use and the reduction of environmental impacts are a core requirement of all developmental activities. The strategic objective of the Policy is to coordinate environmental protection and natural resources conservation for sustainable development.

- ***National Guidelines and Standards for Environmental Pollution Control in Nigeria, 1991***. This represents the basic instrument for monitoring and controlling industrial and urban pollution.

- ***National Environmental Protection (Effluent Limitation) Regulations (1991*)**.
  The Effluent Limitation Regulation makes it mandatory for industries to install anti-pollution and pollution abatement equipment on site. Appropriate penalties for contravention are also prescribed.

- ***National Environmental Protection (Pollution Abatement in Industries and Facilities Generating Wastes) Regulations, 1991***. This imposes restrictions on the release of toxic substances into the environment and stipulates requirements

for pollution monitoring units, machinery for combating pollution and contingency plan by industries.

- ***National Environmental Protection (Management of Solid and Hazardous Wastes) Regulations, 1991***. This Statutory Instrument regulates the collection, treatment and disposal of solid and hazardous wastes from municipal and industrial sources and gives the comprehensive list of chemicals and chemical waste by toxicity categories.

1.8.1.2. EIA Act Cap E12 LFN 2004.

The EIA Act is the primary Act governing Environmental Impact assessment (EIA) in Nigeria. It was promulgated in order to enable the prior consideration of an EIA on specified public or private projects. The Act sets out the procedure to be followed and methods to be used in undertaking an EIA. Section 2(2) of the Act requires that where the extent, nature or location of the proposed project activity is such that it is likely to significantly affect the environment, an EIA must be undertaken in accordance with the provisions of the Act. National Environmental Impact Assessment Procedural and Sectoral Guidelines in response to the promulgation of the EIA Act, the FMEnv developed National EIA Procedural Guidelines and other set of guidelines on various sectors of the National economy. Applicable to this study is the EIA Guidelines for Manufacturing Sector (2013).

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1.8.1.3. National Environmental Standards and Regulations Enforcement Agency (NESREA), 2007

The Federal Government of Nigeria established the National Environmental Standards and Regulations Enforcement Agency (NESREA) in 2007 as a parastatal of the FMEnv. The Agency is charged with the responsibility of enforcing the environmental laws, guidelines, standards and regulations in Nigeria, specifically during the operational phase of developmental projects. The NESREA's regulations applicable to this pesticides production include:

- ***National Environmental (Surface and Groundwater Quality Control) Regulations, 2011***. The purpose of this regulation is to enhance and preserve the physical, chemical and biological integrity of the groundwater and surface water resources.

- ***National Environmental (Air Quality Control) Regulations, 2013***: The objective of this Regulation is to ensure the control of air pollutants that may affect the ambient environment.

- ***National Environmental (Hazardous Chemicals and Pesticides) Regulations, 2013***: The main objective of this Regulation is to ensure that best practices are applied and maintained in the transport, use, storage, handling and management of hazardous chemicals and pesticides.

1.8.1.4. *Harmful Waste (Special Criminal Provisions) Act No 42 of 1988 (amended in 2004)*.

This Act prohibits and declares unlawful all activities relating to the purchase, sale, importation, transit, transportation, deposit, and storage of harmful wastes. Appropriate penalties for contravention are prescribed.

1.8.1.5 Criminal Code Act of 1990 (amended in 2004).

The Act contains the basic criminal law offences that relate to damage to the environment, public health and natural resources. Some environmental offences include: causing a public nuisance; fouling the water of any spring, stream, well or reservoir of a place; and violating the atmosphere in any place so as to make it noxious to the health of persons in general in the neighbourhood.

1.8.1.6. Labour Act Cap L1 LFN 2004.

The Nigeria Labour Act was enacted in 1990 and amended in 2004 by the Act of Parliament. The Act is the primary law protecting the employment rights of individual workers. The Act seeks to promote ethical practices in line with international best practices, respecting the rights of individuals and promoting the dignity of labour and provides comprehensive legislation on conditions of work and employment. The Act covers protection of wages, contracts, employment terms and conditions, and recruitment; and classifies types of workers and special workers.

Part I sets out general provisions relating to wages, contracts and terms of employment. Employers shall not advance more than one month's wages to an employee (s. 4).Section 8 of the Act requires that workers entering a contract be medically examined at the employer's expense. Section 20 governs redundancy. Part II regulates recruiting, including the licensing of recruiters (s. 25), and the right to be accompanied by family (not exceeding 2 wives) (s. 34).Part III relates to special classes of workers, including apprentices (ss. 49-53), women (ss. 54-58), and young persons (ss. 59-64). In general, women and young persons are prohibited from performing underground and night work.

Section 73 prohibits forced labour. Part IV contains supplemental provisions relating to administration and the settlement of disputes. Section 90 repeals the Labour Code.

The proposed project shall ensure adequate compliance with provision of this Act. There will be no discrimination based on gender, ethnicity, or other social affiliation, although due preference will be given in employment of local community for project development activities.

1.8.1.7 National Policy on Child Labour (2013)

The Federal Government of Nigeria with the support of the International Labour Organization (ILO) launched a National Policy on Child Labour. Together with the National Policy, other publications were also launched including National Action Plan for Elimination of Child Labour (2013-2017), List of Hazardous Child Labour in Nigeria, Ogun State Action Plan for Elimination of Child Labour in Nigeria 2014-2017 (although not specifically relevant to the proposed project), Oyo State Action Plan for Elimination of Child Labour in Nigeria 2014-2017 (although not specifically relevant to the proposed project), and Good Practice Report – Eliminating the Worst Forms of Child Labour and Strengthening Sub-regional Cooperation Through ECOWAS

The national policy on child labour seeks to proscribe the demeaning practices of using children (defined as individuals below the age of 18, according to the Child Rights Act, 2003) for work that are injurious to their physical, psychological, cognitive and moral development. Often the use of under aged labour is exploitative and leads to exposure of young people to conditions that adversely affect their well being. The policy stipulates what constitute child labour in Nigeria context and prohibits such practices.

Based on this act, the proposed Oshodi bus interchange project shall be undertaken in compliance with provision of this policy on child labour by ensuring screening of potential employees to ensure that only mature and physically fit persons are engaged for development activities. To this end, the proposed project shall not use any child or minor during any phase of its development

1.8.1.8. Employees Compensation Act, 2010.

This Act repeals the Workmen's Compensation Act W6 LFN 2004 and makes comprehensive provisions for payment of compensation to employees that suffer from occupational diseases or suffer injuries from accident at workplace or in the course of the employment.

1.8.1.9. Land Use Act CAP 202, LFN 2004

The Land Use Act of 1978, the Constitution of 1999 and the State Public Lands Acquisition Laws of the relevant states constitute the governing policy governing land acquisition in Nigeria. The Act vests in the governor's power to administer the issues relating to public lands in urban areas of the State, except land belonging to Federal

Government. The Act specifies procedure and approach to compensation for resettlement of people, revocation of rights of occupancy, among others. The proposed bus terminal project involves resettlement of some traders and in line with the provisions of this Act. The proponent has taken appropriate steps to ensure that all issues pertaining to project have been satisfactory addressed by obtaining the consent of relevant stakeholders including local, and Federal authorities.

1.8.1.10 The Nigerian Urban and Regional Planning Act CAP N138, LFN 2004

The Urban and Regional Act. The Urban and Regional Planning Act is aimed at overseeing a realistic, purposeful planning of the country to avoid overcrowding and poor environmental conditions. **Section 39 (7)** of the Act establishes that an application for land development would be rejected if such development would harm the environment or constitute a nuisance to the community. Section 2 (1) of the Act requires that a registered Architect or Town Planner should draw building plan. Highlights of the Act include:

- The commission, Board and Authority shall respectively establish a "Development Control Department" which shall be responsible for assessing and granting of any development plan (S.28);
- That it is mandatory to obtain approval for any development plan from the Control Department and none of the Government Agencies shall be exempted, and all laws that previously exempt them repealed (S.29);
- For non-compliance with the requirement for approval before the commencement of any development activities, the Control Department shall serve an enforcement notice on the owner of such private residential, commercial or industrial land

1.8.1.11 Federal Roads Safety Commission (FRSC) Act CAP 141 LFN 2004

In February 1988, the Federal Government established the Federal Road Safety Commission through Decree No. 45 of the 1988 as amended by Decree 35 of 1992 referred to in the statute books as the FRSC Act cap 141 Laws of the Federation of Nigeria (LFN), passed by the National Assembly as Federal Road Safety Corps (establishment) Act 2004. Generally, the function of the commission relates to:

- Making the highway safe for motorists and other road users.
- Recommending works and devices designed to eliminate or minimize accidents on the highways and advising the Federal and State Governments including the Federal Capital Territory Administration and relevant governmental agencies on the localities where such works and devices are required, and
- Educating motorists and members of the public on the importance of discipline on the highway.

In particular, the Commission is charged with responsibilities as follows:

- Preventing or minimizing accidents on the highway.
- Clearing obstructions on any part of the highways.
- Educating drivers, motorists and other members of the public generally on the proper use of the highways.
- Designing and producing the driver's license to be used by various categories of vehicle operators.
- Determining, from time to time, the requirements to be satisfied by an applicant for a driver's licence.
- Designing and producing vehicle number plates.
- The standardization of highway traffic codes.
- Educating drivers, motorists and other members of the public generally on the proper use of the highways.
- Giving prompt attention and care to victims of accidents.
- Conducting researches into causes of motor accidents and methods of preventing them and putting into use the result of such researches.
- Determining and enforcing speed limits for all categories of roads and vehicles and controlling the use of speed limiting devices.
- Cooperating with bodies or agencies or groups in road safety activities or in prevention of accidents on the highways.
- Making regulations in pursuance of any of the functions assigned to the Corps by or under this Act.
- Regulating the use of sirens, flashers and beacon lights on vehicles other than ambulances and vehicles belonging to the Armed Forces, Nigeria Police, Fire Service and other Paramilitary agencies;
- Providing roadside and mobile clinics for the treatment of accident victims free of charge.
- Regulating the use of mobile phones by motorists.
- Regulating the use of seat belts and other safety devices.
- Regulating the use of motorcycles on the highways.
- Maintaining the validity period for drivers' licenses, which shall be three years subject to renewal at the expiration of the validity period.

In exercising these functions, members of the Commission have the power to arrest and prosecute persons reasonably suspected of having committed any traffic offence

The FRSC has also observed that Fleet Operation in the country is not properly regulated and many operators lack the basic competence in terms of handling road safety issues. Safety is relegated to the background. Hence, Section 115 of the National

Road Traffic Regulations (2004), made 4pursuant to Sections 5 and 10 (10) of the FRSC (Establishment) Act 2007 provides for the establishment of Safety Units and appointment of competent Safety Managers by all road transport operators. Arising from the above provisions, the Scheme referred to as the Road Transport Safety Standardization Scheme (RTSSS) is hereby formulated and adopted as Road Traffic Safety working document. The Scheme is being implemented through the Corps Transport Standardization Office (CTSO) at the Federal Road Safety Commission National Headquarters (RSHQ).

There are Transport Standardization Officers in all the field commands of the FRSC to implement the scheme nationwide. RTSSS is a road transport regulatory policy, which stipulates minimum safety requirements for fleet operators (organizations, Ministries, Departments and Agencies as well as companies and other road transport owners), with a minimum of five (5) vehicles in their fleet.

The Road Transport Safety Standardization Scheme (RTSSS) is classified into 7 (seven) broad areas as follows:

I. Compilation and Registration of fleet operators.
II. Certification of transport operators.
III. Improving quality of driver's training
IV. Collaborative efforts among lawmakers, law enforcement agencies and transport operators.
V. Continuous inspection of Fleet Operators / activities.
VI. Enforcement of Model Safety Policy for Fleet Operators: and
VII. Evaluation and Reporting

The proposed project is located on the loop of two highways and shall involve transportation of heavy construction materials to the site using heavy-duty vehicles. The transportation may pose high risks for accidents. Based on this Act, the proponent shall take necessary steps to liaise with the FRSC to conduct the project development and operation in manner that will prevent vehicular accident along the highway section abutting the project site as well as carry out enforcement of Model Safety Policy for private bus Operators that shall use the terminal.

1.8.1.12. Public Health Law in Nigeria.

The Public Health Law provides justification for the execution of developmental projects under guidelines that promote health by protecting the environment and safeguarding the humans' health. Subsections 6 and 7 of the Public Health Laws empower Medical Officers of Health (operating at the local government council, under the supervision of the State and Federal Ministries) to ensure the promotion of good health.

1.8.1.13. National Policy on Occupational Safety and Health (2006)

The National policy on occupational safety and health was formulated by the Federal Ministry of Labour and Productivity. The policy was formulated in line with Section 17(3c) of the constitution of the Federal Republic of Nigeria (1999) stipulates that the health, safety and welfare of all persons in employment must be safeguarded and not endangered or abused. The policy provides framework for participative and operational safety and health of workers in all economic sector of Nigeria. Protection. The objective of the policy include:

- To create a general framework for the improvement of working conditions and the working environment
- To ensure the provision of occupational safety and health services to all workers in all economic activity
- To prevent health accident and departures from health arising out of or in the course of work

1.8.2 State Regulations

The developmental drive in Lagos State created the need for framework strategies within which adequate planning of transportation system within the state could take place. In Lagos State, several regulations and legislative laws guide the transportation system including infrastructures such as the Oshodi Transport Interchange and its operations. The proposed Project falls within the jurisdiction of Lagos State Government. The regulations that are relevant to the proposed Oshodi Transport Interchange Project are described below:

1.8.2.1 Lagos State Traffic Management Authority Law (2004 amended 2008):

The Lagos State House of Assembly passed the law that established the Lagos State Traffic Authority (LASTMA) in 2004 and amended in 2008. The law provides for road traffic administration and makes provisions for road traffic and vehicle inspection in Lagos state and other connected purposes.

Without prejudice to the provisions of Section 11 of the Lagos State Traffic Management Authority Law, the Authority's control and management of vehicular traffic in the State, shall include the

(a) Prohibition or restriction of the use of any specified highway by vehicles of specified class or description;
(b) Prohibition of driving or propelling of vehicles on any specified highway otherwise than in a specified direction;
(c) Prohibition of vehicles parking or waiting on any specified highway;

(d) Prohibition or restriction of the use of sirens, and the sounding of horns or other similar appliances either in general or during specified hours or in respect of specified areas;
(e) Regulation of the conduct of persons driving, propelling, being in charge of or riding any vehicle or animal on a highway;
(f) Application of breath testing, blood and urine specimen testing devices on any driver to detect driving under the influence of alcohol, or drugs;
(g) Demand of a psychiatric evaluation of any person who drives against the normal flow of traffic or who fails to comply with any of the provisions of this Law, if in the opinion of any officer of the Authority such an evaluation is necessary for the purpose of determining the person's ability to operate a motor vehicle provided that such shall be at the driver's cost; and
(h) General regulation of traffic on public highways

In the exercise of the functions conferred on the Authority, officers of the Authority shall have power to arrest where appropriate and allow the alleged offender to pay the fine stipulated for the offence under this Law. The Authority shall have power to designate part of the under listed routes as bus lanes for priority services during peak hours of 6:00a.m – 10:a.m and 4:00p.m – 9:00p.m;

- Ikotun – Ejigbo - Cele Express way;
- Iyana Ipaja - Agege Pen Cinema, Ogba - Ojodu Berger;
- Iyana Ipaja – Idimu - Iyana Iba Roundabout
- Iyana Ipaja – Idimu - Ikotun;
- Berger - Third Mainland Bridge -Tafawa Balewa Square (TBS)
- Iyana Oworo – Anthony – Oshodi - Mile 2 - Apapa;
- Sango - Iyana Ipaja - Oshodi; and
- Orile Iganmu - Mile 2 – Okokomaiko.

Subject to the provisions of Section 211 of the 1999 Constitution of the Federal Republic of Nigeria, the Authority may prosecute persons reasonably suspected of having committed any offence under the provisions of this Law or any other Law

Provision of Vehicular Parks

Under the Section 9 of the LASTMA Law, the State government has the duty:
(a) To provide suitable facilities (including equipment and operators) for the removal of vehicles in pursuance of the provisions of Section 8 above;

(b) To provide and maintain places to which Vehicles may be removed to in pursuance of the provisions of Section 8 above and to ensure that an officer in charge of each Park

is at all times present in the Park;

(c) To make reasonable arrangement for the safe custody of removed vehicles while they are in vehicle parks;

(d) To provide and maintain at the principal offices of the Authority a record containing particulars of each removed vehicle and its contents and specifying the date of its removal, and the park in which it is situated; and

(e) To keep the record open during normal office hours for inspection free of charge by members of the public.

(2) The Authority shall not be under any duty to protect removed vehicles otherwise than as mentioned in paragraph (c) of the foregoing subsection (1) above and in particular shall not be under a duty to protect removed vehicles from damage attributable to sun, rain, wind or other physical conditions.

1.8.2.2 Building Lines Regulation Law:

This Law was enacted by Lagos State to provide for the regulation of the position of buildings and other obstructions with reference to roads. This Law may be cited as the Building Lines Regulation Law [F. & L. 1958, Cap. 28. L.N. 257 of 1959.]

1.8.2.3 Lagos State Urban and Regional Planning and Development Law of 2010

The law provides for the administration of physical planning, urban development, urban regeneration and building control in Lagos state and for connected purposes. Under this law, three physical planning and development agencies were established. These are

- Lagos State physical planning permit authority
- Lagos State building control agency; and
- Lagos State urban renewal agency.

With respect to the planned activities, the project proponent is the same Lagos State Government therefore securing approval for the proposed Oshodi Transport Interchange from the three physical planning and development agencies might not be necessary since the development is part of the State government Infrastructural development plan for the State.

Lagos State Building Control Agency (LABSCA)

The Lagos State Building Control Agency was established 0n 12th August 2012 and charged with the responsibility of ensuring integrity of building in the State. The agency enforces the enforcement of building regulatory system with a view to ensuring that the design, construction and maintenance of building are done in line with high safety standard to mitigate building collapse. The Lagos state building act has made it illegal to

commence a building or any form of construction project without the use of a trained and certified building engineer.

The Law stipulates that building project that commences without a certified engineer is deemed illegal in the sight of law. The penalty might be demolition of such structures, will also attract penalty, fine and prosecution. The law states that dumping of construction waste on the roadside is a health hazard to the public, resulting in pollution and other roadside accident. Such act will attract Penalties, Fine and prosecution**.** The agency has specific functions, which are:

- Enforcement of building regulation
- Removal illegal and building that do not conform to standard
- Identification and removal distressed building to prevent collapse
- Regulation and inspection of building works and certification of various stages of building construction as a well as keeping of such records
- Issuance of certification for completion and fitness for habitation
- Enforcement of the provisions of the law and its regulation in respect of building inspection verification and certification of building insurance
- Public enlightenment on building control

Lagos State Physical Planning Permit Authority (LASPPPA)

The Lagos State Physical Planning Permit Authority (LASPPPA) created on 28th April 1998 by Edict no 2 as amended by Lagos State urban and Regional Planning law of 2010. LASPPPA provides orderly planning, building permits and development in the use of land for a sustainable environment in Lagos. Specifically, the function of the agency includes:

- Processing and issuance of Permit in the State
- Design, develop and deployment of electronic planning permit
- Monitoring compliance with approved and operative physical development plan, Approval orders and regulations
- Preparation and periodic review of District plan, Town plans, Local Plans, Development Guide and Plans for excised villages

Lagos State Urban Renewal Agency (LASURA)

Lagos State Urban Renewal Agency (LASURA) is an agency of Ministry of Physical Planning and Urban Development and came into existence as a result of restructuring of former Lagos State Urban Renewal Board to reposition the defunct parastatal to functional and effective unit. The agency is charged with the responsibility to implement the State government policy on urban renewal and upgrading of slums in the State.

1.8.2.4 The Land Use Act 2000 of Lagos State

The Land Use Act 1978, it must be said, has not destroyed or fundamentally altered the concept of land ownership in Nigeria that was in existence before its promulgation in 1978. Even though in theory by section 1 of the Act, the land that is comprised in the territory of each state is vested in the governor of the state, the concept of communal, family and individual ownership of land has not been destroyed and the governor cannot take the land of any individual unless the land is required for public purpose. If the acquisition were not for public purpose, it would be declared invalid.

The Land Use Act is a nebulous legislation in the sense that in theory the radical title to the land is in the governor but in practice, the radical title in the community, family and individual has been maintained and preserved only with the requirement that alienation of these interests must be with the consent of the Governor. This led to the enactment of Land use Act of 2000 by the Lagos State Government

Land Acquisition by the Government

By virtue of the Public Lands Acquisition Law, the state government may acquire land compulsorily for public purpose from individual landowners subject to the payment of compensation to such landowners.

The notice of acquisition by the government must be served on the landowner as the courts have consistently held that non-service of the ***Notice of Acquisition*** would render the acquisition invalid.

It must be noted that the acquisition of private individuals' interest in land can only be done by the government for public purpose as any acquisition not done for public purpose will be declared invalid by the courts on being challenged.

Furthermore, as the Notice of Acquisition represents a constructive notice to the whole world, there is need for members of the public desirous of purchasing land to confirm through a solicitor, whether the land/property they are purchasing is under government acquisition.

While it is true that government may decide to excise some area from the already acquired land area, prospective land purchasers must ensure that such excision and the precise areas properly gazette.

Registration of Title Document

It is important that the document being presented by the seller to the prospective buyer must have been registered at the Lands Registry. This is because any document that creates or purports to create any interest in land must be registered at the Lands

Registry. The registration makes it a public document under the Evidence Act and if the original copy is lost or destroyed, the certified true copy can be used in appropriate cases.

When a document is registered, the registration constitutes a notice to the whole world of the interest in the land to which the land/document relates. However, if there is any defect in the title of the person in whose name the document has been registered, the defect in the title cannot be cured by the registration.

Where it comes to the issue of priority, determination would depend on the time of registration. If A and B had purchased the same parcel of land from C and A registers his own document before B, the document of A shall have priority over that of B unless B can establish that he purchased the land from C before A and had entered into possession of the land immediately after the purchase of the land from C and A has knowledge of his interest, he may lose the land to A who has registered his own interest.

Proof of Title to Land

To establish his title to a prospective buyer of land in Lagos State, a seller may present before the buyer any of the following pieces of evidence:

1. That he is the traditional owner of the land by way of customary inheritance i.e. on partition of family property or that his ancestor and predecessor-in-title owned the land from time immemorial and had been in uninterrupted possession before the Land Use Act and that he is therefore the person entitled to the right of occupancy in respect of the land. He is, in the eyes of the law, a deemed holder of the right of occupancy.

2. That he has been in occupation and possession of the land prior to the Land Use Act by virtue of a Deed of Conveyance that must have been duly registered at the Lands Registry.

3. That he is the beneficiary under a Will or Letters of Administration covering the land or property in which case he is the person entitled to the grant of the statutory right of occupancy. It must however, be observed that due care must be exercised by the prospective purchaser and his solicitor in confirming whether the Will has been genuinely admitted to Probate or whether the Letters of Administration was properly issued by the appropriate Probate Registry and there is no objection to the appointment of the Administrator is defective or invalidated as a result of objections being raised in respect thereto, the purchaser would have bought nothing as the sale would be void albinitio.

4. That he has applied to the Governor of the state and been validly granted a Certificate of Occupancy. Undoubtedly, this represents the most popular and preferred mode of proving title to a piece of land in Lagos State. Although the Certificate of Occupancy is, in itself, not entirely unimpeachable, it still represents the most reliable method of establishing ownership.

5. That he possesses a Deed of Assignment in respect of the land granted to him by an Assignor who was the holder of a Certificate of Occupancy. The Deed of Assignment must have been duly stamped at the Stamp Duties Office and registered at the Lands Registry after the consent of the State Governor must have been obtained. Failure to obtain Governor's consent to the Deed of Assignment renders the Deed void.

***1.8.2.5 Lagos State Ministry of the Environment* and Water Resources.** The Lagos State Ministry of the Environment and Water Resources is responsible for the protection and management of the environment in Lagos State. The authority administers the various laws of Lagos State on environmental protection.

1.8.2.6 Lagos State Environmental Protection and Management Law, 2017

The law was meant to consolidate all existing laws relating to the environment for the management, protection and sustainable development of the environment in Lagos and for connected purposes. The law places the overall management of the environment and environmental matters in the State in the Lagos State Ministry of the Environment. The existing consolidated environment-related laws in the State are:

- Lagos State Environmental Protection Agency Edict of 1996
- Environmental Sanitation and Enforcement Law of 2000
- Environmental Pollution Control Law of 1998
- Sand Spillage and Gravel Spillage Law of 1984

The primary objective of the law include:

- To provide a clean, safe and healthy environment for all residents in the State, and
- To enable citizen have access to the various public amenities or segment of the environment for recreational, educational, health, cultural and economic purposes

Section 2(1) Part 1 of this law specifically listed the various Agencies whose supervision shall be under the Ministry of the Ministry. The agencies are:

- Lagos Sate Environmental Protection Agency (LASEPA).
- Lagos Water Corporation (LWC)

- Lagos Waste Management Authority (LAWMA)
- Lagos State Signage and Advertisement Agency (LASAA)
- Lagos State Parks and Gardens Agency (LASPARK)
- Lagos State Wastewater Office (LASWAMO)
- Lagos State Enforcement Sanitation Enforcement Agency (LSESEA)
- Lagos State Water Regulatory Commission (LSWRC)
- Public Utilities Monitoring and Assurance Unit (PUMAO); and
- Any other agency or board as may be established by under the law of the State

Under this Law, LASEPA shall

a) be a body corporate with perpetual succession and a common seal ;
b) Have power to sue and be sued in its corporate name; and
c) Be capable of purchasing acquiring, holding and disposing of movable and immovable for the purpose of carrying out its function under this part

It is imperative to note that the functions of LASEPA prior to consolidation of Environmental Laws in Lagos State are the same as captured in the new harmonized Law. The functions of the Agency that are relevant to this EIA study include:

I The Monitoring and controlling of all forms of environmental degradation from agricultural, industrial and government operations;
II Monitoring of all forms of surface, underground and portable water, air, land and soils within the State to determine the pollution level as well as collect baseline data
III Co-operating with federal, State and local government, statutory bodies and research agencies on matter and facilities relating to environmental protection

In order to execute the functions, the Agency is also empowered to amongst others perform tests and take samples of any substance found in any premises searched

Also, Part VII of the Harmonized Law identifies citizen's participation in Environmental protection including access to information and environmental impact assessment. Section 202 (1) specifically states that:

1) Every person shall have the right to obtain information on any matter of the environment and its protection by following the conditions laid down in the provision of this part
2) The appropriate authority shall be obliged to obtain and make available to the public, relevant information on the environment and its protection

The project shall be developed in compliance with provisions of this Law during all phases of the development

1.8.2.7 Lagos State Environmental Protection Agency (LASEPA) Edict of 1996

The Edict establishing the Lagos State Environmental Protection Agency (LASEPA) was signed into law in November 1996. The Edict spells out clearly the functions of the Agency, the authority of the Agency, and acts that are prohibited within the State together with associated penalties for flouting such prohibitions. The functions of the Agency include; Monitoring and controlling of all forms of environmental degradation from agricultural, industrial and government operations, Monitoring of surface, underground and potable water, air, land and soils within the State to determine the pollution level etc. LASEPA Edict is one of the nine (9) environment related consolidated laws in the State as previously explained in section 1.7.2.6

1.8.2.8. Lagos State Road Traffic Law 2012

The law provides for the control and management of vehicular traffic in Lagos State. Without prejudice to the provisions of Section 11 of the Lagos State Traffic Management Authority Law, the Authority's control and management of vehicular traffic in the State, shall include the:

(a) Prohibition or restriction of the use of any specified highway by vehicles of specified class or description;
(b) Prohibition of driving or propelling of vehicles on any specified highway otherwise than in a specified direction;
(c) Prohibition of vehicles parking or waiting on any specified highway;
(d) Prohibition or restriction of the use of sirens, and the sounding of horns or other similar appliances either in general or during specified hours or in respect of specified areas;
(e) Regulation of the conduct of persons driving, propelling, being in charge of or riding any vehicle or animal on a highway;
(f) Application of breath testing, blood and urine specimen testing devices on any driver to detect driving under the influence of alcohol, or drugs;
(g) Demand of a psychiatric evaluation of any person who drives against the normal flow of traffic or who fails to comply with any of the provisions of this Law, if in the opinion of any officer of the Authority such an evaluation is necessary for the purpose of determining the person's ability to operate a motor vehicle provided that such shall be at the driver's cost; and
(h) General regulation of traffic on public highways.

In the exercise of the functions conferred on the Authority, officers of the Authority shall have power to arrest where appropriate and allow the alleged offender to pay the fine stipulated for the offence under this Law. The Authority shall have power to designate part of the under listed routes as bus lanes for priority services during peak hours of 6:00a.m – 10:a.m and 4:00p.m – 9:00p.m;

- Ikotun – Ejigbo - Cele Express way;
- Iyana Ipaja - Agege Pen Cinema, Ogba - Ojodu Berger;
- Iyana Ipaja – Idimu - Iyana Iba Roundabout
- Iyana Ipaja – Idimu - Ikotun;
- Berger - Third Mainland Bridge -Tafawa Balewa Square (TBS)
- Iyana Oworo – Anthony – Oshodi - Mile 2 - Apapa;
- Sango - Iyana Ipaja - Oshodi; and
- Orile Iganmu - Mile 2 – Okokomaiko.

Based on the provision of this law, the proponent shall be very strict in screening the vehicles that can ply the interchange to ensure the safety of passengers and their satisfaction. In this regard, efforts shall be put in place to ensure that vehicle that pick passenger in the proposed interchange shall not develop mechanical problems on the road.

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1.8.2.9 Lagos State Safety Commission Law Cap NO. 6, 2011

The Lagos State Safety Commission Law was signed on 26th July 2011. The function of the Commission as listed in Section 9 of the law include:

(a) Policy formulating, advisory & regulatory body for the co-ordination of all Government Ministries, Agencies and, Parastatals and relevant bodies on matters relating to:
   i. Safety of lives and property at all levels.
   ii. Other safety related issues
(b) Set safety standard for all sectors in the states Set safety standard for all sectors in the states
(c) Issuance and withdrawal of Safety compliance Issuance and withdrawal of Safety compliance certificates at all levels certificates at all levels
(d) Conduct safety training, seminar &workshops Conduct safety training, seminar &workshops
(e) Promote Safety culture in the State Promote Safety culture in the State
(f) Conduct & review risk assessment report
(g) Conduct & review risk assessment report workplace safety, wellbeing, wellness and Improve workplace safety, wellbeing, wellness and

(h) Give out safety alerts and signals
(i) Periodically review and update set standards

Also, Section 10 of the law vested in the Commission the power to:

(a) Clearly define and set safety standards for all Ministries and agencies of Government
(b) Formulate and adopt safety policies, procedures to ensure enforcement and compliance with all relevant laws, by-laws and regulations on safety in the State at all levels
(c) Co-ordinate and monitor the activities of relevant organization involved in safety services in the State

1.8.2.10 The Lagos State Fire Service Law 1988

On the 10th of October 1988, a law to make provision for the organization, discipline, powers and duties of the Lagos State Fire Service and for matters incidental thereto or connected therewith was enacted.

1.8.2.11 Lagos State Properties Protection Law, 2016

Generally, the Land Use Act (1978) as amended specifically vests the ownership of all lands in Nigeria in the Governors of the respective State. The same Acts also requires that any person who wants to alienate or transfer his land must obtain Governor's Consent to make the transaction valid in accordance with Land Use Act.

Notwithstanding the foregoing, the purchase or transfer of properties in Lagos State has been greatly hindered by the activities of Land grabbers otherwise known as Omo- Onile. The practice of land grabbing entails the use of force, threat or violence to take possession or prevent a purchase from acquiring legitimate interest and possession of properties unless certain conditions are met.

The Lagos State Properties Protection Law 2016 was passed to prohibit forceful entry and illegal occupation of landed properties as well as violent and fraudulent conducts in relation to landed properties in Lagos State. **The main objective of the law is to provide legal comfort and assurance to interested investors that they can carry on legitimate land and property transactions without fear of harassment, intimidation or unnecessary exploitation by these land grabbers**

Section 2 of the Law prohibit the use of help, force, threat or self-help to take over any landed properties, or engage in any act inconsistent with the proprietary rights of the owner. Additional, persons who have used force to take the property

of another and remains in possession after the commencement of the Law shall be held to have committed an offence and liable to ten (10) years imprisonment.

Section 4 provides that any person who occupies a property as an encroacher and fails to leave the property, upon a request by the owner commits an offence punishable upon conviction with a fine not exceeding 5M (Five Million Naira) or 5 years imprisonment or both.

Section 8 of the Law criminalizes any offer by any person to sell a property for which he has no lawful title or the requisite authority to sell. The section also prohibits the sale of or offers for sale of land that has been previously sold, without a court judgment repudiating the earlier sale

However, for the purpose of Property Protection Law 2016, the land being planned for the proposed bus interchange belongs to the government. The proponent has taken appropriate steps to ensure that all issues pertaining to land have been satisfactory addressed by obtaining the consent of relevant stakeholders including local, and Federal authorities

1.8.3. International Laws and Regulations.

Nigeria is signatory to several laws, treaties and regulations that govern the environment. The international conventions that are relevant to this EIA study are:

(i) World Bank Guidelines on Environmental Assessment {EA} (1991).
(ii) International Union for Conservation of Nature and Natural Resources (IUCN) Guidelines.
(iii) Convention on the Migratory Species of Wild Animals (Bonn Convention)
(iv) United Nations Framework Convention on Climate change, 1992
(v) Convention Concerning the Protection of the World Cultural and National Heritage Sites (World Heritage Convention)
(vi) Basel Convention on the Control of Trans-boundary Movements of Hazardous Wastes and their Disposal.

1.8.3.1. Convention Concerning the Protection of the World Cultural and Natural Heritage Sites (or World Heritage Convention).

The convention sets aside areas of cultural and natural heritage for protection. The latter is defined as areas with outstanding universal value from the aesthetic, scientific and conservation points of view.

1.8.3.2. Basel Convention on the Control of Trans-boundary Movements of Hazardous Wastes and their Disposal

The convention focuses attention on the hazards of the generation and disposal of hazardous wastes. The convention defines the wastes to be regulated and control their trans-boundary movement to protect human and environmental health against their adverse effects.

1.8.3.3. United Nations Framework Convention on Climate Change (1992)

This convention is aimed at promoting sustainable approach to economic development, In order to achieve sustainable social and economic development, energy consumption for developing countries needs to grow taking into account the possibilities for achieving greater energy efficiency and for controlling greenhouse gas emissions in general. This also includes the application of new technologies on terms, which make such an application economically and socially beneficial, determined to protect the climate system for present and future generations.

Article 2 of this convention notes its objective as “stabilization greenhouse gas concentration in the atmosphere at a level that will prevent anthropogenic interference with the climate system”.

1.8.3.4 Rio Declaration on Environment and Development (1972)

This declaration was ratified in Rio, Brazil, 1972 during the United Nations Conference on Environment and Development. The declaration underscores the need to conduct EIAs prior to development activities. Principles 17 of the declaration state that “ Environmental Impact Assessment as a national instrument shall be undertaken, for proposed activities that are likely to have significant adverse impact on the environment and are subject to decision of competent national authority”

1.8.3.5 International Labour Organisation (ILO) Convention, Treaties and Recommendation

These are legal instruments that sets out basic principles and rights at work. ILO constituents’ members comprising government, employers and workers drew the treaties, convention and recommendation. They can be divided into Conventions and Recommendations whereas the conventions are legally binding international treaties that are ratified by member states; Recommendations are supplementary non-vending guidelines, which can sometimes be autonomous (i.e. not linked to any convention). ILO has ratified 8 core Conventions on fundamental principles and rights to work as well as developing four (4) Governance Conventions that are stated in its Declaration on Social

Justice for a fair Globalization. Nigeria has ratified 40 Conventions of possible 189, distributed as follows: Fundamental (8/8), Governance (2/4), Technical (30/177). The proposed Oshodi bus interchange shall apply relevant ILO standards in managing labour issues throughout the project implementation.

1.8.3.6 World Bank Group Environmental, Health and Safety (EHS) Guidelines

The World Bank Group EHS Guidelines are technical reference documents designed to assist project managers and decision makers with relevant industry background and technical information. This information supports actions aimed at avoiding, reducing, and controlling potential EHS impacts during the construction, operation, and decommissioning phase of a project, particularly in those aspects related to pollution prevention and occupational and community health and safety.

1.8.3.7. IFC Performance Standards on Environmental and Social Sustainability

The IFC Performance Standards on Environmental and Social Sustainability are a set of standards which the IFC requires its clients to apply while undertaking due diligence for corporate or project financing.

1.8.3.8 Vienna Convention on Road Traffic, 1977

The Convention is a multilateral treaty designed to increase road safety and aid international road traffic by standardizing the signing system for road traffic in use internationally. Nigeria is also among the few countries in Africa to have assented to the Vienna Convention adopted by the UN Economic and Social Council's on Road Traffic (7 October – 8 November 1968) and concluded in Vienna on 8 November 1968. It came into force on 21 May 1977. This conference also produced the Convention on Road Signs and Signals. The Convention had amendments on 3 September 1993 and 28 March 2006. There is a European Agreement supplementing the Convention on Road Traffic (1968), which was concluded in Geneva, on 1 May 1971

On 18 October 2018, Nigeria acceded to the following agreements:

- 1968 Convention on Road Traffic (enters into force 18 October 2019);
- 1958 Agreement concerning the Adoption of Harmonized Technical United Nations Regulations for Wheeled Vehicles, Equipment and Parts which can be Fitted and/or be Used on Wheeled Vehicles and the Conditions for Reciprocal Recognition of Approvals Granted on the Basis of these United Nations Regulations (enters into force 17 December 2018);
- 1997 Agreement concerning the Adoption of Uniform Conditions for Periodical Technical Inspections of Wheeled Vehicles (enters into force 17 December 2018);

- 1998 Agreement concerning the Establishing of Global Technical Regulations for Wheeled Vehicles, Equipment and Parts (enters into force 17 December 2018);
- 1957 Agreement concerning the International Carriage of Dangerous Goods by Road (ADR) (enters into force 18 November 2018).

During the operational phase of the proposed project, passengers are expected to board commercial buses from the bus terminal to Kotonou, Benin Republic and vice versa. Therefore, the project shall be conducted in compliance with the provision of this Convention by ensuring that all road safety international road traffic is obeyed.

Plate 1.4: View of a typical transport interchange in Victoria Terminus in London, during construction activities

1.9. Planet Projects Limited Health and Safety Policy

Planet Projects Limited (PPL) established a set of policies guiding its operations on the protection of human health and the environment. These policies include, amongst others include Environmental Protection Policy, Occupational Health and Safety Policy, Security Access Control Policy, and Emergency Response Policy. The commitments

and principles documented in the policies shall be applicable to the proposed pesticides Project.

Planet Projects Limited (PPL) Health, Safety and Environment Policy ensures that all activities shall be planned and executed in a manner that;

- Preserves the health, safety and security of all Company and contractor personnel and members of the public;
- Preserves the integrity and security of Company assets;
- Minimizes the impact of operations on the environment; and
- Is sensitive to the needs and concerns of the Host Communities.
- All personnel, including those of contractors, shall be trained and made fully aware of the hazards, risks, sensitivities and controls in place;
- Plans and procedures shall be in place to respond to any emergency or loss of control.

Every employee and contractor employee must plan and perform his work in accordance with this policy. Each employee is required to report, and where necessary, suspend any activity considered to be in contravention of this policy.

The implications of implementing this policy are that, - All activities shall be analyzed to systematically identify related hazards, risks and sensitivities; -Arrangements shall be put in place to control the hazards, risks and sensitivities and to deal with consequences should they arise; -Any activity which is unhealthy, unsafe, environmentally unsound or may adversely impact relations with the community, shall be suspended until an acceptable solution is found. □

1.10. EIA Report Structure

In line with the FMEnv guidelines, this EIA report has been organized into nine (9) chapters, which is similar to the indicative outline of an ESIA provided by the World Bank in its Environmental and Social Framework, 2016.

The EIA report is structured as follows:

- Preliminary Sections: These include Table of Contents, List of Tables, Figures and Plates, and Executive Summary
- **Chapter One**: Introduction containing an overview of the proposed expansion Project, the EIA objectives and process and applicable legal and institutional framework.
- **Chapter Two**: Project Justification containing a rationale for the proposed project as well as the analysis of Project alternatives.

- **Chapter Three**: Project Description containing the technical elements of the Project and the Project's associated infrastructure and facilities.
- **Chapter Four:** Description of the Environment. It details the baseline data that are relevant to the Project location, design, and operation.
- **Chapter Five**: Potential and Associated Impacts. This takes into account all relevant environmental, social risks and impacts of the proposed project including cumulative impacts.
- **Chapter Six:** Mitigation measures for the identified environmental and social impacts.
- **Chapter Seven**: Is the Environmental Management Plan (EMP) for the Project. It summarizes the key measures and actions and the timeframe including responsibility for the implementation of the recommended measures.
- **Chapter Eight:** presents an overview of remediation plan after decommissioning and project closure.
- **Chapter Nine:** Conclusions and Recommendations
- References
- Appendices

CHAPTER TWO

PROJECT JUSTIFICATION

2.1 Introduction

This section of the report provides the justification for the proposed project based on the need, benefits and value of the project as well as analyses of the different options and alternatives to the project. The options to the project that were considered in the course of this EIA study included: No-Project option; Delay project option; Go Ahead (Implement Project as Planned) Option while the Alternatives include Alternative location and Alternative Project Concept.

2.2 Need for the Project

Transportation is crucial to both social development and economic growth of any nation. According to the World Bank Development Indicators (2009), most West Africans will live in urban areas by 2030 despite the prevailing situations in the urban cities. It is expected that urban population in this region will reach a staggering 270 million between 2010 and 2030. Lagos, as one of the fastest growing mega cities in the world, is not left out in this predicted exponential population growth, presently over 20 million people are living in Lagos and this figure is expected to increase by about 30% in 2025.

The rapid urbanization will continue to put pressure on transportation demand as well as existing infrastructure in the State. It is estimated that the State loses 3 billion hours to traffic congestion each year costing about N25 billion (Ehingbeti, 2012). The growth in demand for trips in Lagos metropolitan area by all mode of transportation is 20 million trips per day and this would increase to 30 million trips per day by the year 2020 (Ehingbeti, 2012).

To address this challenge and take full advantage of the immense economic opportunities that come with it, there is need to implement an efficient and sustainable Strategic Transport Master Plan (STMP) and Travel Demand Model for the Inter Modal Transportation System put in place in the State. One major focus of this plan is to aggressively develop public transportation infrastructure and improve security across the State so as to enable the organized Private Sector actively participate in the State's economy.

The need for the proposed world class Oshodi Transport Interchange is premised on the desire to take full advantage of the potentials of Oshodi as the largest transport interchange in West Africa presently with over 13 parks (both interstate

and intra-city) where about 500 vehicles are parked at any point in time, over 5,000 buses loading daily, over 100,000 commuters boarding daily (over 40 million/year), about 1 million pedestrians and a railway station.

This is further strengthened by the desire of the current administration in the State to transform Oshodi into a world-class Central Business District (CBD) with business, travel and leisure activities conducted in a serene, secure, clean, orderly and hygienic environment, a concept that anchored is on a 3-pronged approach – Transportation, Security and Urban Renewal & Environmental Regeneratio**n.**

2.3 Value of the Project

The Initial estimate of the total cost of the project has been put at 20 Billion Naira with well over 50 per cent of the cost injected into the local economy through procurement of Construction materials, Operational facilities and equipment, Civil engineering Services, Skilled and Unskilled labour etc. The project is to be funded by the Lagos State Government through government subvention, Equity and Debt.

2.4. Benefits of the Project

There are several benefits expected to accrue from this project. The beneficiaries include the project proponent, the State and the local economy. The followings are some of the benefits of the project:

2.4.1 Ameliorating Infrastructural Deficiency for Public Transport in the state

One way of solving the overwhelming transportation challenges with the teeming population in Lagos state is through provision of public transport infrastructure. Considering the plan by the project proponent, Lagos State Government, is to provide a world-class transport interchange at Oshodi, the proposed project will afford the operators of the public transportation the opportunity of having modern public transport infrastructural facilities. The provision of these infrastructural facilities for different categories of public transport such as the private buses, public buses such as BRT will go a long way in solving the infrastructural deficiency being experienced by the public transportation sector of the State. It will equally and to some extent provide standard shopping mall to the displaced marketers within the Oshodi market thereby improving the local economy in the area.

2.4.2 Improving the Security within the Project Environment

According to the report that the Oshodi area is blighted by criminal activities such as pickpocketing and bag snatching to mention a few, it is expected that the proposed project development will improve the security situation with the project area since the planned public transport facilities will be equipped with surveillance equipment such as CCTV.

2.4.3 Improving the traffic situation and Quality of life

The style and quality of public transport infrastructural facilities being planned for the Oshodi Transport Interchange project can be compared to the standards obtainable in the advanced countries of the world. This high standard will appeal to the healthy psychology of the inhabitants of the Oshodi environment; for instance the usual gridlock arising from the traffic by the volume of cars in and around Oshodi, partly caused by the flow of visitors to the market on daily basis will be eliminated thereby improving the serene and healthy environment of Oshodi that will promote good health and improved life expectancy.

2.4.4 Creation of Employment Opportunities

The project will create employment opportunities right from the construction phase to the operational phase. A lot of both skilled and unskilled labour will be employed during the construction phase of the project; particular attention will be given to local hands with regards to employment. During the operational phase of the project, even more employment opportunities are likely to be created in the course of meeting the service demands of the facilities within the proposed Oshodi Transport Interchange project. In addition to these direct employment opportunities, the subcontractors during the construction phase will also create indirect employment.

2.4.5 Driver for Further Development

With the transformation of the Oshodi area into a world-class Central Business District (CBD) with business, travel and leisure activities conducted in a serene, secure, clean, orderly and hygienic environment, the proposed Oshodi Transport Interchange Development project is expected to further usher in series of development on this axis of Lagos state.

2.4.6 Improving the Socio-economic Status

The development of the proposed Oshodi Transport Interchange project at Oshodi area of Lagos will create socio-economic interaction within the project area such as creation of standard bus terminals and parks for interactions in the project area and its environment as well as creation of employment opportunities, thereby improving the socio-economic situation of Lagos.

2.5 Envisaged Sustainability

The sustainability of the project is here discussed in the light of its ***Economic, Environmental, Technological and Social sustainability***

Economic Sustainability

The Project Proponent (Lagos State Government) will be providing the required funds for the execution of the project while the Private Sector will be engaged for the operation and management of the facility. The project fund during construction phase shall be properly managed in line with the transparency and accountability policy of the State Government. It is anticipated that when operational, the facility can generate over 700million Naira annually, thus making available funds for its maintenance and management. Therefore, the proposed development is economically viable and sustainable.

Technological Sustainability.

Modern Equipment and Best Available Technology shall be employed in the construction and operation of the proposed Oshodi Transport Interchange. Facility Construction works shall be carried with strict compliance with all relevant local and international standards and codes. The State Government Workforce parades officers with the required competencies and skills that would be involved in the supervision of the project construction and operation. Thus, technological sustainability of the project can readily be guaranteed.

Environmental Sustainability

The project principles are based on cost reduction, minimization of negative environmental and social impacts and utilization of local skilled labour. Environmental, Public safety and Health considerations shall be given adequate attention while appropriate mitigation measures and Environmental and Social Management Plan shall be carefully implemented.

Social Sustainability

The proposed project is expected to impact positively on the social life of the people of Lagos by enhancing transportation, eliminate or considerably minimize incidences of crimes and vices that are synonymous with Oshodi and boost economic activities. The Construction and operation phases of the proposed Interchange shall create opportunities for direct and indirect, temporary and permanent employment. The Proponent of the project shall ensure sustained consultations with relevant stakeholders particularly operators within the Transportation Sector in the State.

2.6 Alternative Project Concepts

Three (3) Project concepts were considered before the proposed concept was eventually selected. They are as follows:

Concept A: Rebuild the Parks with some Greenery

This concept will involve the reconstruction of the existing parks to give them facelifts with provision for some greenery. Though this option will change the landscape of Oshodi to some extent, it will not take advantage of its full potentials for the transportation sector of the State. This Concept was therefore considered inappropriate.

Concept B: Renovate the Parks and Rebuild the Markets with modern Lock up Shops

This concept sought to renovate the existing parks and rebuild the markets at Oshodi into shopping malls with lock up shops. Though this concept would enhance the aesthetic of the Oshodi Environment and improve the economic activities, it will still not exploit the full benefits of the Oshodi as a transport interchange hub.

Concept C: Oshodi Transport Interchange

This concept seeks to transform Oshodi into a world-class Central Business District (CBD) with business, travel and leisure activities conducted in a serene, secure, clean, orderly and hygienic environment. This concept is premised on a 3-pronged approach – Transportation, Security and Urban Renewal & Environmental Regeneration – and would see the following initiatives:

- Consolidation of all 13 intra-city and interstate parks into 3 multi-storey bus park & terminals (4 floors, 30,000 sq.m for each terminal) to take care of the parking and passenger demand.
  *Terminal 1 (Mosafejo Market Axis) would be for Inter-state;
  *Terminal 2 (Former Owonifari Market);
  *Terminal 3 (adjacent to NAFDAC) for Intra-city transport activities. These terminals would have standard facilities including waiting area, loading bays, ticketing stands, drivers lounge, parking areas, rest rooms, etc.
- Accessible walkways and Pedestrian Bridges/Sky-walks to link all the 3 terminals and malls;
- Introduction of Bus Lanes, Lay-bys, etc.;
- Introduction of Green parks to soften the environment; and
- Proper Waste Management Strategy;
- Fencing, Street lighting and a dedicated security team for Oshodi including

Surveillance Tower, CCTV, etc.

- Development of shopping malls adjacent to the bus terminals.

2.7 Project Option

There are usually several options to any project. The selection of a particular option is premised on several considerations, including the desirability/ acceptability of the project, the Government policy or inclinations on the project, as well as the socio-economics impact of the project. For the proposed Oshodi world class Transport Interchange project, a number of options were considered and these include: *No-Project Option; Delayed Project Option; Alternative Location Option and Go Ahead (Implement Project as Planned) Option.*

2.7.1 No Project Option

This option assumes that the project will not take place as planned. The implication of this option is that the *status quo ante* will remain, the environmental abuse and degradation, as well as the under utilization of the potentials of Oshodi as the largest Transportation Interchange in West Africa will continue. Going by this option, all the pre-implementation planning, design, feasibility studies and other pre-project investments would go down the drain. By extension it also means that the businesses, individuals particularly the good people of Lagos that would have benefited from the operation of the facility would also not have such benefits, while the revenues that would have accrued to the State Government will also not be possible. This alternative is usually considered either when the environmental implications of the project are too grave to allow, or when the economics are not viable enough. For the proposed development, the negative impacts can be adequately mitigated. In fact, the Socio-economic benefits anticipated far outweigh the expected negative impacts. Therefore, the No-project option in this case was not considered as a viable option.

2.7.2 Delay Project Option

Sometimes, either as a result of civil unrest or public outcry against a development or project, the implementation of a project may be delayed. Applying this option to this project would mean that the proposed project implementation would be stalled until conditions are favourable. However, none of the above stated conditions currently apply to this project. In fact, the people of Lagos are yearning for the facility in view of its envisaged immense social and economic benefits. Therefore, selecting the Delay Project Option would mean a larger part of those living in Lagos would have their dream of utilizing an efficient world-class transport Interchange delayed. Thus the option was also not considered a viable and acceptable one.

2.7.3 Alternative Site/ Location

This consideration comes up usually, when there are constraints such as unavailability of the required space, commitment of the space to other uses, or availability of better alternatives. The proposed facility is designed and planned to take advantage of and exploit the full potentials of Oshodi as a major Transport Interchange. The site is also large enough for the intended use and as such the need to consider alternative locations for this predetermined location does not come up.

2.7.4 'Go Ahead' Option

The need for this project in the proposed location outweighs the other options of 'no project' delayed project or alternative locations. It is also clear that if the full potentials of the project location are to be exploited, the proposed development should be allowed to go ahead as planned. Adequate mitigation measures shall be put in place to minimize or eliminate potential negative environmental and social impacts of the proposed project

2.8 Summary

In summary, the proposed project plan, including the current location is considered the most optimal. As such, the project can proceed as planned, as long as adequate measures are put in place to effectively mitigate/ameliorate the negative environmental and social impacts that may attend the proposed project. The various environmental impacts and the proposed mitigation options for the negative impacts are discussed in subsequent sections of this report.

CHAPTER THREE

PROJECT DESCRIPTION

3.1 INTRODUCTION

This chapter describes the facilities and the ancillary infrastructure to be established by the proposed Oshodi Transport Interchange project. It also discusses the activities to be undertaken during the various phase of the project as well as provides an over view in sufficient depth to enable the scope and extent to be understood, and for all potential sources of impacts to be identified.

3.2 PROPOSED PROJECT DESIGN CONCEPT

The proposed Oshodi Transport Interchange concept seeks to transform Oshodi into a world-class Central Business District (CBD) with business, travel and leisure activities conducted in a serene, secure, clean, orderly and hygienic environment. The proposed project is designed to consolidate the existing thirteen (13) interstate and intra-city transport parks into three (3) multi-storey bus terminals, which before the project conception were haphazardly operated by transporters. The proposed project is to restore order and sanity in the manner in which transport and commercial activities are haphazardly being conducted in the area. By so doing, the project will re-brand Oshodi into world-class Central Business District (CBD) with business, travel and leisure activities conducted in serene secure, clean, orderly and hygienic environment. The project concept is premised on a 3-prolonged approach- Transportation, Security and Urban Renewal & Environmental Regeneration.

3.3 PROPOSED PROJECT COMPONENTS

The proposed Oshodi transport interchange project has the following components:

- Three (3) multi-storey terminal buildings.
- Three Standard (3) bus Parking Areas
- Two (2) covered pedestrian walkways/ bridges to link the three complex (building and bus parking)
- Shopping mall
- Associated Infrastructures, which include waste management facilities, fencing, lighting, dedicated security systems, surveillance tower, CCTV etc.

3.4 DESCRIPTION OF THE PROPOSED PROJECT COMPONENTS

There will be three (3) different terminal buildings and bus parks with one each to be cited in each of the site as earlier stated. The architecture of the terminal building reflects the trends in development of public buildings in the country. The façade is treated with modern materials like aluminum composite panels and with stone cladding to achieve a modern and a low maintenance building. The front of the building is

designed with ample landscape and paved area for commuter's movement and a good ambiance in the terminal. Glass is suggested as a material for the entrance lobby to allow ample light and to highlight the entrances.

3.5 DESIGN FEATURES OF THE TERMINAL

In order to prepare plan for the design of the proposed bus terminal, the following technical factors were into considerations:

- Landuse requirement of the various activities
- Planning norms and regulations
- Topographic and geotechnical such as ground features and slopes, type of soil and ground water level
- Standard for provision of parking requirement
- Traffic growth trend and future demand
- Water, drainage, power, communication and transport facilities
- Seismic zone and wind direction
- Safety and security

The proposed bus terminal building as shown in the **Annex 2** is a four (4) - storey building. The terminal will accommodate a retail food court, bus parking, fence and associated facilities such as lighting, borehole, waste management, bus loading bays or passenger lounge, and Parking lots for all types of Vehicles as earlier explained. The terminal has provision for:

- Separate departures and arrival areas
- Facilities for handicap/disable persons
- Ticketing booking systems/reservation area
- Enclose passenger concourse
- Communication facilities and baggage check-in
- Commercial and business areas (shopping malls. Restaurant, hotels, entertainment facilities etc.)
- Vehicle maintenance facilities (wash areas, service areas and workshop)
- Driver Rest Areas/Lodges
- Air-conditioned waiting Lounges
- Security tracking systems
- Management Offices, Meeting Auditorium
- Offices for the transport operators and regulators.

The bus terminal is designed to provide all necessary passenger and commuters' facilities for an enhanced user experience. The main aspect of the terminal is to provide

proper bus circulation and well-designed and comfortable terminal. The design features include the following:

i. **Bus circulation**: The bus circulation is designed to be unidirectional with buses entering to the left side of the terminal and exiting to the right side of the terminal. The drive-way are designed to avoid any crossing of buses and to avoid any U-turn in the terminal. The buses will be parked at 45 degrees to the terminal.
ii. **Taxi and private vehicle**: The cars and private vehicles parking will be limited to the front of the terminal building without any conflict with movement of passengers. The existing road in front of the terminal building will facilitate all necessary queue length for cars and autos without affecting the road traffic
iii. **Passenger Circulation**: The entrance of the each of the terminal are located in three zones, the left, right and centers
iv. **Terminal Building**: The terminal building is designed to take peak traffic. The passenger waiting areas are designed to facilitate smooth and clear movement of pedestrian without needing to cross over the bus movement area.
v. **Facilities in the passenger terminal area**: These include entrance lobby, administrative area, passenger utilities, commercial retail and office area, restaurant, passenger waiting area, car and auto parking.
vi. **The terminal building:** The architecture of the terminal building reflects the trends in the development of public building in the country. The farcade is treated with modern materials like aluminum composite panels, and with a stone cladding to achieve a modern and low maintenance building. The front of the building is designed with ample landscape and paved area for commuter movement and good ambience in the terminal.
vii. **Building orientation:** Each of the building is oriented to west of the sites to allow for shading of the passenger waiting area from the evening sun. Diffused light is used to

The bus terminal shall also be equipped with wide range of supporting infrastructures, which aid in enhancing experience, efficiency and attractiveness of the terminal. These infrastructures include provision for feeder infrastructure, seating, landscaping, lighting, way finding (Passenger Information System (PIS), signage and marking), public art and breakdown service. Facilities. The proposed terminal building floor plans is attached as appendix and the specific facilities to be provided per floor as well as floor allocation is presented in **Table 3.1** and **Table 3.2** respectively.

Table 3.1: Summary of the floor plans and loading area in each terminal

S/N	Project component	Total Number of Floor	Number of floor to be used as Bus Loading bays
1	Terminal 1	4	2
2	Terminal 2	4	3
3	Terminal 3	4	3

Table 3.2: OTIP floor plan_ space allocation of the proposed terminal buildings

Description of building areas	Terminal 1					Terminal 2					Terminal 3				
	Ground floor	1st floor	2nd floor	3rd floor	4th floor	Ground floor	1st floor	2nd floor	3rd floor	4th floor	Ground floor	1st floor	2nd floor	3rd floor	4th floor
Transport/circulation (%)	100	87.7	0	0	24.2	75.28	99.25	95	5.11	23.35	65.93	99.27	95	5.11	0
Admin (%)	0	3.8	22.6	100	0	1	0	5	0	0	1	0	5	0	100
Commercial (%))	0	8.5	68.28	0	75.80	23.72	0.75	0	94.89	076.63	33.07	0.73	0	94.84	0
Total size (sq. m)	-	392.7225	3151.83	-	792.15	1144.17	36.1	-	4576.93	807.93	159.530	55.36	-	4287.65	-

The terminal is designed with loading bays in each terminal. Terminal 1 has its loading bay and parking on the ground floor and the mini-depot while terminals 2 and 3 have loading bay on the ground, first and second floors and their respective mini-depot

Terminal 1
Loading Bays = 7 Mini Buses and 2HoVs
Parking = 30 Mini Buses
Layover Capacity = 40 Mini Buses
Total – 70 Mini Buses; 2HoVs

Terminal 2
Loading Bays = 12 Mini Buses and 3 HoVs
Parking = 24 Midi Buses and 3 HoVs
Layover Capacity = 30 Midi Buses
Total – 66 Midi Buses; 6HoVs

Terminal 3
Loading Bays = 12 Mini Buses and 10 HoVs
Parking = 24 Midi Buses and 10 HoVs
Layover Capacity = 40 HoV Buses
Total – 24 Midi Buses; 50HoVs

The infrastructural development at the proposed bus terminal facility can be classified for three different user types. These include passengers, terminal staff and bus staff (driver and conductor). The areas associated with the respective user type are indicated in **Table 3.3**

Table 3.3: User types and areas of the proposed terminal complex

Passenger areas	Areas for terminal staff	Areas for bus staff
Ticketing and queuing	Revenue office	Canteen
Passenger waiting area	Security and information	Resting areas
Passenger conveniences (drinking water facilities and toilets)	Ticketing booth resting room	Lodging areas
Passenger circulation	Staff conveniences (drinking water facilities and toilets)	Bus staff conveniences (drinking water facilities and toilets)
Boarding/Departing areas	Canteen	
Facility entry	Maintenance staff (chairs and lockers)	
Security including CCTV camera	Control room (CCTV surveillance)	
Retails, concession and lease space		

Table 3.4: List of facilities and area in the proposed terminal

TERMINAL 1			
	Ground Floor	**General Facilities**	**Area**
1		Male Convenience - 2 No.	25ml
2		Female Convenience - 3 No.	42ml
3		Lifts - 6 No.	128ml
4		Escalator - 1 No.	15ml
5		Stairs - 6 No.	192ml
		Transport Facilities	
1		Information Desk	21ml
2		Security Screening - 2 No.	329ml
3		Ticketing - 17 No.	174ml
4		Operation Offices - 2 No.	32ml
5		Luggage Holding - 2 No.	155ml
6		Luggage Locker	65ml
7		Loading Bay - 7 No.	356ml
		Commercial Facilities	
1		ATM Gallery	137ml
	First Floor	**General Facilities**	**Area**
1		Male Convenience -12 No.	123ml
2		Female Convenience - 15 No.	129ml
3		Lifts - 6 No.	128m²
4		Stairs - 6 No.	192m²
5		Escalator - 1 No.	15ml
6		Porters - 2 No.	163ml
		Transport Facilities	
1		VIP Waiting Lounge	258ml
3		Passengers Waiting Lounge	1626ml
3		Pedestrian Ramp	199ml
		Commercial Facilities	
1		Kiosk - 10 No.	417ml
	Second Floor	**General Facilities**	
1		Utility Room/Store	8ml
2		Male Convenience - 2 No.	43ml
3		Female Convenience - 3 No.	50ml
4		Lifts - 6 No.	115ml
5		Stairs - 2 No.	81ml
		Transport Facilities	
1		Operator Offices - 31 No.	692ml
	Third Floor	**General Facilities**	
1		Admin Office/offices -27 No.	510ml
2		Stairs - 2 No.	81m2
3		Lifts - 6 No.	115m2
4		Conference Hall	57ml
5		Male Convenience - 2 No.	45ml
6		Female Convenience - 3 No.	53ml
		Transport Facilities	
1		I.T Room	17ml
	Fourth Floor	**General Facilities**	
1		Lobby	180ml
2		2 Lifts - 6 No.	165ml
3		3 Stairs - 1No.	41ml

		Stairs - 1No.	41ml
	Depot	**Transport Facilities**	
1		Bus Parking Spaces - 27 No. (Mini Bus) 3911m²	391mll
		TERMINAL 2	
1		Male Convenience - 5 No.	78ml
2		Female Convenience - 8 No.	74ml
3		Lifts - 6 No.	141ml
4		Escalator - 1 No.	15ml
5		Stairs - 5 No.	192ml
6		Store	13ml
		Transport Facilities	
1		Information Desk	21ml
2		Security Screening - 2 No.	135ml
3		Ticketing - 19 No.	251ml
4		I.T Room	11ml
5		Ramp	660ml
6		Loading Bay - 6 No.(HoV)	315ml
		Commercial Facilities	
1		Kiosk - 24.No	320ml
	First Floor	**General Facilities**	
1		Male Convenience - 2 No.	27ml
2		Female Convenience - 2 No.	31ml
3		Lifts - 6 No.	141m²
4		Stairs - 5 No.	192m²
5		Escalator - 1 No.	15ml
		Transport Facilities	
1		Ticketing - 12 No.	207ml
2		Passengers Waiting Lounge	431ml
3		Bus Parking Spaces - 12 No.(Midi)	695ml
4		Ramp	660m²
		Commercial Facilities	
1		Kiosk - 2 No.	39ml
	Second Floor	**General Facilities**	
1		Offices - 4 No.	175ml
2		Male Convenience - 4 No.	67ml
3		Female Convenience - 4 No.	56ml
4		Lifts - 6 No.	134ml
5		Stairs - 4 No.	138ml
		Transport Facilities	
1		I.T Room	19ml
2		Cloakroom	48ml
3		Drivers' lounge	121ml
4		Bus Parking Spaces - 12 No.(Midi)	2500ml
	Third Floor	**General Facilities**	
1		Lifts - 6 No. 243ml	243ml
2		2 Stairs - 1 No. 56m²	56ml
		Commercial Facilities	
1		1 Roof Garden	165ml
	Fourth Floor	**General Facilities**	
1		Lobby	185ml
2		Lifts - 6 No.	161ml
3		Stairs - 1 No.	56ml

4		Electrical room	12m2
	Depot	**Transport Facilities**	
1		Bus Parking Spaces - 28 No. (HoV)	4043m²
		TERMINAL 3	
	Ground Floor	**General Facilities**	
1		Male Convenience - 5 No.	81ml
2		Female Convenience - 8 No.	71ml
3		Lifts - 6 No.	141ml
4		Escalator - 1 No.	15ml
5		Stairs - 5 No.	192ml
6		Store	13ml
		Transport Facilities	
1		Information Desk	21ml
2		Security Screening -2 No.	165m²
3		Ticketing - 19 No.	247ml
4		I.T Room	11ml
5		Ramp	600ml
6		Loading Bay - 10 No. (HoV)	600ml
		Commercial Facilities	
1		1 Kiosk - 24 No.	320ml
	First Floor	**General Facilities**	
1		Male Convenience - 2 No.	34ml
2		Female Convenience - 2 No.	29ml
3		Lifts - 6 No.	141m²
4		Stairs - 5 No.	192m²
5		Escalator - 1 No.	15ml
		Transport Facilities	
1		Ticketing -12 No.	217ml
2		Passengers Waiting Lounge	331ml
3		Bus Parking Spaces - 12 No.	1308ml
		Ramp	600m²
		Commercial Facilities	
		Kiosk -2 No.	39ml
	Second Floor	**General Facilities**	
1		Offices - 4 No.	175ml
2		Male Convenience - 4 No.	67ml
3		Female Convenience - 4 No.	56ml
4		Lifts - 6 No.	134ml
5		Stairs - 4 No.	138ml
		Transport Facilities	
1		I.T Room	19ml
2		Cloakroom	48ml
3		Drivers' Lounge	117ml
4		Bus Parking Spaces - 12 No.	2500ml
	Third Floor	**General Facilities**	
1		Lobby	185ml
2		Male Convenience -1No. 17ml	17ml
3		Female Convenience 1 No. 5ml	5ml
4		Lifts - 6 No. 165ml	165ml
5		Stairs - 1No. 56m²	56m²
6		Electrical room 12m²	12m²
		Transport Facilities	

1		Security Observation Room 144ml	144ml
	Depot	**Transport Facilities**	
1		Bus Parking Spaces - 32 No. (HoV)	6341m²

Terminal 3 will serve BRT buses from Oshodi to Abule Egba and other destinations such as Anthony, Ojota, Lagos Island, Ikorodu, Ajah, CMS, Berger, Ketu Yaba, Obalende. Terminal 2 will be used as in-tra Lagos city motorpark. Terminal 3 complex on the other hand shall be used for inter-state transport activities serving those travelling outside Lagos and the west coast. The destinations from this terminal shall include Ibadan, Oshogbo, Ilorin, Ado, Ondo, Ife, Abeokuta and Akure amongst others. All the Terminals shall be equipped with security tower including surveillance systems and CCTV cameras to provide good illumination and effective monitoring of the three complex at night.

Terminal 1 complex

Terminal 1 complex shall be used for inter-state transport activities and shall serve those travelling outside Lagos and the west coast. The destinations from this terminal shall include Ibadan, Oshogbo, Ilorin, Ado, Ondo, Ife, Abeokuta and Akure amongst others. The Terminal 1 shall be equipped with security tower including surveillance systems and CCTV cameras to provide good illumination and effective monitoring of the three complex at night.

As earlier explained the proposed building is designed to have 4-floors. The ground floor to the 2nd floor shall have bus parking area and office spaces while the whole of the 4th floor will be devoted to administrative offices. The ground floor has bus and taxi entry points, entrance lobby, passenger circulation, 80 person capacity elevator to move passengers and other workers to/from 4th floor. In addition, each floor has adequate toilets to cater for convenience of the passengers.

Terminal 2 and 3 complex

At terminal 2 complex location, there will be creation of 2 -lane up and drop off lay-by totally separated from traffic in the mile 2 and Iyana-Ipaja directions, The ground floor of each terminal has an entry lobby, a security system and 80 person capacity elevator area. The 1st floor is entirely for administrative offices while the 2nd floor of the proposed building will have a bus parking area. The building is equipped with adequate passenger and staff amenities including drinking water facilities and toilets conveniences.

Shopping Mall

A shopping mall shall be located adjacent terminal 1 complex. The mall is a commercial activity center designated to serve the leisure of passenger and tourist within and outside the country. The malls will form a complex of shops representing merchandisers with interconnecting walkways that enable customers to walk from unit to unit. The mall also have features including a restaurant, Department Store, Drugstore, Wine Store, Cigar Store, Boutiques, Shoes and Gift Stores, Galleries, Furniture Stores, Antique and Jewellery Stores. It will be equipped with 100% power back-up system, Centralized air-conditioning system, advanced security, surveillance and access controls, heat, smoke and fire detectors and directional audible signaling, automatic trolley management and parking management systems conveniences and complete sewage treatment plants and wastage drainage system for each constituent of the project.

Bus parking

In addition to the bus parking within the proposed building, a large sized bus parking area will be constructed in front of each terminal building. This is designed to have ancillary amenities such as passenger boarding/departing area, barrier free circulation, passenger waiting area, walkways, traffic signage. The bus circulation is designed to be unidirectional with busses entering to the left side of the terminal and exiting to the right side of terminal. The driveways are designed to avoid any crossing of busses and to avoid any U turns in the terminal. The busses will be parked at 45 degrees to the terminal. The cars and private vehicles parking will be limited to the front of the terminal building, without any conflict with the movement of the busses. The 7m lane in front of the terminal building will facilitate all necessary queue length for all cars and autos without affecting the road traffic.

Pedestrian walkway/bridge

The three terminals shall be linked with one another with covered pedestrian sky-walkways/ bridges to enable the passengers' access one terminal from the other. The pedestrian walkways will be placed on top of the 4th floor of each building. Each terminal complex will also be accessed through existing road that connect Apapa-Oshodi and Lagos-Abeokuta Expressway at the proposed interchange area.

3.6 DESIGN CODES AND STANDARDS

The engineering design, procurement and installation for the proposed bus terminal facility shall be in accordance with relevant codes and standards. This includes:

- National Building Codes 2006
- Applicable International codes and standards for bus terminal

- Planet Projects Limited (PPL) adopted Design and Engineering Practice (DEPs); and
- PPL standard facility design manuals
- International Building Code IBC (ICC, 2003a)
- International Energy Conservation Code (ICC, 2003c)
- IS 456 for Plain and Reinforced concrete
- IS 873 part 1, 2, 3 and 5 for dead load, live load, wind load and combinations
- SP 34 for detailing Reinforcement

3.7 DESCRIPTION OF PROJECT DEVELOPMENT PHASES

The project development will be implemented in three phases involving pre-construction phase, construction phase, operational phase and decommissioning phase. The activities that will be carried out during each phase of the project are as highlighted as follows:

Preconstruction phase

- Site survey (location, topographic, traffic and geotechnical investigation)
- Mobilization of equipment and transportation of workers to the site
- Setting up of camp office
- Site preparation/clearing;

Construction Phase

- Transportation of construction material to the site
- Drilling of borehole
- Grading and excavation work
- Civil construction work for building and park
    - Foundation work,
    - Mechanical Installation (fabrication of steel and iron parts and assemblage)
    - Electrical Installation
    - Perimeter fence, storm water drainage channel (1x1.5x1.5m) and gutters;
    - Ancillary utilities such as water supply, borehole, sewage systems and electricity supply (National Grid and low emission lean burn diesel rating CAT Generator
    - Waste storage and collection for disposal by contractors;
- Installation of pedestrian bridge and sky-walks
- Landscaping of the project site especially trees planting and lawns for aesthetics;

- Construction of all weather access roads, parking and walkways within the project site.

Operation Phase

- Bus operation
- Maintenance activities
- Security monitoring

Figure 3.1: 3D model of the proposed Oshodi Transport Interchange Project

3.7.1 Pre-Construction Phase

During the pre-construction phase, the activities will essentially be desktop, feasibility environmental and technical considerations. As part of the activities in this phase, several site studies have been performed as indicator and basis for engineering works. These studies are considered as preliminary studies. For engineering details, information given herein and described in the report will be considered during the details design and construction works. The activities during the phase of the project are described:

3.7.1.1 Project Initiation stage

The proposed bus terminal development commenced with project initiation stage, This stage involves all necessary analysis undertaken for planning the project such as conceptualizing availability of sites, with detailed information on operators, principal

stakeholders and authorities, city demographics, existing transport scenario and facilities conditions.

3.7.1.2 Topographical survey

Topographical survey of the site was carried out with the aim of collecting essential ground features of the project areas using a Total Station so as to develop a Digital Terrain Model (DTM) to take of design requirement including the geodetic points of the land plot on which the building and other infrastructure are to be located. The data collected were used in the final design and also used for computation of earthwork and other quantities required. Spot levels were taken along the proposed areas at regular interval to understand the ground variation. The utility services present along the existing area were also plotted.

3.7.1.3 Traffic survey

Bus count survey was carried out for three weeks at the existing entry and exit point of motor garages for a period of 16 hours per day. Based on the results, the current demand of buses is estimated to be 5,000 with an estimated 50intra and interstate destinations, which is then projected to 200,000 buses in 10 years considering the vehicular growth pattern. The details of the result is presented in **figure 3.4- OTIP-Intra-city Public Transport Daily Pax. Demand per direction**).

3.7.1.4 Geophysical survey/site test

The geotechnical investigations was designed according to BS 5930: 1981 Code of practice for site investigation. Subsoil investigations were carried out between 6th of June and 4th July 2016 to obtain relevant information for assessing the bearing capacity of the existing ground profile to adequately support the proposed Bus Terminal Development. The subsoil layers and their properties were determined to facilitate the foundation type, depth, size and configuration. Subsoil condition was analyzed along with evaluation of field and laboratory data for determination of necessary physical and chemical characteristic of the in-situ soil strata. A total of 24 Geotechnical Bore holes were drilled at various locations to a depth of 30m respectively using light cable of percussion rig of pilcon Wayfarer type. Eight boreholes were taken in each of the proposed terminal site. In general, the sub soil strata comprises of silty sand and sandy silt up to 10.0 and 10.0 - 18.0m depth respectively.

Thin layers of clayey silt and sandy silt with clay were encountered to a depth of 30m and 40m below the existing at the location tested. Below this depth the subsoil strata consists of fine sand. SBC value of 225kN/m2 is considered at a depth of 2.5m below ground level. It is also recommended to take adequate number of confirmatory

boreholes during execution. The bore log details, test results and recommendations are given in.

The results of the tests which is described in chapter four of the report in details indicated that there are no underground formations around the project location and that the shallow foundation (pad, strip or raft) option imposing allowable bearing capacity of 100KN/m2 to 150 KN/m2 can be adopted for supporting structures at the proposed terminal sites and set at about 0.05m to 0.75m depth below the ground level. For structures that may transmit higher foundation loads than the ones specified, result of the test also confirms that deep foundation in form of piles is recommended to support the column loads.

3.7.1.5 Mobilisation of Equipment and Personnel

The equipment and personnel (skilled and unskilled) will be mobilized through land transportation to the site. The workers particularly the expatriate ones shall be accommodated in existing hotels located in Ikeja which is about 15 minutes' drive to the project sites while the local workers (both skilled and unskilled) shall come from their various residential areas within Lagos. The equipment to be used are wide range of tools which include hand tools and mechanically operated machines with few of the equipment to be sourced outside the country while some are expected machinery to be sourced locally. **Table 3.5** is a list of equipment and craft that will be used for the construction phase of the propose project

Table 3.5: List of Equipment and crafts for the proposed construction work

Equipment	Number to be Deployed
Excavator crawler	3
Bulldozer cat D6	3
Crane	1
Truck Concrete mixer	3
Mobile office camp	1
Wheel Loader- cat 980	1
Mobile Sanitary Toilet	1
Hand and spark-resistant tools (jack, hammer, saw, chisel, grinding, cutting or buffing wheel, goggle, glove, shovel/spade, trowel, mattock/pick axe, rake, safety shoe, reflective jackets, helmets, boiler suits	As required

Tools are to be inspected before use, and shall be well maintained and operated in accordance with the manufactures' instruction. The various hand tools are to be used in different construction activities, which include small depth excavation, lifting of excavated soil, digging of small sized trenches, removal of small layer of soil.

- **Excavato**r:

An excavator contains what is called a house, undercarriage, boom stick, and bucket. These components feature the motors and gears to move the equipment, lift the bucket, and a spot for someone to sit and be in control of the machinery. Tracked excavators consist of a boom, dipper stick, bucket, and cap, all of which are on a rotating platform, while the cab sits on tracks. This type of power is perfectly suited for tasks like digging, material handling, demolition, open-pit mining, and much more. Excavator is of two types. These are tracked excavator and wheeled excavator. The equipment will be used for digging, excavation and trenching activities during construction work.

Plate 3.1: Typical excavator at work

- **Bulldozer**:

Bulldozer consists of a hard steel plate with sharp edge at its front. The sharp edge helps the blade to cut the soil and for excavation. The metal plate can be raised and lowered with the help of hydraulic arms. Bulldozer is available in tracked wheeled forms, large and extremely powerful-tracked vehicles. The equipment will be used for levelling and to lift heavy soil and materials from one area to the other within the site.

Plate 3.2: A Typical bulldozer

- **Crane**

Cranes are of different types ranging from shovel and tower. The equipment consists of three major components:

- A carrier or mounting, which provides mobility and stability for the machine.
- A revolving deck or turntable, which contains the power and control units.
- A front-end attachment, which serves the special functions in an operation.

Tower cranes are to be deployed for the purpose of the proposed project construction work. The equipment will be used to lift loads to great heights and to facilitate the erection of steel building frames.

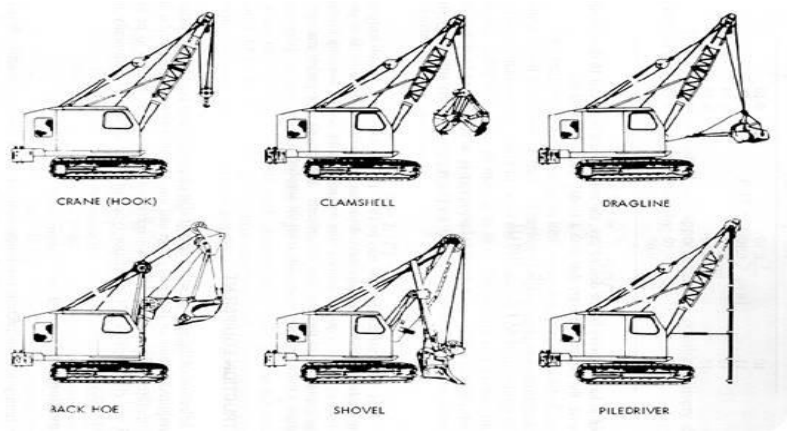


Figure 3.2: Typical Crane Family

- **Rollers**

This equipment is of different types and has wide range of operating characteristics. For the purpose of this project, a self-propelled vibratory tamping foot roller will be deployed. The equipment will be used to bring the earthwork to the desired shape and elevation and also for compaction of soil to achieve higher mechanical density.

- **Concrete Mixer**

Concrete mixers are used to mix cement, sand, gravel and water in batches for other types of construction other than paving. For the purpose of this project, both truck concrete and paving mixer will be employed. A truck mixer is concrete mixer mounted on a truck, which can transport ready mixed concrete from a central batch plant to construction sites. A paving mixer on other hand is a self-propelled concrete mixer equipped with a boom and a bucket to place concrete at any desired point within a roadway. It can be used as a stationary mixer or used to supply slipform pavers that can spread, consolidating and finishing a concrete slab without the use of forms.

- **Bituminous Distributor**

A bituminous distributor is a truck-mounted plant for generating liquid bituminous materials and applying them to road surfaces through a spray bar connected to the end of the truck. Bituminous materials include both asphalt and tar, which have similar properties except that tar is not soluble in petroleum products. While asphalt is most frequently used for road surfacing, tar is used when the pavement is likely to be heavily exposed to petroleum spills.

- **Mobile office camp:**

Six (6) portable mobille temporary cabin will be deployed to the site using a flat bed truck, two (2) to be placed in each of the proposed terminal location. The cabin consist of steel materials and has a dimension of 8ft by 2ft. The portable cabin will serve as temporary camp office to provide logistics requirement such as changing room and administrative work during the course of implementing the project. It shall also serve as storage for other site equipment working tools. The office will have the capcity to accommodate ten (10) persons at a time.

Plate 3.3: A typical portal cabin to be deployed for the site work

- **Mobile Sanitary Facility**:

Three (3) mobile sanitary facilities will be mobilized to the site, one (1) to be placed at each of the proposed terminal location. The facility is composed of Water Closet (WC), Wash Hand Basin (WHB) and water system and shall be used to collect and store human waste by workers and visitors to the site. This facility will be continuously monitored to ensure that it is not completely filled up before the contents are evacuated for disposal at appropriate disposal site approved by the Lagos State Government.

3.7.1.6 Site Clearance and preparation

The proposed sites are devoid of trees and vegetation and are quite accessible, being connected with existing roads and Expressway. Based on this, there is no need to construct any site access roads. However, the sites are still left with rubbles of the previous demolition that were carried by Lagos State Government. The rubbles will be segregated to recover the valuable materials such as iron which will be recycled for

further use while the sand containing materials will the evacuated and sold for filling purposes. The site preparation is to create favorable conditions for the construction work to start. It involves the following activities:

Construction of Temporary site fence: The fencing location shall be marked and the site will be shielded with solid protective aluminium fence of 2.0m high and 210m. This will be accompanied with appropriate warning signs and labels to prevent unauthorized access to the site.

Machinery parking area: The construction of temporary site fence shall be followed with the allocation of space for parking and repair of earthmoving and other machineries at the site. A workshop area shall also be allocated for fabrication of steel and related materials prior to installation as may be necessary during the construction work.

Provision of temporary services: In the preparatory period, temporary services shall be established. The services include temporary water supply, including fire water supply, heat supply and power supply with electricity connections to different parts of the site for the use of site workers.

3.7.2 Construction Phase

The construction phase of the proposed Oshodi transport interchange project will have several discrete activities as highlighted in section 3.4. The Planned works in the scope of the Project include: preparatory works, earth works, drainage works, construction of structures and tunnels, dislocation works, construction of pavements and installment of road signalization. The specific pattern of construction activities will generally follow this sequence although some activities may be carried on concurrently.

3.7.2.1 Materials Requirement and Transportation

Construction material is any material that is used for a construction purpose. Different types of materials will be used for the development of the proposed transport interchange project. The materials include sharp sand, ballast, granite stones, cement, ceramics (tiles and marble), blocks, metal sheet, stanchion steel, glass, electrical devises, plumbing materials (PVC pipes, Water Closet, Washing Hand Basin, shower), water and paints, fuel (diesel, petrol). Others are roofing sheet, nails, and wood/Planck.

These materials will be sourced locally and greater emphasis will be laid on the procurement of these materials around Oshodi community and environs, because of the proximity to the project site, which will make both economic and environmental sense as it will reduce the negative impact of transportation through reduced distance of travel by materials transport vehicles. The materials will be transported from their extraction, manufacture, or storage sites using transport trucks.

The volume/quantity of the materials anticipated for the construction phase of the proposed transport interchange project is given in **Table 3.6**.

Table 3.6: Summary of the construction materials and the anticipated Volume/quantity to be used

Material	Form	Estimated quantity
Sharp coarse sand (very silty, averagely silty)	Solid	4,000tons
Cement (50kg bag)	Solid	300 tons
Granite stone (3/4", ½", 1")	Solid	5, 200tons
Structural steel (25mm, 16mm, 12mm and 10mm)	Solid	750tons
Wrought iron burglar-proof (70mm by 750mm, 900mm by 1200mm, 1200mm by 1200mm)	Solid	95tons
Tiles (ceramic, vitrified and walls)	Solid	tons
Molded Block (6'' and 9'')	Solid	
Glass materials	Solid	
Electrical cable	Solid	
Plumbing materials (WC, WHB, pvc pipes)	Solid	
Roofing sheet	Solid	
Hardwood	Solid	
Nails	Solid	
Water	Liquid	10,300 m^3
Fuel (diesel, petrol)	Liquid	1.4 million liters
Paint (water and oil base)	Liquid	10,000m^3

It is anticipated that there will be heavy human and vehicular traffic around the proposed project location during the construction phase of the project site. As a result of this, a plan shall be made such that construction materials are delivered on-site with no obstruction and/ injury caused to human and vehicular traffic either within or outside the site. To achieve this, a Material /Resource Allocation Chart shall be prepared using the project work schedule/material schedule to determine the frequency of use of each material in a way that there will never be an excess of any unused material at anytime during the construction activity.

3.7.2.2 Fuel Requirement

Premium Motor Spirit (PMS) and Automotive Gas Oil (AGO) will be used to run material transport vehicles and the various construction equipment/machinery listed in **Table 3.7**. As already stated in **Table 3.7**, an estimated volume of 1.2 Million liters of fuel is anticipated to be used out of which 45% of the volume will be used by transport vehicle while the remaining 55% is anticipated to be used by other site machineries. The fuel shall be purchased from the nearby filling Stations located at 2km from the site along the Oshodi-Oworoshoki Expressway and delivered to the site by tanker. The fuel shall be stored in a 30, 000 capacity temporary storage facility which shall be provided and

strategically positioned at the site. An average usage of 3,200- 4,000 liters of diesel fuel is anticipated on daily basis during the project construction phase

3.7.2.3 Layout Plan for the Landuse Distribution of the Proposed Project

The proposed transport interchange project shall occupy a total of 90, 000 sq. m land area, of which 30, 000sqm each shall be used for the development of terminal 1, terminal and 2 and terminal 3 respectively. The land was acquired by Lagos State Government and later released to the Planet Projects Limited for the development of the project.

Table 3.7: Landuse Analysis Distribution

Land Use	Areas (sq. m)
Terminal buildings	90,000
Terminal park	30,000
Road network	30,000

The landuse analysis as stated in Table 3.7 shows that the terminal building area occupies a total of 90,000sqm of the total area while the terminal park, and road network occupies a total area of 60,000 sqm.

3.7.2.4 Construction Activities

The proposed project sites are already connected with roads that provide direct access to the site. Therefore, there is no need to construct any site access road. The project sites have rough surface with clay topsoil and shall be prepared as explained in the earlier sections of the report. The civil construction activities shall be undertaken in accordance with relevant architectural and engineering drawings of the project and structure to be constructed as shown in **Annex 2**. As previously highlighted, these will involve the following activities:

- Site clearance
- Excavation for foundation
- Casting of foundations, column, and ramp
- Construction of brick wall
- Installation of doors, windows and fixtures
- Building finishes
- Installation of water supply and sewerage facilities-internal plumbing works, water and sewer connections with Oshodi utility network

3.7.2.5 Construction of Terminal Building

The proposed building and structures have varying degree of numbers of supporting structures and dimensions. The numbers is presented in **Table 3.9.** The salient features of terminal building are:

- Length- 210.079m long
- Breadth-134.275m wide
- Column spacing (along the length)-
- Column spacing (along the breadth)-
- Plinth area- 12,722 sqm for ground floor
- Plinth area- 1,720sq.m for first floor.

The floor height for Atrium block and Canopy at the main entrance as well as side entrance shall be 7m and 4m respectively. The height for each floor shall be 3m. The floor height for the passenger waiting area shall be 6m and for the platform shall be 5m. A combination of column beam/slab beam arrangement is proposed for the building. Large column spacing of 10.0m is adopted along length and breadth for the main area. The flat slab area shall have circular columns and where beam slab arrangement is given, columns shall be rectangular as per requirements. Mild condition of exposure is considered in design. Isolated rectangular or square footings are provided as foundations except at one location where combined footing is given.

3.7.2.6 Excavation Activities

The construction work will begin by setting and pegging out the area for building in accordance with site layout. The area for the building is excavated by means of an excavator to create a foundation trench size of 2.5m depth and 1.0m wide.

3.7.2.7 Foundation Requirement

No performance criteria have been given at the time of geophysical investigation of the proposed site. However, Coduto (2011) presents typical design values for the allowable settlement (S_{all}) shown in **Table 3.8**. These values are serviceability criteria and thus may be compared directly with the predicted settlement for the foundation.

Table 3.8: Typical Allowable Total Settlement for Foundation Design (Coduto 2011)

Types of structures	Typical Allowable Total Settlement ($S_{all)(mm}$)
Office/Residential Building	12-50 (25 is most commonly used)
Heavy Industrial Building	25-75

As earlier explained, the results of subsoil geophysical investigation of the site indicates that the imposed loadings from the proposed building structures will be in excess of the allowable bearing pressure values as given in chapter four. Based on this and in order

to support the column loads a deep foundation in form of piles has been considered for the project. The piles will be bored or driven in-situ.

Table 3.9: Summary of salient features of proposed Terminal buildings and structures

Proposed Items	Terminal 1 building	Terminal 2 building	Terminal 3 building	Skylink 1 Brige	Skylink 2 Bridge
Number of proposed piles	362	385	385	85	65
Diameter of piles	600mm	600mm	600mm	600mm	600mm
Type of drainage network layout	Surface network	Surface network	Surface network		
Dimension of the drainage network	1.1m wide and 1.0m deep	1.1m wide and 1.0m deep	1.1m wide and 1.0m deep		

A pile is a column of concrete that extends downward deep into the soil. Piled foundations consist of a number of piles connected by a ring of concrete called a ground beam. The structuring of the pile layout for the three terminals is as shown in **Appendix**. A typical pile foundation is shown in plate 3.5 while **Table 3.10-Table 3.12** shows pile termination depth values, indicating zoning arrangement according to the terminal. Using the available pile design software PILE and adopting a safety factor of 2.5, the safe working load (SWL) for different pile configuration are indicated below for bored pile. It is also important to emphasize that scheduled pile load test shall be done to determine the actual safe working load and this shall be done by the Lagos State Material Testing Laboratory or any other approved Material Testing (QAQC) engineering firm.

Table 3.10: Pile Terminal Depth for Terminal 1

Pile Depth (m)	Pile size (mm)	Safe Working Load (kN)
20	450	600
20	600	800
20	800	1000
20	1000	1200
22	450	700
22	600	1000
22	800	1200
22	1000	1400

Table 3.11: Pile Terminal Depth for Terminal 2

Pile Depth (m)	Pile size(mm)	Safe Working Load(kN)
20	450	600
20	600	800
20	800	1000
20	1000	1200
22	450	700
22	600	1000
22	800	1200
22	1000	1400

Table 3.12: Pile Terminal Depth for Terminal 3

Pile Depth (m)	Pile size(mm)	Safe Working Load(kN)
18	450	500
18	600	700
18	800	900
18	1000	1100
20	450	600
20	600	850
20	800	1150
20	1000	1250

In this project, large diameter bored piles type of 600m will be installed. Because the rotary bored technique enables the reinforcement to be added into the open bore rather than into the ready poured concrete, as in CFA, it has the distinct advantage of allowing the cage to be the full depth of the pile.

Piles are formed by drilling through a temporary casing to the designed depth, using an auger or other tools such as drilling buckets, core barrels etc. to cope with a variety of ground conditions. The casing gives support to the pile through unstable ground and once the required depth is reached, the auger is removed, the reinforcement is added and the concrete poured. When the concrete reaches the required level, the casing is removed allowing it to be reused in future.

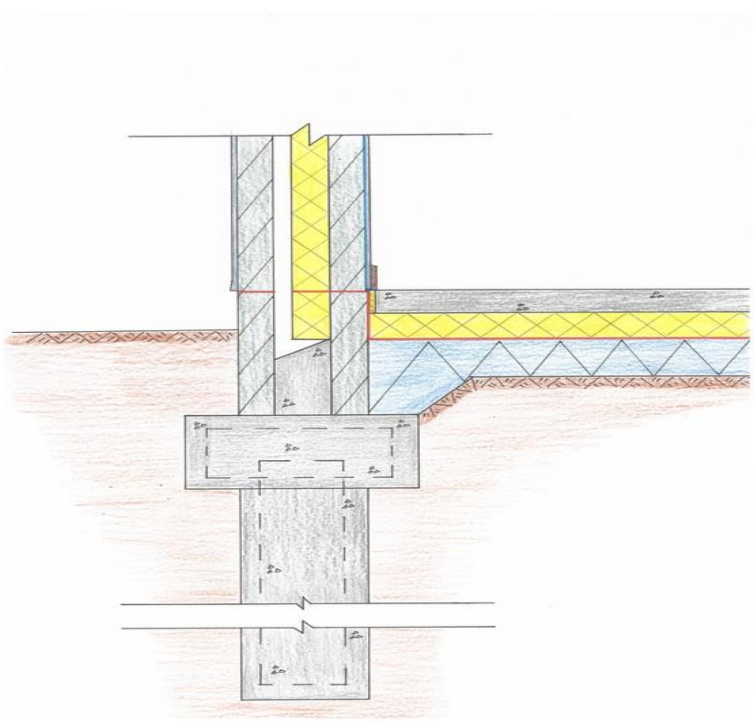


Plate 3.3: A typical pile for a multi-storey building

The pile foundation involves the drilling a pile hole in the soil, which is then poured with concrete and reinforced with steel. The concrete mix specification for the proposed pile is 30N/mm^2.

After the completion of pile foundation, the ground beam will be created. This is the surface of which the walls of the dwelling can be built. A compacted hardcore base of minimum 150mm will be installed to form a platform for the subfloor and the subsequent loads of the dwelling. The 150mm concrete subfloor is poured on the hardcore in order to provide a strong, smooth platform for the insulation.

A radon barrier is installed to form a continuous seal on the entire footprint of the building. A Damp Proof Course is installed in order to repel any rising moisture. It is vital that the DPC is carried up into the block-work to form a watertight seal over the entire floor area. The DPC shall run through the block-work at a minimum of 150mm above finished ground level. 100mm of rigid insulation will be installed below the finished floor to ensure thatthere is no heat lost through the foundation.

3.7.2.8 Construction of External Works

The construction of external works for the proposed project include construction of parking and loading/ offloading area, walkways, drainage networks, Street light, road marks and signals and road pavement.

Construction of Parking and Loading/Offloading Area

The park shall have some facilities to support the efficient operation. The park shall have a pedestrian walkway, clearly lined road, loading/offloading points, and traffic signs. The excavated area will be graded using a combination of hand tools and planning machinery, called graders after which the surface layer is smoothed and leveled. Once the soil has been leveled, an aggregate base of soil, concrete and limestone is used to stabilize the area. During this phase, curbs, gutters and drains are also constructed.

The subsoil probing within the proposed terminal sites reveals the availability of firm to stiff lateritic clayey materials within the topsoil zone at all locations, except in few localized cases that reveals soft to firm consistency. The soft consistency is believed to be due to previous land use. This suggests a flexible pavement solution like asphaltic concrete for the proposed development. This is anticipated to give room for pavement durability. The construction of parking and loading/offloading shall be done with laterite materials complemented with crushed rock materials. The internal roads shall consist of asphalt concrete pavement. Based on the technical requirement for such roads, the following pavement constituents shall be adopted for the project:

- Sub-base with a minimum thickness of 200mm made of materials with a CBR values not less than 30%
- Base-course (crushed stone) with a minimum thickness of 150mm made of materials of CBR value not less than 80%
- Acceptable solution for wearing course, using asphaltic concrete of not less than 50mm thickness

Construction of Drainage Network

The entire drainage network around the proposed Oshodi Transport Interchange project will be reconstructed for easy flow of stormwater. The drain will be both open and covered surface drains adequately sized and slopped to drain the entire interchange area. The dimension for the drainage network will 1.1m wide and 1m deep open/cover rectangular drains and culvet. The drainage network system will be designed to drain the interchange area free of water five minutes after any storm. Drainage works comprises of road drainage and drainage below ground level.

Walkway Construction Works

The walkway construction works will be designed to promote smooth flow of traffic. The walkway will be constructed with interlocking load bearing concrete tiles 12.0M wide allowing for 1.2m wide shoulder and 600mm wide covered concrete drain on each side. Paved car park areas will be designed to allow for parking space in excess of the vehicle population.

Interlocking Concrete Pavers will be concrete pavers and bedding sand over a compacted aggregate base for pedestrian and vehicular applications. Pavements shall be subjected to vehicles and shall be designed in consultation with a qualified civil engineer, in accordance with ASCE/T&DI/ICPI 58-10 Structural Design of Interlocking Concrete Pavement for Municipal Streets and Roadways.

Roads Kerbs/Edgings/Channels/Paving Accessories

Pre-cast concrete kerbs comprising concrete (136-38mm aggregate) joined in length with cement and sand (1:6) and laid on concrete bed (aggregate) complete with hunching in concrete 600 x 450 x 150mm thick foundation and Hunching.

Security Fencing

Security Block Wall Fencing will be constructed to separate the transport interchange from neighbouring existing properties. High wall fencing will be constructed along the boundaries of the planned project. Boundaries that are very vulnerable shall be 3 metres high, while the front's view shall be kept secure at 1.8m high.

Steel Works

The steel works for the proposed Oshodi Transport Interchange project shall include mostly the steel fabrication activities. Most of the steel products for the project will be sourced locally and by importation. Specifically, the steel product specifications that will be sourced for the proposed project include S275 for hot-rolled structural members and grade 8.8 for bolts. The steel fabrication works will be both on-site and off-site.

The metal fabrication involves the building of metal structure by cutting, bending and assembling process. It is a value added process that involves construction of steel structure from various steel materials. Some of the metal pre-fabrications that will be carried include metal cutting, drilling, grinding, hot-work welding, bolting and machining with tools and equipment.

Civil Works

The civil works for the proposed Oshodi Transport Interchange project include the Block walls and rendering, construction of frames, staircase and roof structures.

Superstructure Frames (Frames, staircases, lift walls and roof structure and cover*)*

The super structural members mainly column, beams and slab to be constructed by seasoned in-house professionals and will be supervised by consultants. At every stage of structural construction work (right from piling, foundation works up to the frame), various tests will be carried out to ascertain the integrity of construction materials and compliance with design specifications.

Block Walls and Rendering

Block wall/builders work commences after the completion of relevant structural frame works. The block wall shall be erected by seasoned builders and supervised by our in house professionals. This is to ensure that all works are in conformity with the approved architectural and engineering design. The electrical and mechanical works shall be carried out by specialists in these fields, under the supervision of relevant consultants.

Finishing (Painting and Furnishing)

Materials required for this work shall be carefully selected to ensure that they meet with present day acceptable standards and will surely stand the test of time and are economic in line with the project's objective.

Construction of the Tunnels

The bus depot area constructed for the parking of the buses and to serve as the waiting area will be connected to the terminal by the proposed tunnels. The terminal 1 will be linked to the adjacent bus depot by the tunnel and likewise the terminal 2 will be connected to the bus depot by another tunnel. The tunnels are meant to create easy access for the buses to the terminals respectively during the operation phase.

3.7.2.9 Installation of Pedestrian Skywalkway/ Bridge

There will be installation of two (2) pedestrian skywalkway/bridge to link the three terminal complex. One will be mounted over the existing Oshodi Oke flyover bridge along Apapa-Oshodi Expressway to connect Terminal 1 and Terminal 2 buildings while the second will cross Lagos-Abeokuta Expressway to connect terminal 2 and 3 buildings. The Skywalk Bridge, the longest free standing pedestrian bridge in Nigeria is 53.4m long and 6m wide. The pre-fabricated structural steel trussel will be hoisted with crane and the activity will be carried out between 10pm on Sunday to 5am on Monday to ensure safety of people and also to prevent impact on traffic. It is anticipated that this activity will cause disruption of traffic with movement of heavy steel and equipment. Some certain section of roads within the axis would also be closed to vehicular and human traffic while alternative routes would be created to avoid delay.

In order to reduce the traffic to the barest level, the existing flyover would be completely closed in the direction of Anthony to the Murtala International Airport, while the motorists (in both directions) shall make use of the second carriageway, that is, the one in the direction from Airport to Oshodi to Anthony. The Planet Projects Limited in collaboration with the operatives of both Lagos State Government and Federal Government including Lagos State Transport Management Agency (LASTMA), Federal Road Safety Corps (FRSC), Police and Vehicle Inspection Office (VIO) among others would be on ground to manage traffic and provide safety and security support during the seven-hour night operation.

Motorists coming from Anthony to Apapa axis shall be restricted to either access Town Planning Way through Ikorodu Road or Apapa Oworonshoki Expressway and then turn to Ilupeju Industrial Avenue then link Agege Motor Road via Ilupeju by-pass and make a U-turn at Bolade and turn to Apapa Oworonshoki Expressway.

Similarly, motorists coming from Isolo/Airport Road, shall be restricted to the service lane at Charity and turn to Agege Motor Road at Oshodi and then link Ilupeju Industrial Avenue via Ilupeju Bypass and then turn to Town Planning Way to link up Apapa-Oworonshoki Expressway.

3.7.2.10 Terminal Utilities Requirement

The various utilities such as water storage, lighting, powerhouse, and central sewage shall be constructed at the respective designated area as provided in the site layout plan:

Water Storage and Supply

The water storage tank will be installed to serve the entire terminal building and park. It shall have the capacity take 60,000 litters of water at time. The construction shall be done with mild and stainless steel and the erection work with bottom-up construction method that includes Base and annular plate laying.

From the preliminary geophysical investigation of the properties of the underlying geology of the site, the site and the proposed project area is of high water table and the water bearing aquifer will yield the required quantity of water for the project. However, due to the anticipated large volume of water requirement of the proposed project operations, an industrial borehole is preferable for the project. The borehole shall be drilled to depth between 110m and 120m, will have depth of 16m screen using a truck drilling rig. The rig is placed on the ground to drill the soil downward to the required depth. The driller will line the borehole with a slotted liner of lower permeability to allow water to percolate and a solid liner near the surface to prevent migration of surface

water into the wall. The borehole will then be pumped over a period of time to assess both the volume of water it will produce and the speed at which the surrounding rocks will release the water. The water will be subjected to laboratory test to determine the level of portability after which it will be pumped to an elevated reservoir for onward supply to various discharge points within the complex. Raw water abstracted from the borehole will be taken through a water treatment plant before discharging into bulk storage tanks. The quality of potable water supply and distribution will be in accordance with the standards of the WHO.

Power supply and distribution

The total power requirement for the proposed terminal complex is 3,700kw per day. The power supply shall be used for administrative building, lightning of internal roads and perimeter fence area and the terminal complex surrounding. The generator will run on diesel. It is fitted with catalytic converter/Evaporation Loss Control device (ELCD) at the exhaust in order to control the air pollution.

The operating hours and working life is 25,000 hours and 18-20years respectively. In order to extend the life there shall be a design method of maintenance routine 240hours of working hours to reduce its emission and lengthen its working life. The three terminals complex shall be connected to the national grid for this purpose. However, electricity generators with capacity ranging from 7-11 kVA shall be installed as a back to provide power during the grid failure.

Standby Power Generation

Generators will be provided as standby power supplies to power essential or infrastructural services – e.g. water works, street lighting, and surveillance and telecom services. The generators will be located in the Utility area. Connection/change over will be made at the applicable transformer substations to which the lighting kiosks are connected.

Fuel

A mini diesel fuel storage facility of 5, 000 liters shall be installed at each terminal complex for the use of generator. The three terminal complex shall have no fuel station within the as buses especially BRT are expected to take fuel from the main Bus Depot in Ikorodu while other private and commercial buses shall obtain their fuel at the preferred fuel filling stations outside the terminal complex

Drainage

As earlier indicated, the geophysical soil investigation was carried during a period of moderate rainfall session which introduced a run-off at sporadic locations in the neighbourhood of the project site but most of the storm water were discharged into structured channels during the following few hours. During the investigation, it was

observed that a substantial part of the proposed project route and sites has a fairly drained topography. Adequate drainage system in form of concrete gutters shall be provided within the complex and this is designed to cause no stagnation at the maximum rate for which the different units of the terminal complex are designed. According to the Washington Metropolitan Area Transport Authority (2009), passenger-boarding areas should be designed with minimum slope gradient of 1:50 (2%) for drainage

The drainage systems shall be done in a way that major interface zones between commuters and buses are kept away from drainage facilities. As drain are observed outside the proposed terminal site, adequate consideration shall be given to modalities for disposing run-off and other flowing water into the channels without negatively affecting the ground conditions

Additionally, boarding and off-boarding areas shall be adequately sloped to drain water from the passenger-buss interfaces. This water shall then be directed to drainage channels. The channels shall be located (and shaped) to minimize the potential for traffic hazard and to accommodate the anticipated storm-water flows. The drainage inlets be positioned suitably to prevent ponding, and to limit the spread of water to critical areas (where commuters alight and board). It shall be covered with slotted gratings and aligned perpendicular to passenger path to prevent hindering their movement, especially for people with baggage trolleys, prams, and walking aids

Lighting Installations.

External lighting such as streetlights will be provided both as a security measure and general lighting requirement. Generally, pole-mounted discharge luminaries will be employed for the external lighting. External lights are to be automatically operated by means of photocell switches. About 1000 light will be installed around the interchange, to create effects, to reflect the mood of a celebration like Christmas and Independence Day celebration, beaming the green and white national colours.

CCTV Surveillance Systems

A central surveillance systems service will be provided for the proposed Oshodi Transport Interchange project. The service shall be capable of providing surveillance system for the entire transport interchange area. The monitoring centers will be linked to the Lagos State Monitoring Centre.

3.7.3 Operation Phase

The operation phase of the proposed Oshodi transport interchange project shall be operated in accordance with operational procedures developed through extensive experience from similar transport interchange. Fully trained and qualified personnel will manage the park. The operation phase will involve mainly Bus operation, Maintenance activities Security monitoring activities

3.7.3.1 Hotel and Shopping Malls

About 1000 light will be installed around the interchange, to create effects, to reflect the mood of a celebration like Christmas and Independence Day celebration, beaming the green and white national colours of Nigeria.

3.7.3.2 Bus Operation

The proposed bus terminal will cater for intra and inter bus transport. The operation at the bus terminal shall be passenger centric with alighting and boarding facilities. About 5,000 buses are anticipated to depart the three terminals daily to an estimated 50intra and interstate destinations. In the first year of operation, an estimated 300,000 passengers are projected to use the terminal and the various facilities in a day that will increase to 500,000 and ultimately one million in 10 years. The operation of buses and cars at the terminal shall be well organized. At terminal 1, the transport mode will involve mini buses while at terminal 2; the transport mode will include Bus Rapid Transit (BRT), buses, mini-buses, taxi and private cars. At, terminal 3 park; the transport mode will include mini, BRT and long buses as well as taxi. The bus shall not exceed a maximum height of 6m for BRT and other long buses and 1.3m for mini-buses. Also, the taxi and private cars shall not exceed 1m in height.

An estimated 100 private cars are anticipated to park on a daily basis at the proposed terminal while the motorist shall use another transport mode to continue their journey and reach their destinations. The Intra city public transport daily passenger demand analysis per direction for each of the terminal complex as shown in **figure 3.3** has been carried out as part of the preliminary studies for this EIA study.

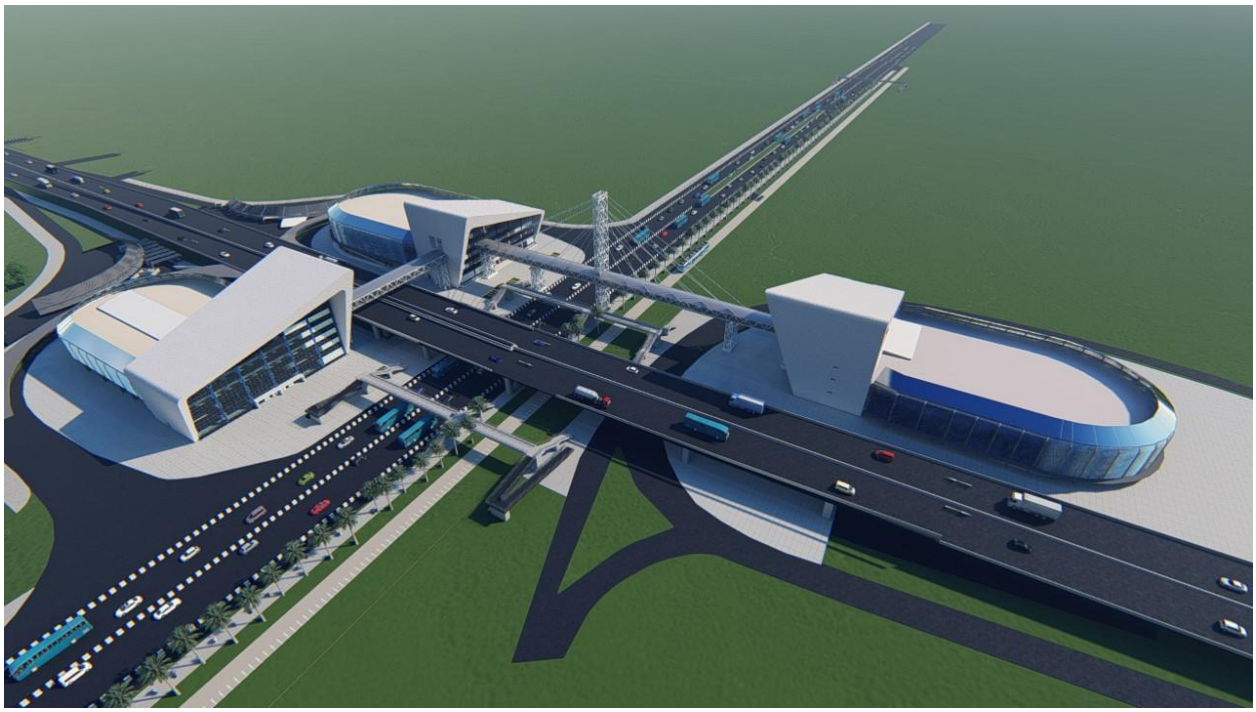


Figure 3.4: Intra city public transport daily passenger demand analysis per direction for each of the terminal complex

The passenger demand analysis based on the location of each terminal shows that passenger shall depart the three terminal en-route three different directions, which are Mushin direction, Mile 2 direction, Bolade direction and Anthony direction to about 33 destinations in Lagos and Ogun State. From **Figure 3.3**, a total 129,571 intra-city passengers are projected to depart the terminals daily with public transport systems. The summary of the demand analysis per direction is shown in **Table 3.13.**

Table 3.13: Summary of Passenger Demand Analysis per direction of the proposed Project

Demand Analysis	Mushin Direction	Mile2 Direction	Bolade Direction	Anthony Direction
Total OTIP Daily Pax. Demand	129, 571	129, 571	129, 571	129, 571
OTIP Avg, Daily Pax.Demand per Direction	29,567	20,937	36,250	42,817
Percentage Share	23%	16%	28%	33%

3.7.3.3 Fire Fighting

The proposed bus terminal complex shall be constructed, equipped, maintained and operated in fulfillment of the need to avoid undue danger to the life and safety of occupants from fire, smoke, fumes or panic during the time period necessary for

escape. An integrated systems approach that allows analyzing all the terminal components as a comprehensive fire safety system package (WBOG Secure/Safe Committee 2014) shall be adopted for the proposed project. The analysis shall include code compliance, or meeting the minimum legal responsibilities for protecting terminal facility from the disaster. Therefore code requirement shall be adequately integrated with other safety measures and design to achieve a balanced design that provides desired level of safety 9evacuation, recovery and egress). In ensuring firefighting and safety for the proposed terminal complex the National Building Code of Nigeria and other relevant international code shall be followed. Adequate and effective measures shall be provided to detect, contain and control and/or extinguish a fire event at early stages. The firefighting systems to be installed include:

- Wet riser
- Hose reel
- Automatic sprinkler system
- Fire hydrant
- Surface water tank with draw or connection
- Terrace water tanks
- Fire pump
- Terrace pump
- First Aid firefighting
- Auto detection system
- Manually operated electrical fire alarm system
- Public assistance system with talk back facility
- Emergency lights
- Auto D.G set
- Illuminated exit sign
- Means of escape or fire exit

3.7.3.4 Emergency management plan

The emergency management plan for the proposed bus terminal project is discussed in details in chapter seven of this EIA report. However, Emergency Response Protocol shall be developed in consultation with local police, hospital/ambulance, fire services department and other relevant authorities and support personnel with special emphasis to be laid on the evacuation of large number of people from the building

3.7.3.5 Maintenance Activities

The maintenance of the proposed bus terminal, though costly and time consuming is a critical indicator of the terminal attractiveness. Proper maintenance of the bus facilities goes a long way in preserving terminal system's positive image. Maintenance shall be

carried out by creating a database of maintenance schedule (to track elements like conditions of pavement surfaces, age of the facilities, history of damages and condition of shelter, benches and other transit amenities.

Maintenance and inspection of activities of the various facilities at the proposed park will be periodic with adequate attention given to the condition of structures and performance of life. Maintenance activities shall include repair of damaged facilities, sweeping of the terminal complex. The generator is fitted with catalytic converter/Evaporation Loss Control device (ELCD) at the exhaust in order to control the air pollution. Maintenance of the generators shall be according to usage. The operating hours and working life is 25,000 hours and 18-20years respectively. In order to extend the life there shall be a design method of maintenance routine 240hours of working hours to reduce its emission and lengthen its working life

There will not be any facility for maintenance/repair works including fueling or washing, but will cater for very minor or compulsory such repair of deflated tire wheel.

3.7.3.6 Operation of Utilities

3.7.3.6.1 Central Sewage Facilities

Sewage includes all sanitary waste and grey water. It is generally assumed that one person produces 0.1m^3 /day of sewage effluent (including flushing). An estimated 30,000m^3/day of effluent, which is mostly from the toilet, bathroom and restaurant water with traces of solid matter and soaps shall be produced from the use of the terminal and facilities. This shall be stored in septic tanks from where they will be evacuated by LASWAMO approved contractor for disposal in one of the Lagos State approved sites.

3.7.4 Decommissioning and Closure Phase

Decommissioning is the last phase of the proposed project implementation. The proposed transport interchange project shall have life expectancy of about 50 years. Decommissioning will be effected when the active life of all the facilities and structures have expired. The decommissioning activities will involve the removal of all the installed facilities and restoring the land to its original status. Facilities to be removed include:

- Terminal Building,
- Infrastructure such as perimeter fence, water storage, storm water drainage system, pedestrian bridge/skywalk, Asphalt, road median, signage, security system, waiting stand/seat, street light, median, sky-walkways
- Utilities such as water and fuel storage tanks, concrete structures, generator, Sewage Treatment Plant, storm drainage, Firefighting system

The guideline outlined under the Federal Ministry of Environment and NESREA

guidelines for infrastructure will be applied for the decommissioning of the project. This include:

- Assessing the soil
- Protecting the environment during decommissioning activities
- Ensuring that the site is restored to pre-disturbance land capability and is compatible with adjacent land use

3.8 WASTE GENERATION AND MANAGEMENT

Wastes refer to any material (solid, liquid, gaseous or mixture) that is surplus to requirement. Typically, a lot of waste will be generated during the site preparation, construction, operation and decommissioning phase of the project. This will include solid, liquid and gaseous emission**.** Waste management for the proposed Oshodi transport interchange project shall be carried out in consultation and in line with the waste management guidelines of Planet Project Limited. The proponent shall take all practical and cost effective measures to minimize the generation of wastes, by employing the R's (Reduce, Reuse, Recycle, and Recovery) through process of optimization or redesign, efficient procedures and good housekeeping.

Waste handling and disposal procedures shall be well defined at source and a waste inventory register kept. The waste to be generated in the course of implementing this project shall be defined and appropriately documented by waste contractor who shall be engaged by the Planet Project. The minimum general information required for the adequate definition of wastes includes; waste stream identification, proper waste categorization, waste segregation and appropriate handling and disposal practice, recommended management practices.

The waste streams that shall be generated from different phases of the proposed Oshodi transport interchange project have been quantified and contained in **Table 3.14.** The different types of wastes are described in section 3.8.1-3.8.2 below:

3.8.1 Site preparation/Pre-construction phase Activities

- **Solid waste**: This include excavated materials, paper, Suspended particulate Mater ($PM_{2.5}$ and PM_{10}), plastic containers, nylon. The SPM will be generated as a result of dust emanating from grading and compaction activities

- **Liquid waste**: The liquid wastes include human waste, spent oil, wastewater

- **Atmospheric Emission**: The atmospheric emission will include gaseous substances such as: carbon monoxide (CO), Carbon dioxide (CO_2), Oxides of

Nitrogen (NO_X), Sulphur dioxide (SO_2), particulate matter. These wastes are expected to generate as result of diesel combustion by equipment/machinery and movement of trucks during site preparation.

3.8.2 Construction/Installation phase activities

Large amounts of waste materials will be generated during the construction phase activities of the proposed project. These will include:

- **Solid wastes:** Steel and metal scrap, rejected materials, rubbles, surplus materials, excavated materials, paper bags, disused/wire cut, nylon wrapper, empty cartons, empty paint and solvent containers, broken glass, waste from foodstuffs, empty plastic containers, cartons, sanitary waste, particulate matter. Waste rubbles in particular shall be generated during the dismantling of the existing structures at the site. All reusable/recyclable materials like steel, wooden, glass, roof sheets etc. shall be retrieved

- **Liquid waste:** This includes cement sludge/concrete, spent oil during the use of machinery and wastewater from kitchen and washing activities. There will be provision for soak away pit and ETP where these shall be discharged for treatment before being collected for final disposal in line with Lagos Waste water Office guidelines for such wastewater disposal.
- **Atmospheric Emission:** This include carbon monoxide (CO), Carbon dioxide (CO_2), Oxides of Nitrogen (NO_X), Sulphur dioxide (SO_2), and particulate matter. These wastes are expected to generate as result of diesel combustion by equipment/machinery and movement of trucks during construction activities.

3.8.3 Operational phase

- **Solid Waste**: Solid waste will include used boarding ticket, packaging materials, plastic containers, waste food items materials electronic and electrical wastes (EEW) such as broken hard drives, cracked monitors, dysfunctional keyboard, mouse, Central Processing Unit (CPU), toner and ink cartridge, printer, photocopier, disused cables, lead-acid batteries, recyclable boxes from equipment packaging, dysfunctional personal computers, TV sets, cables, restaurant items, water plastic containers, bag, writing materials, fluorescent bulbs (this contains some toxic materials like mercury), electrical materials such as switches, plugs, sockets, fans, air conditioners gear box, gas containers

- **Liquid waste:** This includes wastewater from washing, bathrooms and kitchens, human waste, sewage. The soak away is a central disposal for sewage of 180m^3

in size. It will be constructed with a reinforcement bar of 16mm in grade 25 concrete mix and the under laying stratum of hardcore to sieve the slurry. As earlier explained in section 3.4, the proposed project also will generate surface runoff water that will gently be captured and conveyed to the main public channels at the main road by a 1x1x1.5m concrete channels around the proposed project site

- **Atmospheric emission;** This includes carbon dioxide, stilage, volatile organic carbon (VOCs), Carbon dioxide (CO), Nitrogen dioxide (NO_2), Particulate matter (PM), Sulphur dioxide (SO_4). This wastes are to be generated mainly from generator operation and buses that shall be coming and going out of the terminal park

Table 3.14: Summary of the proposed Oshodi Transport Interchange project Waste Estimates and Disposal Plan

Project Phase	Types of Waste	Form of waste	Source of waste	Estimated quantity/day	Disposal Location
Site preparation/Pre-construction phase	Degradable	Metal scrap, wood materials, kitchen waste	Camp, grading and excavation	340m^3/day	LAWMA Approved disposal site
Construction phase	Degradable	Kitchen waste	Camp office	32 m^3/day	
	Mixed	Metal scrap, wood, pipes, nylon/plastics, spilled cement, excavated spoil, asphalt waste,	Camp office, fabrication yard, pilling, decking and masory activities	115 m^3/day	Scrap buyer/Re-use location
	Emission	SO_2, CO, NO_2	Machinery, transport vehicles	10mt/day	Recovery
	Sewage	Camp office	Personnel	130 m^3 /day	LASWAMO Approved site
	Hazardous	Spent oil	Machinery, transport vehicles	0.75 m^3/month	Spent oil buyer/Re-use location
Operation phase	Degradable	Nylon/plastics	Terminal building, bus parking	300 m^3 /day	Scrap buyer/Re-use location
	Hazardous	Electrical/ electronic waste	Computers, TV, electrical materials, cables	240 m^3/year	Electronic waste buyer/Re-use location
	Sewage	Human waste, bathing water, kitchen waste	Terminal building, bus parking	300 m^3	LASWAMO Approved site
	Emission	SO_2, CO, NO_2	Buses, taxi and private car	330mt/day	Recovery

Decommissioning and abandonment	Mixed	Demolished concrete, meta scrap, pipes, cable, asphalt	Terminal building, bus parking,	230 m^3	LAWMA Approved site

3.9 LABOUR REQUIREMENTS AND HOURS OF OPERATION

- **Labour Requirement**

The labour (skilled and unskilled) requirements for the proposed transport interchange project consist of skilled/technical and unskilled workers. It is anticipated that a total of 150 workers will be employed for the proposed project. This number includes 60 skilled workers and 90 unskilled workers, which is made up of five (5) expatriate and 145 local worker. Ninety (90) workers are to be engaged during the site preparation and construction phase.

An estimated 60 people comprising mainly terminal staff shall be employed during the operation phase. The terminal staff shall be responsible for revenue collection, security patrol and information, ticketing booth, facility maintenance, cleaning and operation of the various facilities within the terminal building and park. There shall be other workers mainly from the various transport Unions including NURTW and RTEAN who shall use the bus terminal park for transport activities.

- **Hours of Operation**

The construction workers are to work for five (5) days a week from Monday to Friday and given the need to undertake most of the work in a planned system outages, the construction work will include work outside normal construction hour and will include night time and weekend period as required. All construction activities that are likely to generate noise shall not be undertaken during night-time. The operation within the three terminal shall be a 24 hours a day.

3.10 PROJECT TIME SCHEDULE

Planet Projects Limited (PPL) has developed a 1-year phased work programme that seeks to deliver the Oshodi Transport Interchange project as quickly as possible while reducing disruptions to transport activities in Oshodi environs to the barest minimum.

PPL would therefore construct and deliver the Terminals 1, 2, & 3 at the recently demolished Mosafejo and Owonifari Markets within 1 year with completion period of July 2017(**See Table 3.15**).

CHAPTER FOUR

DESCRIPTION OF PROJECT ENVIRONMENT

4.1 Introduction

This section of the report presents information on the existing baseline condition of the project environment. Relevant information and data on the physical, biological, hydrological and social environment within and around the project area of influence were obtained from a number of sources, including literature review, field survey and investigations, laboratory analyses and remotely sensed imageries.

Detailed information is provided on the various biophysical and socio-economic components of the project environment that are likely to be affected by the planned development project activities indicated in chapter three of this report. The environmental components considered include though are not limited to: climate & meteorology, air quality, vegetation and soil resources, water quality & wildlife resources, noise and socio-economics.

4.2 Study Approach

The field information and data reported in this EIA report were collected using the following approach:

4.2.1 Pre–Field Investigation Visit

Reconnaissance field visit was made to the proposed project location prior to field investigations. During the visit, visual observations were made to identify and record important environmental features and in some instances, photographs of some important features within and around the proposed project locations were taken. The information gathered during the visit was synthesized to design the field observation and sampling strategy.

4.2.2 Field and Laboratory Study Design and Strategy

Generally, the area of influence of the proposed project is fully built up and is part of the commercial nerve centres in Lagos state. Therefore, information on the biophysical baseline condition was mostly basically premised on review of relevant literature. This is because environmental media (other than for ambient air quality and noise level, traffic count) sampling in the project area and its area of influence is practically impossible in view of the near total physical development of the landscape.

4.2.3 Data Collection and Observation

Field sampling exercise was carried out in August 2016 to document the baseline information for the study area. The sample collection methodologies were in line with the FMEnv standards, and conformed to established field sampling guidelines. The main objective of the field data acquisition was to establish the current status of the

study area through collection of ambient air quality and noise measurement including the traffic count. A map of the sampling locations for the project area is shown in **Figure 4.1**.

4.2.4 *Methodology for Fieldwork and Laboratory Analysis*

4.2.4.1 Air Quality and Noise Levels

During the study, on-line monitors were deployed to monitor all the parameters including meteorological, air pollutants and ambient noise levels with sampling locations chosen in compliance with the approved Terms of Reference. The locations include the four flanks of the project site, its central area, upwind and downwind. A control location was also selected to understand the peculiar characteristics of the airshed, if any. While the EXTECH 45170 Weather Tracker was used for meteorological parameters, Met one AEROCET 531S Particle Mass/ Particle counter was used for the particulates.

Fig 4.1: Air Quality Sampling Locations Within and Around the Proposed Project Site

The Aeroqual Series 200 and Wolf PackTM Modular Area Monitors were used for gaseous pollutants while the EXTECH Instruments, US Model 407750 sound meter was deployed for ambient noise levels. Status of air quality was assessed using the measured concentrations and National Ambient Air Quality Standards (NAAQS) while the airshed was classified using the World Bank method. Detailed sampling methodology is reported in **Annex 3**. **Plate 4.1** is a typical air quality and noise monitoring set up during the field study.

Plate 4.1: Typical Air Quality/Noise Monitoring Setup during the Study

Table 4.1 gives the summary and coordinates of the air quality and noise monitoring sampling locations for the study.

Table 4.1: Air Quality Sampling Locations during the Study

Sampling Codes	Coordinates		Designation
	Latitude (°N)	Longitude (°E)	
AQ1	003° 21.079’	06° 33.292’	Proposed Terminal 1 Site
AQ2	003° 21.061’	06° 33.349’	Proposed Terminal 2 Site
AQ3	003° 21.168’	06° 33.392’	Proposed Terminal 3 Site
AQ4	003° 21.207’	06° 33.393’	Oshodi Bridge – Approach
AQ5	003° 21.123’	06° 33.355’	Oshodi Bridge – Up
AQ6	003° 21.053’	06° 33.329’	Oshodi Bridge – Descend
AQ7	003° 20.413’	06° 33.068’	Charity Bus Stop by Oshodi Waste Transfer Loading Station
AQ8	003° 20.706’	06° 34.308’	Ladipo Busstop by Ikeja GRA off shogunle control
AQ9	003° 21.066’	06° 33.439’	Interchange link junction by Agege Motor Road off welcome to Oshodi Isolo (turning)
AQ10	003° 21.154’	06° 33.195’	Interchange link by Mushin Road
AQ11	003° 21.288’	06° 32.878’	LASEMA Response Unit Area by Mushin Road control
Control 1	003° 22.131’	06° 33.470’	Control

Emission Sources

Emissions from activities of the proposed Transport Interchange development and its operation with significant sources of criteria air pollutants were considered. Though it’s identified phases with potential sources of emissions include the construction and operation, the operation phase is the focus of this study. In this phase, the identified major sources of air emissions are vehicles (line sources) while the identified emissions are those resulting from combustion activities. The air pollutants modeled for ground level concentrations therefore include: carbon monoxide (CO), sulphur dioxide (SO_2), oxides of nitrogen (NO_X), suspended particulate matter (SPM) and volatile organic compounds (VOCs). The total number of vehicles involved in this

operation phase of the project was obtained from the initial traffic study carried out in the project area. Emission rates and exhaust vent stack parameters (height, diameter, exhaust temperature, and exit velocity) used as model input parameters were obtained from project proponent.

This is anticipated to be the major phase of the proposed project. During the phase, the vehicle types identified as major sources of air pollutants include: cars/sport utility vehicles (suvs), trucks, motorcycles and tricycles (**Table 4.2**). Emissions from these sources were estimated using Emission Factors assuming hourly operation. Other assumptions include: cars/suvs, motorcycles and tricycles run on gasoline while trucks run on automotive gas oil (diesel). Emission calculations also assumed that vehicles drive into and out of the Terminal (**Table 4.3**).

The proposed Transport Terminal facility site is an urban area and this was so indicated during the modeling. The identified line emission sources with all the parameters listed in **Table 4.2** - were considered as input parameters into the modeling while **Table 4.1** was used to investigate their impacts on ambient air quality.

Table 4.2: Emission Sources in the Proposed Transport Terminal Project

Traffic Direction	Average Automobile/Hour						Total
	Period of the Day	Automobile Category					
		Cars /SUVs	Buses	Trucks	Motorcycle	Tricycle	
Gbagada-Oworonshoki Traffic Bound (1360 m)	Morning	2604	1174	158	84	2	4022
	Afternoon/ Evening	2558	1112	207	78	0	3955
Mushin Traffic Bound (780 m)	Morning	1666	1768	96	179	0	3907
	Afternoon/ Evening	4236	1716	118	196	0	6266
Agege-Ikeja -Iyana Ipaja Traffic Bound (600 m)	Morning	1360	1390	109	96	0	2955
	Afternoon/ Evening	1794	1975	130	116	0	4015
Isolo-Mile2 -Apapa Traffic Bound (850 m)	Morning	4323	769	234	77	2	5405
	Afternoon/ Evening	4827	698	219	76	0	5820

Table 4.3: Calculated Vehicular Emission Rates by Vehicle Types in the Proposed Transport Terminal Project

Morning Emission Rates (g/s)					Afternoon/Evening Emission Rates (g/s)			
Gasoline passenger cars								
Parameters	Gbagada Axis	Mushin Axis	Agege-Ikeja Axis	Isolo-Mile2 Axis	Gbagada Axis	Mushin Axis	Agege-Ikeja Axis	Isolo-Mile2 Axis
NO_X	0.1837	0.0674	0.0423	0.1906	0.1803	0.1714	0.0558	0.2127
VOCs	0.4428	0.1626	0.1021	0.4595	0.4348	0.4132	0.1345	0.5127

CO	3.8134	1.4000	0.8789	3.9565	3.7438	3.5581	1.1579	4.4149
SO_2	0.0098	0.0036	0.0023	0.0102	0.0097	0.0092	0.0030	0.0114
PM	0.0082	0.0030	0.0019	0.0085	0.0081	0.0077	0.0025	0.0095
Gasoline Light Duty Vehicles(g/km)								
NO_X	0.1088	0.0938	0.0568	0.0445	0.1028	0.0910	0.0806	0.0405
VOCs	0.2282	0.1968	0.1192	0.0934	0.2157	0.1911	0.1692	0.0850
CO	1.3613	1.1740	0.7110	0.5568	1.2862	1.1395	1.0091	0.5067
SO_2	0.0044	0.0038	0.0023	0.0018	0.0042	0.0037	0.0033	0.0017
PM	0.0037	0.0032	0.0019	0.0015	0.0035	0.0031	0.0027	0.0014
Diesel Trucks Vehicles								
NO_X	0.0523	0.0178	0.0156	0.0477	0.8373	0.7958	0.2590	0.9874
VOCs	0.0101	0.0034	0.0030	0.0092	0.1618	0.1538	0.0500	0.1908
CO	0.0452	0.0154	0.0135	0.0412	0.7230	0.6871	0.2236	0.8526
SO_2	0.0006	0.0002	0.0002	0.0006	0.0097	0.0092	0.0030	0.0114
PM	0.0005	0.0002	0.0002	0.0005	0.0081	0.0077	0.0025	0.0095
Motorcycles/Tricycles								
NO_X	0.0008	0.0010	0.0004	0.0005	0.0242	0.0230	0.0075	0.0285
VOCs	0.0112	0.0131	0.0054	0.0063	0.3301	0.3137	0.1021	0.3893
CO	0.0544	0.0640	0.0264	0.0306	1.6102	1.5304	0.4980	1.8989
Assumptions: *Emission factor from EEA (2009)*								

Emission Modeling Protocol

The ISC-AERMOD View used in this study is a user-friendly interface for four U.S. EPA air dispersion models: ISCST3, ISC-PRIME, AERMOD and MET developed specifically for Microsoft Windows. It uses pathways that compose the run stream file as the basis for its functional organization. Its version 8.2.0 with licensed serial number AER00005543. The model has a wide range of options for modeling air quality impacts of pollution sources where source emission rates can be treated as constant throughout the modeling period, or varied by month, season, hour-of-day, or other optional periods of variation. It is capable of handling multiple sources, including point, volume, area and open pit source types. Line sources may also be modeled as a string of volume sources or as elongated area sources. Vehicular emissions being the major air pollutants identified in this study, they were treated as line emission that they are.

Emission Sources Input Scenarios

Only two different vehicular emission scenarios were used to investigate anticipated impacts of the proposed transport facility on ambient air quality.

- ***Scenario 1*** investigates morning time traffic air emissions impact; and
- ***Scenario 2*** considers emissions from the traffic flow from and to the transport facility in the afternoon/evening.

The two scenarios assumed continuous movement of vehicles around the facility in the investigated condition.

Receptors Locations

Considered in this modeling study as receptor to the air pollutants in the vehicular emissions anticipated around the proposed project were the environment within 1.5 km radius from the proposed site (***Figure 4.2*****).** This allows the study to cover the important receptors within the proposed Project area without compromising the quality of the data prediction provided by the model. This includes the Gbagada Axis, Mushin Axis, Agege-Ikeja Axis, and the Isolo-Mile 2 Axis of the road networks around the area

Meteorological Data

An essential requirement of the ISC-AERMOD air dispersion modeling for accurate results is the meteorological information. The surface and upper air observations were compiled using meteorological data from the Lakes Environmental meteorological observations (Met Data Order # MET 134283) and the project acquired surface meteorological data on site. These have winds with prevalence for a south-westerly direction *(**Figure 4.2*****).**

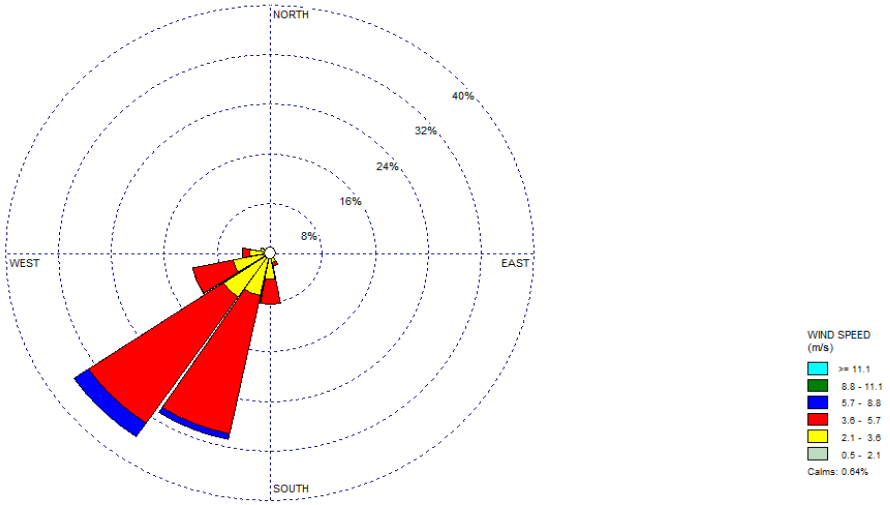


Fig.4.2: Windrose of the Area Generated from the Wind Data used in the Study

Land Surface Characteristics Data

The ISC-AERMOD View uses several parameters to represent certain features that affect complex dispersion processes to accomplish its calculations. Information is also sought about the nearby terrain and surface features that induce turbulence in addition to hourly surface and upper air meteorological data. These include roughness length, which represents the height of trees or other obstructions to wind flow. In this study, the necessary parameters were selected based on the nature of the area and its closeness to the Atlantic Ocean.

Noise Emission Sources

Automobiles including cars, buses, trucks, tricycles and motorcycles could be sources of significant level of noise on the roads and in their area of operation. In traffic, noise can be from engine exhaust system and transmission, and this is the

dominant source when traffic is not freely flowing, particularly from heavy vehicles. Noise levels will vary primarily according to engine speed rather than vehicle speed. It can also be from interaction of tyres with the road surface and this is the dominant noise source under free flow traffic conditions. Various noise sources in an automobile include engine, exhaust system, intake system, fan and cooling system, transmissions and tyres. The automobile noise is one of the major sources of noise exposure in residential areas and causes substantial annoyance during night (Harkude and Malagi, 2015). At lower speeds (below 40-50 km/h), engine noise including exhaust and intake noise dominates for cars but for higher speeds above 70 km/h, tyre-road noise dominates while for heavier vehicles the engine noise is dominant.

The Sound Power Level (SPL) of each of the predominant vehicle types along roads leading to and from the proposed project facility was established from the literature (**Table 4.4**). These are fed into the noise-modelling tool with the characteristics observed during the fieldwork (**Table 4.5**).

Table 4.4: Noise Level Characteristics of On-Road Vehicles

Emission Source	Sound Power Level, dB (A)
Cars/Sport Utility Vehicles (SUVs)	102
Buses	108
Trucks	114
Motorcycle	94
Tricycle	90

Schreurs *et al*. (2011)

Table 4.5: Noise Emission Sources in the Proposed Transport Terminal Project

Traffic Direction	Average Automobile/Hour						Total
	Period of the Day	Automobile Category					
		Cars /SUVs	Buses	Trucks	Motorcycle	Tricycle	
Gbagada-Oworonshoki Traffic Bound (1360 m)	Morning	2604	1174	158	84	2	4022
	Afternoon/ Evening	2558	1112	207	78	0	3955
Mushin Traffic Bound (780 m)	Morning	1666	1768	96	179	0	3907
	Afternoon/ Evening	4236	1716	118	196	0	6266
Agege-Ikeja -Iyana Ipaja Traffic Bound (600 m)	Morning	1360	1390	109	96	0	2955
	Afternoon/ Evening	1794	1975	130	116	0	4015
Isolo-Mile2 -Apapa Traffic Bound (850 m)	Morning	4323	769	234	77	2	5405
	Afternoon/ Evening	4827	698	219	76	0	5820

Noise Emission Modelling Protocol

Ambient noise levels calculations from vehicles into and out of the proposed transport terminal facility at some receptors locations were carried out with the

NoiseMap 2000 software. NoiseMap 2000, noise modeling tool from the WS Atkins' noise calculation software, is used by many major companies and governmental authorities (NoiseMap, 2006). It is available as separate modules: RoadNoise 2000; RailNoise 2000; and SiteNoise 2000 with a number of other applications, such as noise insulation assessments, planning applications, noise barrier design, environmental impact assessments, designing housing layouts and creating environmental liability databases. Its RoadNoise facility was considered for the study. The modeling tool uses UK standard calculation procedure and BS 5228.

NoiseMap 2000 imports Ordnance Survey and other digital maps to generate accurate noise maps for a combination of noise sources, including predicted noise levels for road traffic, railways and industrial sites. A NoiseMap 2000 model can be built by importing the information from a digital map, tracing the model on-screen over a scanned map, or digitizing. The typical outputs from the model are: plant data, working and ground type, activity data, barrier data, contour data, and receptors location to noise sources, among others. The calculated noise can be represented in contour and the model can represent their interaction from different sources.

Noise Emission Sources Input Scenarios
Two operations noise emission scenarios from the identified sources were considered. These were informed by the morning and afternoon/evening traffic data collected in the proposed project site during the fieldwork. They were used to predict the ambient noise levels within the site and its surroundings.

Receptors Locations
Both the immediate and distant environments of the proposed project site were considered as receptors to noise in this study. Specifically, about 1.5 km radius from the proposed site (*Figure 1.3*) was considered. This allows the study to cover the important receptors within the proposed Project area without compromising the quality of the data prediction provided by the model. The investigated areas include the Gbagada Axis, Mushin Axis, Agege-Ikeja Axis, and the Isolo-Mile 2 Axis of the road networks around the area

4.2.4.2 Wildlife and Endangered Species

The proposed project area is located within and around built-up part of Lagos State, hence the information on the animal and wildlife resources were sourced from past projects and literatures within the study area. Additional information was obtained through interviews and other interactive sessions with residents in the area.

4.2.4.3 Landuse and Environmental Sensitivity

A high-resolution satellite imagery captured in January 2015 was acquired for the static landuse study around the project area. A high-resolution satellite imagery acquired in year 2015 was pre-processed for determining the existing landuse/ land cover pattern around the proposed project at Oshodi communities. The standard

image processing techniques of extraction, layer stacking, and geometric correction/ geo-referencing were performed on the three Landsat TM images**.** Furthermore, data management tools extension was used to clip out 2km radius around the study facility from the processed image. Manual head-on image digitization method and other ancillary data were used to thematically identify the landuse, the map was cartographically produced using GIS- ArcMap10.1.

4.2.4.4 Social Impact Assessment Studies

The study was conducted in selected areas of Oshodi including the market/motor garage sections of the area. Research information was collected using a combination of quantitative and qualitative methods/instruments, viz:

- Individual/Household Interviews,
- Business Operators Interviews;
- In-Depth/Key Informant Interviews,
- Focus Group Discussions, and
- Observation.

Targeted and Achieved Samples Interviews

The survey was designed to interview 25 household respondents, 200 Business Owners/Operators and 25 In-Depth Interview respondents, as well as four Focus Group Discussion (FGD) sessions in Oshodi. In most cases, the targets were met and exceeded as indicated in **Table 4.6**. The study covered 51 household respondents, 234 business operators/owners, 25 key informants, as well as two Focus Group Discussion panels.

Table 4.6: Targeted and Achieved Samples

Categories	Targeted	Achieved
Individual/Household Interviews	25	51
Business Operators/Owners Interviews	200	234
Key Informant/In-Depth Interviews	25	25
Focus Group Discussions (FGDs)	4	2

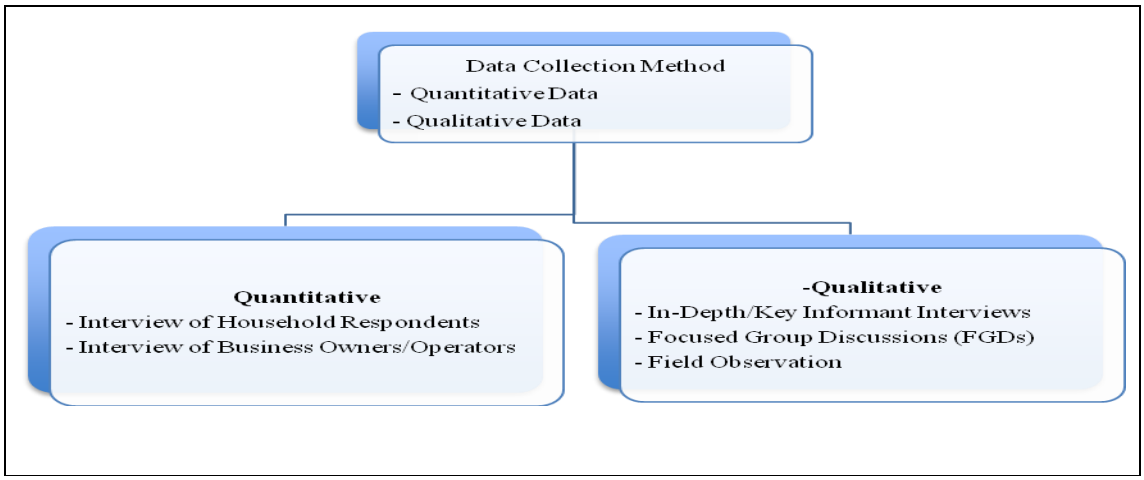


Fig. 4.3: Procedure for Socio-economic Data Collection.

Research Instruments

Four instruments (see Appendix I for details) were developed for the survey, viz:

- Individual/Household Interview Schedule,
- Business Operators Interview Schedule,
- In-Depth/Key Informant Interview Schedule, and
- Focus Group Discussion Guide

The Individual/Household Interview Schedule was an 88-item instrument, which was administered on selected husbands/wives or senior household members resident in Oshodi and its environs.

The Business Operators Interview Schedule was a 70-item instrument, which was administered on shop/business owners/operators or responsible staff in the Oshodi central area.

The In-Depth Interview Schedule was a 34-item instrument which was administered on community leaders, defined as people who occupy leadership positions in the communities, including community/CDA leaders, chiefs, religious leaders, women leaders, market leaders, trade/association leaders and youth leaders.

The Focus Group Discussion Guide was an 11-item instrument used for the discussion groups. In addition to the interviews, two Focus Group Discussions (FGDs) were organized in each study community, as follow:

Table 4.7: Distribution of the FGDs

Communities	**No.**
Male Adult	1
Female Adult	1
TOTAL	**2**

Fieldwork Activities

Field Personnel

The field team was made up of twelve persons, comprising ten (10) male and female Researcher Associates, all working under two-fieldwork supervisors. All the members of the research team were graduates of tertiary institutions.

Training of Field Team

A participatory one-day training programme was organized for the research team, using the survey instruments and study design. The purpose of the training was to ensure a common understanding of the objectives of the study and the content of the survey instruments, as well as to enhance the capacity of the Research Associates to conduct the fieldwork, with a view to ensuring uniform administration of the

research instruments. In-house Role Plays were also organized as part of the training for the research team.

Fieldwork
The fieldwork was conducted from 7th to 12th March 2018. The household respondents were selected from the streets adjoining Oshodi bus terminus and market. All the streets in the area were covered for the study. In order to ensure a good distribution, specific households/individuals and business operators for interview were selected using the quota sampling technique, taking cognisance of gender, age and class differentials.

The entire data collection and processing were subjected to rigorous quality control processes to ensure the credibility and reliability of information collected and analyzed. The research instruments were carefully drafted and subjected to internal pre-test and validation checks. The research team further reviewed the instruments during the training programme for the researchers and necessary corrections were made, before the fieldwork.

The fieldwork process was conducted under close supervision. In addition to the competence of the trained Research Associates, the Supervisors were responsible for quality assurance at the field level, checking the completed instruments for completion and correctness. It was after clearance by the supervisor that the instruments were sent for keying into the computer using the SPSS programme, which is a dedicated computer programme for statistical analysis. The keyed data were subjected to further checks, including on-screen checks and random checks of individual questionnaires.

Informed Consent
In line with ethical standards, participation in the survey was completely voluntary and the consent of each participant was obtained before the interview and discussion.

Streets Covered

Individual Interviews
The household survey was conducted in various streets in Oshodi and its environs:, including: Alimi Oke Street, Araromi Street, Boladale Street, Brown Street, Church Street, Dideolu Street, Igbehinadun Street, Mafoluku, Michael Street, Mosaku Street, Ogunlana Street, Oredein Street, and Owoseni Street.

Streets/Markets Covered (Business Operators' Interview)
The markets, areas and streets covered for the business operators survey include: Oshodi Road, Abibat Mogaji Modern Market, Adeoye Street, Agedegudu Lane, Agege Motor Road, Ajala Street, Alade Street, Anjorin Street, Araromi Street,

Asejere Park, Brown Street, Canal Ankara Market, Dipeolu Street, Express Road, First Bank Arena, Igbehinadun Street, Ireti Oluwa Road, Kairo Market, Macarthy Street, Suwebatu Street, Oshodi Main Market, Oshodi Oke, and Oshodi Road.

Streets/Markets Covered (In-Depth Interview)
Alade Street, Araromi Central Mosque, Ayoade Shopping Plaza, Banjoko Street, Brown Street, Church Street, Igheyinadun Street, Ikawolaso Street, Ireti Oluwa Street, Oshodi Market, Oshodi Oke, Oshodi Phase 2 Taxi Park, Oshodi Resettlement Market, Oshodi Road, Saudi Unit, Oshodi, Temidire Street, and Tinubu Ojo Street.

Language of Interview

In order to enhance a good understanding of the survey issues and effective communication between the researchers and the respondents, interviews and interactions were conducted in languages that the respondents were most comfortable with. Analysis of the languages of interview showed that most of the individual household respondent interviews, business operators' interviews and in-depth interviews were conducted in Yoruba language (68.6%, 46.2% and 56% respectively). English language was the next most common language of interview, followed by pidgin-English (see **Fig. 4.4**).

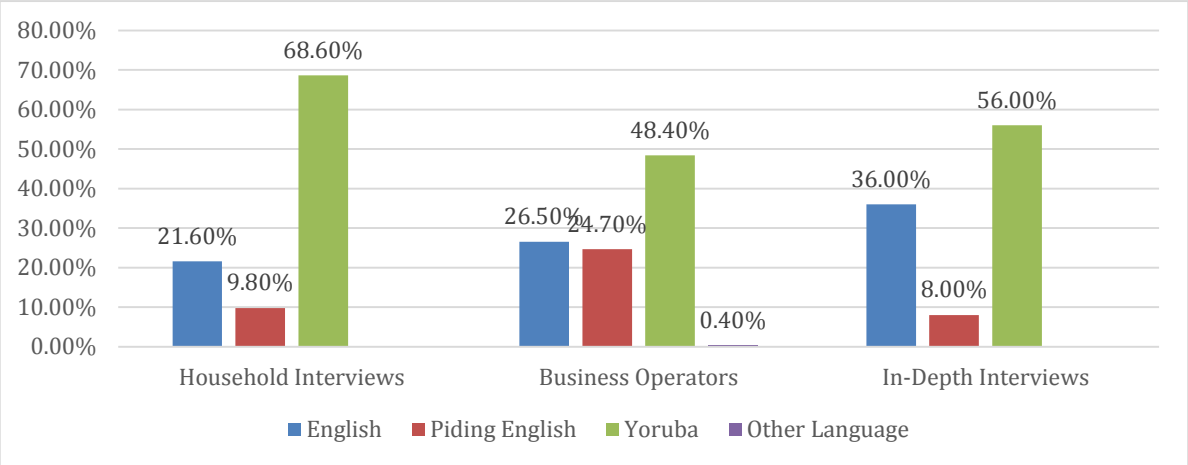


Fig. 4.4: Language of Interviews

Table 4.8: Language of Interview (Business Operators)

Language of Interview	Household Respondents	Business Operators	In-Depth Interviewees
English	21.6	25.2%	36.0
Pidgin English	9.8	23.5%	8.0
Yoruba	68.6	46.2%	56.0
Igbo	--	0.4%	--
Total	100.0%	100.0%	100.0%

	
Household interview session	Household interview session
	
Business operator interview session	Business operator interview session
	
Business operator interview session	Business operator interview session

	
Business operator interview session	Business operator interview session
	
Business operator interview session	Business operator interview session
	
Male Focus Group Discussion Session	Female Focus Group Discussion Session

Plate 4.2: Photo Log of Fieldwork

4.2.5 Quality Assurance and Quality Control (QA/QC)

In order to ensure quality control, sample treatment and handling were carried out in accordance with scientifically proven and acceptable standard methods. The Quality Control and Quality Assurance Procedures adopted during the field study covered all aspects of the work, including sample collection, handling, sample chain of custody, chemical analysis of the air samples, data coding, and manipulation of statistical analysis and preparation of results.

4.3 Baseline Biophysical Environmental Condition of the Project Location

4.3.1 Atmospheric Conditions of the Investigated Airshed

Using the data gathered during this fieldwork and the other relevant information from the literature and past studies on the study area, its atmospheric conditions are described as herein presented.

4.3.1.1 Climate and Meteorology

The meteorology of the proposed project area is discussed using long-term data measurements obtained from NIMET (2019) Oshodi, the proposed project area is in Lagos air basin. Generally, Nigeria's climate is characterized by the hot and wet conditions associated with the movement of the Inter-Tropical Convergence Zone (ITCZ) north and south of the equator. This ITCZ appears as a band of clouds, usually thunderstorms that circle the globe near the equator and Nigeria is located just north of the equator. When the ITCZ is to the south of the equator, the north-east winds prevail producing the dry-season condition and whenever it moves into the Northern Hemisphere, the south westerly wind prevails accompanied by rainfall and the rainy (wet) season thus giving the proposed project area both the dry and wet seasons.

Rainfall

In the proposed project area, the two (2) dominant seasons are the longer Wet Season (between March and November) and a shorter Dry Season of December to February with a total rainfall of about 2400 mm. The lowest rainfall is in January and the maximum around July and September (**Figure 4.5**). Its rainfall regime is characterized by double maxima that occur in July and September. A "short break" usually experienced in August is associated with the brief southward retreat of the ITCZ during the period. The relatively high rainfall relates to the contiguity of the area with the Atlantic Ocean. The water body also complements the ITD-initiated rainfalls.

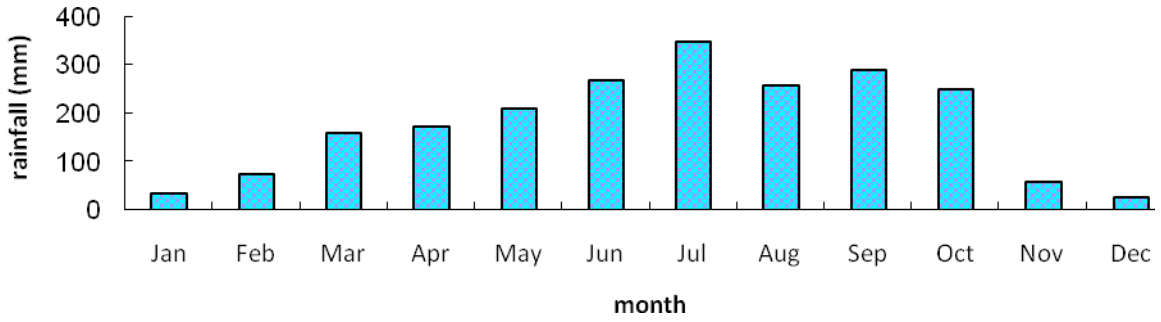


Fig. 4.5: Average Monthly Rainfall Distributions in the Area (NIMET, 2018)

Relative Humidity

The proposed project area Relative Humidity ranges between 60 and 83% at 16:00 hours and 81.5 – 87% at 10:00 hours with respective mean of 72.9% and 84.4% (**Figure 4.6**). June through September have the highest relative humidity with the lowest in December and February. The high relatively humidity is attributed to its closeness to the Atlantic Ocean and the direct impact it receives from the ocean. During this study, Relative Humidity levels were 66% - 78% (**Table 4.9**), which agree with the climatic data of the area.

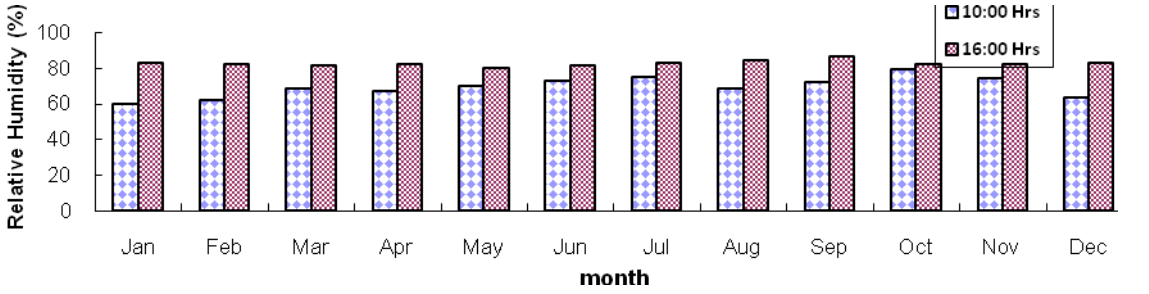


Fig. 4.6: Monthly Relative Humidity Distributions in the Study Area (NIMET, 2018)

Table 4.9: Field Measured Meteorological Parameters in the Area during the Study

Level	Temperature (°C)	Relative Humidity (%)	NE Wind (m/s)	SW Wind (m/s)
Minimum	27.5	66.0	1.3	1.6
Maximum	30.7	78.0	3.1	4.1
Mean	29.2	74.5	2.5	3.2

Air Temperature

The proposed project area experiences uniformly high temperatures throughout the year with mean temperature of 22.5 – 33.7 °C (**Figure 4.7**) being in the coastal zone of the tropics. Its highest mean monthly temperature occurs between February and April at the peak of the dry season with the lowest in July, the peak period of the wet season. The air temperatures are subjected to both diurnal and seasonal variations, though temperature variations are not very large. The lowest temperature during the wet season is attributed to the depletion of incoming solar radiation by greater cloud

cover. This study measured air temperature of 27 – 30 ºC with an average of 29 °C (**Table 4.9**) compared well with the climatic data of the area.

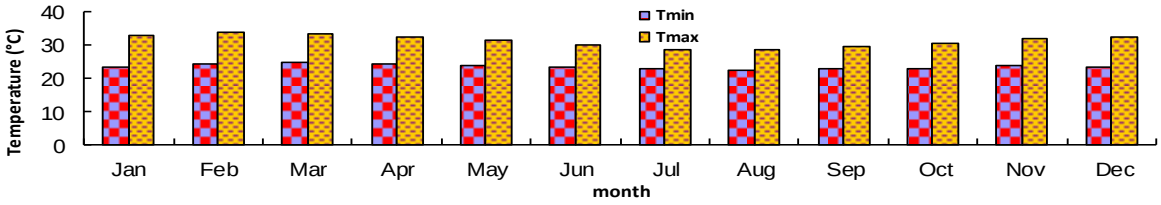


Figure 4.7: Mean Monthly Air Temperature in the Study Area (NIMET, 2018)

Sunshine Pattern

The annual sunshine period in the study area is about 1500 hrs. with monthly period of 51.2 – 165.7 hrs. and an average of 121.9 hrs.(**Figure 4.8**). It receives the minimum sunshine between July and September while its maximum is between December and January. The short sunshine period in July is associated with the greater amount of cloudiness and rainfall characteristic of the period. Conversely, the higher December sunshine period is due to the prevalent clear skies accompanying the ITCZ movement in its northward migration.

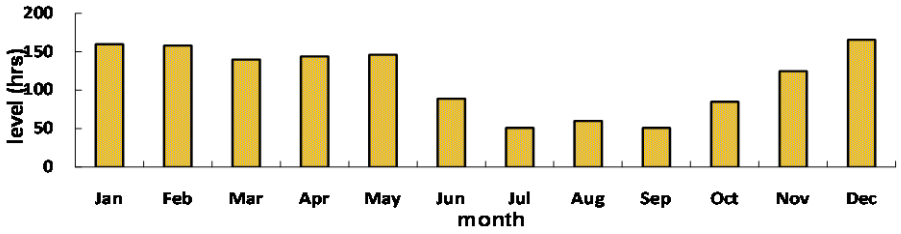


Fig. 4.8: Sunshine Pattern in the Study Area (NIMET, 2018)

Atmospheric Pressure

The mean atmospheric pressure in the climatic data is 1015 – 1020 mbar with the minimum and maximum in January and June respectively (**Figure 4.9**).

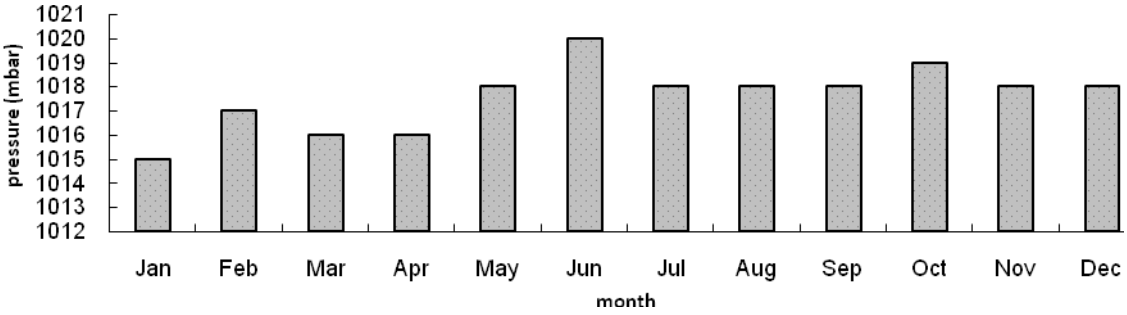


Fig. 4.9: Atmospheric Pressure Pattern in the Study Area (NIMET, 2018)

Cloud cover

Cloud cover in the area appears high throughout the year with very little variations. It is higher in May and October but low in June and July with average monthly levels of 6.7 – 6.9 Oktas, indicating a generally overcast sky with some bits of blue sky (**Figure 4.10**).

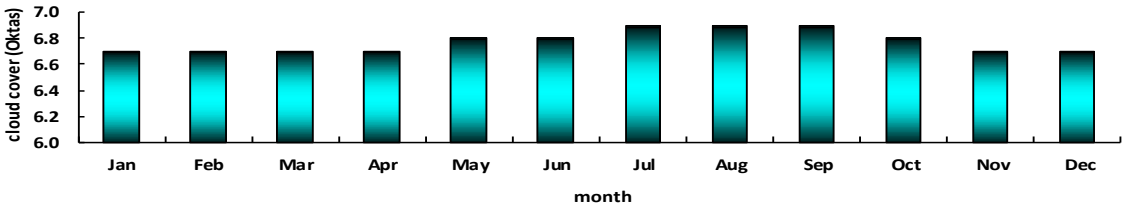


Fig. 4.10: Cloud Cover Distribution in the Study Area (NIMET, 2018)

Wind Speed and Direction

Surface wind speed in the area is characterized by small diurnal variation influenced by both land and sea breezes resulting from their alternate warming. It reaches maximum level during the night due to radiation cooling leading to instability in the surface layer. The two major wind regimes are the Northeast and the Southwest Trade Winds (**Figure 4.11**). Its wind speeds generally vary from 0.5 to 2.0 m/s in the night, and increases to between 2 and 6 m/s during the day. The onshore south-westerly winds which are predominant during May to September are characterized by higher wind speeds varying between 6 and 9.5 m/s, with gusts that could reach up to 18 m/s. The measured wind speeds of 1.3 – 3.1 m/s and 1.6 – 4.1 m/s in the Northeast and Southwest during the fieldwork agree with these (**Table 4.9**).

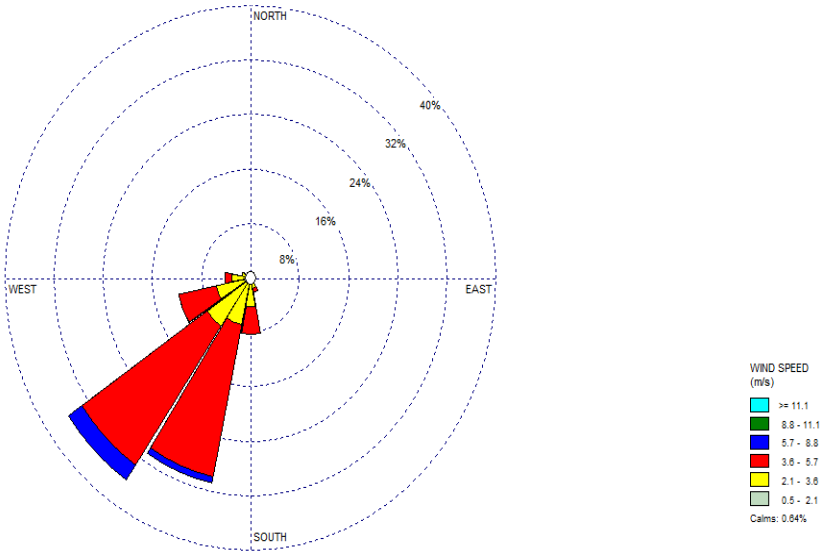


Fig. 4.11: Windrose of the Proposed Project Area (NIMET, 2018)

4.3.2 Baseline Air Quality Status of the Proposed Project Site and Area of Influence

4.3.2.1 Ambient Air Quality

During the fieldwork, ambient air quality of the project area investigated at selected locations included Ammonia (NH_3), Methane (CH_4), Nitric Oxide (NO), Nitrogen Dioxide (NO_2), Carbon Monoxide (CO), Volatile Organic Compounds (VOCs), Sulphur Dioxide (SO_2), Hydrogen Sulphide (H_2S), Ozone (O_3) and Suspended Particulate Matter (SPM). While the measured gaseous pollutants are summarized in **Table 4.10** their daily equivalents are presented in **Table 4.11**. Similarly **Table 4.12** and **Table 4.13** are the measured particulates concentrations and their daily equivalents respectively.

Table 4.10: Measured 1-Hour Concentrations of Gaseous Pollutants during the Fieldwork

Sampling Codes	Concentration (ppm)								
	CO	NO	NO_2	CH_4	VOCs	H_2S	SO_2	NH_3	O_3
AQ1	0.0	0.0	0.003	0.0	0.52	0.01	0.0	0.39	0.01
AQ2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.03	0.0
AQ3	0.0	0.0	0.002	0.0	0.0	0.03	0.0	0.0	0.01
AQ4	1.2	0.0	0.003	0.0	0.36	0.08	0.0	0.05	0.02
AQ5	0.0	0.0	0.001	0.0	0.16	0.06	0.0	0.03	0.02
AQ6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
AQ7	4.2	0.0	0.03	0.0	0.53	0.0	0.0	0.0	0.0
AQ8	7.2	0.0	0.03	0.0	0.63	0.0	0.0	0.0	0.0
AQ9	7.5	0.0	0.3	0.0	1.83	0.0	0.0	0.0	0.0
AQ10	4.2	0.0	0.04	0.0	0.4	0.0	0.0	0.0	0.0
AQ11	4.4	0.0	0.02	0.0	0.8	0.0	0.0	0.0	0.0
AQ12 (Control)	4.4	0.0	0.14	0.0	0.04	0.0	0.0	0.0	0.0
1-Hour Limit (FMEnv)	20	-	-	-	5.0	0.1	0.1	0.3	0.2

Table 4.11: Extrapolated Daily Concentrations of Gaseous Pollutants during the Fieldwork

Sampling Location Codes	Air Pollution Indices								
	CO	NO	NO_2	CH_4	VOCs	H_2S	SO_2	NH_3	O_3
	[Concentration (ppm)]								
AQ1	0.00	0.00	0.00	0.00	0.27	0.01	0.00	0.20	0.01
AQ2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00
AQ3	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.01
AQ4	0.62	0.00	0.00	0.00	0.18	0.04	0.00	0.03	0.01
AQ5	0.00	0.00	0.00	0.00	0.08	0.03	0.00	0.02	0.01
AQ6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
AQ7	2.15	0.00	0.02	0.00	0.27	0.00	0.00	0.00	0.00
AQ8	3.69	0.00	0.02	0.00	0.32	0.00	0.00	0.00	0.00
AQ9	3.85	0.00	0.15	0.00	0.94	0.00	0.00	0.00	0.00
AQ10	2.15	0.00	0.02	0.00	0.21	0.00	0.00	0.00	0.00
AQ11	2.26	0.00	0.01	0.00	0.41	0.00	0.00	0.00	0.00
AQ12 (Control)	2.26	0.00	0.07	0.00	0.02	0.00	0.00	0.00	0.00
24-Hour Limit (FMEnv)	10.0	0.04 – 0.06		-	1.6	0.01	0.01	0.28	0.1

Table 4.12: Measured Particulates in and around the Study Area

Sampling Locations		Concentrations (µg/m^3)		
Location Code	Designation	$PM_{2.5}$	PM_{10}	TSP
AQ1	Proposed Terminal 1 Site	2.4	4.7	11.2
AQ2	Proposed Terminal 2 Site	2.3	5.3	14.8
AQ3	Proposed Terminal 3 Site	7.4	38.3	61
AQ4	Oshodi Bridge – Approach	4.6	13.4	26
AQ5	Oshodi Bridge – Up	25	72.7	134.1
AQ6	Oshodi Bridge – Descend	2.7	16.8	25.9
AQ7	Charity Bus Stop by Oshodi Waste Station	9.9	24.5	66.1
AQ8	Ladipo Busstop by Ikeja GRA (control)	11.0	27.2	73.4
AQ9	Interchange link junction by Agege Motor Road	11.8	29.3	79
AQ10	Interchange link by Mushin Road	8.4	20.8	56.2
AQ11	LASEMA Response Area by Mushin Road	10.7	26.7	72
AQ12 (Control)	Control	7.4	18.3	49.3
24-Hour Limit (FMEnv)	-	-	-	600

Table 4.13: Extrapolated Daily Particulates in and around the Study Area

Sampling Locations		Concentrations (µg/m^3)		
Location Code	Designation	$PM_{2.5}$	PM_{10}	TSP
AQ1	Proposed Terminal 1 Site	1.2	2.4	5.7
AQ2	Proposed Terminal 2 Site	1.2	2.7	7.6
AQ3	Proposed Terminal 3 Site	3.8	19.6	31.3
AQ4	Oshodi Bridge – Approach	2.4	6.9	13.3
AQ5	Oshodi Bridge – Up	12.8	37.3	68.8
AQ6	Oshodi Bridge – Descend	1.4	8.6	13.3
AQ7	Charity Bus Stop by Oshodi Waste Station	5.1	12.6	33.9
AQ8	Ladipo Busstop by Ikeja GRA (control)	5.6	13.9	37.7
AQ9	Interchange link junction by Agege Motor Road	6.0	15.0	40.5
AQ10	Interchange link by Mushin Road	4.3	10.7	28.8
AQ11	LASEMA Response Area by Mushin Road	5.5	13.7	36.9
AQ12 (Control)	Control	3.8	9.4	25.3
24-Hour Limit (FMEnv)		25	80	250

During the study CO was measured to be 1.2 – 7.5 ppm while NO_2 was 0.001 – 0.30 ppm with VOCs, H_2S, NH_3 and O_3 levels of 0.16 – 1.83 ppm, 0.01 – 0.08 ppm, 0.03 – 0.39 ppm and 0.01 – 0.02 ppm. However none of NO, CH_4, and SO_2 was detected in any of the sampling locations. Only NH_3 breached its 1-hour standard and at only one location. The Daily equivalent of the measured CO was 0.62 – 3.85 ppm with NO_2 and VOCs levels of 0.01 – 0.15 ppm and 0.08 – 0.94 ppm respectively (**Table 4.11**). While the measured H_2S and NH_3 were respectively 0.01 – 0.04 ppm and 0.02 – 0.20 ppm as daily equivalents that of the measured O_3 during the study was 0.01 ppm. They are all within their FMEnv respective limits except NO_2 at AQ9.

Concentrations of the measured $PM_{2.5}$ were 2.3 – 25.0 µg/m^3 with PM_{10} levels of 4.7– 72.7 µg/m^3 while TSP was measured to be 11.2 – 134.1 µg/m^3 (**Table 4.12**). In all the locations where detected, the 600 µg/m^3 1-hour FMEnv limit of TSP was not exceeded. Similarly their respective daily equivalent concentrations of 1.2 – 12.8

µg/m^3, 2.4 – 37.3 µg/m^3, and 5.7 – 68.8 µg/m^3 were all within their FMEnv respective limits (**Table 4.13**.).

Carbon Monoxide (CO) is a colourless and odourless gas that can be harmful when inhaled. Breathing air with high CO concentration reduces oxygen transported in the blood stream to critical organs like the heart and brain. Generally CO is a primary air pollutant formed from methane and non-methane hydrocarbon oxidation. In the urban centres like the proposed project site in Oshodi, its sources may include fossil fuel combustion in vehicles, industry and domestic heating. Similarly fuel combustion in electric power generators in the industry, commercial and domestic areas of the project site could be its additional sources. Though not expected to be a major source, solid waste combustion may be additional source. Its primary sink is oxidation by the hydroxyl radical (OH) and this may be one of the reasons while the CO concentrations detected during the fieldwork did not breach its set limit in any of the sampling locations.

Oxides of Nitrogen (NO_X) that are of concern in atmospheric pollution are Nitric Oxide (NO) and Nitrogen Dioxide (NO_2). Elevated levels of NO_2 in the atmosphere can irritate airways in the human respiratory system which may aggravate respiratory diseases including asthma, leading to respiratory symptoms such as coughing, wheezing or difficulty breathing. In air, NO_2 along with other NO_X reacts with other chemicals to form particulate matter and ozone, which could also be harmful when inhaled. Usually NO is formed from oxidation of nitrogen present either in combustion air or fuel. However it is not very stable but easily converts to NO_2 in the atmosphere. It may be the major source of NO_2 detected during the fieldwork especially in vehicles, industries and commercial areas of the project site.

Volatile Organic Compounds (VOCs) are organic chemical compounds whose composition makes it possible for evaporation under normal indoor atmospheric conditions of temperature and pressure. Many VOCs form ground-level ozone, a constituent of photochemical smog, by “reacting” with sources of oxygen molecules such as NO_X, and CO in the atmosphere in the presence of sunlight. Their health effects may include eye, nose and throat irritation; headaches, loss of coordination and nausea; damage to liver, kidney and central nervous system. Outdoors, VOCs are volatized or released into the air mostly during manufacture or use of products (including hydrocarbon products) and materials. The presence of VOCs during the fieldwork could be associated with hydrocarbons evaporation and combustion in vehicles working around the proposed project site. Private electric power generation in the industry as well as in the commercial and residential areas of the project site may be additional source during the fieldwork. Similarly hydrocarbons evaporation in fuel filling stations during car refuelling, underground tank breathing, among others, located around the proposed project site, may be additional sources.

Ammonia (NH_3) is one of the nitrogenous compounds with high impacts on ambient air quality due to its potential for secondary particle formation. Its main local problem when released into air is the unpleasant odour, which is detectable even at low concentrations. At particularly high concentrations it can also harm vegetation. The harm caused by Ammonia in water bodies can be serious due to its toxicity to aquatic organisms. On a wider scale, ammonia plays a role in the transportation and enhanced deposition of acidic pollutants, resulting in acidification of ground and water bodies, which can harm plant and animal life. Exposure to high concentrations of Ammonia in air causes immediate burning of the nose, throat and respiratory tract. This can cause bronchiolar and alveolar edema, and airway destruction resulting in respiratory distress or failure. Inhalation of lower concentrations can cause coughing, and nose and throat irritation. The main sources of Ammonia detected in the proposed project area during the study could be from decaying excreta of humans and animals. It can also be from vehicular traffic, biological sources (e.g. garbage containers), wastewater treatment plants in the nearby industries, and solid waste treatment plants.

Hydrogen Sulphide (H_2S) is colourless, flammable and extremely hazardous gas. It is both an irritant and chemical asphyxiant with effects of both oxygen utilisation and central nervous system. Its health effect can vary depending on the level and duration of exposure. Low concentration irritates eyes, nose, throat and respiratory system. Repeated or prolonged exposure may cause eye inflammation, headache, fatigue, irritability, insomnia, digestive disturbances and weight loss. Moderate concentration can cause more severe eye and respiratory irritation, dizziness, nausea, vomiting and staggering. High concentration can cause shock, convulsion, inability to breathe, extremely rapid unconsciousness, coma and death. Hydrogen sulphide (H_2S) occurs naturally in crude petroleum, natural gas and hot springs. In addition, it is produced by bacterial breakdown of organic materials and human and animal, waste (i.e. sewage), petroleum/natural gas drilling and refining, wastewater treatment, coke ovens, tanneries and kraft paper mills. Its source during this fieldwork could be bacterial breakdown of organic materials including human and animal wastes.

Suspended Particulate Matter (SPM) is a complex mixture of organic substances, present in the atmosphere as solid particles and liquid droplets. They include fumes, smoke, dust and aerosols. Health impacts of PM vary depending on the size and the concentration of particles. For regulatory purposes and estimating health impacts, PM is measured and classified by what is called the respiratory fraction of particles including $PM_{2.5}$ and PM_{10} as monitored in this study. Suspended Particulate Matter causes respiratory morbidity, deficiencies in pulmonary (lung) functions including decreased lung function (especially in children), and lung cancer with the consequence of increased mortality, among others. They can also contribute to acid deposition and may absorb solar radiation and impair/reduce visibility. Particulates are formed during fuel combustion. This and dust re-suspension could be the major

sources of particulates detected during the fieldwork because some mobile plants were observed working around the project site.

Classification of the Proposed Project Site Airshed

With the World Bank Group Airshed Classification as basis, the present air quality status of the proposed project site can be classified as un-degraded with respect to all the fieldwork measured air quality parameters thus described an un-degraded airshed.

4.3.2.2 Ambient Noise Levels

The daytime minimum noise levels (L_{min}) in the study area during the fieldwork were measured to be 51.1 – 75.4 dB (A) with maximum levels (L_{max}) of 58.2 – 85.3 dB(A) as presented in **Table 4.14**. The background noise levels (L_{90}) in the study area were determined to be 56.2 – 79.0 dB(A) which all breached the 55 dB(A) day-time limit of the World Bank. Similarly the 70 dB(A) industrial area noise limit of the World Bank was breached in about 50% of the sampling locations. Vehicles were the major anthropogenic sources of noise observed during the study. The natural source includes wind, among others.

Table 4.14: Day-Time Measured Ambient Noise Levels in and around the Project Site

Sampling Locations	L_{min}	L_{max}	L_{90}
AQ1	65.5	79.2	66.5
AQ2	75.4	82.5	76.0
AQ3	64.7	71.6	68.1
AQ4	73.2	80.1	75.2
AQ5	71.1	78.4	72.2
AQ6	67.4	85.3	68.3
AQ7	65.2	68.1	66.1
AQ8	71.4	74.2	73.4
AQ9	75.2	79.9	79.0
AQ10	51.1	58.2	56.2
AQ11	69.5	73.1	72.0
AQ12 (Control)	44.3	51.7	49.3

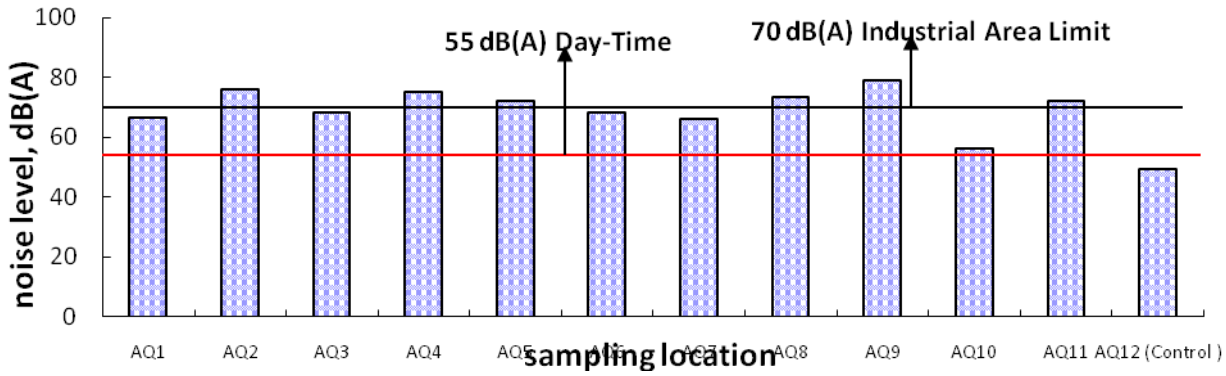


Fig. 4.12: Background Noise Levels in the Proposed Project Area

4.3.2.3 Result of the Emission Dispersion Modeling

Ground Level Concentrations Associated with Traffic in the Proposed Site

The associated 1-hour averaging period ground level CO concentrations from traffic flow in the proposed project site are 390.3 – 8270.7 µg/m^3 in the morning (**Figure 4.13**) but 477.2 – 8920.5 µg/m^3 in the afternoon/evening (**Figure 4.14**). Its morning period 24-hour concentrations are 29.5 – 993.8 µg/m^3 (**Figure 4.15**) but 36.2 – 1071.6 µg/m^3 in the afternoon/evening (**Figure 4.16**). As presented in **Figure 4.17** the 1-hour ground level SO_2 associated with vehicular emissions in the proposed project site is 1.1 – 22.7 µg/m^3 but in the afternoon/evening session, it was 1.5 – 28.6 µg/m^3 (**Figure 4.18).** The 24-hour averaging period SO_2 levels from vehicular emissions in the area are 0.08 – 2.73 µg/m^3 in the morning (**Figure 4.19**) but 0.12 – 3.43 µg/m^3 in the afternoon/evening (**Figure 4.20**).

While the 1-hour ground level NO_X are 76.9 – 1430.8 µg/m^3 (**Figure 4.21**) and 245.8 – 5110.2 µg/m^3 (**Figure 4.22**) from morning and afternoon/evening traffics respectively, their 24-hour morning and afternoon/evening levels are respectively 1.9 – 61.4 µg/m^3 (**Figure 4.23**) and 5.8 – 172.0 µg/m^3 (**Figure 4.24**) with annual morning levels of 0.3 – 26.3 µg/m^3 (**Figure 4.25**) and afternoon/evening levels of 0.9 – 93.8 µg/m^3 (**Figure 4.26**). The morning period 1-hour ground level SPM are 0.9 0 18.9 µg/m^3 (**Figure 4.27**) with afternoon/evening levels of 1.3 – 23.8 µg/m^3 (**Figure 4.28**). Their 24-hour levels are 0.07 – 2.28 µg/m^3 (**Figure 4.29**) in the morning but 0.097 – 2.861 µg/m^3 (**Figure 4.30**) in the afternoon with annual averaging period concentrations of 0.003 – 0.348 µg/m^3 (**Figure 4.31**) in the morning but 0.004 – 0.400 µg/m^3 (**Figure 4.32**). The 24-hour averaging period ground level SPM is 3.9 – 123.2 µg/m^3 (**Figure 4.33)** in the morning but 5.6 – 165.7 µg/m^3 (**Figure 4.34**) in the afternoon/evening.

Impacts of the Proposed Terminal Project Traffic on Ambient Air Quality

Though five air quality parameters were considered, only the predicted maximum ground level concentrations of NO_X and VOCs breached their FMEnv limits **(Table 4.15**) and both are in the afternoon. The predicted maximum concentrations are 0.92 – 81.87% of the respective FMEnv's limits except where breached. Similarly the predicted maximum ground level air pollutants associated with vehicular emissions in the proposed site are 1.50 – 65.75% of the WBG limits except in NO_X where the respective limits were breached. Both its 1-hour and annual WBG's limits were breached.

The above observation implies that the proposed transport interchange terminal considered for improved free flow of traffic in the study area will assist greatly to achieve reduced air pollutants from the anticipated reduced traffic levels and associated reduced vehicular emissions. This is expected to enhance the quality of air available in the area.

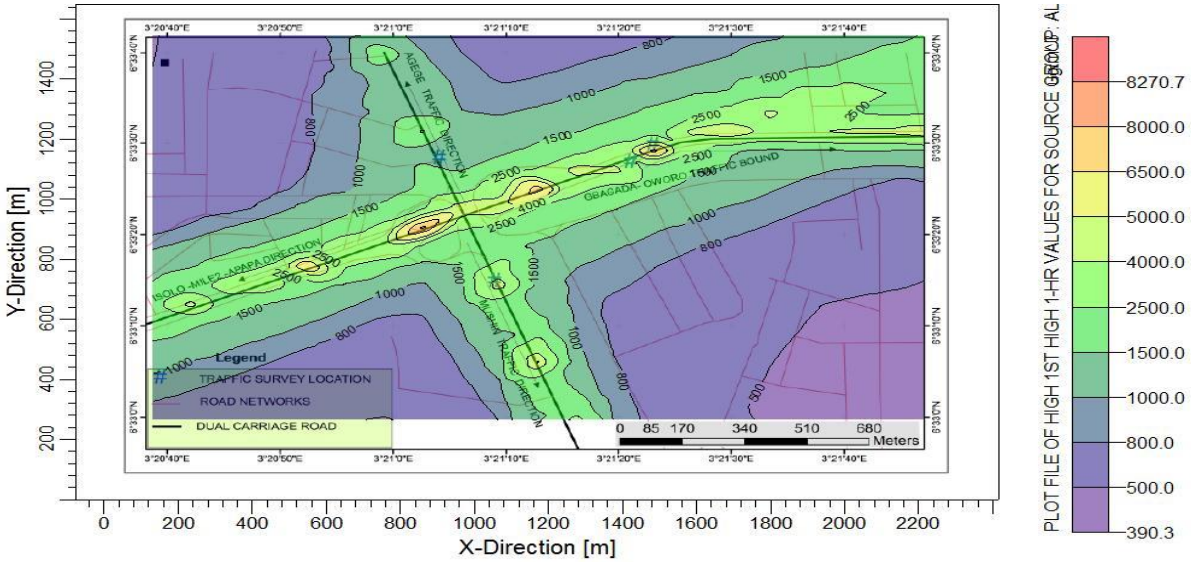


Fig. 4.13: Isopleth of 1-hour Ground Level CO from Morning Traffic (Scenario 1)

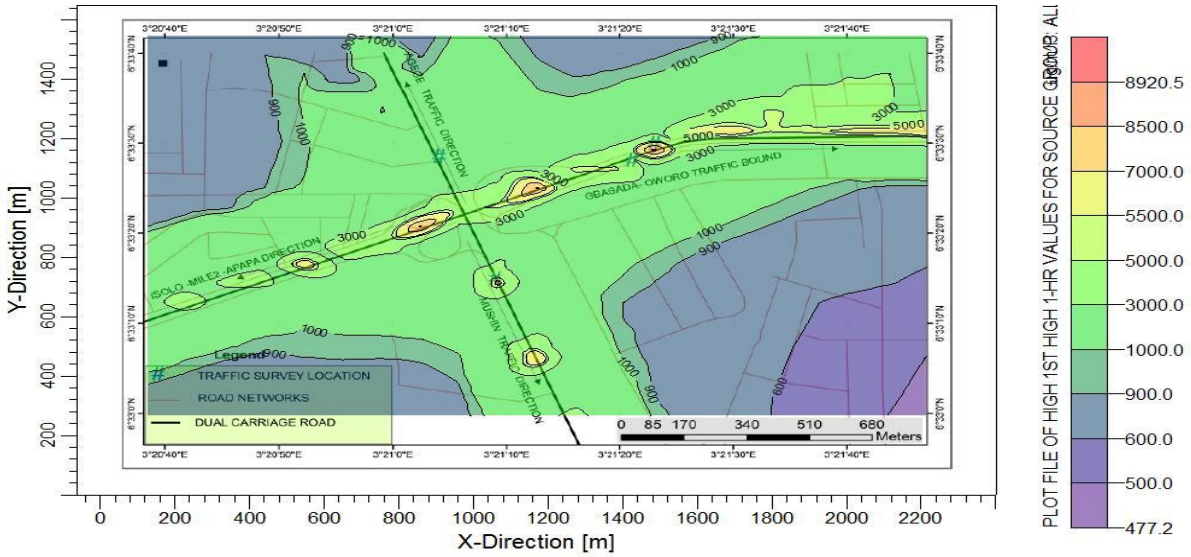


Fig. 4.14: Isopleth of 1-hour Ground Level CO from Afternoon Traffic

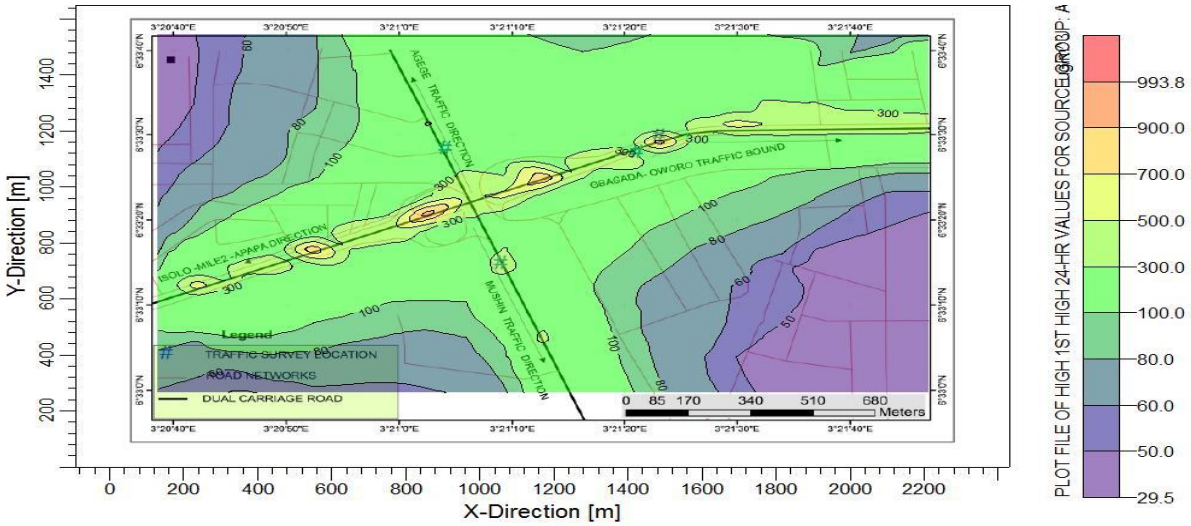


Fig. 4.15: Isopleth of 24-hour Ground Level CO from Morning Traffic

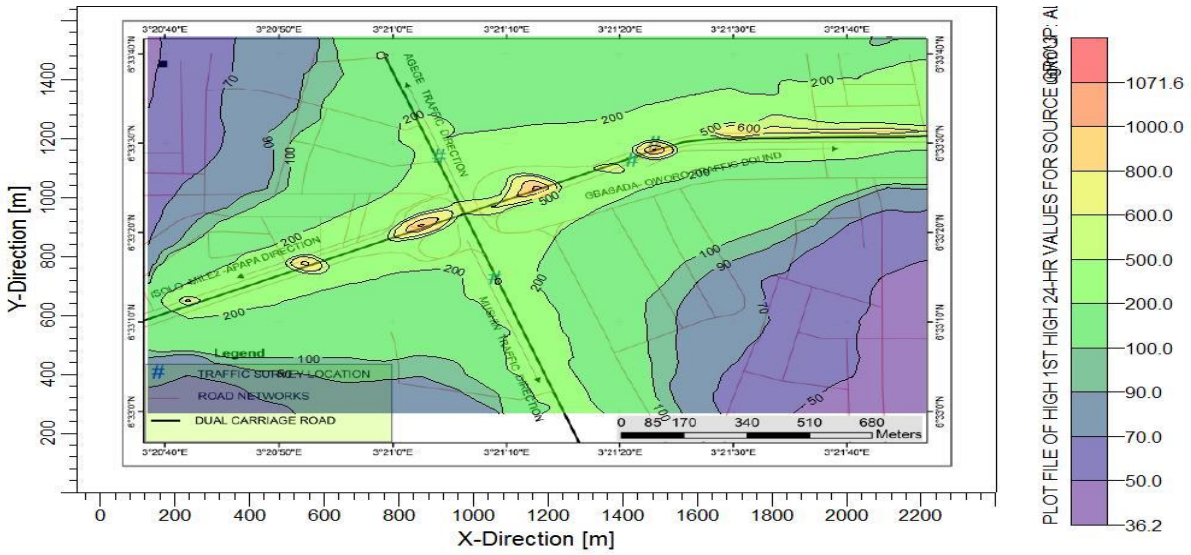


Fig. 4.16: Isopleth of 24-hour Ground Level CO from Afternoon Traffic

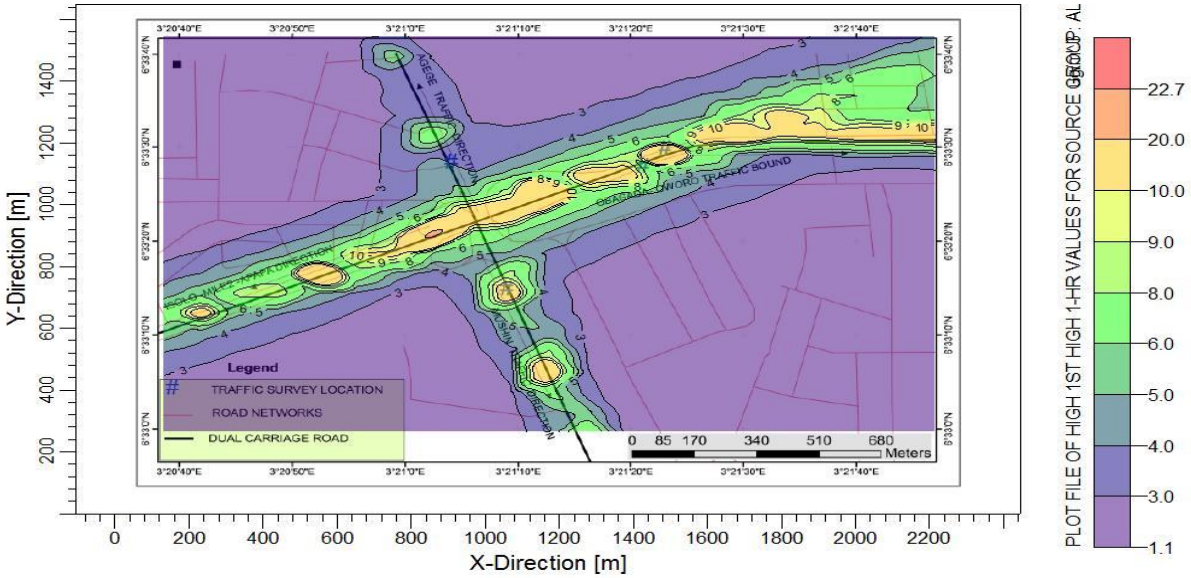


Fig. 4.17: Isopleth of 1-hour Ground Level $SO_2$from Morning Traffic

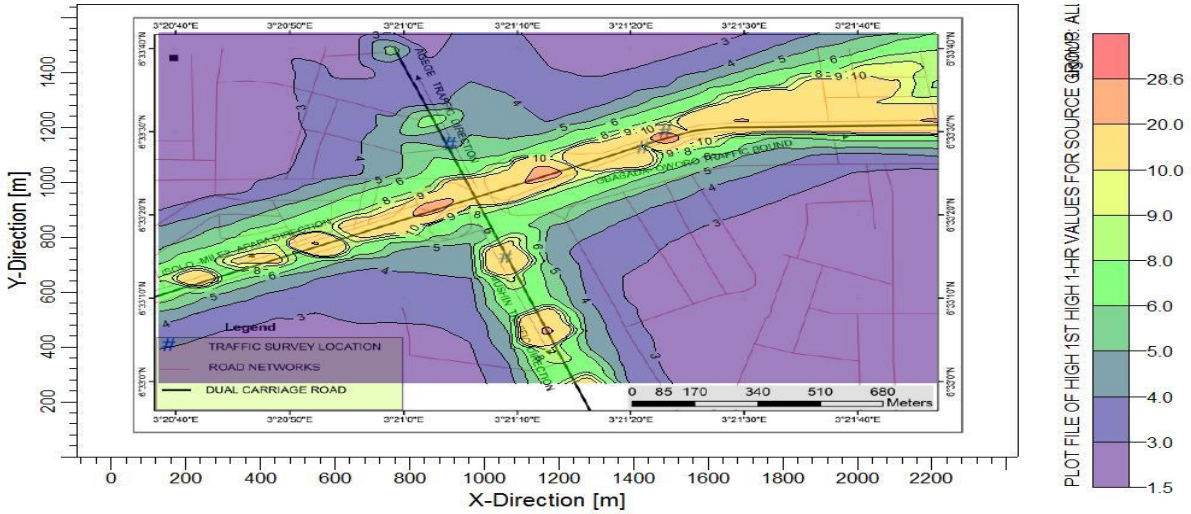


Fig. 4.18: Isopleth of 1-hour Ground Level $SO_2$from Afternoon Traffic

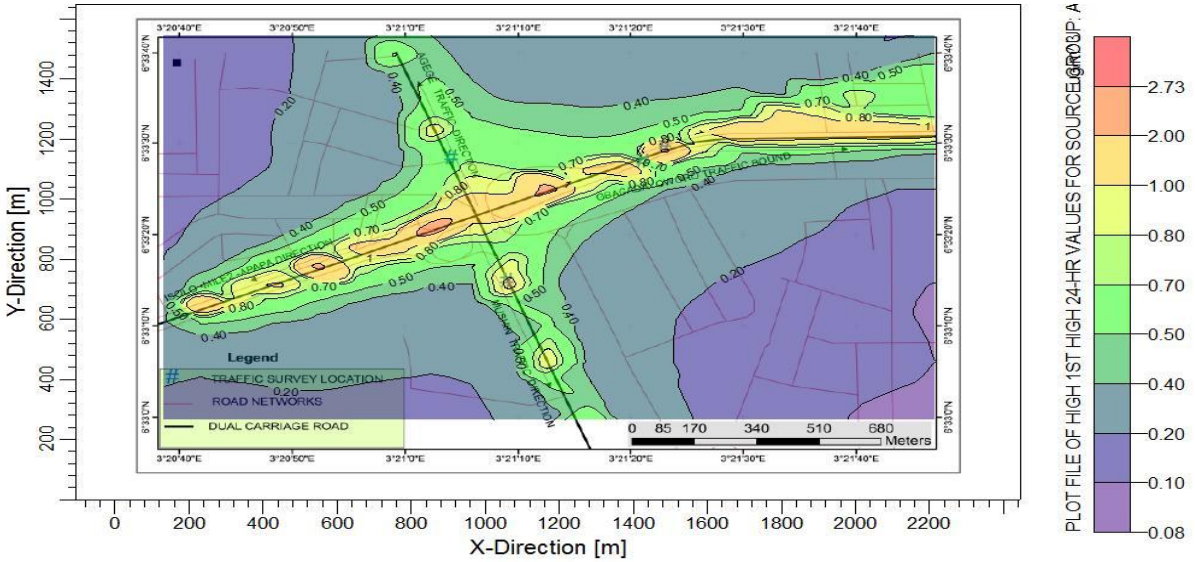


Fig. 4.19: Isopleth of 24-hour Ground Level $SO_2$from Morning Traffic

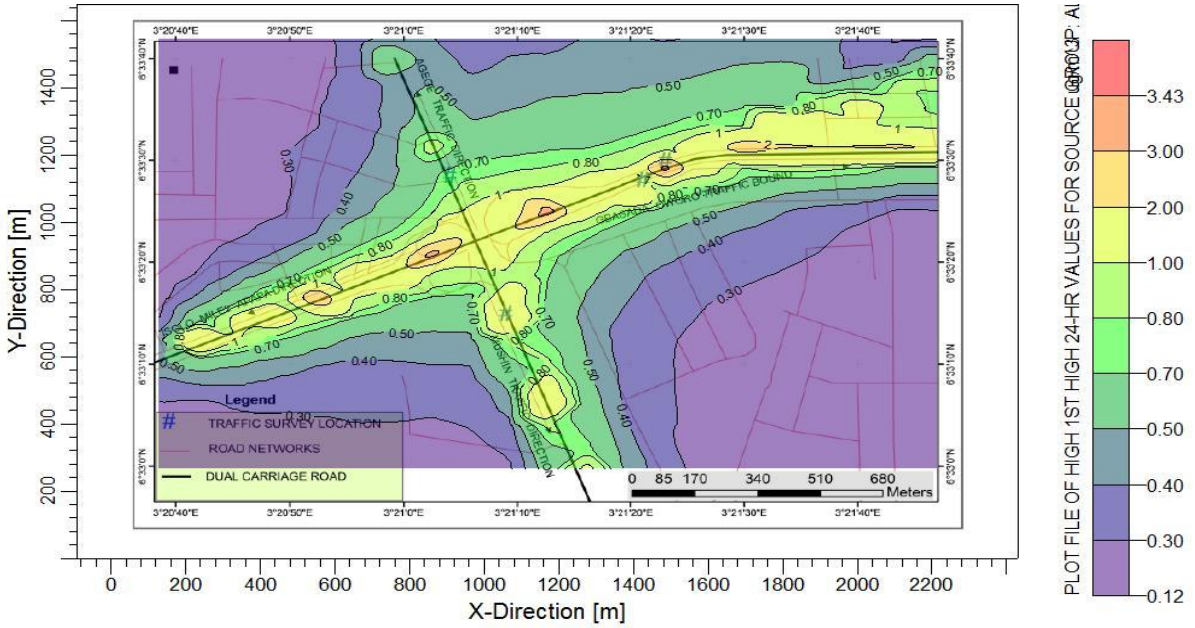


Fig. 4.20: Isopleth of 24-hour Ground Level $SO_2$from Afternoon Traffic

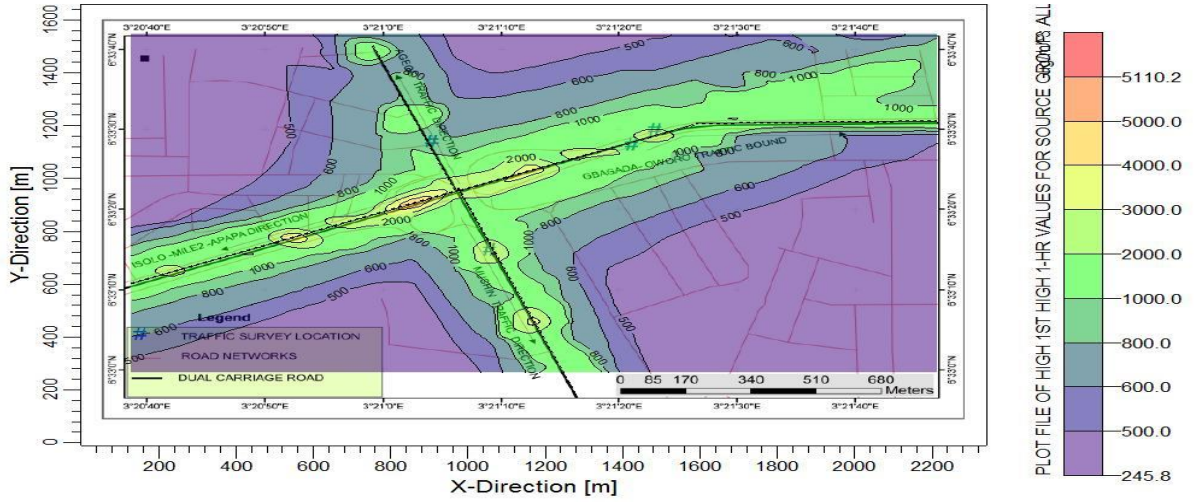


Fig. 4.21: Isopleth of 1-hour Ground Level $NO_X$from Morning Traffic

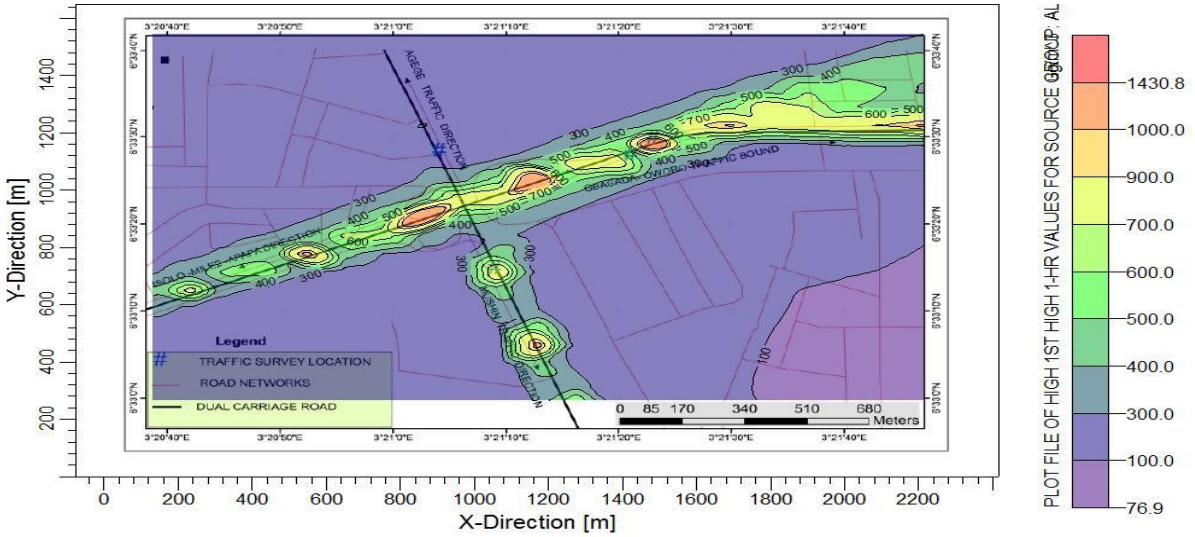


Fig. 4.22: Isopleth of 1-hour Ground Level NO_X from Afternoon Traffic

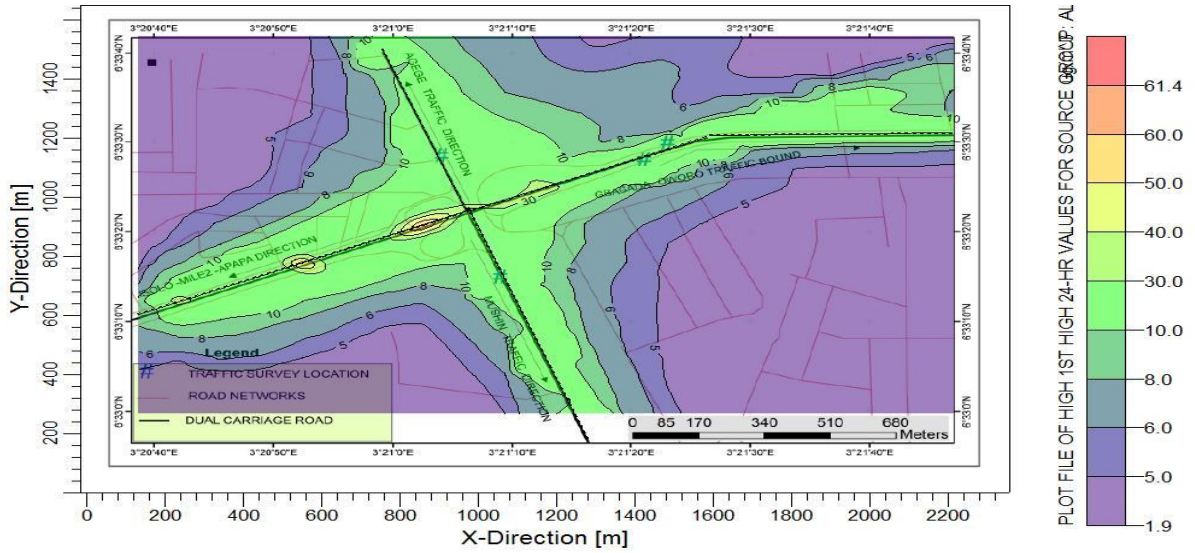


Fig. 4.23: Isopleth of 1-hour Ground Level NO_X from Morning Traffic

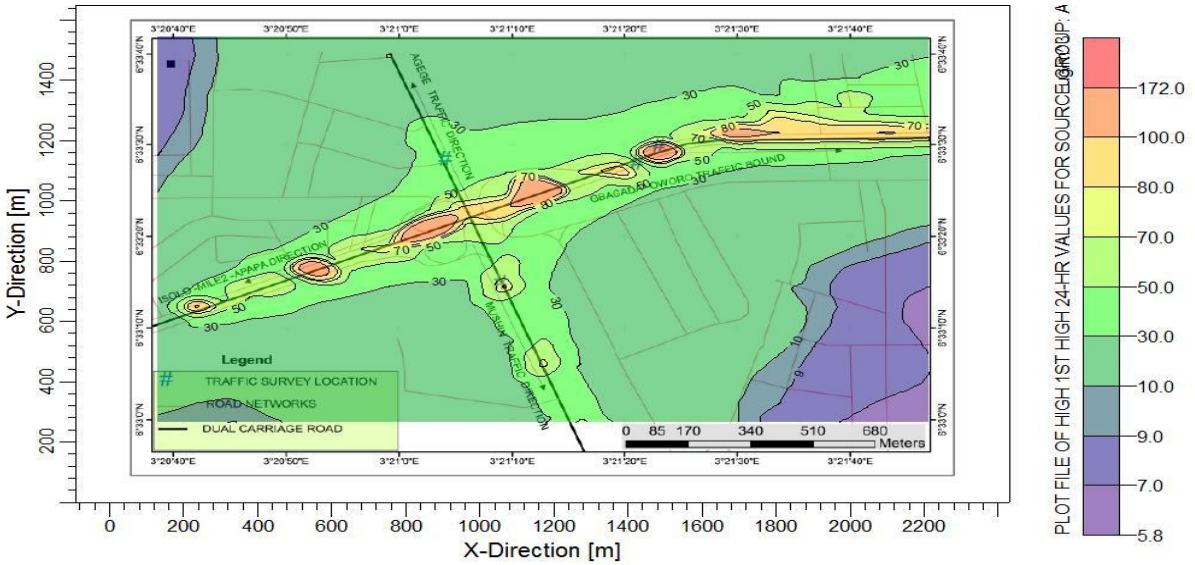


Fig. 4.24: Isopleth of 24-hour Ground Level $NO_X$from Afternoon Traffic

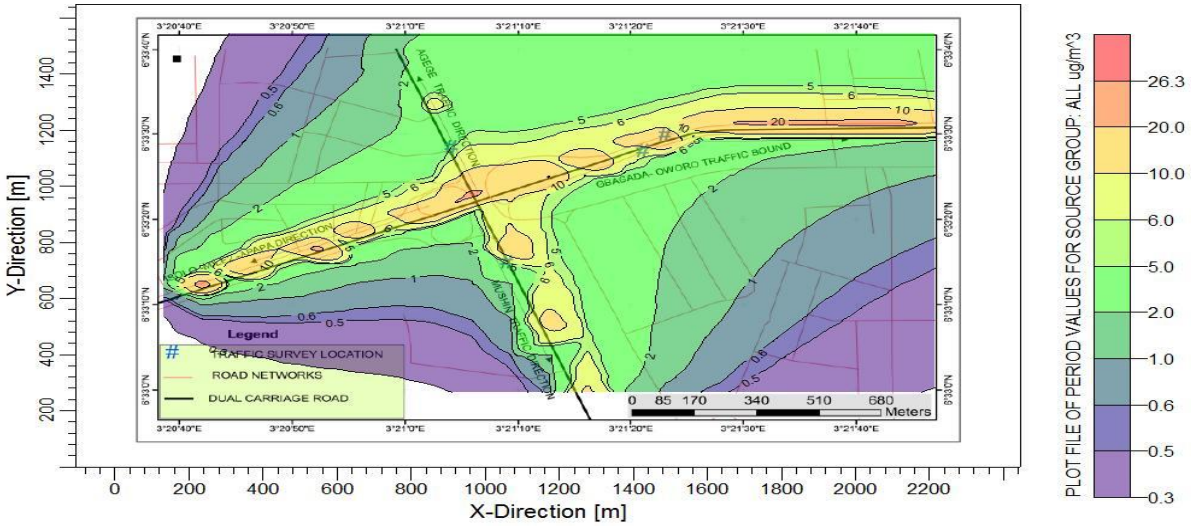


Fig. 4.25: Isopleth of Annual Ground Level NO_X from Morning Traffic

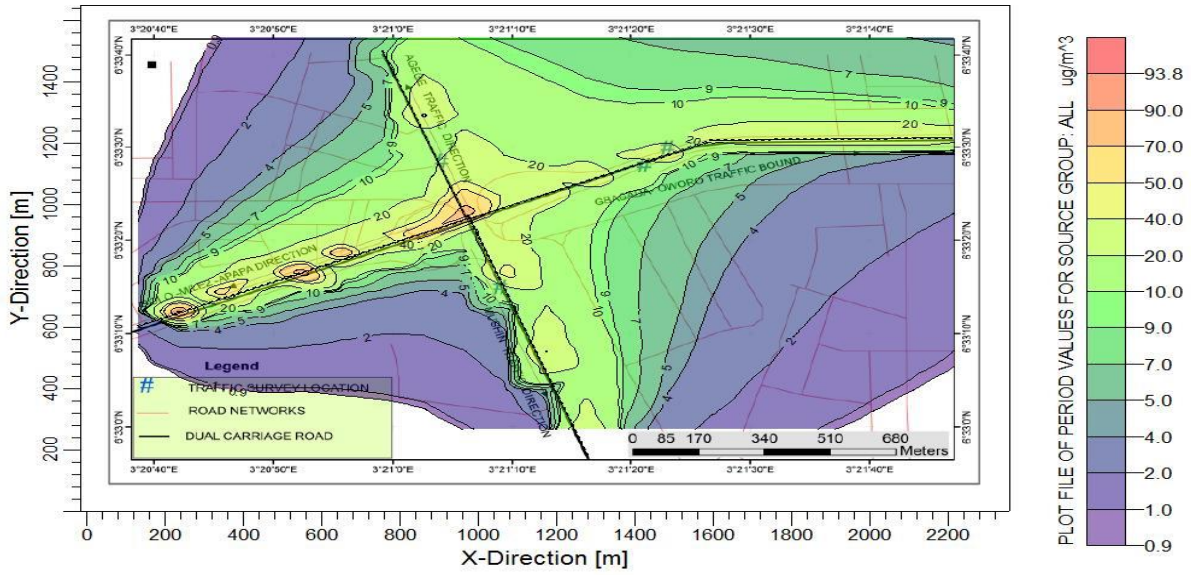


Fig. 4.26: Isopleth of Annual Ground Level NO_X from Evening Traffic

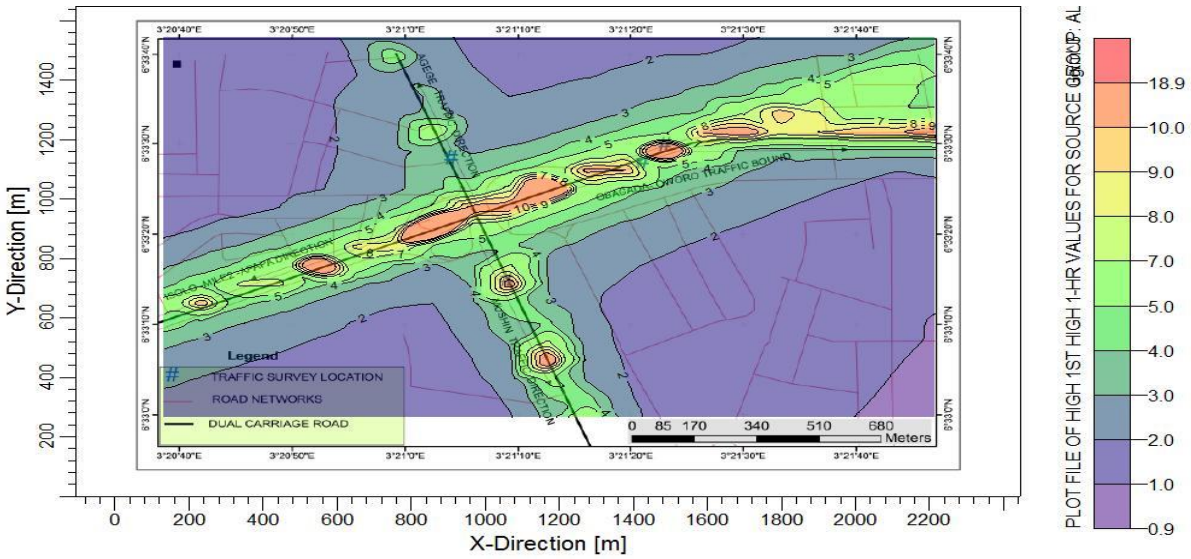


Fig. 4.27: Isopleth of 1-Hour Ground Level SPM from Morning Traffic

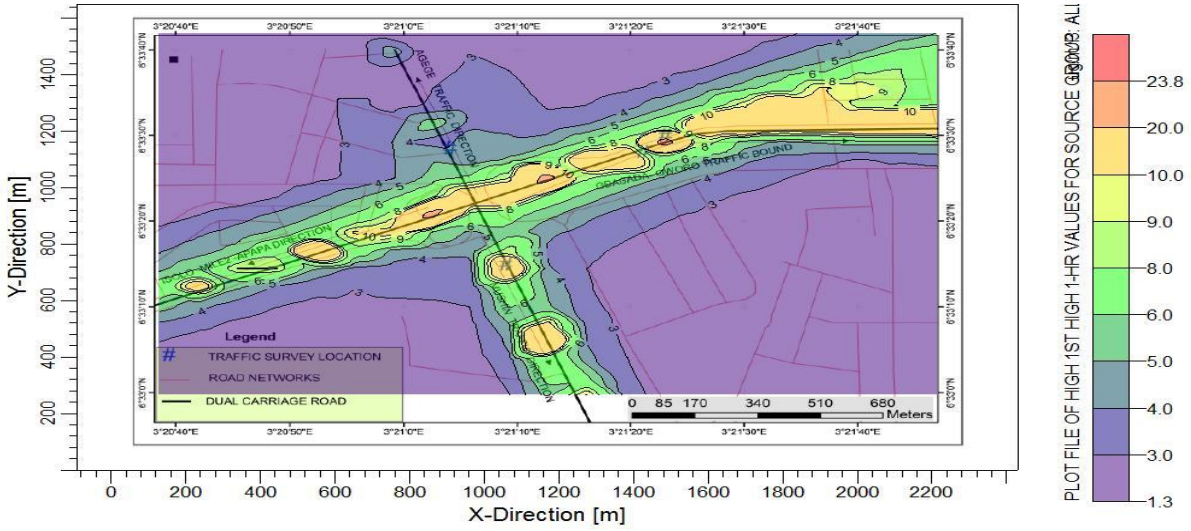


Fig. 4.28: Isopleth of 1-Hour Ground Level SPM from Evening Traffic

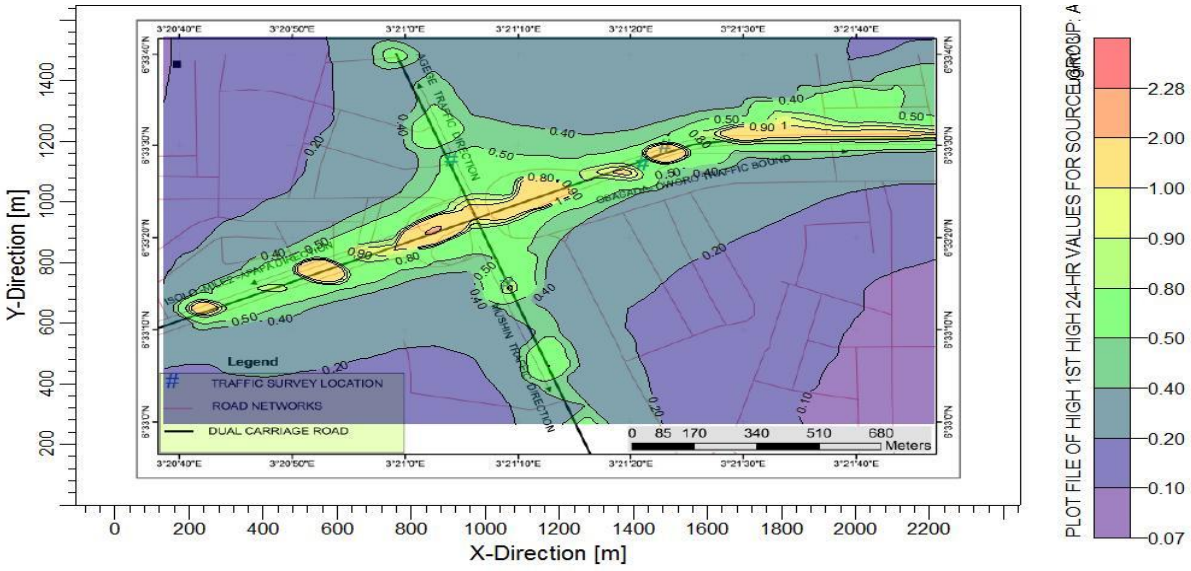


Fig. 4.29: Isopleth of 24-Hour Ground Level SPM from Morning Traffic

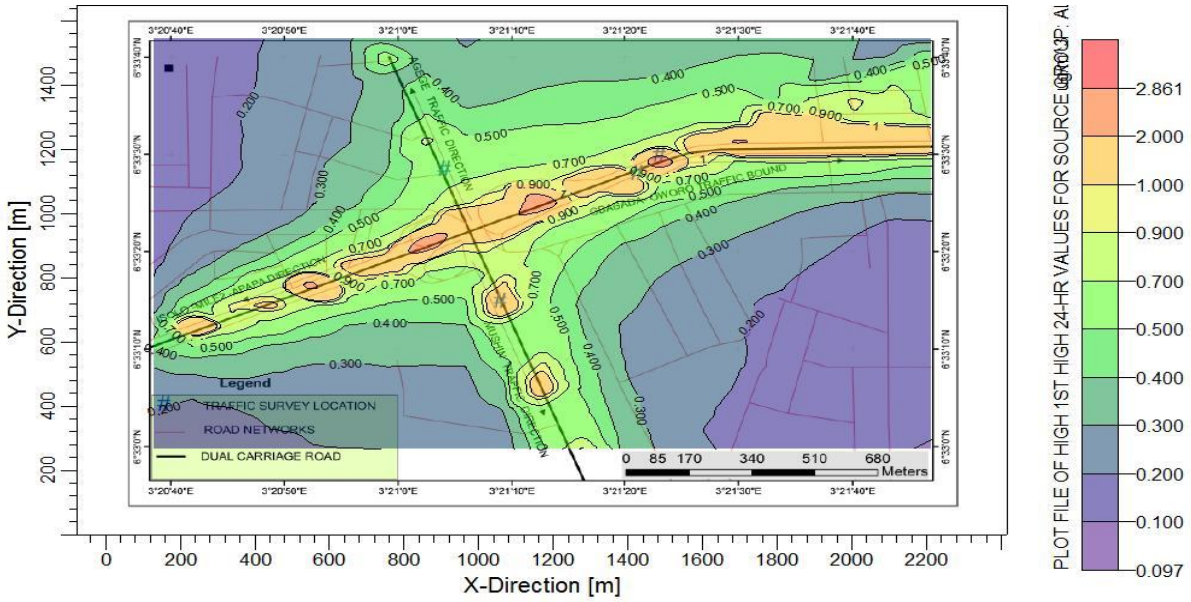


Fig. 4.30: Isopleth of 24-Hour Ground Level SPM from Evening Traffic

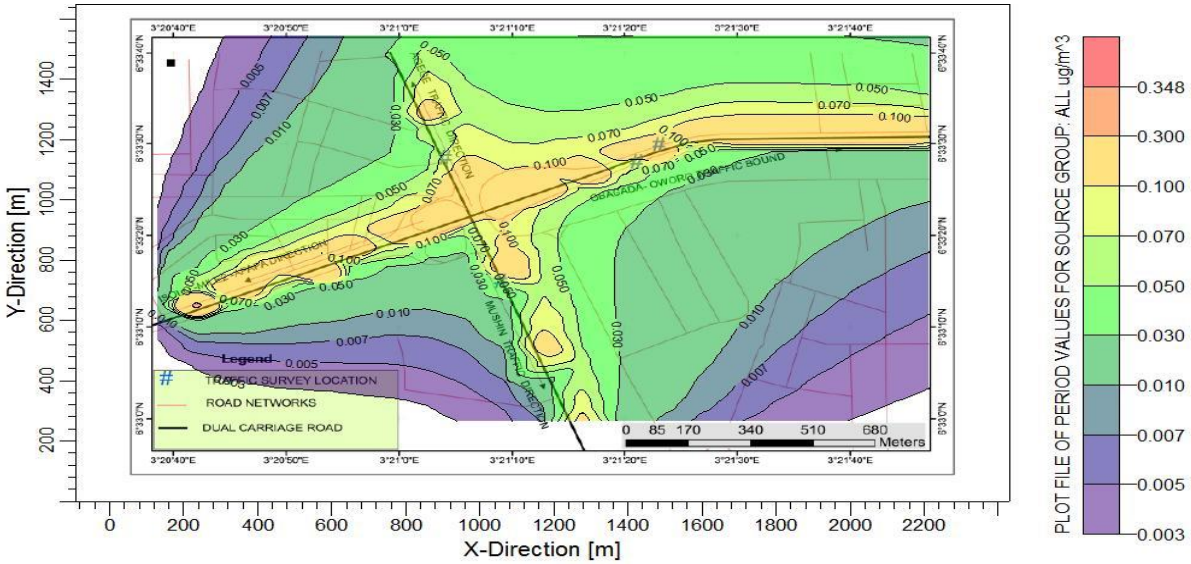


Fig. 4.31: Isopleth of Annual Ground Level SPM from Morning Traffic

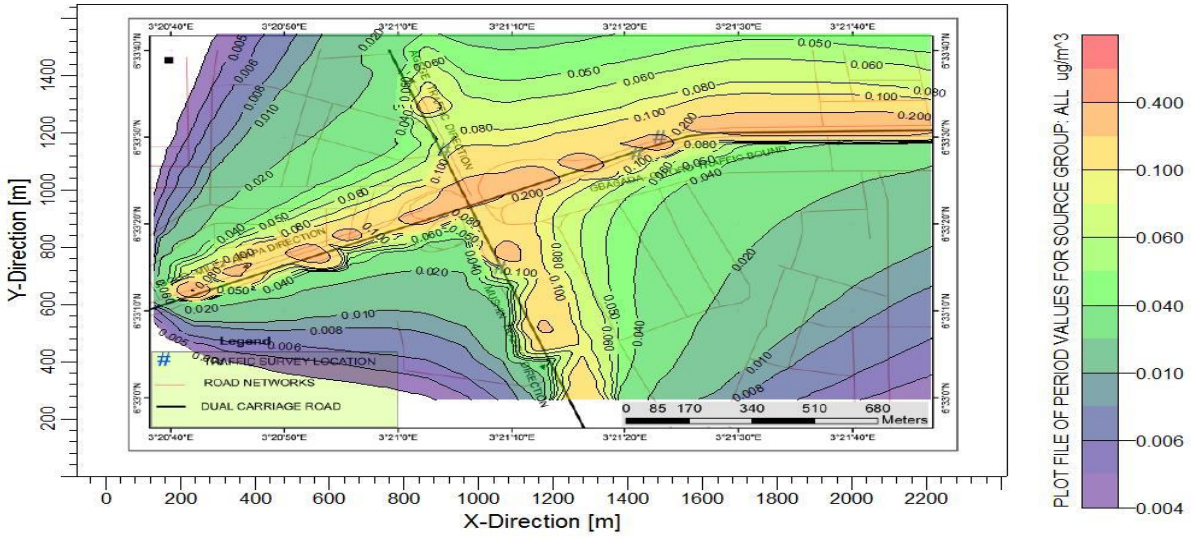


Fig. 4.32: Isopleth of Annual Ground Level SPM from Evening Traffic

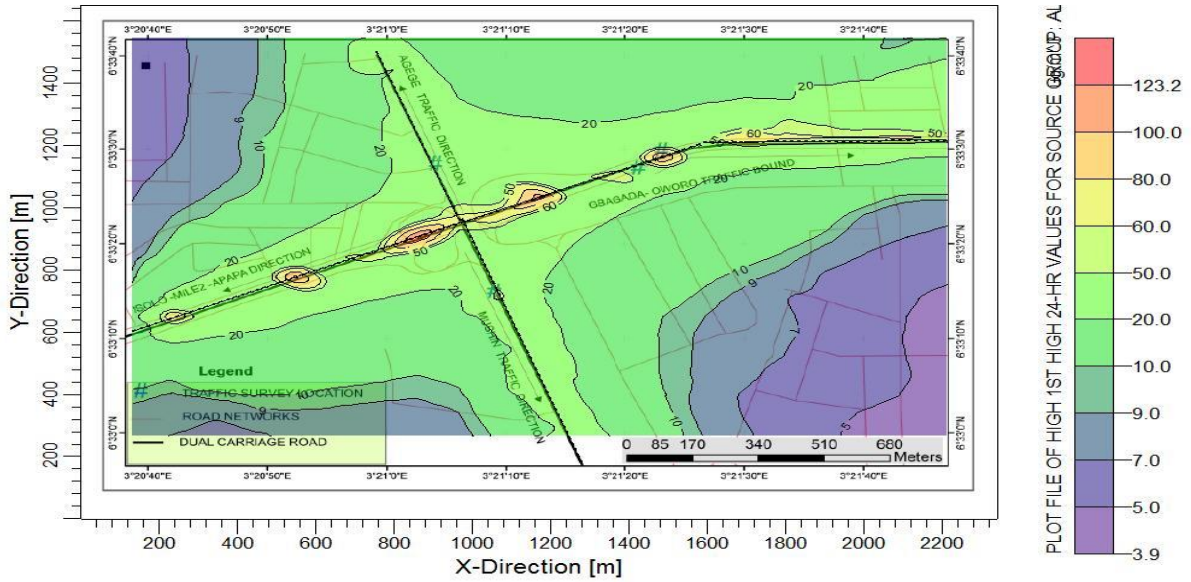


Fig. 4.33: Isopleth of 24-Hour Ground Level VOCs from Morning Traffic

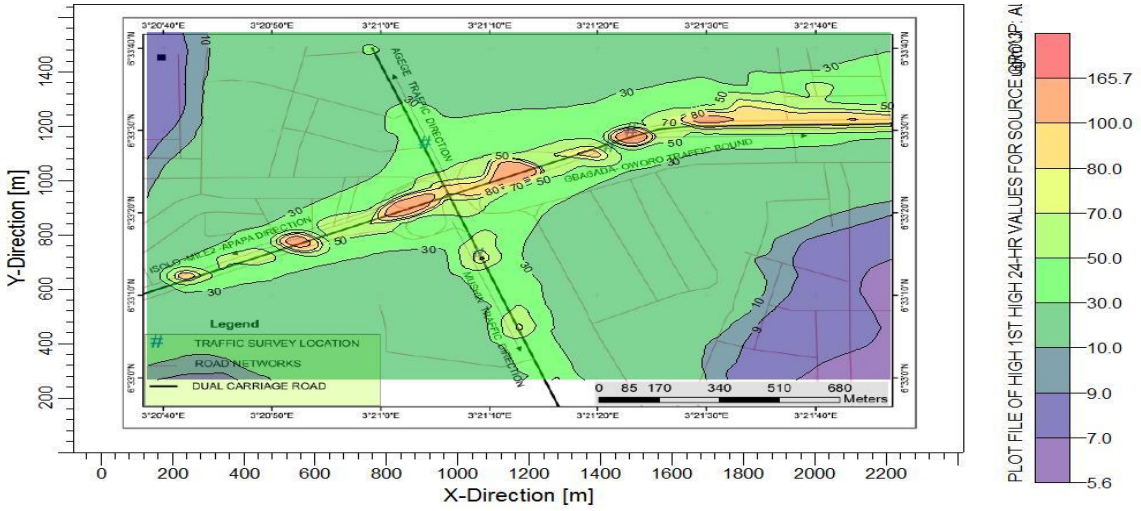


Fig. 4.34: Isopleth of 24-Hour Ground Level VOCs from Evening Traffic

Table 4.15: Predicted Maximum Ground Level Air Pollutant Associated with the Project

Air Pollutant	Averaging Period	Scenario	Concentration (µg/m³)*	% of Limit	
				FMEnv	WBG
CO	1-Hour	*Morning (Scenario 1)*	8270.7	27.57	-
		Afternoon/Evening (Scenario 2)	8920.5	29.74	-
	24-Hour	*Morning (Scenario 1)*	993.8	8.72	-
		Afternoon/Evening (Scenario 2)	1071.6	9.40	-
SO_2	1-Hour	*Morning (Scenario 1)*	22.7	8.73	-
		Afternoon/Evening (Scenario 2)	28.6	11.00	-
	24-Hour	*Morning (Scenario 1)*	2.73	10.50	13.65
		Afternoon/Evening (Scenario 2)	3.43	13.19	17.15
NO_X	1-Hour	*Morning (Scenario 1)*	5110.2	-	**2555.1**
		Afternoon/Evening (Scenario 2)	1430.8	-	**715.4**
	24-Hour	*Morning (Scenario 1)*	61.4	81.87	-
		Afternoon/Evening (Scenario 2)	172.0	**229.33**	-
	Annual	*Morning (Scenario 1)*	26.3	-	65.75
		Afternoon/Evening (Scenario 2)	93.8	-	**234.5**
SPM	1-Hour	*Morning (Scenario 1)*	18.9	3.15	-
		Afternoon/Evening (Scenario 2)	23.8	3.97	-
	24-Hour	*Morning (Scenario 1)*	2.3	0.92	4.6
		Afternoon/Evening (Scenario 2)	2.9	1.16	5.8
	Annual	*Morning (Scenario 1)*	0.3	-	1.5
		Afternoon/Evening (Scenario 2)	0.4	-	2
VOCs	24-Hour	*Morning (Scenario 1)*	123.2	77.00	-
		Afternoon/Evening (Scenario 2)	165.7	**103.56**	-

4.3.2.4 Result of Noise Dispersion Modeling

Calculated Ambient Noise Levels

As presented in **Figure 4.35**, traffic flow into and out of the proposed terminal facility during the morning period as investigated in scenario 1 results in ambient noise levels of 52.5 – 107.8 dB(A). While the minimum levels are in the Gbagada-Oworonsoki axis the maximum are in the Isolo-Mile axis. However in the

afternoon/evening period, ambient noise levels associated with traffic flow in and out of the study area are about 82.5 – 141.4 dB(A) within the investigated receptors locations (**Figure 4.36**). Its minimum noise levels during this period are from the Agege axis while the maximum are from Mushin axis.

Impacts of the Proposed Project on Ambient Noise Levels

Few metres away from the roads leading in and out of this proposed project site, the maximum ambient noise levels associated with traffic flow could be as high as 100 dB(A) in the morning (**Figure 4.35**) and about 120 dB(A) in the afternoon/evening (**Figure 4.36**). These are not only clearly above the 55 dB(A) day-time noise permitted level and the 45 dB(A) night-time permitted level by the World Bank Group but also above the 90 dB(A) noise level permitted by the Federal Ministry of Environment for 8-hour period. This implies that the introductions of the Terminal Facility as proposed by the Lagos Government will ease traffic flow in the area thus reducing ambient noise level associated with traffic flow in the project site.

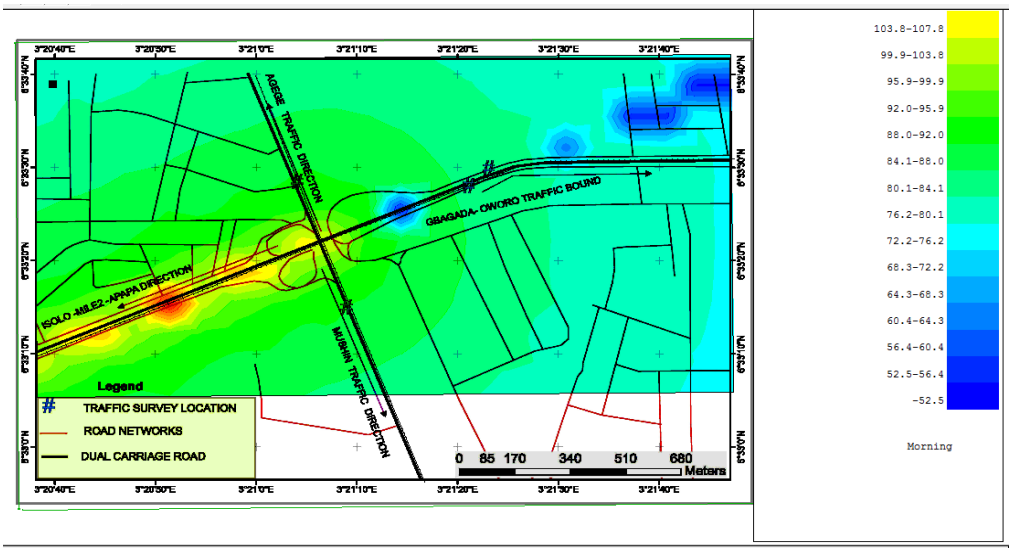


Fig. 4.35: Contours of Ambient Noise Asscoatied with Morning Period Traffic

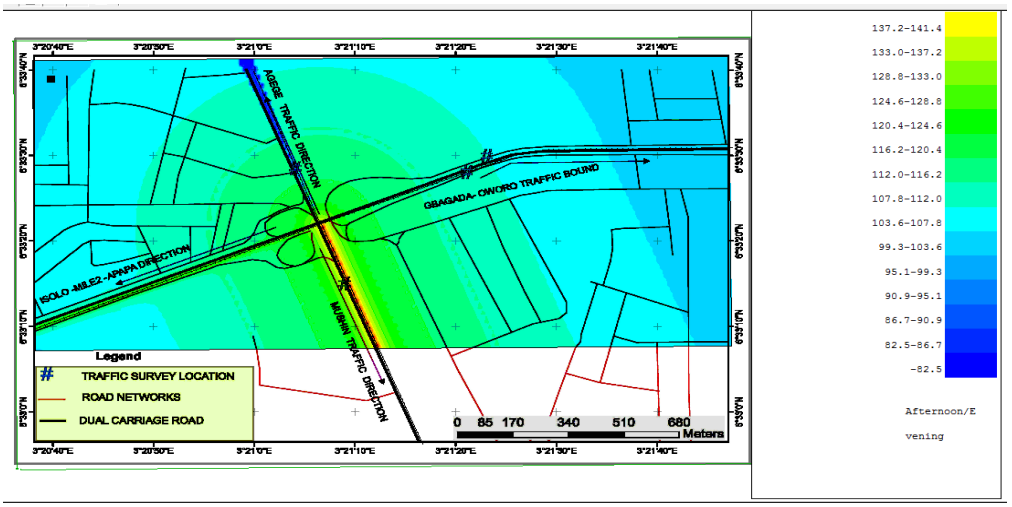


Fig. 4.36: Contours of Ambient Noise Associated with Afternoon/Evening Period Traffic

4.3.3 Geology and Hydrogeology

Geology

The geology of the study area is a component part of the general geology of southwestern Nigeria. Geologically speaking, Nigeria is characterized by the occurrence of a combined Precambrian Basement Complex and the Sedimentary basins with the Basement complex areas accounting for approximately 60% of the entire landmass and the sedimentary areas occupying the remaining 40% (Rahaman, 1988).

The older rock units in Nigeria belonged to the Precambrian Basement Complex and consist mainly of rocks belonging to the Older Granites suite, the Younger Granites suite as well as the reworked metamorphic complexes. The Sedimentary basins developed along the triple junction of the rivers Niger and Benue that joined at the southern most part of the country to create the Nigerian Niger Basin. Coastal plain sands complete the sedimentary units with these being deposited mainly along the Nigerian coastline and the associated lagoons and rivers in direct contact with the sea.

The proposed project area is part of the recent coastal plain sands. The coastal plain sands are products of marine and fluvial activities from the Atlantic Ocean, the Lagos Lagoon and the inland rivers of Southwestern Nigeria. The coastal plains of Southwestern Nigeria are composed mainly of very fine to coarse water bearing sands that occur as thick sequences extending to very great depths in most areas.

Field studies and geophysical investigations within the vicinity of the study area properly corroborated the known geology of the area and went further to indicate the occurrence of relatively well sorted, unconsolidated deposit of medium sized sandstone.

Hydrogeology - <u>Groundwater Resources</u>

The relatively flat low-lying area is dominated by coastal plain sands that are water bearing and constitutes the main groundwater resource in the area. The sands are mostly well-sorted medium grained while the coarse grain sands make up the main aquiferous (water bearing) units. The sands are products of deposition from a combination of brackish marine and fluvial sources.

A review of some of the existing reports (NPA – EER, 2002, DNL-EIA, 2005 and ICUBES-EIA, 2011) in the area of study indicated that the aquifers in the area, i.e. the underlying sands, are recharged both from the surface (vertical) as percolation from rain and from the sides (horizontal) by the rivers and the lagoon itself in contact with the water bearing sands. Three boreholes drilled in a triangular format were reported in studying the ground water hydrology. The findings indicated that groundwater flow is basically north–south into the lagoon. This is not particularly

quite obvious physically as the land area slopes south-north while surface drainage in the study area was southwest. This implies that the hydraulic gradient is to a reasonable extent not being entirely controlled by the topography (elevation surface).

Static water levels in the three boreholes ranged between four feet (1.33 meters) at the northern most boreholes through approximately two feet (2.0 meters) in the two southern boreholes as at the time of field investigation (i.e. late July, 2013). Recharge is exceptionally good with minimal drawdown between the piezometric head of the static water level and cone of cylindrical depression not exceeding 3 feet (1.0 m). Transmissibility and infiltration rates of the aquiferous unit within the study area ranged between 120 and approximately 2000 square meters per day and 12 – 40 liters per second, respectively.

Groundwater Quality

The quality of the groundwater in the study area is relatively good (i.e. clean water) with specific reference to the physicochemical and microbial characterization. Hydrocarbon concentrations in all cases were low with total petroleum hydrocarbon (TPH) of less than 3µg/l. However the water is slightly turbid, with turbidity values ranging generally between 68.93 and 129.78 NTU while total suspended solids (TSS) and total dissolved solids (TDS) ranged from 54.8 – 97.89mg/l and 175.63 – 230.24mg/l respectively (**Table 4.16**). The oxygen parameters particularly biological oxygen demand (BOD_5) and chemical oxygen demand (COD) were particularly low showing some level of clarity and oxygenation of the subsurface water in the area. COD was generally higher than BOD, suggesting that the bulk of the oxygen demand was for chemical activities.

Heavy metals' concentrations in the groundwater indicate that toxic metals (Pb, Hg, & Cr) levels in the water samples are very low, generally less than 0.31mg/l. Apart from the turbid nature of the groundwater, it could pass for potable (drinking) water based on its biological and chemical composition.

Table 4.16: Physical and Chemical Characteristics of Groundwater in the Study Area (July, 2014)

Parameter	A		B		C	
	RS	DS	RS	DS	RS	DS
Colour (Pt-Co)	3	2	0	2	13	2
Turbidity (NTU)	70.3	32.25	133	239.5	131	68.03
TSS (mg/l)	57	34	99	171.5	84	32
pH	6	6.7	5.5	6.38	5.6	6.23
Conductivity (µs/cm)	443	693.5	419	686.5	340	762.5
TDS (mg/l)	229	327	216	325.5	176	361
Acidity ($CaC0_3$) (mg/l)	43	8	32	7	34	8
Alkalinity ($CaC0_3$) (mg/l)	88	181	31	132	30	182
$C0_2$ (mg/l)	147	-	172	-	129	-
$S0_4^{2-}$ (mg/l)	166.2	65.9	194.6	70.4	129.3	89.9
Cl^- (mg/l)	4.74	5.2	2.26	3.6	12.69	8.6
$N0_3^-$ N (mg/l)	0.29	3.72	0.06	4.1	0.18	2.56

$N0_2^-$ N (mg/l)	0.03	0.005	0.04	0.01	0.03	0.00
NH_4-N (mg/l)	1	0.68	1.65	0.69	1.49	0.99
T. $P0_4$ (mg/l)	0.03	0.08	0.06	0.16	0.05	0.14
Available $P0_4$ (mg/l)	0.03	0.45	0.02	0.15	0.03	0.06
TOC (mg/l)	1.05	1.00	1.12	0.98	1.06	0.88
DO (mg/l)	2.2	4.6	3	4.2	2.2	4.1
DO %Sat	40	38	55	37	40	36
BOD_5 (mg/l)	0.8	2.3	0.4	0.3	0.4	0.32
COD (mg/l)	112	104	64	58	0.4	0.4
TPH (µg/l)	0.32	0.22	0.23	0.21	0.16	0.15

RS = Rainy season; DS = Dry season

Data Sources: HOGL-EIA, (2007) ICUBES –EIA,(2011); AITEO-EIA, (2014).

4.3.4 Geomorphology and Soils

Physiographic unit of the Project Area

Land surface in Nigeria resulted from alternating denudational and aggradational activities, giving rise to three broad geomorphological units or major relief features: the plains, the highlands and the troughs & river valley (FDALR, 1990). Modern aggradational land surfaces extend to the West Coast of Nigeria, and are composed of sedimentary rocks, which are largely sandstones, shales and clays of Cretaceous and Tertiary ages. The proposed project site lies within the plain with characteristic very gently undulating topography (0-2% slope), presenting an area with low potential for soil erosion and subsidence hazards.

Soil Quality in the Project Area

Within and around the proposed project area, the main physiographic unit recognised by FDALR (1990) is the nearly level coastal plains generally with 0-2% slopes. The maximum elevation is about 2 metres above mean sea level (msl). Soils on this geomorphic unit, around the project area, are basically the same (see NPA-EER Report, 2002; DNL-EIA Report, 2005, ICUBES-EIA Report, 2011 and AITEO-EIA report, 2014), and are derived from alluvium of fine littoral and lagoon sediments. Summary data of the characteristics of soils from the study area are presented in **Tables 4.17a&b**. The high sulphate content of the soils is probably due to the coastal nature while the aliphatic and aromatic petroleum hydrocarbon contents of the soils are most likely due to anthropogenic sources. This is because the project area is one of the public transport hubs in Lagos hence the presence of petroleum hydrocarbon in detectable amount in soils of the area.

Soils within and around the project area are very deep and poorly drained. They have dark gray, sandy clay loam to sandy clay surface over light brownish gray to light gray, sandy clay loam to sandy clay subsoils. In the topsoil, the soil reaction ranges from extremely acid to very strongly acid (pH 4.1 - 4.5). The soils are classified as Typic Tropaquent (USDA) and/or Drystic Fluvisol (FAO/UNESCO)

meaning recently formed, low fertility, acidic tropical soils with high ground water table.

Table 4.17a: Summary of the characteristics of the topsoil (0-15cm) within and around the project site

Soil Parameter	Sampling Locations			
	Project Area		Control Area	
	RS	DS	RS	DS
Texture	SCL	SCL	SC	SCL
pH	4.8	4.2	4.1	3.8
SO_4^{2-} (mg/kg)	2194.0	2035	2214.13	711
Total-P (mg/kg)	251.62	296	255.13	762
Total-N (%)	0.04	0.1	0.31	0.26
TOC (%)	1.5	1.4	3.2	3.0
Aliphatic petroleum (mg/kg)	2.085	6.270	5.795	2.594
Aromatic petroleum hydrocarbon (mg/kg)	7.956	2.464	3.487	2.015
Total petroleum hydrocarbon (mg/kg)	10.041	8.734	9.282	4.609

RS=rainy season; DS=dry season; Sc=sandy clay; SCL=sandy clay loam

Sources: NPA-EER Report (2002); DNL-EIA Report (2005), ICUBES-EIA (2011) and AITEO-EIA, (2013)

Table 4.17b: Summary of characteristics of the subsoil (15-30cm) within and around the project site

Soil Parameter	Project Area		Control Area	
	RS	DS	RS	DS
Texture	SC	SCL	SC	SCL
pH	4.5	4.7	4.5	3.5
SO_4^{2-} (mg/kg)	3210.8	229	2817.2	942
Total-P (mg/kg)	169.29	350	317.55	590
Total-N (%)	0.14	0.03	-	0.06
TOC (%)	0.9	0.6	5.5	3.3
Aliphatic petroleum (mg/kg)	7.747	4.72	3.197	6.12
Aromatic petroleum hydrocarbon (mg/kg)	0.491	2.91	2.551	4.35
Total petroleum hydrocarbon (mg/kg)	8.238	7.63	5.748	10.47

RS=rainy season; Ds=dry season; Sc=sandy clay; SCL=sandy clay loam

Sources: NPA-EER Report (2002); DNL-EIA Report (2005); ICUBES-EIA Report (2011) and AITEO-EIA, (2014)

Heavy Metal Content of the Soils

Results of the heavy metal content (mg/kg) of the soils from the various recent studies within and around the project area are indicated in **Table 4.18**. The concentrations of the various heavy metals reported were generally within the normal range in soils reported for different countries of the world as in Alloway (1991). The

concentrations of heavy metals that were investigated were all below the critical levels specified for unpolluted soils (Alloway, 1991). The implication of this is that as at the various times of the studies which reports were reviewed, the soils within the proposed project site showed no evidence of heavy metal pollution. The situation is expected to remain the same as at today because there has been no report of contamination and or pollution in the study area up to the time of this report.

Table 4.18: Heavy Metal Content (mg/kg) of Soils within and around the Project Area

Parameter	Concentration (ranges)	Average concentration values
Cd	0.01- 0.05	0.02
Cr	0.21- 2.12	0.32
Cu	3.70- 12.44	9.30
Ni	1.49-13.0	5.00
Pb	0.58-15.9	4.71
Zn	9.06 – 23.7	17.1
Fe	1780- 9,122	2,399

Sources: NPA-EER Report (2002); DNL-EIA Report (2005), ICUBES-EIA (2011) and AITEO-EIA, (2014)

Soil Microbiology

Table 4.19 shows the various species of microorganisms isolated from the soil samples collected from within and around the proposed project site at various times of study (NPA-EER Report, 2002; DNL-EIA Report, 2005, ICUBES-EIA, 2011 and AITEO-EIA report, 2014*).* A total of 13 bacterial species and 11 fungal species were isolated from the soil samples. *Klebsiella pneumoniae, Pseudomonas aeruginosa and Bacillus spp,* had the highest frequency of occurrence among the bacteria with percentage frequencies of 71.4, 71.4 and 42.9 respectively. *Aspergillus niger* had the highest percentage frequency of occurrence among the fungi with a percentage of 42.9.

Table 4.19: Microbial Species Isolated from Soil Samples within and around the project location and their percentage Frequencies

BACTERIA	% FREQUENCY	FUNGI	% FREQUENCY
Achromobacterium spp	**21.4**	***Aspergillus flavus***	**21.4**
Bacillus spp	**42.9**	***Aspergillus glaucus***	**28.6**
Bacillus cerus	**35.7**	***Aspergillus niger***	**42.9**
Desulfovibrio halophicus	**35.7**	***Cladosporium herbarium***	**7.1**
Enterobacter agglomerance	**21.4**	***Microsporium audoiunii***	**21.4**
Klebsiella edwardsii	**50**	***Mucur mucedo***	**14.3**
Klebsiella pneumoniae	**71.4**	***Penicillium camemberti***	**7.1**
Proteus mirabilis	**7.1**	***Rhizopus japanicus***	**7.1**

Proteus morganella	**21.4**	***Rhizopus oryzae***	**14.3**
Proteus rottgeri	**14.3**	***Rhodotorula spp.***	**35.7**
Pseudomonas aeruginosa	**71.4**	***Trichoderma spp***	**42.9**
Psuedomonas cepacia	**21.4**		
Pseudomonas pseudomallei	**21.4**		

Sources: NPA-EER Report (2002); DNL-EIA Report (2005), ICUBES-EIA (2011) and AITEO-EIA, (2014)

The populations of bacteria and fungi isolated from soil samples collected from within and around the project area during different recent studies as earlier indicated are presented in **Table 4.20**. Generally, the THB and THF counts ranged from 12 x 10^5 cfu/g to 280 x 10^5 cfu/g and 0.0013 x 10^5 cfu/g to 0.68 x 10^5 cfu/g respectively while the mean THB and THF were 61 x 10^5 cfu/g and 0.22 x 10^5 cfu/g respectively. Hydrocarbon utilizing bacteria ranged from 0.018 x 10^5 cfu/g to 3.07 x 10□ cfu/g while Hydrocarbon utilizing fungi ranged from 0.00 cfu/g to 0.008 x 10^5 cfu/g in the soils. From the microbial population distribution, there is no evidence of hydrocarbon contamination and or pollution in the project area as observed from the data reported in the various recent studies within and around the project location.

Table 4.20: Statistical summary of microbial properties of soils from within and around the project site

Stat	THB (cfu/g) x 10^5	HUB (cfu/g) x 10^5	HUB %	Total Coliforms (cells/g) x 10^5	THF (cfu/g) x 10^5	HUF (cfu/g) x 10^5	HUF %
Min	12	0.0005	0	0	0.0013	0	0
Max	280	3.07	2.56	0.038	0.68	0.008	1.43
Mean	61	0.41	0.33	0.0029	0.22	0.0006	0.102
S.d.	69.7	0.85	0.73	0.01	0.23	0.002	0.38

4.3.5 Wildlife and Endangered species

It should be noted that areas within and around the project location are all built-up part of Lagos State. Therefore, the commonest wildlife expected is birds and the reptiles. Various birds have been reportedly present in the project location and indeed Lagos, and these include aquatic species such as kingfishers, egrets; and garden and forest species such as the doves and weaverbirds. Their number and variety suggests that the avian population of the area and indeed Lagos is very rich. **Table 4.21** presents a list of birds noted to occur in Lagos area.

Table 4.21: Birds Commonly Reported for Lagos Area

Common Name	Biological Name
Little Egret (white phase)	***Egretta garzetta***
Grey Heron	***Ardea cinerea***
Green-backed Heron	***Butorides striatus***
Hammerkop	***Scopus umbretta***
Crowned Hawk Eagle	***Stephanoaet-us coronatus***
Senegalese Coucal	***Centropus senegalensis***
Palm-nut Vulture	***Gypohierax angolensis***

Black Kite	***Milvus migrans***
Red-eyed Dove	***Streptopelia semitorquata***
Vinaceous dove	***Streptopelia vinacea***
Senegal Kingfisher	***Halcyon senegalensis***
Pied Kingfisher	***Ceryle rudis***
Square-tailed Rough-winged Swallow	***Psalidoprocne nitens***
Plain-backed Pipit	***Anthus leucophyrs***
Carmelite Sunbird	***Nectarinia fuliginosa***
Olive-bellied Sunbird	***Nectarinia chloropygia***
Common Bulbul	***Pycnonotus barbaetus***
Francolin (bush fowl)	***Francolinus bicalcaratus***
Grey-headed Sparrow	***Passer griseus***
Village Weaver	***Ploceus cucculatus***

The reptilian fauna reported for Lagos area consists of tortoise, crocodiles, snakes and lizards (**Table 4.22**). Dangerous snakes found in the area include pythons, mambas and spitting cobras. In view of the complete built-up of the project area and its environ, endangered, extinct and threathened wildlife species could not be readily identified.

Table 4.22: Reptiles and Amphibians reported to be present in Lagos Area

Biological Name	Common Name	Status
Trionyx triunguis	**African Soft-shelled Turtle**	**Uncommon**
Kinixys erosa	**Serrate Hinge-backed Tortoise**	**Common**
Varanus niloticus	**Nile Monitor Lizard ("Iguana")**	**"**
Python sebae	**African Python**	**"**
Dasypeltis fasciata	**Egg-eating Snake**	**Common**
Dendroaspis jamesoni	**Green Mamba**	**Common**
Naja nigricollis	**Spitting Cobra**	**"**
Chameleo gracilis	**Common Chameleon**	**Common**
Dicroglossus occipitalis	**Bullfrog ("Jumping Chicken")**	**"**

4.3.6 Temporal Traffic Study

The importance of traffic study and planning cannot be over-emphasized for economic activities particularly in industrial and populous cities such as Lagos state.

The Oshodi interchange (Loop) is a conglomeration of traffic in the metropolitan Lagos; it connects and links traffic from various sections of Lagos State to another. The traffic survey locations were strategically chosen to capture estimate vehicular flow/volume along a particular direction. As Shown in the **Figure 4.37,** the traffic study adopted hourly vehicular flow from four directions- Gbagada – Oworonshoki traffic, Isolo-Mile 2 - Apapa Traffic, Agege – Isolo Traffic Bound, and Mushin Traffic bounds. In order to obtain a good representative of the traffic volume characteristics, continuous hourly data on morning and evening vehicular movements were collected during the weekdays and weekends. All automobile types were captured in the survey material; these automobile types are cars - including the Sport Utility Vehicles (SUV), Buses - Mini and Long Buses, Trucks - Mini and heavy trucks, motorcycles, and Tricycles.

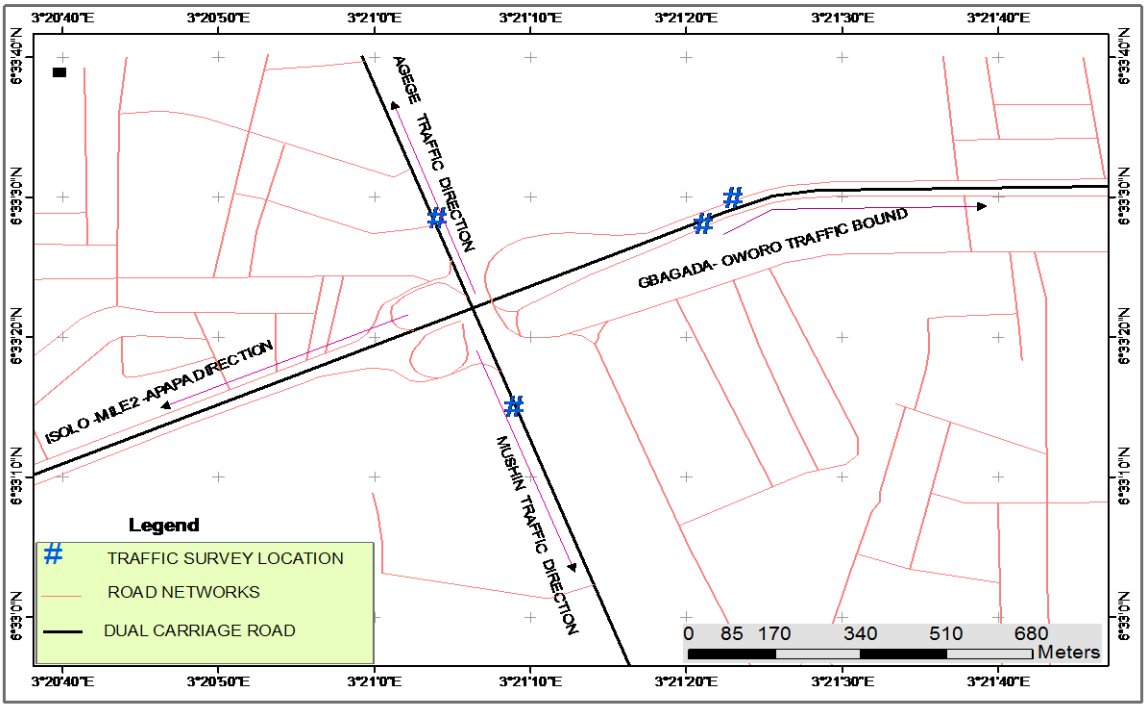


Figure 4.37: Road Networks around Oshodi Loop and Traffic Survey Location

Plate 4.3: Aerial View of Oshodi Traffics

Hourly Traffic Flow Analysis

As show in the **Figure 4.38 - 4.41** between the four directions of the traffic flow, Isolo-Mile 2-Apapa traffic bound records the highest number of car movements with about 4320 cars flow within an hour (8am-9am). Within this hour, there was no significant difference between Car flow towards Mushin and Gbagada- Oworonshoki traffic bound, while the lowest car (1100 cars) flow was recorded on Isolo-Agege traffic bound. Rank next to the number of cars is bus; highest number of buses was recorded on traffic towards Mushin axis while the lowest was recorded along Gbagada – Oworonshoki direction. Mile 2 - Apapa traffic had the highest frequency of trucks movement while no tricycle was recorded on all directions between the hours of 8am and 9am.

Gbagada –Oworonshoki Direction

Based on vehicular category, car is the most frequent vehicles in all direction of movements. On the average about 2,604 cars move along Oworonshoki-Gbagada traffic direction in the morning hours every day while it is about 2,558 cars in the evening hours. It was observed from the survey that Tricycle locally known and *Keke-Marwa* is not common along the route. .Average total vehicular movements recorded along Gbagada direction was 4,022 and 3,955 in the morning and evening hours respectively. This shows that there is no significant difference between the morning and the evening traffic along the axis.

Mushin Traffic Bound

Unlike the Gbagada - Oworonsoki traffic flow, there was a significant difference between morning and evening traffic flow. An average of 1,666 cars move towards Mushin within 60 minutes in the morning hours while it is about 4236 in the evening hours. The highest number of Motorcycles was recorded along Mushin traffic direction with an average of 179 and 196 in one hour in morning and evening period respectively.

Agege-Ikeja -Iyana Ipaja Traffic Bound

As shown in the **Table 4.23** there are more buses than cars recorded along Agege-Ikeja and Iyana Isolo direction at morning and evening hours. On the total of all automobile types, traffic along this direction was the lowest with an average of 2,955 and 4,015 within one hour in the morning and evening periods respectively.

Table 4.23: Traffic Characteristics in the Morning and evening Periods within and Around the Project Location

		Average Automobile/Hour					Total
		Automobile Category					
Traffic Direction	Period of the Day	Cars/SUVs	Buses	Trucks	Motorcycle	Tricycle	
Gbagada-Oworonshoki Traffic Bound	Morning Hour	2604	1174	158	84	2	**4022**
	Afternoon/Evening Hour	2558	1112	207	78	0	**3955**

Mushin Traffic Bound	Morning Hour	1666	1768	96	179	0	**3907**
	Afternoon/Evening Hour	4236	1716	118	196	0	**6266**
Agege-Ikeja -Iyana Ipaja Traffic Bound	Morning Hour	1360	1390	109	96	0	**2955**
	Afternoon/Evening Hour	1794	1975	130	116		**4015**
Isolo-Mile2 -Apapa Traffic Bound	Morning Hour	4323	769	234	77	2	**5405**
	Afternoon/Evening Hour	4827	698	219	76		**5820**

Summary

Generally, the traffic volume is high in all the four directions surveyed. However, Isolo-Mile2-Apapa has the highest traffic volume from morning till evening hours. Trucks are also more frequent along the Mile2-Apapa and Gbagada –Oworonshoki directions. This is expected as this is the route that connects the Lagos Apapa sea port where goods are imported into and exported out of Nigeria. The traffic was observed to be free flow for most of the days; however, it tends to build up in the evening hours in all directions particularly between 16.00hrs (4pm) and 18.00hrs (6pm).

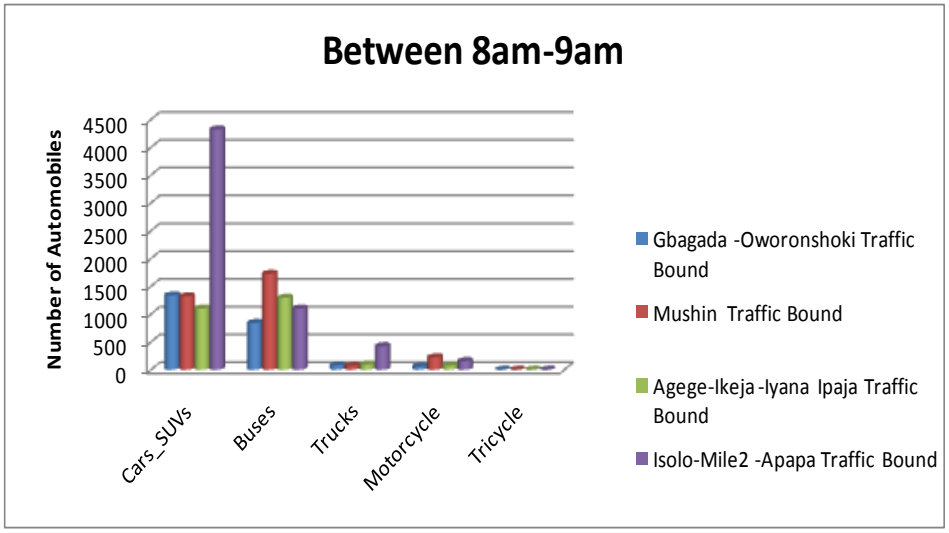


Figure 4.38: Traffic Characteristics between the hours of 8am and 9 am

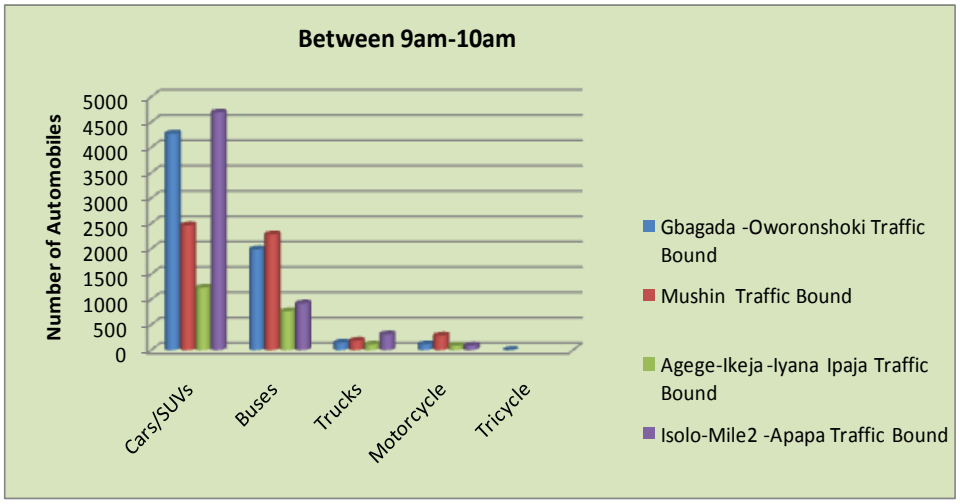


Figure 4.39: Traffic Characteristics between the hours of 9am and 10am

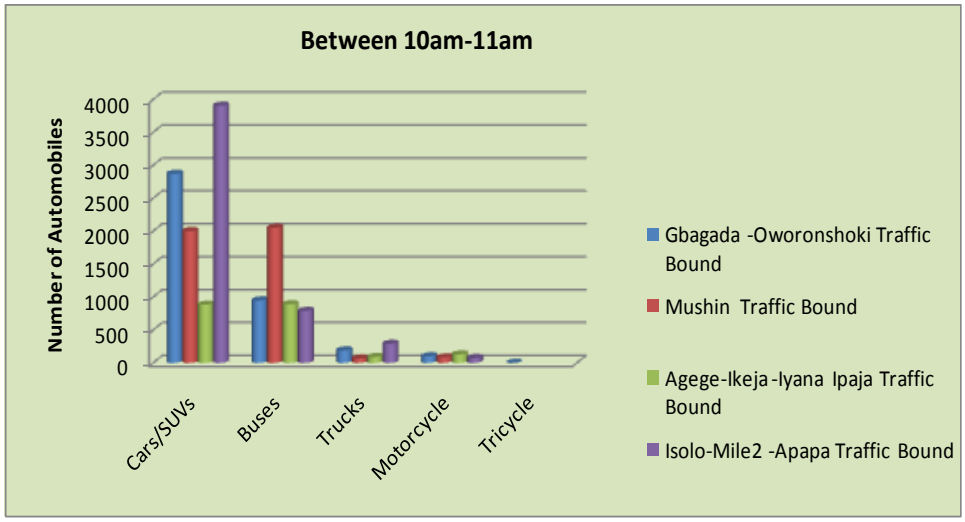
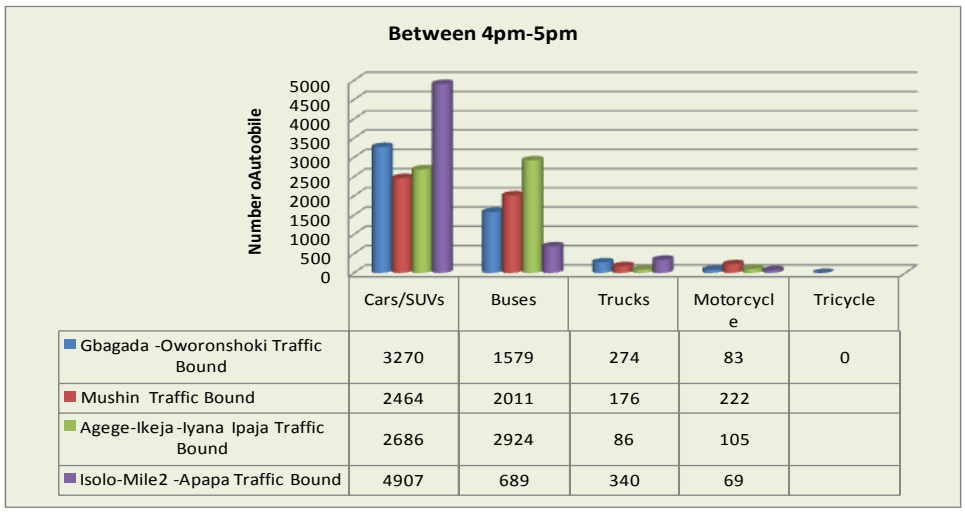


Figure 4.40: Traffic Characteristics between the hours of 3pm and 4pm



	Cars/SUVs	Buses	Trucks	Motorcycle	Tricycle
Gbagada -Oworonshoki Traffic Bound	3270	1579	274	83	0
Mushin Traffic Bound	2464	2011	176	222	
Agege-Ikeja-Iyana Ipaja Traffic Bound	2686	2924	86	105	
Isolo-Mile2 -Apapa Traffic Bound	4907	689	340	69	

Figure 4.41: Traffic Characteristics between the hours of 4pm-5pm

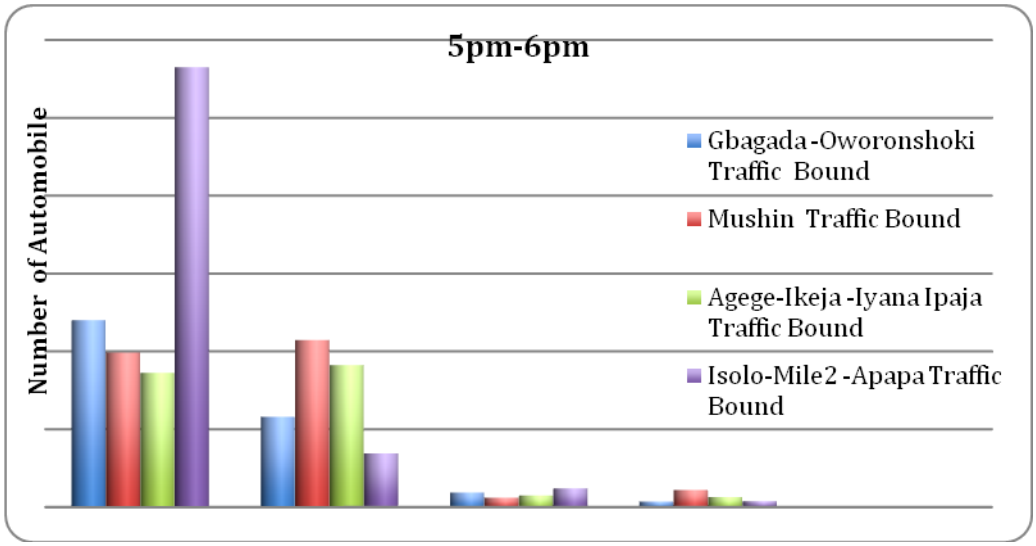


Figure 4.42: Traffic Characteristics between the hours of 5pm-6pm

4.3.7 SOCIOECONOMIC CHARACTERISTICS WITHIN AND AROUND THE PROJECT LOCATION

4.3.7.1 Identity and Sex of Household Respondents

Table 4.24 provides information about the socio-demographic backgrounds of the household respondents. The analysis shows that either the husband or the wife was interviewed in most (74.5%) of selected households, with more wives interviewed (52.9%) than husbands (21.6%). Male or female senior members of households were interviewed in one-quarter (25.5%) of the selected households. This analysis also shows that overall, more females (60.8%) than males (39.2%) were interviewed for the survey.

Socio-Demographic Characteristics of Respondents

Table 4.24: Identity of Household Respondents

Identify of Respondents	**No.**	**%**
Husband	11	21.6
Wife	27	52.9
Male Senior Member of Household	9	17.6
Female Senior Member of Household	4	7.8
Total	51	100.0
Sex of Respondents		
Male	20	39.2
Female	31	60.8
Total	51	100.0
Marital Status		
Single/Never Married/Co-habiting	12	23.6
Married	31	60.8
Separated/Widowed	8	15.6
Total	51	100.0
Educational Background		
No formal education	7	13.7
Primary school	6	11.8
Secondary school	20	39.2
Post-secondary	18	35.3
Total	51	100.0
Occupational Status		
Employed/Self-employed	35	68.6
Unemployed	3	5.9
Retired	7	13.7
Housewife	1	2.0
Student/apprentice	1	2.0
Other	4	7.8
Total	51	100.0
Religion		
Christianity	24	47.1
Islam	27	52.9
Total	51	100.0

Ages of Respondents

The ages of the household respondents ranged from 21 to 90 years, with a mean age of 43.93 years, a median of 40 years and a mode of 37 years.

Marital Status of Respondents

Majority (60.8%) of the household respondents were married, 15.6% separated or widowed, while 23.6% were single.

Educational Background

Three-quarter (74.5%) of the household respondents reported having secondary school or higher education (secondary school 39.2%; post-secondary 35.3%), while 11.8% had primary school education and 13.7% did not have any formal education.

Occupational Status

Majority of the household respondents (68.6%) employed were either working for others or for self. Business/trading was shown to be the predominant occupation among the household respondents in Oshodi (reported by 52.4% of the respondents who answered the pertinent question), followed by artisans (mechanics, welders, etc.) 11.9%. Other forms of occupation reported by the respondents (e.g. artisans, mechanics, welding, hair dressing/fashion designing, civil service, transport business, etc.) each accounted for less than 10% of the household respondents.

Religious Background

The household respondents comprised more Muslims (52.7%) than Christians (47.1%).

Table 4.25: Identity of Household Respondents

Ethnic Background of Respondents	**No.**	**%**
Yoruba	42	82.4
Igbo	5	9.8
Others (Esan West, Owan, Itsekiri and Obudu)	4	7.8
Total	51	100.0
State of Origin		
Ogun	18	35.3
Kwara	7	13.7
Lagos	5	9.8
Osun	5	9.8
Oyo	3	5.9
Delta	3	5.9
Ondo	2	3.9
Edo	2	3.9
Others (Abia, Anambra, Imo, Cross River, Ekiti and Kogi States) (one respondent each)	6	11.8

Ethnic Background and State of Origin of Household Respondents

People of Yoruba origin constituted the majority (82.4%) of the household respondents, followed by Igbos (9.8%). Other ethnic groups (including Esan, Owan, Itsekiri and Obudu) made up 7.8%. This distribution is understandable, given that the project location and study community is in the Yoruba part of the country.

Analysis of the state of origin of the household respondents showed that Ogun State had the highest representation (35.3%), followed by Kwara State (13.7%); Lagos and Osun states (9.8% each); Oyo and Delta states (5.9% each). All other states had less than 5% respondents.

Tenure of Residency in Community

The respondents said they had been living in the community for periods ranging from one year to 90 years, with a mean tenure of 20.75 years, a median of 14 years and a mode of 1 year.

Whether Respondents Planned to Continue to Live in the Community

Majority (68.6%) of the household respondents who provided an answer said they planned to continue to live in the community, while less than one-third (31.4%) said they planned to leave the community. This gives an idea of about community residential stability.

Table 4.26: Plan to Continue to Live in the Community

Plan to Continue to Live in Oshodi	Frequency	Percentage
Yes	35	68.6
No	16	31.4
Total	51	100.0

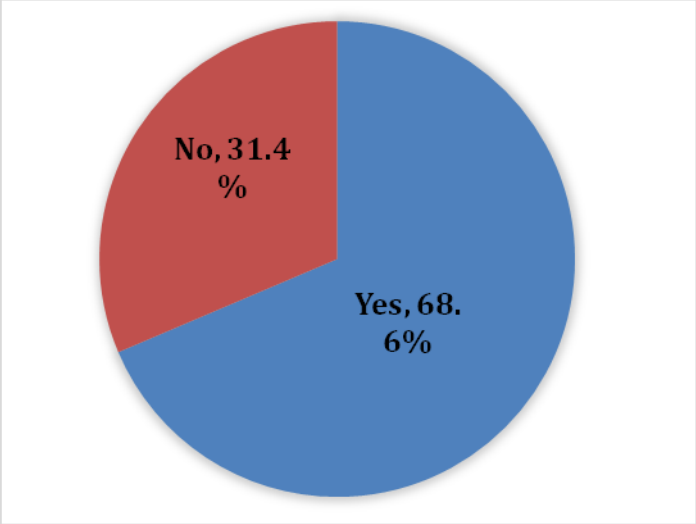


Fig. 4.43: Whether household respondents planned to continue to live in the community.

Those who planned to leave the community gave various reasons, some of which are related to the community/environment, such as bad roads, unstable/irregular power supply, and crowded house/community. Some also gave personal reasons, including plans for marriage and to travel abroad, while some attributed their plan to leave the community to the fact that their houses had been sold.

Significant Changes that have taken place in the community over the past five or more years

The household respondents who had been living in Oshodi for five or more years reported various changes, which have taken place in the community over the past five or more years. About 46% of the respondents mentioned negative changes, such as deteriorated roads, poor/declining electricity supply, demolition of houses, high community population density, increased noise and traffic, and increased insecurity. However, another 26% mentioned positive changes such as new road construction and drainages, improved security, improved environment, while some others said there had been no significant change.

Location of Business/Workplace (Individual Respondents)

About half (49%) of the individual household respondents who answered the pertinent question said their business/workplaces were located within or around Oshodi, 9.8% outside Oshodi, but within the LGA; and 17.6% outside the LGA (**Table 4.27)**.

Table 4.27: Where business/work/office is located

Where respondents' business/work/office is located	**No.**	**%**
Around Oshodi bus stop	13	25.5
Within Oshodi and its environs	12	23.5
Outside Oshodi, but within LGA	5	9.8
Outside LGA	9	17.6
Total	39	76.5
No response	12	23.5
Total	51	100.0

Household Situation and Facilities

Number of Households Living in Compounds

The number of households per compound in the study areas ranged from 1 to 22, with an average of 7 households per compound, a median of 7.86 and a mode of 6.5.

Number of Persons per Household

The number of persons per household was said to range from 1 to 10, with a mean of 5.08, a median of 4 and a mode of 4 persons per household.

Estimated Total Income of Household per month

Household monthly income was reported to range from N800 to N150, 000 per month, with an average of N40, 680.00 per month, a median of N20, 000.00 and a mode of N15, 000. With an average household density of 5.08, this is N8, 007.87 per capita. This gives an idea about the economic conditions of the households.

Type of House Respondents Lived In

The survey indicated that majority (84.3%) of the residents in Oshodi lived in rooming houses (predominantly single-room-occupancy houses) popularly called 'face-me-I-face-you', while 15.7% lived in blocks of flats.

Table 4.28: Household Situations and Facilities

Demographic Information	Frequency	Percentage
Type of house respondents lived in		
Rooming house (Face-to-Face)	43	84.3
Block of flats	8	15.7
Regularity of Public Electricity Supply in the Community		
Regular (18 hrs or more)	27	52.9
Just ok (14-17 hrs)	12	23.5
Irregular (10-13 hrs)	2	3.9
Very Irregular (6-9 hrs)	9	17.6
No response	1	2.0
Total	51	100.0
Main Source of Water Supply		
State water piped into house	2	3.9
Borehole piped into house	13	25.5
Water tanker/seller	13	25.5
Yard piped	4	7.8
Public/street stand piped	7	13.7
Others	12	23.5
Total	51	100.0
Satisfaction with Water Supply Situation		
Very satisfied(18 hours or more)	8	15.7
Satisfied(14-17 hours)	7	13.7
Just okay910-13 hours)	13	25.5
Dissatisfied(6-9 hours)	9	17.6
Very dissatisfied(less than 6 hours)	8	15.7
Total	45	88.2
No response	6	11.8
Total	51	100.0
Most common mode of solid waste disposal from household		
PSP/LAWMA and Truck pusher/private refuse collector	51	100.0
Total	51	100.0
Street lights		
Yes	5	9.8
No	43	84.3
No response	3	5.9
Total	51	100.0
Do the street lights work regularly?		

Yes	5	9.8

Source of and Regularity of Electricity Supply in Respondents' Houses
All the respondents identified PHCN as their main source of electricity supply. Further enquiry showed that a little more than half (52.9%) said electricity supply in their community was 'regular' (average of 18 or more hours per day), 23.5% said it was 'just okay' (14-17 hours per day), 3.9% said it was 'irregular' (10-13 hours per day), and 17.6% 'very irregular' (6-9 hours per day).

Sources of and Satisfaction with Water Supply Situation
The households got their water supply from various sources, including borehole piped into houses (25.5%), water tanker/water sellers (25.5%), public/street standpipe (13.7%), yard pipe (7.8%), state water piped into houses (3.9%) and other sources of water supply (23.5%). Generally, the people in Oshodi reported dissatisfaction with their water supply situation, with only 29.4% reporting satisfaction (15.7% 'very satisfied' and 13.7% 'satisfied'), while one-quarter (25.5%) said the water supply situation was 'just okay', and 33.3% were dissatisfied (17.6% 'dissatisfied' and 15.7% 'very dissatisfied').

Most common mode of solid waste disposal from household
All the households disposed of their solid waste materials through PSP/LAWMA and truck pushers (private refuse collectors).

Street lights on the street where respondents live
Streets lights were reported to be uncommon in Oshodi, with only 9.8% reporting the presence of streetlights in their areas. The five household respondents who reported the presence of streetlights on their streets also said the lights worked regularly.

Modes of Transport Used by Respondents and Members of Household

Modes of Transport used by Respondents to their offices/business places
Public transport was reported to be the most common mode of transport used by household respondents to get to their places of work/business (used by 54.9%), followed by motorbike (19.6%). Only 3.9% said they used private cars, while 5.9% simply walked to their offices/business places.

Majority (96.1%) of the household respondents said they or other members of the households used public transport, with most (80.4%) of them said to use public transport often (3-4 days a week) or very often (5 or more days a week).

Table 4.29: Modes of Transport Used by Household

Household Transport Use	Frequency	Percentage
Usual mode of transport to work place		
Private car	2	3.9

Private motorbike	10	19.6
Public transport	28	54.9
Walking	3	5.9
No response	8	15.7
Total	51	100.0
Do you or other members of your household use public transportation		
Yes	49	96.1
No response	2	3.9
Total	51	100.0
Frequency of use of Public transport		
Very often (5 or more days per week)	34	66.7
Often (3-4 days per week)	7	13.7
Not so often (1-2 days per week)	6	11.8
No response	4	7.8
Total	51	100.0

Common Economic Activities of People in the Community

Common economic activities of people in this community
Trading/business were said to be the predominant economic activities of people in Oshodi area (mentioned by 86% of the household respondents), about one-quarter also mentioned artisanship and associated activities (transporters, mechanics, okada riders, etc.).

For male youth in the community, the predominant activities were said to be artisanship, trading/business, okada riding, factory/casual work, and what some respondents simply called self-employment. A couple of other miscellaneous activities engaged in by young males in the community were also reported, including playing football, touting, and social miscreant activities.

For the female youth, the common activities were said to include trading/business, artisanship, schooling, and 'self-employment'.

Adult males in the community were said to be mainly engaged in trading/business, and community development activities, while the adult females were said to be mainly into business/trading, schooling, politics and community development activities.

Common Health Issues in the Community
In terms of health, malaria/fever was identified as the most common health issue in the community (mentioned by 70.5%). Other ailments mentioned were cholera and typhoid fever.

Table 4.30: Common Health Issues in the Community

Common Health Issues in the community	Frequency	Percent
Malaria	36	70.5
Cholera	1	2.0
Typhoid fever	1	2.0
No response/unspecified	13	25.5
Total	51	100.0

Availability of Facilities in the Community

The survey also sought to know about the availability of basic facilities in the study area. When asked about the availability of some basic facilities in the community, 94.1% each mentioned markets and police stations; followed by post office (88.2%), private hospitals (88.2%), public primary schools (86.3%), public secondary schools (82.4%), and government hospitals (72.5%). Other facilities reported by much fewer respondents, viz: recreation centres (27.5%), and fire stations (21.6%).

Table 4.31: Availability of Facilities in the Community

Availability of Facilities	Frequency	Percentage
Post office	45	88.2
Recreational centre	14	27.5
Public Primary School	44	86.3
Public Secondary School	42	82.4
Market	48	94.1
Fire station	11	21.6
Police station	48	94.1
Government hospital	37	72.5
Private hospital	45	88.2

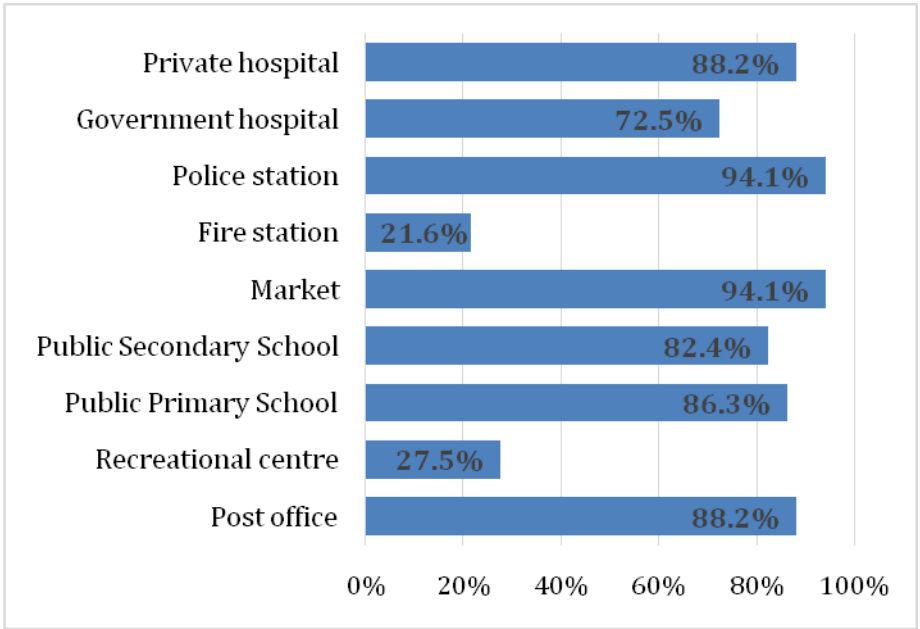


Fig. 4.44: Availability of Facilities in the Community

4.3.7.2 Socio-Demographic Characteristics of Business Operators

Altogether, 234 business operators were selected for interview in Oshodi. Three-quarter of them (75.2%) were the owners of the businesses at which they were interviewed, 21.4% were responsible staff/assistants, while others described themselves as standing in other capacities.

The ages of the business operators interviewed ranged from 18 to 86 years, with a mean of 39.3 years, a median of 38 years and two modes of 35 and 40 years. Male business operators constituted the majority (53.4%) of business operators interviewed, while females constituted 46.6%.

Table 4.32: Socio-Demographic Characteristics of Business Operators

Demographic Information	Frequency	Percentage
Identity of person interviewed		
Business owner	176	75.2
Responsible staff/assistant	50	21.4
Others	8	3.4
Sex		
Male	125	53.4
Female	109	46.6
Highest level of education		
No formal education	25	10.7
Quranic education	6	2.6
Primary education	42	17.9
Secondary education	104	44.4
Post-Secondary (non-degree)	7	3.0
Post-Secondary (degree)	48	20.5
Other	1	0.4
No response	1	0.4
Religion		
Christianity	133	56.8
Islam	95	40.6
Traditional Religion	3	1.3
Other	1	0.4
No response	2	0.9
Total	234	100.0

Majority of the business operators (68.4%) had secondary school education or higher. Only 10.7 said they did not have any form of formal education. As expected, most of the business operators belonged to the Christian (56.8%) or Muslim (40.6%) faith. All the business operators encountered for interview were Nigerians, from different ethnic groups.

Ethnic Background

The survey showed that Yoruba people predominated (61.1%), followed by Igbo (33.3%). Other groups include Edo, Hausa, Ibibio and Warri, each of which accounted for less than 5%.

Table 4.33: Ethnic Background of Respondents

Ethnic Background	Frequency	Percent
Yoruba	143	61.1
Igbo	78	33.3
Others	13	5.6
Total	234	100.0

The Key Informants interviewed also confirmed the predominance of Yoruba in the market; with most of them acknowledging that the Yoruba were in the majority among the business operators, followed by Igbo.

The business operators came from various states, including: Ogun 20.7%; Anambra, 12.4%, Osun 11.1%, Kwara 9.4%, Oyo 8.5%, Imo 8.5%, Lagos 4.7%, Enugu 4.3%, Ekiti 3.8%, Ebonyi 3.0%, Ondo 2.7%, Abia 2.1%, Delta 1.7%, Edo 1.3%, Akwa Ibom 0.9%, Kogi 0.9%, Kano 0.4%, Katsina 0.4% and Borno 0.4%. This distribution also confirms the description of Lagos in general, and Oshodi market in this particular instance, as the melting pot of Nigeria, with traders drawn from all the six geo-political zones of the country.

Tenure of Business Operation in Oshodi

The business operators said they had been operating their businesses in Oshodi for periods ranging from 1 to 48 years, with a mean of 10.79 years, a median of 9 years and a mode of 10 year.

Plan to continue to do business in Oshodi

Majority (92.3%) of the business operators interviewed said they planned to continue to operate their businesses in Oshodi.

Table 4.34: Planned to continue to do business in Oshodi

Continue to doing business in Oshodi	Frequency	Percentage
Yes	216	92.3
No	18	7.7
Total	234	100.0

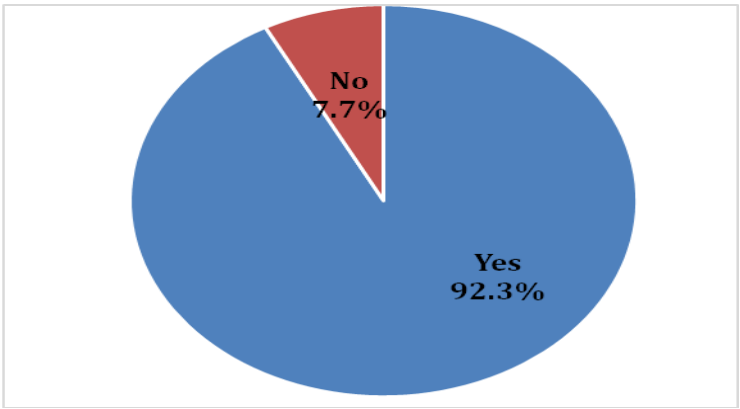


Fig. 4.45: Whether Business Operators Planned to Continue to do business in Oshodi

The business operators who said they did not want to continue to operate in Oshodi gave various reasons, including: that their shops had been demolished for the construction works, the stress of operating in Oshodi was too much, and reduction of sales and business.

Hours of Business Operation

The hours of business operation was reported to range from 5 to 24 hours, with a mean of 10.8 hours, a median of 10 hours and a mode of 10 hours. One-quarter of the business operators put in 12 or more hours per day. This gives an idea about the time and effort put in by the business operators.

Days of Business Operation

The minimum number of days that the businesses operated was 4 days, while some operators said their businesses were open seven days a week, with a mean, median and mode of 6 days a week. In more specific terms, most (95.7%) of the business operators interviewed said they operated their businesses in Oshodi 6-7 days a week (7 days a week 22.2%, six days a week 73.5%), while 1.7% operated four (4) days a week, and 2.6% operated five (5) days a week.

Incomes of Business Operators

Virtually all the business operators did not provide information about their incomes. This is not unusual in surveys of market/business operators who are often apprehensive of the possibility of information provided about their incomes/earnings/profits being used for taxation purposes, despite assurances about confidentiality, anonymity and non-relationship of the researchers with the tax office.

Categories of Business Operators and Types of Business Facilities

The survey covered various categories of business operators, including small-scale, medium scale and large-scale business, traders in various items and products, including drinks, recharge cards, clothes and wearing apparels, electronics, telephone handsets, foodstuffs, confectioneries and provision stores, restaurants, as well as motor transport operators, including motorbike operators, cab operators and bus operators.

The types of business facilities covered varied, including stores/shops 40.2%, vendor tables 18.4%, kiosk stalls 10.7%, artisan tables 3.8%, mechanic workshops 1.3%, coaster/big buses 5.1%, minibus/cab operators 6.4%, and bicycle/wheelbarrow/umbrella stalls 1.3%. Other types of facilities constituted 12.8%.

The shops/stalls were made of various materials, including cement 48.7%, plywood/wood 23.1%, iron/steel 12%, aluminium/corrugated sheets 0.9%, and other materials 6.4%.

The scale of business was assessed to range from very small (about N20,000 or less) 18.8%; through small (N20,001-N50,000) 17.1%; medium scale (N50,001-N100,000) 15.4%; large scale N100,001-N500,000 (15.4%); and very large scale N5,000,001 or more (25.4%). This analysis gives an idea about the size/scale of business operations in the project area.

The businesses reported employing various numbers of staff, with the majority (75.2%) employing 1-2 employees, and 15.8% employing 3-4 employees. Only 4.3% reported having five or more employees.
Most (54.7%) of the business premises were said to be immovable, while 37.2% were movable. This information may be useful for the assessment of compensation for business operators who may be physically displaced or economically relocated, as those with movable structures are likely to require less financial assistance.

Table 4.35: Economic Activities of Business Operators

Economic Activities		Frequency	Percentage
Type of business facility			
	Vendor table	43	18.4
	Kiosk stall	25	10.7
	Store shop	94	40.2
	Artisan table	9	3.8
	Workshop	3	1.3
	Transport (coaster/large bus)	12	5.1
	Transport (minibus/cab)	15	6.4
	Bicycle, wheel barrow, Umbrella	3	1.3
	Others	30	12.8
Type of material used for shop/stall			
	Iron/steel	28	12.0
	Plywood/wood	54	23.1
	Cement	114	48.7
	Aluminium/Corrugated sheet	2	0.9
	Others	15	6.4
	No response	21	9.0
Business Premise Movable or Immovable			
	Movable	87	37.2
	Immovable	128	54.7
	No response	19	8.1
Scale/volume of business			
	Very small (worth N20,000)	44	18.8
	Small (worth N20,100 – N50,000)	40	17.1
	Medium (worth N50,100 – N100,000)	36	15.4
	Large (worth N100,100 – N500,000)	36	15.4
	Very large (worth more than N500,000)	59	25.4
	No response	19	8.1
Number of employees			
	1-2 employees	176	75.2
	3-4 employees	37	15.8
	5-10 employees	2	0.9

	11 or more employees	8	3.4
	No response	11	4.7
	Total	234	100.0

Ownership and Allocation of shop/premise/space/structure

The shops/stalls/business premises were reported to be owned by various categories of people, with the largest proportion (41.5%) saying they were owned by individual landlords, 24.8% of the business operators said they owned the premises, 9.8% reported that the premises were owned by the Local Government Authorities, 6.4% state government, 8.5% some family members, while 3% mentioned other owners.

Table 4.36: Information about Business Premises

Who owns this shop/premise/space/structure		**Frequency**	**Percentage**
	Self	58	24.8
	Family	20	8.5
	Individual landlord	97	41.5
	Local Government	23	9.8
	State Government	14	6.4
	Others	7	3.0
	No response	15	6.4
	Total	234	100.0
Who allocated the business space			
	Family	29	12.4
	Individual landlord	105	44.9
	Local Government	32	13.7
	State Government	6	2.6
	Other	22	9.4
	No response	40	17.1

Majority of the business operators (44.9%) also said the premises were allocated to them by individual landlords/owners, 13.7% Local Government Authorities, 12.4% family members, 2.6% state government, while other respondents said they were allocated by various other categories of people.

4.3.7.3 Socio-Demographic Characteristics of In-Depth Interviewees

Identity of In-Depth Interviewees

Altogether, 25 key informants/in-depth interviewees were interviewed in Oshodi, the In-Depth Interviewees included community leaders, Christian and Muslim religious leaders, market leaders, women leaders, youth leaders and business/trade association leaders.

Males constituted about two-third (68%) of the Key Informants interviewed for the study, while females constituted about one-third (32%). This is a reflection of the

gender character of business and community leadership in the study location, and is not unusual for a patrilineal society.

Tenure of Living in Community

The in-depth interviewees said they had been living in the community for periods ranging from 2 to 50 years, with a mean of 27.52 years, and median of 15 years and a mode of 20 years. Most of the in-depth interviewees were males.

Tenure in Community Leadership Positions

The IDIs have been in their positions for periods ranging from two to forty-three years, with a mean of 9.17years, a median of 3.5 years, and a mode of two years.

Table 4.37: Identity of In-depth Interviewees

Sex of Respondents	No.	%
Male	17	68.0
Female	8	32.0
Total	25	100.0

4.3.7.4 Awareness, Attitude and Opinion about the Proposed Oshodi Transport Interchange Project

Whether Aware of the Proposed Oshodi Transport Interchange Project

When the survey was conducted, most (84.3%) of the household respondents said they were aware of the Oshodi Transport Interchange project, while only 15.7% said they were not aware of the project. Furthermore, nearly all the business operators (97.9%) said they were aware of the project, while all the Key Informants interviewed said they were aware of the project.

Table 4.38: Awareness about the Project

Awareness of Project	Individual Operators		Business Operators		In-Depth Interviewees	
	No.	%	No.	%	No.	%
Yes	43	84.3	229	97.9	25	100.0
No	8	15.7	5	2.1		
Total	51	100.0	234	100.0	25	100.0

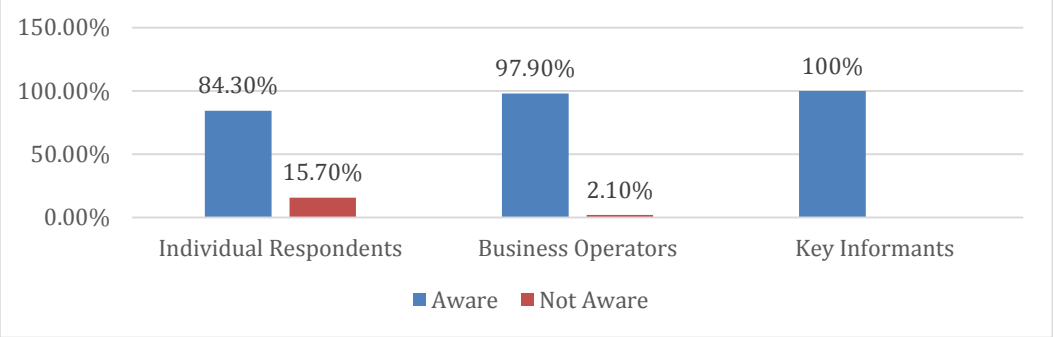


Fig. 4.46: Awareness about the Project

The respondents reported getting to know about the project through various sources, including: during demolition exercise, through banners and leaflets; construction billboards; through the media (radio and television); advertisements, and information obtained through market associations, friends and CDA officials. Some of the business operators said they got to know about the project when the actual demolition exercise commenced and the construction work started, and when the transport operators were displaced from the park. However, the Key Informants had prior notice about the project, with many saying they got to know about the project at Stakeholders Meeting, and communication to and interaction with community leaders by the government about the project as far back as 2016.

General Opinion about the Proposed Transport Interchange

The household respondents expressed various opinions about the Oshodi Transport Interchange project, with more than half making favourable comments that it is a good project, that it will enhance development, it will lead to further development of the area and the entire community, it will boost business, reduce traffic congestion, as well as reduce the number of 'agberos' and area boys and social miscreants, who were said to often cause problems in the community. However, about one-fifth of the respondents had negative opinion about the project, complaining about demolition of structures, shops, etc. Some of the FGD discussants said they were given only seven days before the demolition works started. As may be expected, there were more unfavourable opinions by the business operators than both the individual household respondents and the Key Informants. Generally, the In-Depth interviewees had more favourable opinions about the project than the individual household respondents.

Some of the respondents who had favourable opinions about the project also expressed concern about the plight of people who were displaced or whose shops and business facilities were demolished, but as some also reasoned, people would have to endure some suffering in order to enjoy the benefits. As some of them said, nothing good comes easily without some costs. They concluded by advising that the government should compensate people whose businesses and properties were affected.

Possible Effects of the Project on People and Households

The respondents thought the project could affect them in various ways, both positive and negative, although more people thought it would have more positive than negative effects. The potential positive effects that were mentioned by some of the respondents include: increased business opportunities, improved transportation systems, cheaper transportation costs and generally better life. However, about one-third of the household respondents mentioned negative effects, including demolition of own or spouse's shops and structures, displacement of people from their houses and businesses, unemployment, and increased traffic. Furthermore, some complained about loss of income, because the market was not moving like before.

Some of them also expressed concern that it was likely to lead to increases in rent and general prices, although it is debatable whether this is generally positive or negative. For instance, the landlords would probably be happy with increases in rent, while the tenants will be unhappy about the same. Generally, the respondents pleaded for compensation for people affected.

The negative effects indicated by the business operators includes complaints about the demolition of shops and business premises, displacement of traders, leading to joblessness for many people, loss of customers, loss of sources of livelihood, reduction of sales/business. However, about one-fifth said they were not going to be affected in any way by the project, while some of the respondents also said they would wait until the project is completed for them to know fully how they would be affected. Some of the business operators also looked at the project from a positive perspective, saying it is for the ultimate good of the people and the community, saying it could lead to more business in the future, improved environment, improved transportation, and reduction of traffic congestion. However, even among the traders, some (especially the petty traders) said they were not affected much, with some saying all they needed to do was to carry their wares and move to another location.

Possible Effects of the Project on the Communities

Similar opinions were expressed about the possible effects of the project on the communities. More than half (about 53%) of the household respondents mentioned positive effects including improved environment, development of the community, improved transportation system, and better roads. However, one-fifth said their community was not likely to be affected in any way or could not say how it could affect their communities, while nearly one-quarter (23.5%) mentioned negative effects, including the demolition of houses and shops, displacement of people and businesses, and indiscriminate parking of buses on the roads as a result of the demolition of the motor parks and garages. The business operators and the community leaders expressed similar opinions.

Problems that the Proposed Transport Interchange Project Could Bring to the Community

The respondents mentioned various problems that they thought the Transport Interchange Project could bring to the community, including the return of the area boys, increase in house rent, destruction of public infrastructure, demolition of houses, displacement of people (residents and traders/business people), loss of jobs for displaced traders and business people; increase in the cost of transportation, increased poverty, health hazards, community congestion as a result of the influx of more people; and increased traffic in the community.

Some of the in-depth respondents expressed concern that some of the displaced transport operators (drivers, conductors, motor garage touts, etc.) could start harassing people in the communities by taking to theft and other forms of crime as a

result of joblessness. Some also opined that it could lead to increases in air-borne diseases arising from the dust from the construction works.

Furthermore, some FGD discussants said it could compound economic/financial problems for some people, especially traders who might have taken loans for their businesses, and who may not be able to pay the loans back if they are displaced or their shops/business premises are destroyed. They also said it could lead to general price increase.

Solutions to Problems the Project could cause for the community

Various solutions were proffered by the respondents to the identified problems, including: construction of shops, adequate compensation for project affected persons, provision of alternative accommodation for people affected, and that the construction works should be completed quickly in order to minimise the effects on people. Some opined that alternative shops and houses should have been put in place before the commencement of demolition works. Some also counseled that the government should be sympathetic to the plight of the people and give development a human face.

Solutions proffered by the in-depth respondents and FGD discussants include provision of low-cost/affordable shops and houses for people displaced, employment of the transport operators in the government transport scheme, government should assist affected people to relocate to alternative places, government should pay adequate compensation for affected people, and that the government should ensure quick completion of the project in order to minimize the inconvenience for the people.

Possible effects of the project on women, children and youth

Most of the respondents thought the project would have positive effects on women and children, who they said would be able to walk safely on the streets without fear of being molested or attacked by the area boys and thieves. Some also said the transport interchange project has the potential of creating employment opportunities for women, as well as young people in general, although some also talked about the possible negative impact on women who are family breadwinners and those who are responsible for the feeding and upbringing of their children.

Benefits of the project for People and Households

Some of the benefits that the household respondents mentioned for people and households from the project include: more accessible/improved roads, improved transportation, eradication of traffic jam, increased employment opportunities, increased business, and more income, although a few of the respondents did not mention specific benefits or simply said they did not know.

For business operators and key informants, possible benefits of the project were said to include: improved/more beautiful environment and community, easier/smoother

flow of traffic, improved business, increased job opportunities, more customers, and more patronage, although some said the project would not be of any benefit to them personally, while others said they would wait until the project is completed.

Benefits to the Communities

For communities in general, the potential benefits of the project were said to include improved environment; development of the community; good roads, increased job and business opportunities, Oshodi will become a bigger market and transport centre, beautification of the environment, easier transportation system, reduction in crime and violence in the community, and removal of touts and area boys. Although some of respondents said they did not know much about the project and would rather wait until it is completed before they could talk of its benefits. Some also did not answer the question. Similar views were expressed by the FGD discussants.

Particular Groups of people who may be affected by the proposed transport interchange

When asked if there were some particular groups of people that may be affected by the transport interchange project, 80% of the respondents answered in the affirmative that some groups of people were likely to be affected by the project, while 20% said no groups of people would be affected. Similarly, majority (69.1%) of the business operators said there were some groups of people who may be affected by the proposed transport interchange project.

Table 4.39: Groups of people who may be affected by the proposed transport interchange

Are there some groups of people who may be affected by the proposed transport interchange	Household Respondents		Business Operators	
	Frequency	Percent	Frequency	Percent
Yes	40	80.0	161	69.1
No	10	20.0	72	30.9
Total	50	100.0	233	100.0
No response	1		1	

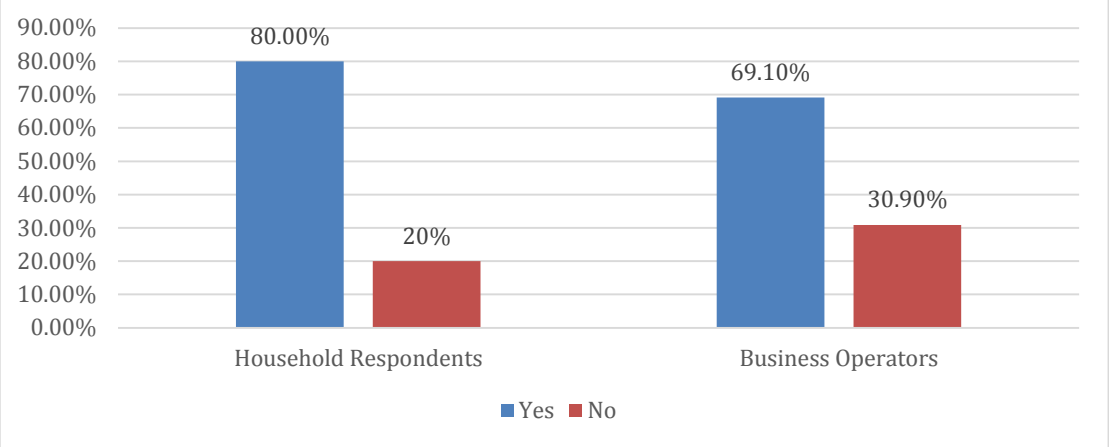


Fig. 4.47: Whether there are particular groups that may be affected by the project

When prompted, groups that were likely to be affected were mentioned by the household respondents and business operators to include: traders, landlords, community residents, transport workers, business owners and market people, small-scale and petty traders, as well as people whose houses and shops were demolished. These groups of people were believed to be vulnerable because of demolition of shops and houses, which could lead to unemployment, poverty, homelessness, rent increases, loss of income, reduction of sales ('market'), loss of properties, displacement and relocation.

4.3.7.5 Vulnerable Groups in the Community

About one-quarter of both the household respondents and business operators said there were some vulnerable or particularly disadvantaged people in the community, including the beggars, the homeless people, physically-challenged people, people with mental challenges, 'osa-nle' children (children who ran away from their homes), homeless children, area boys, the local thugs, and motor park touts. Although some respondents said all poor people were vulnerable.

The particularly vulnerable groups and people were said to be located inside and around the markets and motor parks, road sides, under the bridge, around the post office, along the railway line, and generally around Oshodi. These people were said to be vulnerable because of the possibility of being displaced and sent away from their present locations.

Table 4.40: Vulnerable Groups of People in the Community

Are there some vulnerable or particularly, disadvantaged group/groups of individuals	**Household Respondents**		**Business Operators**	
	No.	**%**	**No.**	**%**
Yes	12	23.5	64	27.4
No	27	52.9	169	72.2
Don't know	12	23.5		
No response			1	0.4
Total	51	100.0	234	100.0

Possible Conflict between the Project and People in the Community

When asked if there could be a conflict between the people of the community (residents and business operators) and the project, only two (2) household respondents (3.9%) and 13.2% of business operators said there could be conflict, while the over-whelming majority (96.1% and 86.8% respectively) did not foresee any conflict between the residents and the project.

Table 4.41: Possible Conflict between the Project and People in the Community

Do you foresee any possible conflict between the residents of this community and the project	Household Respondents		Business Operators	
	Frequency	Percent	Frequency	Percent
Yes	2	3.9	31	13.2
No	49	96.1	203	86.8

Total	51	100.0	234	100.0

Possible sources of conflict were said to revolve around problems with the displacement of people from their businesses, increases in the rent for houses and shops, increases in the cost of transportation, parking of buses on the roads, rendering some people homeless and displacing people from their businesses. Some people also complained about harassment of displaced traders who moved their businesses to the roadside by the Kick Against Indiscipline (KAI) officials and the police. The Business Operators also mentioned various ways in which the project could conflict with the business of people, including demolition of shops and business premises, displacement of people and businesses, and unemployment/loss of business opportunities. Some respondents simply heaved a sigh of resignation that there was nothing people could do, since they cannot fight the government.

Suggestions to Avoid Conflict with People

Various suggestions were made to avoid conflicts and these amongst others include construction of houses for people; relocation of people and businesses who may be affected/provision of alternative business locations; compensation for people affected, and speeding up the project for early completion in order to minimize the negative effects on people.

Fears/Concerns about the Proposed Transport Interchange Project

Overall, majority (54.9%) of the household respondents said they had no fears or concerns about the Transport Interchange Project, while less than half of them expressed some fears/concerns. Similarly, the largest proportion of business operators (46.6%) also said they had no fears/concerns about the project.

Table 4.42: Fears/Concerns about the Proposed Transport Interchange Project

Do you have any fears or concerns about the proposed transport interchange project	**Household Respondents**		**Business Operators**	
	Frequency	**Percent**	**Frequency**	**Percent**
Yes	23	45.1	96	41.0
No	28	54.9	109	46.6
No response			29	12.4
Total	51	100.0	234	100.0

Those who had concerns mentioned issues about adequate compensation for people who may be affected, increase in rent, increase in the price of goods, demolition of family houses, demolition of own shops and family members' shops, reduction of sales, loss of shops, reduced business opportunities, and loss of income. Some of the IDIs said they have heard people expressing concerns that the new shops may be allocated to government officials upon completion, while scheming out the original shop owners and traders.

Possible Resistance/Objection to the Proposed Transport Interchange Project
A high majority of the respondents (84.3% of household respondents and 90.2% of business operators) did not think there would be any resistance or objection to the project, while only 13.7% and 9.4% respectively thought there could be some objection/resistance.

Table 4.43: Possible Resistance/Objection to the Proposed Transport Interchange Project

Do you think there could be some resistance/objections by the people to the proposed transport interchange project	Household Respondents		Business Operators	
	Frequency	Percent	Frequency	Percent
Yes	7	13.7	22	9.4
No	43	84.3	211	90.2
No response	1	2.0	1	0.4
Total	51	100.0	234	100.0

Those who thought there could be resistance/objection talked about issues arising from possible increases in the rent of shops and houses, blockage of their sources of income, and non- compensation. The IDIs also said there could be opposition from people whose shops and businesses were affected, such as danfo drivers and other transporters, shop owners, and the area boys and "agberos" who may not be able to make the money they were making before. Many of the people who did not think there could be resistance or opposition reasoned that 'nobody could fight the government'.

Solutions to Possible Resistance/Opposition to the Project
The solutions for overcoming possible resistance/opposition from people to the project include suggestions that the government should dialogue with people who may object to the project, re-train the 'danfo' drivers to do other business, build alternative/affordable shops, pay compensation to people affected, create alternative places for the transporters to operate, and prevail on landlords not to increase rents arbitrarily. Some also advised that the government should fast-track and complete the project quickly, in order to reduce the time that people's businesses and livelihood will be affected. The FGD discussants also expressed similar opinions.

4.3.7.6 Probable Reaction to Possible Effects of the Transport Interchange Project

Respondents' reaction if houses or premises were to be affected by the project
If respondents' houses or business premises were to be affected by the transport interchange project, many of the respondents said they would appeal to the government for compensation, appeal for relocation, or plead for provision of alternatives. Although a few said they would be angry, while some simply resigned to fate and leave everything to God. Some said there was nothing anybody can do, because it is the government that is charge. The specific comments by some of the

respondents include: “nobody can fight the government”; “Affected people may not like it, but they should know that it is for the benefit of the people”.

While there is no doubt that people will be unhappy with the loss of their business places and houses, the positive thing here is that most of the people would seek peaceful resolution of the conflict.

What could be done to assist people to reduce the effect of the project

On what could be done to assist them to reduce the effects of the project on them and their households, some of the respondents mentioned assistance with alternative accommodation, compensation, financial assistance to build another house, construction of more low-cost houses and shops for people by the government, and ensuring that landlords do not increase rent. The business operators suggested that the government should build affordable shops, provide alternative shops, give adequate compensation, assist with relocation of affected persons, provide loans for affected persons, and hasten the completion of the project. It was also suggested that the government should provide more enlightenment about the benefits of the project.

4.3.7.7 Relocation

If their businesses were to be relocated because of the project, issues that will be of concern to the business operators include getting new shops, getting new customers, cost of relocation, and the challenges of starting their businesses all over. Some just expressed the hope that they would not be asked to relocate.

Relocation Preferences

If they were to be relocated, majority (82.4%) of the individual household respondents would prefer relocation in or near Oshodi, while 17.6% preferred relocation far away from Oshodi. Similarly, majority (81.6%) of the business operators would prefer relocation in or near Oshodi, while 7.7% preferred relocation far away from Oshodi.

The household respondents who would like to stay within or near Oshodi gave various reasons, including that: Oshodi is good for business/Oshodi is a good place, to benefit from the project, Oshodi is centrally located, and that Oshodi has a good transportation network.

Table 4.44: Preferred Relocation Place (Household Respondents)

Preferred Relocation Place	Household Respondents		Business Operators	
	Frequency	Percent	Frequency	Percent
In or near Oshodi	42	82.4%	191	81.6
Far from Oshodi	9	17.6	18	7.7
No response			25	10.7
Total	51	100.0	100.0	100.0

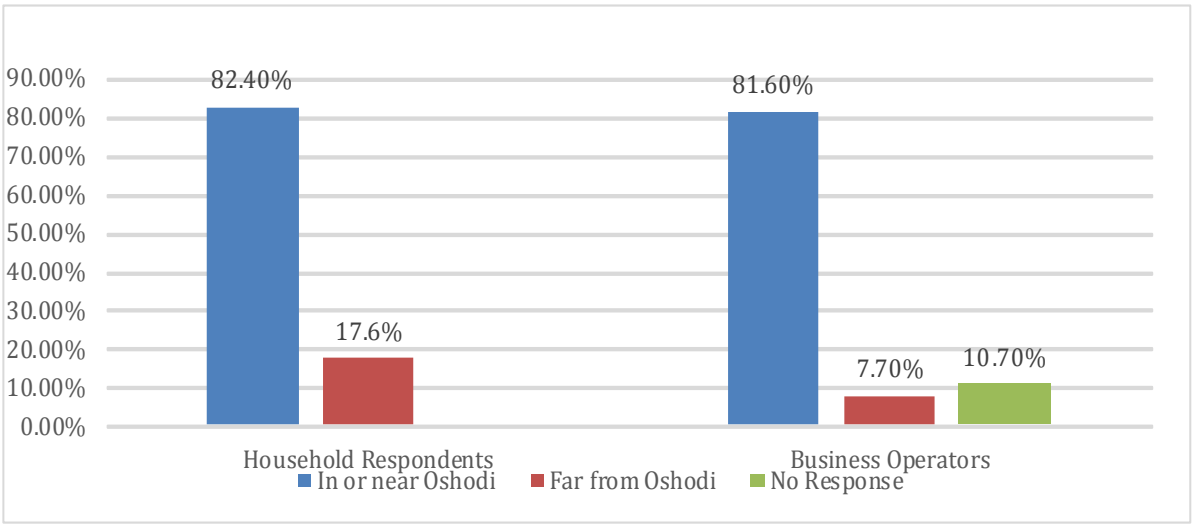


Fig. 4.48: Preferred Relocation Destination for Respondents

The household respondents who expressed a desire to be relocated far from Oshodi also gave various reasons, including the desire for a change of environment, Oshodi is congested, and insecurity in Oshodi.

The business operators also gave reasons why they would want to stay in or around Oshodi, including saying that Oshodi is good for business, Oshodi is centrally located, they have built their customers already, they want to keep their customers, and that they are just used to the Oshodi environment. Some also said they had been operating in Oshodi for a long time and could not just think of moving elsewhere.

On the other hand, the business operators who would like to relocate far from Oshodi gave various reasons, including saying that Oshodi cannot be the same again when the project is completed, while some just want a change of environment.

What can be done to reduce the effect of Relocation

In order to reduce the effects of relocation, the business operators suggested provision of affordable shops, construction of more shops, financial assistance to relocate, adequate compensation for relocation, giving loans with low interest, completing the project on time, and allowing enough time for people to relocate.

Suggested Assistance for Relocation

The business operators expressed need for government to provide alternative shops or assist them in finding alternative shops, provision of loans by the government, as well as adequate compensation for relocation, and giving enough time for them to relocate.

4.3.7.8 Socio-Cultural Artifacts in the Community

Socio-Cultural Artifacts in the Community

Some of the respondents reported the presence of some socio-cultural artifacts in Oshodi, including the Esu shrine, Igbale, Mosque, Ogun Ajobo shrine, Ojubo osa, Egungun shrine, and Isese shrine.

Table 4.45: Socio-Cultural Artifacts in the Community

Are there some socio-cultural artifacts	Household Respondents		Business Operators	
	No.	%	No.	%
Yes	15	29.4	98	41.9
No	35	68.6	108	46.2
No response	1	2.0	24	12.0
Total	51	100.0	234	100.0

A good observation in this regard is that some of the respondents said the socio-cultural artifacts can be relocated.

Plate. 4.4: Ojubo Isese Shrine in Oshodi

4.3.8 Local Organisations/Associations in Oshodi

Local organizations and associations are important for community mobilization and coordination, and can be effectively used for reaching out to various groups and categories of people in communities. Some of the respondents reported the presence of some organisations and associations in the community, with 29.4% reporting the presence of youth organisations, 49% reporting the presence of Community Development Associations (CDAs) and NGOs (7.8%).

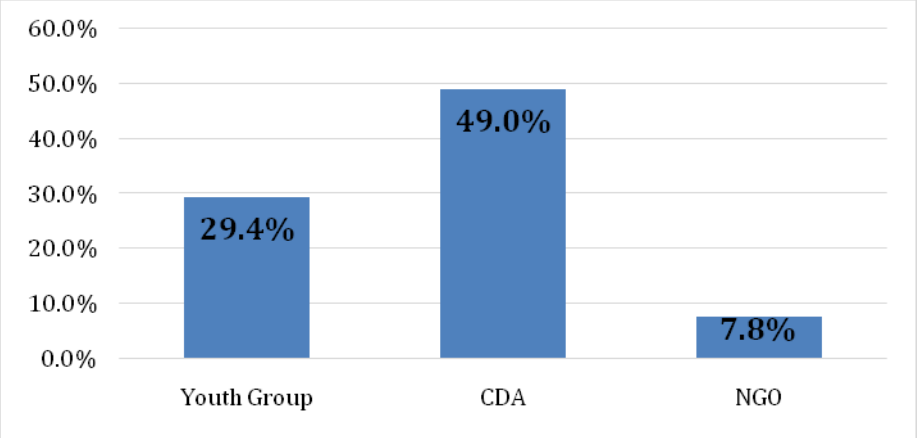


Fig. 4.49: Local Group Organisations/Associations

Table 4.46: Youth Groups in the community

Are there youth-based groups in this community	**Frequency**	**Percent**
Yes	15	29.4
No	35	68.6
No response	1	2.0
Total	51	100.0
Are there community development associations (CDA's) or residents Association(RA's) in this community	**Frequency**	**Percent**
Yes	25	49.0
No	24	47.1
No response	2	3.9
Total	51	100.0
Are there some civil society organizations/community based organizations/NGO's	**Frequency**	**Percent**
Yes	4	7.8
No	45	88.2
No response	2	3.9
Total	51	100.0

4.3.8.1 Membership of Trade Associations (Business Operators)

For traders, business owners, and workers, trade associations can also be used for mobilization purposes and for effective dissemination of information. In some situations, they can also be used for the resolution of conflicts. Surprisingly, less than one-quarter of the business operators interviewed claimed membership of trade associations. However, some male FGD discussants noted that the market is organized plaza-by-plaza, with each plaza having its own leaders. They also noted that the traders and business owners can be reached through their trade associations and plaza executives.

Table 4.47: Membership of Trade Associations (Business Operators)

Membership of Trade Association	Frequency	Percentage
Yes	56	23.9%
No	135	57.7%
No response	43	18.4%
Total	234	100.0

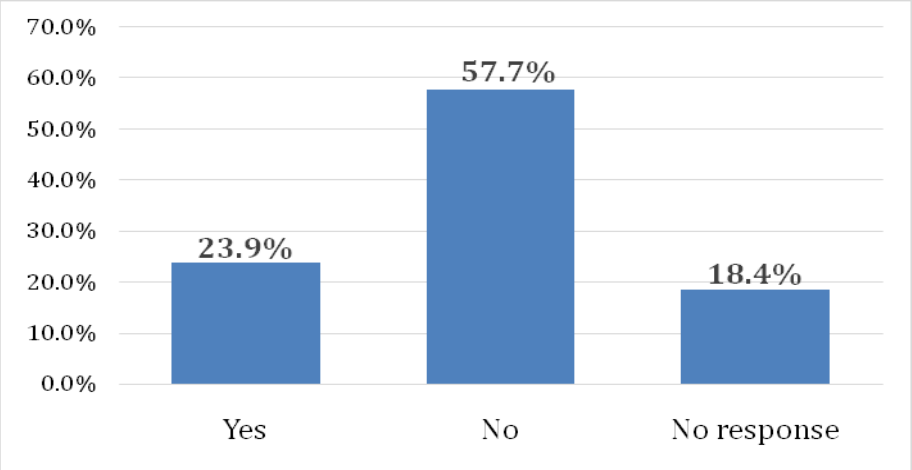


Fig. 4.50: Membership of Trade Associations

4.3.8.2 Community Structures and Arrangements

The traditional leaders in Oshodi and its environs were mentioned to include the Baale of Oshodi, Ajanaku Chieftaincy house, Oba of Odiolowo, Baale of Ilupeju, and the Agedegudu family. It was also noted that these people can also be important for dispute/conflict resolution and community mobilization. Other important personalities were mentioned to include the Iyaloja, Babaloja, Alaje General, NURTW Chairman, leaders of Trade Associations, Plaza executives, the executives of the Community Development Committee (an umbrella group for Community Development Associations in the area), as well as various Community Development Associations. Also important are the religious leaders, including the Chief Imam, the Chairman of the Christians Association of Nigeria Oshodi Branch; and the Chairman of the Pentecostal Fellowship of Nigeria Oshodi Branch.

4.3.9 STAKEHOLDER ENGAGEMENT FORUM

A Stakeholders Forum on the proposed project was organized on 18th September 2018. The purpose of the Stakeholders Forum was to present a summary of the findings of the Socio-Economic Survey (SES) to the stakeholders, highlighting the opinions expressed by the respondents interviewed during the fieldwork about the project. The presentation at the Forum was also to enable the stakeholders to react to the findings of the SEIA as presented, validating, refuting, amending or making additional comments to the findings.

It was noted that the findings of the SES would be useful in understanding the possible negative impacts of the project on people and communities, and in advising the government to take appropriate steps to avoid, minimize or ameliorate the negative impacts.

Venue

In order to enhance easy participation and attendance by the stakeholders, the Forum was held in the Chief Adegboyega Martins Hall, in the Oshodi-Isolo Local Government Secretariat, Oshodi.

Time

The Stakeholders Forum started at about 12 noon and ended at about 2:30 p.m.

Attendance

The Forum was attended by major project stakeholders, including community leadership, (Executives of the Oshodi-Isolo CDC, Executive members of the CDAs and Residents' Associations in the community); representatives of the Head of traders (Iyaloja General), other traders, transporters and business operators, residents of Oshodi and its environs, religious leaders, Vice-Chairman, Oshodi-Isolo LGA, and other officials of the LGA; representatives of the Federal Ministry of Environment, the Lagos State Ministry of Transport, Lagos State Ministry of the Environment, and Lagos State Ministry of Physical Planning, Urban and Community Development, as well as the project consultants.

Address by Government Officials

The Permanent Secretary, Ministry of Transport shed light on the Oshodi Transport Interchange Project, explaining the background to the project and the vision of the state government to develop Oshodi into a transportation hub that is comparable to the best in the world. He also noted that when completed, the project would have significantly transformed Oshodi, enhancing the environment and quality of life of the people. He also noted that the project will enhance the value of properties in the community and promises remarkable benefits for the stakeholders. The representative of the Permanent Secretary, Ministry of Physical Planning, Urban and Community Development made similar remarks.

It was noted that Oshodi is a major transport hub in Lagos State, is centrally located and that the Transport Interchange Project will lead to significant improvement in the transportation system in the state. It was noted that the project, when completed, would provide about 500,000 direct and indirect employment opportunities for people. The optimism was expressed that the benefits will out-way the negative impact it may have on some people, and that the government would make efforts to reduce the negative impacts.

Presentation of the Findings of the Socio-Economic Impact Assessment

The summary of the findings of the Socio-Economic Survey were presented by the socio-economic consultant on the project, highlighting the background to the SES and fieldwork activities, including areas, markets and locations visited, number and categories of respondents interviewed, etc. the level of awareness about the project, general opinions expressed by the respondents about the Oshodi Transport Interchange Project, perception about the potential benefits of the project, views about the possible effects of the project on people and communities, and suggestions on how negative impact could be ameliorated.

Photographs of the fieldwork process and activities, including interview process, Focus Group Discussion sessions and situation photographs of sections of the market, motorpark were also presented to the stakeholders.

Highlight of Reactions to the Report of the SES Findings and other comments

While commending the consultant for the presentation of the findings of the SES, the representative of the Federal Ministry of Environment (FMEnv) noted that dates and times that the fieldwork photographs were taken were not indicated. She also noted that the photographs could have been taken with some landmark locations and buildings in the community to further authenticate the photographs. She advised that these observations should be noted. The consultant appreciated the comments of the representative of the FMEnv and that the comment will be implemented in subsequent reports. Responding further, some of the stakeholders present affirmed that they could readily identify with and recognize the locations shown in the photographs.

The FMEnv representative also sought clarification about whether the SES was for one or two seasons, to which the consultant responded was one season.

The Vice-Chairman of Oshodi-Isolo LGA also appreciated the project and the presentation of the findings. He expressed appreciation that a big project such as the Oshodi Transport Interchange Project was being sited in his LGA. He expressed the hope that the project, when completed will help to reduce the problem of traffic congestion in Oshodi and also help to beautify the community and improve the environment. He expressed optimism that the project will bring a lot of development to Oshodi and its environs. The Vice-Chairman also expressed concern about the representation of the members of the community at the Stakeholders Forum. However, many of the participants present stood up to dispel this concern and announce their presence and the groups and associations that they represented in the community, comprising residents, CDA executives, traders and transporters, as well as religious and community leaders.

The representative of the Iya –Oloja General remarked that the market traders were happy with the project, because of the expected benefits, although she also

complained that the project has had serious adverse effects on many business owners and traders in Oshodi. She also commented that the market leaders were informed before the commencement of the project. She appealed to the government to give primary consideration to the owners of buildings and businesses that were affected by the demolition exercise in the allocation of the shops and stalls when the mall is completed. The representative of the Iya Oloja also noted that when the Resettlement Market was built, the traders who were displaced did not benefit, as the stalls were allocated to other people, noting that the Iya Oloja General and other market leaders hoped that the Oshodi Transport Interchange Project would give consideration to the interest of the existing traders. The representative also expressed hope that the government will duly compensate the traders and business owners affected. The representative also noted that the executives of the Market Association had details of all the shops that were affected in the course of the project and can make this available if necessary.

A representative of the Temidire Odi-Olowo market appealed to the government to help them to further develop the market by building more stalls there. He also asked that the stakeholders be given copies of the SES report. However, the stakeholder was informed that report, after consideration and approval by appropriate government agencies, will be returned to the LGA and will be available on display for some time for all stakeholders and other interested parties to access and review. The representative of the FMEnv also said people could still make comments and observations about the report at any time.

A representative of the ruling family in the community pleaded that the benefits of the project be extended to some adjoining communities in Ewu, Alasia, Mafoluku and Sogunle. He also appealed that the Awori people who are the indigenes/original owners of the lands in Oshodi should be compensated for their land.

The MD, Global Impact Environmental Consulting Limited appreciated the participants at the Stakeholders Engagement Forum, noting that the meeting and interaction would still be continuing and that contact will be maintained with the LGA and the community people as the work progresses.

Table 4.48: Summary of Stakeholder Engagement Participation

Stakeholder Category: Government Stakeholders	**Representation**
Federal Government	Representative, Federal Ministry of Environment
Lagos State Government	Representative, Permanent Secretary, Lagos State Ministry of Transport; Representative, Permanent Secretary, Lagos State Ministry of Physical Planning, Urban and Community Development; Representative, Permanent Secretary, Lagos State Ministry of the Environment;

Local Government	Vice-Chairman, Oshodi-Isolo Local Government Area, representing Chairman Other officials of the LGA
Community Leadership	Representatives of traditional leaders; Oshodi-Isolo Community Development Committee (CDC) executives/representatives of Oshodi-Isolo Community Development Associations (CDAs); Religious leaders (Christian and Muslim leaders)
Community Residents	Cross-section of residents of Oshodi
Traders, Transporters and Business Operators	Representative of Iya Oloja General; Cross-section of traders and business operators; artisans
Consultants	Global Impact Environmental Consulting Limited; sub-consultants and fieldwork research personnel.
Contractors	

Plate 4.5: Some Traders at the Oshodi market during Consultation (Photographed August 2016).

Plate 4.6: Part of the Project Area In Oshodi (Photographed August 2016).

Plate 4.7: Commuters and road network around the project area (Photographed August 2016)

Plate 4.8: Commercial activities around the project area

Plate 4.9: Typical Marketing Structures in Oshodi Market (Photographed August 2016)

Plate 4.10: View of the Stakeholder Engagement Held on the Proposed Project

CHAPTER FIVE
ASSOCIATED AND POTENTIAL ENVIRONMENTAL IMPACTS

5.1 Introduction

This chapter presents the associated and potential impacts of the proposed Oshodi Transport Interchange Project on the biophysical and social environment of the project location and its area of influence. The impact assessment was based on the interaction of project activities with the biophysical, social and health characteristics of the project environment. The methodology adopted involves a comprehensive and systematic evaluation of all potential positive and negative impacts associated with the proposed project. The primary goal of the impact assessment process is to identify project activities requiring impact mitigation and appropriate control measures.

The details of the impact assessment methodology, the results of impact screening, and the qualitative and quantitative impact assessment performed are discussed herein. The associated impacts are those impacts that will occur while the potential impacts are deemed the impacts that could occur during the respective phases of the proposed project. Hence, this ESIA covers the analysis of the associated and potential impacts of all project activities in the site clearing and preparation; the construction; operation and maintenance; and the decommissioning phases of the project.

5.2 Impact Assessment Methodology

The impact assessment methodology approach utilized followed a four-step approach which consists of:

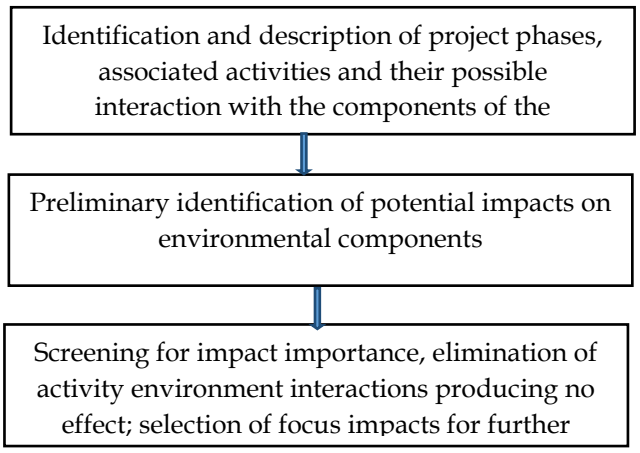
Step One:

Elaboration of baseline situation (already detailed in Chapter Four of this ESIA Report) describes the existing environmental conditions of the project area prior to implementation of the proposed Oshodi Transport Interchange project. Based on this, the impact analysis focused on all environmental and social components that are anticipated to be affected or modified by the project.

Step Two:

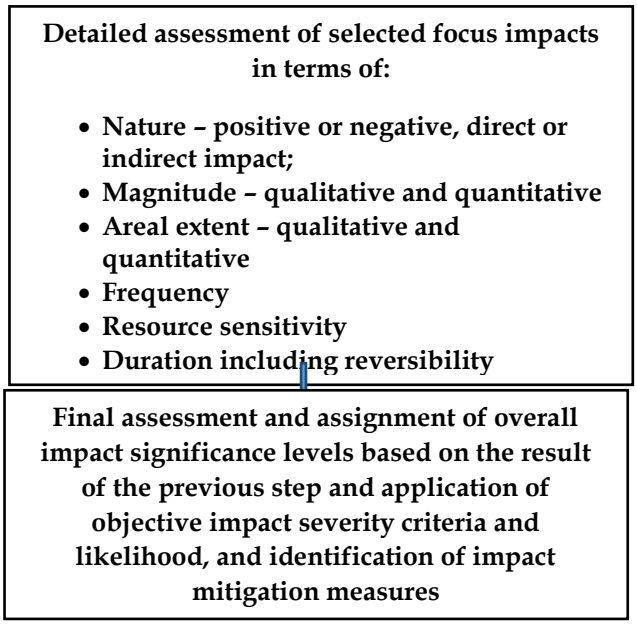
General Screening of potential impacts: The aim of the screening is to identify as exhaustively as possible, all impacts, beneficial or detrimental which can reasonably result from the project implementation. A matrix approach is utilized, crossing all the parameters of the human and natural environment with each project activity involved in the project during site clearing and preparation, construction, operation and maintenance, and decommissioning phases. The impact identification and prediction approach utilizes elements of various impact identification and prediction methods such

as checklists, matrices and flowcharts. To effectively perform these general screening of potential environmental impacts of the projects, the following approach was followed:



Step Three:

Impact Analysis and Elaboration of Corrective Measures: On the basis of the screening stage, the main impacts were analyzed, in order to quantify them, whenever possible and to elaborate specific measures to cancel, reduce or compensate the most detrimental ones. This step was performed by the following tasks:



Step Four:

On conclusion of the impact analysis, the details of the positive and negative effects of the proposed developments on the environment are outlined and appropriate solutions or mitigation measures to minimize any undesirable effects resulting from the proposed are recommended.

5.2.1 Project Activities and Affected Environmental Media

The analysis of project impacts of the Oshodi Transport Interchange project involves the identification of environmental media that could be potentially affected by all project activities in the three phases of the project viz.

1. Construction Phase;
2. Operation and Maintenance Phase; and
3. Decommissioning Phase.

For the purpose of impact identification, the respective project activities to be undertaken for each phase of the project include:

Table 5.1: Project activities at the three phases of the proposed Oshodi Transport Interchange project

S/No	Project Phase	Project Activities
1	Pre-construction Phase -Site Clearing and Preparation	➢ Mobilization and physical presence of workers and equipment to the project site ➢ Contractor's Site Clearing and Preparation, and Logistics arrangements; - General clearing and preparation of the project site for construction works; - Soil sampling and geotechnical testing; - Removal of demolition wastes/unwanted structures from the project site; - Levelling and grading of project site and access roads; - Survey and layout delineation of the project site for the 3 proposed Oshodi Transport Interchange Terminals and the other associated infrastructures; - Setting up of site work space, installation of equipment, development of construction staging and storage areas etc.; - Utilization of existing access roads to the proposed project site; - Support services for project workers.
2	Construction Phase	➢ Mobilization and transportation of heavy equipment, construction materials and physical presence of workers to the project site; ➢ Transportation and supply of water for civil works; ➢ Civil works preliminaries: setting out, pegging and foundations, construction works, excavation works; ➢ Construction of sheds for the storage of building materials, equipment lay down areas, welding workshops, mobile toilet, etc.; ➢ **Construction of Terminals 1, 2, and 3 multi-level bus park**: - Pilling works; - Steel manufacturing, fabrication and transportation; - Steel Erection; - Slab Construction; - Block work; - Mechanical and Electrical (M&E) Works;

S/No	Project Phase	Project Activities
		▪ Teflon manufacturing; ▪ Rendering, Tiling, Teflon installation, Painting and other Finishes ➢ **Construction of Terminals 1, 2, and 3 Buildings**: ▪ Piling Works; ▪ Reinforced Concrete Construction; ▪ Block work; ▪ Mechanical and Electrical (M&E) Works; ▪ Rendering, Tiling, Teflon installation, Painting and other Finishes ▪ Operation of heavy construction equipment; ▪ Fuel storage, dispensing for heavy equipment and vehicles. ➢ **Terminal 1, 2, 3 External Construction Works:** ▪ Construction of Retaining Wall; ▪ Construction of Gate House; ▪ Construction of City Bus Terminal; ▪ Construction of Skywalk; ▪ Construction of Security Post and Surveillance/Telecommunication Tower; ▪ CCTV Camera Installations; ➢ **External Infrastructure Installation and Construction Works:** ▪ Installation of Traffic Management Infrastructure; ▪ Installation of Street Lighting System;; ▪ Construction of Lanes and Lay-by ▪ Construction of Pedestrian Bridges; ▪ Rehabilitation of Bus Station; ▪ Construction and Grading of Tertiary Roads within the Terminals ▪ External Mechanical and Electrical (M&E) Installations ▪ Pavement Surfacing/Construction of Walkway; ▪ Fence Construction ▪ Drainage Channel Construction Works; ▪ Green Parks Landscaping and Horticulture Works ➢ **Ancillary Services and Works:** ▪ Waste storage, logging, and collection for disposal by Private Sector Contractors; ▪ Waste water and storm water generation and management; ▪ Sewage management; ▪ Power Generation
3	Operation Phase	➢ Operation and Maintenance of Transport Interchange Terminals and other associated facilities: ▪ Intercity and intra city transportation of passengers in and out of the 3 Terminals; ▪ Storm water, waste water and sewage generation and management; ▪ Solid waste management and environmental sanitation;

S/No	Project Phase	Project Activities
		➢ Safety and security services; ➢ Power generation and distribution; ➢ Water supply and utilization within the terminals ➢ Fuel Storage and Dispensing.
4	Decommissioning Phase	➢ Demolition of the Transport Interchange Terminals and associated infrastructures/facilities; ➢ Dismantling and Removal of demolition waste stream; and ➢ Re-habilitation of the Oshodi Transport Interchange Project Site.

To aid the impact analyses, individual project activities identified for each phase of the Transport Interchange project are discussed in relation to their interactions with various environmental components.

5.2.2 Preliminary Identification and Screening

In line with recommended impact assessment approaches (FMEnv, 1995; UNEP, 1996; Canter, 1996) the first level of impact assessment involves the preliminary identification and screening of potential environmental impacts by articulating project activity-environment interactions. This requires a thorough understanding of the project activities (project description), the project setting (the baseline environmental description), and interaction with environmental components. A modified Leopold matrix (Leopold, 1971) was used for the identification and screening. The matrix arrays project activities against environmental (biophysical, social and health) components, and supports a methodical, comprehensive, and objective identification of the impacts each project activity may have on each biophysical, social, and health component.

Impact identification was based on Wathern (1988), who defines an impact as “having both spatial and temporal components and can be described as the change in an environmental parameter over a specified period within a defined area, resulting from a particular activity compared with the situation which would have occurred had the activity not been initiated”. To further guide the identification and screening of impacts using the matrix, established environmental impact indicators or indices were developed for each of the environmental interaction categories. Impact indicators are the observable or measurable parameters of each environmental component that can be directly or indirectly linked to changes in environmental conditions. **Table 5.2** gives the specific environmental components and a description of the indicators.

Table 5.2: Environmental, Social and Health Components and Impact Indicators

Components	Impact Indicators
Biophysical	
Geology	Changes to geology, geomorphology, topography
Soil	Changes to physical and chemical properties and soil ecology
Surface Water	Changes to water quality indices, (physicochemical properties, hydrocarbons, metals and microbiology); Effluent discharge
Vegetation	Changes to vegetation population, health, species abundance and diversity and impact on endangered and economic species, etc
Wildlife	Changes to wildlife assemblages, impact on endangered and economic species
Air	Emissions of NO_x, SO_x, PM, CO, VOC, greenhouse gases (CO_2, CH_4, and N_2O), ozone and changes to ground level concentrations of pollutants
Vibration and Noise	Change in noise or vibration levels at sensitive receptors
Aesthetics	Physical presence of facilities, increased night time light
Groundwater	Contamination of shallow or deep groundwater resources, ground water table draw down due to over abstraction
Social	
Population	Changes in population indices, total population, gender ratio, age distribution
Infrastructure	Improvement or pressure on existing urban/rural infrastructure including waste handling facilities
Macro and Micro economy	Change in macro and micro economy, employment, standard of living, occupation
Social and Cultural Structure	Disruption in local authority and governance structure; change in social behaviours; intra and inter-ethnic clashes;
Physical and Economic Displacement	Permanent physical displacement from residence as a result of project land take, or activities; permanent or temporary displacement from land or water based livelihood activities; partial or whole severance from social and cultural networks
Cultural and Archaeological resources	Physical disturbance of shrines, burial grounds, archaeological resources or other desecration
Transportation	Alteration in means of transportation or ability to move efficiently
Education	Change in primary, secondary and tertiary education school enrolment and attendance
Health Determinants	
Pollution Related Health Effects	Increase in concentration of, and exposure to non-ionizing radiation, air pollutants of concern (NOx, SOx, VOC, CO, PM), contamination of surface waters and potable ground water, increased vibration and noise beyond regulatory limits, increased night time light beyond acceptable limits.
Communicable and Non Communicable Diseases	Change in incidence of communicable and non-communicable diseases or disease causing factors
Morbidity and Mortality	Change in health of workers and of general public, change in security of the area

Table 5.2: Environmental, Social and Health Components and Impact Indicators

Components	Impact Indicators
Health Care/Recreational Facilities	Changes in availability of and access to health care and recreational facilities
Psychosocial factors	Drug use/abuse, communal violence, crime, suicide, depression and prostitution; changing expectations of quality of life
Fertility	Changes to fertility levels, changes in birth rates
Accidents/Fires/Explosions	Changes to rate of occurrence and severity of accidents/fires/explosions

5.2.2.1 Modified Leopold Matrix Screening

The modified Leopold impact matrix consists of a horizontal list of biophysical, social and health-safety environmental components that could be affected by the proposed project activities versus a vertical list of project activities, which represent environmental aspects, or "sources of impact," associated with each of Oshodi Transport Interchange project phase. Environmental aspects are elements of an activity that can or will interact with the biophysical and public/worker's health-safety conditions within the area of influence. Entries in the matrix cells represent the nature and ***preliminary ranking*** of the severity of the impact. ***Ranking of the severity*** is based on the following scale and symbols:

- **Major = 2**
- **Minor = 1**
- **Negligible or No Effect: - (*a dash*)**
- **Positive:** +

For this preliminary impact assessment stage, the impacts are defined as follows:

- A **Major impact** is one that would affect a large (higher than 50%) amount of a resource and or have a relatively large footprint and persist for a long time (greater than 10 years) or is irreversible. The extent of the impact on landscape character is large in scale or magnitude as a result of the high sensitivity to change leading to a significant alteration of the integrity of the asset or natural resource. Hence, major impact is of national or regional importance and will be of long term or very severe short term, irreversible and certain or likely to occur.
- A **Minor impact** is one that could either affect a large (as defined above) or moderate (less than 50%) amount of an affected resource, has a mid to long-term effect (1 to 10 years) but is most likely reversible.
- A **Negligible impact** is one that may occur but based on experience, available scientific information and expert knowledge will have no measurable effect on the environmental component. The extent of the impact on landscape character is

barely noticeable in scale or magnitude as a result of low sensitivity to change. The impact is of local importance and will be of short-term and unlikely to occur.

- A **Positive** impact is one that adds a measurable benefit to the immediate and larger project environment including its social, cultural and health dimensions.

All number entries denote negative impacts. Cells with both positive sign (+) and numbers indicate that the specific activity and environment interaction will potentially result in both a positive and negative impact. All potential impacts, whether likely or unlikely, are also considered at this stage.

5.2.3 Detailed Assessment of Impacts

The likelihood of an impact is further assessed in the *detailed* impact evaluation. The identification and screening of impacts has relied on the following:

- Available knowledge of the project activities;
- Documented impacts of similar projects in similar environments;
- Consultation with experts; and
- Professional judgment.

Spatial boundaries of interaction were decided based on map overlays, specialist knowledge and documented experience of the specific activity-environment interaction. The preliminary identification and screening of environmental impacts resulted in a group of focus impacts (impacts ranked 1 and 2), which were further assessed in terms of severity and significance. Impact severity and significance criteria used at this next stage relied on a number of resources and tools including the following:

- Federal Ministry of Environment (FMEnv) EIA Guidelines;
- Overlaying project components on maps of existing conditions to identify potential impact areas and issues;
- Environmental Baseline Studies conducted specifically for this project;
- Consultation with Nigerian experts and residents;
- Experience from similar projects in Nigeria and worldwide;
- Discussion with design contractors and project engineers;
- Published and unpublished documents (such as *The World Bank Environmental Assessment Sourcebook*, relevant IFC Performance Standards, and other authoritative texts on performing environmental impact assessments) providing guidance on performing impact analysis for industrial development activities;
- UNEP EIA Training Resources Manual (1996); and
- European Commission Guidance on EIA/EIS Review (*European Commission, 2001*).

The impact assessment approach applied to the Oshodi Transport Interchange project also incorporates additional impact quantification steps.

5.2.3.1 Impact Severity Evaluation

During detailed assessment, five criteria were used to assess the severity of the environmental (biophysical, social, and health) impacts that were not screened out in the earlier steps (**see Table 5.3**).

The severity criteria set forth in this section are applicable to all types of impacts identified, including impacts that can be expected from the project and impacts resulting from emergencies. Several types of potential consequences (or impacts) were considered for all project stages where applicable:

- Biological and physical environment
- Social environment
- Health and Safety of the public or workers

The detailed assessment of impacts involved evaluating the potential effects of project activities on the impact indicators. Impacts were assessed as to whether they are positive (beneficial) or negative (detrimental) but only negative impacts were given detailed assessment.

PROJECT PHASES AND ACTIVITIES	BIOPHYSICAL IMPACT INDICATORS												SOCIAL IMPACT INDICATORS									
	Surface Water Quality	Groundwater Quality	Soil Quality	Vegetation	Wildlife	Air Quality	Noise and Vibration	Micro Climate	Topography \Landscape Disturbance	Geology	Aesthetics and Visual Aspect	Land use Conflict and Disturbance	Population	Infrastructure	Micro and Macro Economy	Social and Cultural Structure	Physical and Economic Displacement	Transportation	Education	Pollution Related Health Effects	Health Care and Recreation Facilities	Accident – Fire – Explosion Incidence
PRE-CONSTRUCTION PHASE: SITE CLEARING AND PREPARATION																						
Mobilization and physical presence of workers and equipment on the project site	-	-	-	-	-	-	-	-	-	-	-	1	-	1	+	-	-	1	-	-	-	1
Removal of demolition wastes from the project site	-	-	-	-	-	1	1	-	-	-	-	1	-	1	+	-	-	1	-	-	-	-
Levelling and grading of project site and access roads	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	+	-	-	-	-
Survey and layout delineation of the project site for the 3 Terminals and associated infrastructures	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Setting up of site work space, installation of equipment, development of construction staging and storage areas	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CONSTRUCTION PHASE																						
Mobilization and transportation of equipment, materials and physical presence of workers to the project site	-	-	-	-	-	1	-	-	-	-	-	1	-	1	+	-	-	1	-	-	-	-
Civil works preliminaries: Setting out, pegging, excavation and foundation construction works.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-
Construction of sheds for the storage of building materials, equipment lay down areas, welding workshops, etc.	-	-	-	-	-	-	1	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-
Piling works	-	-	-	-	-	1	2	-	-	-	-	-	-	-	+	-	-	1	-	-	-	2
Steel erection works	-	-	-	-	-	-	2	-	-	-	-	-	-	-	+	-	-	-	-	-	-	2

PROJECT PHASES AND ACTIVITIES	BIOPHYSICAL IMPACT INDICATORS												SOCIAL IMPACT INDICATORS									
	Surface Water Quality	Groundwater Quality	Soil Quality	Vegetation	Wildlife	Air Quality	Noise and Vibration	Micro Climate	Topography \Landscape Disturbance	Geology	Aesthetics and Visual Aspect	Land use Conflict and Disturbance	Population	Infrastructure	Micro and Macro Economy	Social and Cultural Structure	Physical and Economic Displacement	Transportation	Education	Pollution Related Health Effects	Health Care and Recreation Facilities	Accident – Fire – Explosion Incidence
Mechanical and Electrical Works	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	1
Operation of Heavy Equipment	-	-	-	-	-	1	2	-	-	-	-	-	-	-	+	-	-	1	-	-	-	2
Fuel Storage and Dispensing; and Hazardous Materials Handling	2	2	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
Construction of Retaining Wall, Gate House, City Bus Terminals, Skywalk, Pedestrian bride, Bus Station, Drainage Channel, fence, and Construction/Grading of Access Roads; Security Post, Surveillance and Telecommunication Tower	-	-	-	-	-	-	1	-	-	-	-	1	-	-	+	-	-	-	-	-	-	2
Installation of Traffic Management Infrastructure and CCTV Cameras	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Installation of Street Lighting System	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	-	-	-	-	-	-	-
Green Parks Landscaping and Horticulture Works	-	-	-	+	-	-		-	-	-	+	-	-	-	-	-	-	-	-	-	-	-
Waste generation, storage and collection for disposal	1	1	1	-	-	1	-	-	-	-	1	-	-	-	+	-	-	1	-	-	-	1
Waste water an Storm water generation and management	2	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sewage generation and management	2	2	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-
OPERATION PHASE																						
Interstate and intra-city transportation of passengers in and out of the three Terminals	-	-	-	-	-	1	1	-	-	-	+	-	-	-	+	-	-	+	-			2

PROJECT PHASES AND ACTIVITIES	BIOPHYSICAL IMPACT INDICATORS												SOCIAL IMPACT INDICATORS									
	Surface Water Quality	Groundwater Quality	Soil Quality	Vegetation	Wildlife	Air Quality	Noise and Vibration	Micro Climate	Topography \Landscape Disturbance	Geology	Aesthetics and Visual Aspect	Land use Conflict and Disturbance	Population	Infrastructure	Micro and Macro Economy	Social and Cultural Structure	Physical and Economic Displacement	Transportation	Education	Pollution Related Health Effects	Health Care and Recreation Facilities	Accident – Fire – Explosion Incidence
Power generation and distribution	-	-	-	-	-	2	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
Environmental Sanitation, Housekeeping and Solid waste management	2	2	2	-	-	2	-	-	1	-	1	2	-	-	-	-	-	1	-	-	-	-
Safety and security services	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
Traffic generation and management	-	-	-	-	-	1	1	-	-	-	-	-	-	-	-	-	-	2	-	-	-	2
Handling of hazardous materials and petroleum products storage and distribution	2	2	2	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
Storm water, waste water and sewage generation and management	2	2	-	-	-	2	-		-	-	-	-	-	-	-	-	-	-	-	-	-	-
DECOMMISSIONING PHASE																						
Demolition of the 3 Transport Interchange Terminals and associated infrastructures/facilities and removal of demolition wastes	-	-	-	-	-	2	2	-	2	-	2	2	-	2	2	2	2	2	-	-		2
Rehabilitation of the Oshodi Transport Interchange project site to its original landscape status	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-

5.2.3.2 Impact Severity Evaluation Criteria

Five impact severity evaluation criteria were applied in this study: Magnitude, Duration, Frequency, Areal Extent, and Sensitivity of the Receptor. Within these five criteria, impacts were also evaluated as to whether they might result in cumulative effects or indirect (secondary) effects. The overall impact evaluation considers not only the potential severity of the impact but also the likelihood of its occurrence.

The following describes the five impacts severity rating criteria:

Magnitude

Magnitude is defined as the quantitative intensity of the impact, and can be measured as the percentage of a resource or a population within the area of influence that may be affected by an impact. The definitions of "high," "medium" and "low" with respect to magnitude may vary depending upon the specific receptor. The magnitude of an impact is characterized as follows:

- High - large amount of the resource or population is affected and the consequence is easily observable and measurable effect;
- Medium - moderate amount of the resource or population is affected and has generally measurable and observable effect
- Low – small amount of the resource or population is affected; low magnitude impact may be within the range of normal variation of background conditions
- Negligible – amount of resource or population affected is unnoticeable or immeasurably small

Magnitude may also be defined with respect to quantitative or semi-quantitative criteria, if available and applicable, (e.g., level of noise as decibels). The magnitude of an impact is characterized as follows:

- High – greater than the quantitative or semi-quantitative criteria
- Medium – at the quantitative or semi-quantitative criteria
- Low – less than the quantitative or semi-quantitative criteria
- Negligible – impact not detected or at background conditions

Duration

Duration is defined as the time that is estimated for a population or resource to return to baseline conditions (i.e., before the impact). The duration is calculated from the time the impact begins, which may coincide with the start of the activity that causes the impact. The duration of an impact is characterized as follows:

- High – long-term impact (recovery would not occur within ten years)
- Medium – moderate-term impact (recovery time between one year and ten years)
- Low – short-term impact (recovery time within or less than one year)
- Negligible – impact or recovery time is very short or immediate

Characterization of the duration of an impact as low, medium, or high includes consideration of the ***degree of reversibility of the impact***. Impacts for which the duration is classified as high, as defined above, are considered irreversible impacts.

Frequency

Frequency is defined as the number of times an impact is expected to occur over the life of the project. The frequency of an impact is characterized as follows:

- High – impact will occur continuously throughout the life of the project (e.g., continuous process wastewater discharge)
- Medium – impact will occur intermittently over the life of the project (e.g., spillage of petroleum products, fire explosion and accident)
- Low - impact will occur rarely or a very limited number of times (e.g., construction impacts)

There is no "negligible" category for frequency because impacts with no frequency would not occur, and were screened out.

Extent

Areal Extent refers to the potential geographic range of an impact, and may be quantified in units of area affected (e.g., hectares). The areal extent is characterized as follows:

- High – impact has influence well beyond the project environment to the regional or even global environment
- Medium – impact limited to the general vicinity of the project site or study area
- Low – impact limited to the immediate area of the activity or occurrence
- Negligible – impact limited to a very small part of the activity area

Sensitivity

Sensitivity refers to economic, social, and/or environmental/ecological relevance of the receptor, including the intrinsic sensitivity of the resource, reliance on the receptor by people for sustenance, livelihood, cultural significance or economic activity, and to the importance of direct impacts to persons associated with the resource.

The sensitivity criterion also refers to potential impacts to Environmentally Sensitive Areas (ESAs) and impacts on species, including loss of endangered species, effects of invasive species introduction, and similar environmental/ecological impacts. The intrinsic sensitivities of a receptor species and actions that alter the function of the receptor are also considered. Sensitivity is characterized as follows:

- High – receptor is of high economic, social, and/or environmental relevance and or has an intrinsic sensitivity (including vulnerability and exposure) to the specific impact (e.g., floodplain water resources and agricultural land uses).

- Medium – receptor is of moderate economic, social, and/or environmental relevance and is not particularly vulnerable and/or exposed to the impact.
- Low – receptor is of low economic, social, and/or environmental relevance and is not vulnerable and/or exposed to the specific impact.
- Negligible – receptor is not of economic, social, and/or environmental relevance or is not sensitive to impact.

Impact Significance

The following section describes the method by which the overall impact severity rating and associated impact significance is derived.

Impact Severity Rating

To reach an overall impact severity rating for each impact assessed, the five impact severity criteria above are aggregated using impact severity matrices. Aggregation is at three levels.

First, magnitude and areal extent are combined to arrive at a rating for the Impact Quantum while duration and frequency are aggregated to give the overall Temporal Effects. Impact Quantum and Temporal Effects are then combined and their resulting aggregate assessed in terms of sensitivity to arrive at the overall impact severity. **Table 5-4, Table 5-5**, and **Table 5-6** show the aggregation process.

Impact Likelihood

To further assess the significance of the severity associated with each potential negative impact identified in the previous section, a likelihood criterion is applied to each negative impact. The likelihood criteria are used to determine whether negative impacts can be prevented or mitigated or if they are unavoidable. It should be noted that the likelihood criteria are applied to the likelihood of the impact occurring and not of the activity occurring. Thus the overall severity rating (significance) of a negative environmental impact is a function of its severity as earlier defined and the likelihood of occurrence as defined in the table. For example, a moderate impact that has a high likelihood of occurrence would be more severe than a major impact with a very low likelihood of occurrence. Assigning a significance ranking and a likelihood ranking to each impact allows for semi-quantitative evaluation of the severity of the impact. The colour coded impact severity matrix presented in (Table 5-6) illustrates the application of the impact severity and likelihood. The likelihood ranking is placed in the y-axis and the impact significance ranking in the x-axis. The colour codes are also used in the text discussing each impact assessed using this method.

Overall Impact Significance

The overall impact significance level is indicated by the position on the impact significance matrix. For example, impacts placed within the red boxes have a high likelihood of occurrence and serious consequence; thus they have a high significance rating. These high-significance impacts become high priority for further

evaluation or management action (e.g., design change or mitigation). Impacts in the yellow category are moderate impacts, with medium priority; impacts in green boxes are lower priority. Impacts identified by the white boxes indicate positive or beneficial impacts. The criteria and severity matrix set forth in this section are applicable to all the types of events and impacts identified. The criteria are summarized in **Table 5-8.**

Table 5.4: Impact Assessment of Spatial Effects

SPATIAL EFFECTS			
Magnitude	**Areal Extent**		
	Low	**Medium**	**High**
Low	Low	Medium	Medium
Medium	Low	Medium	High
High	Medium	High	High

Table 5.5: Impact Assessment of Temporal Effects

TEMPORAL EFFECTS			
Frequency	**Duration**		
	Low	**Medium**	**High**
Low	Low	Low	Medium
Medium	Low	Medium	High
High	Medium	High	High

Table 5.6: Impact Assessment of Combined Spatial and Temporal Effects

COMBINED SPATIAL AND TEMPORAL EFFECTS			
TEMPORAL EFFECTS	**SPATIAL EFFECTS**		
	Low	**Medium**	**High**
Low	Low	Low	Medium
Medium	Low	Medium	High
High	Medium	High	High

Table 5.7: Overall Impact Assessment Severity (Combined Spatial and Temporal Effects and Sensitivity)

IMPACT ASSESSMENT AND SENSITIVITY			
SENSITIVITY	**COMBINED SPATIAL AND TEMPORAL EFFECTS**		
	Low	**Medium**	**High**
Low	Minor	Minor	Moderate
Medium	Minor	Moderate	Major
High	Moderate	Major	Major

Table 5.8: Overall Impact Significance

OVERALL SIGNIFICANCE				
LIKELIHOOD	SEVERITY			
	Positive	Minor	Moderate	Major
Low	BENEFICIAL	LOW	LOW	MODERATE
Medium	BENEFICIAL	LOW	MODERATE	HIGH
High	BENEFICIAL	MODERATE	HIGH	HIGH

Table 5.9: Summary of Impact Severity

Impact Severity	SPATIAL EFFECTS		TEMPORAL EFFECTS		SENSITIVITY	LIKELIHOOD
	Magnitude	Areal Extent	Frequency	Duration	Receptor	Likelihood
High	Large amount of resource or population affected; easily measurable; or greater than the quantitative or semi-quantitative criteria	Impact to the national, regional, or global environment	Impact will occur continuously throughout the life of the project	Impact is long-term; recovery would not occur within ten years	Receptor is of high economic, social, and/or environmental relevance; has very high intrinsic sensitivity	Impact is likely to occur during normal operations (i.e., greater than 70% likelihood of occurring or has been known to result routinely, though not necessarily in all similar circumstances)
Medium	Moderate amount of resource or population affected; generally measurable or observable; or at the quantitative or semi-quantitative criteria	Impact to the general vicinity of the project site or study area	Impact will occur intermittently over the life of the project	Impact is moderate-term and recovery will occur between one year and ten years	Receptor is of moderate economic, social, and/or environmental relevance; has moderate intrinsic sensitivity	Impact could occur infrequently during construction or normal operations, but could occur more readily if safeguards and controls breakdown (i.e., between approximately 20% to 70% likelihood of occurring or impact has been known to result in similar circumstances)
Low	Small amount of resource or population affected; or less than the quantitative or semi-quantitative criteria; may be in the range of normal	Impact limited to the immediate vicinity of the activity or occurrence	Impact will rarely occur or will occur on a limited number or on occasions	Impact is short-term and recovery will occur in less than one year	Receptor is of low economic, social, and/or environmental relevance; has low intrinsic sensitivity.	Impact highly unlikely, given the controls in place (i.e., between approximately 2% to 20% likelihood of occurring or impact has been known to result, but only very rarely, in similar circumstances
Negligible	Amount of resource or population affected is unnoticeable or immeasurably small; or impact not detected or at background conditions	Impact limited to a very small part of the activity area	Impact never occurs or impact is not possible	Impact is very short term and recovery is nearly immediate	Receptor is not of economic, social, and/or environmental relevance; has no sensitivity to impact	Impact has approximately less than 2% likelihood of occurring; impact unknown to have previously occurred in similar circumstances

5.2.4 Associated and Potential Impacts

The associated (i.e., known) and potential impacts discussed in the following sections are those activity-environment interactions in the impact matrix, which were not screened out and therefore have entries as either "1", "2" or "+" in **Table 5.3**.

For ease of reference, impact identification prefixes have been assigned to each impact discussion category as follows:

- B = Beneficial Impact (+ve)
- SC = Site Clearing/Preparation Activities
- PP = Physical Presence of Workers and Equipment on Project Site
- CCW = Civil Construction Works
- PW = Piling Works
- EMW = Mechanical and Electrical Works
- OHE = Operation of Heavy Equipment
- WGHD = Wastes Generation Handling and Disposal
- SGM = Sewage Generation and Management
- OOTIT = Operation of Oshodi Transport Interchange Terminals
- ESHSWM = Environmental Sanitation, Housekeeping and Solid Waste Management
- TM = Traffic Management
- OHE = Operation of Heavy Equipment
- FSDHMH = Fuel Storage and Dispensing; and Hazardous Materials Handling
- WSWM = Waste and Storm Water Management
- SSS = Security and Surveillance Services
- DTITD = Demolition of Transport Interchange Terminals and Disposal
- ROTIT = Rehabilitation of the Oshodi Transport Interchange Terminals Site
- PG = Power Generation, Transmission and Distribution

5.3 Project Beneficial (Positive) Impacts

The proposed Oshodi Transport Interchange project will result in a number of beneficial impacts to the people of Lagos State, road commuters, Inter-state and intra-city transporters. Most benefits will be in the form of social and economic positive impacts. The positive impacts of the proposed project are discussed in this section of the ESIA report.

5.3.1 Increased Employment Opportunities for the people of Lagos State

Quite a number of workers will be employed during the one-year construction phase of the project. Local contractors, unskilled and semi-skilled workers as well as

professionals will be employed. For instance, Private Sector Participants in waste management approved by LAWMA will be engaged in the removal of demolition wastes from the project site; unskilled workers will be engaged during site clearing and preparation phase to set up the project site and equipment for construction works; the levelling and grading of access roads in and around the project site will improve accessibility and transportation in the project area among others. The proposed Transport Interchange Terminals when fully operational will immensely boost the business of the Nation Union of Road Transport Workers (NURTW) operating within Lagos and interstate across the South-western region. Hence, the project will boost the economy of local contractors and suppliers of building materials; create employment opportunity for a large number of Lagos State and national workers that shall be engaged during the one-year construction phase of the project.

5.3.2 Increase in Local Cash Flow and Macro/Micro Economy (B2)

Substantial amount of project investment financing will be done in the implementation of the proposed Oshodi Transport Interchange project. Preliminary cost estimates for the project shows that the cost of implementing the Transport Interchange Terminals 1, 2, and 3, and the other associated infrastructures is in the range of 20 billion Naira. Out of this, 50% of the total project cost will be injected into the local economy. The utilization of support services such as catering services, provisions shops, mobile phone recharge card hawkers, sales of food items, restaurant services, office stationary, accommodation, and hospitality services, cleaning services, transportation services will engender micro economic benefits and generate huge income during the implementation of the proposed project. Building materials supplies will be sourced within Lagos State, trading opportunities within Oshodi will increase as a result of influx of people especially during the construction phase of the project.

During the construction phase, business opportunities will ensue for dealers in construction water supply through water tankers; civil engineering and construction companies and workers will be exposed to immense business opportunities and macro/micro economic benefits. This will bring huge increase in cash injection and cash flow into the local economy of Lagos State right from the start of the construction phase of the project, for a period of one year, and will continue into an unprecedented boom in transportation business and micro/macro-economic benefits in the operation phase of the Oshodi Transport Interchange Terminals.

5.3.3 Increased Tax Revenue for Oshodi-Isolo LGA and Lagos State Government (B3)

The proposed Transport Interchange project will create opportunity for Lagos State Government and Oshodi-Isolo Local Government to have increased tax revenue from the proposed project. It is anticipated that new tax revenue will accrue to Lagos State

Government from the project as well as the shopping malls that will develop with the project.

5.3.4 Improvement in Infrastructures (B4)

The proposed project will initiate the construction of priority access roads, pedestrian bridges, walkways, sky-links, street lighting, installation of CCTV Cameras, surveillance systems, security/telecommunication towers and traffic management systems which will be available to the general public and thereby impact positively on social security, traffic flows and accessibility to Oshodi-Isolo environ by the people in the area. A number of commuters and road transporters will benefit from the improved roads transport interchange terminals and associated facilities. The improved interconnections in the area will enable better access to markets, sources of supplies and transportation to other parts of Lagos State and Nigeria. The improvement in roads is particularly important to the economy of Oshodi area besides its usefulness in interstate and intra-city road transportation. The people of Lagos will experience a generally better quality of life through the provision of improved electricity, increased commerce and business opportunities that will enhance the livelihood of the residents of Lagos in general.

5.3.5 Reduced pressure on existing access roads around the project site

Demand on existing Lagos – Apapa - Oshodi Expressway and Agege Motor Road – Oshodi will change with the operation of the transport interchange during the operational phase. The situation would have improved during the operation phase when the three terminals are fully functional and new roads, lanes, walkway, pedestrian bridge would have been constructed to improve the traffic flow in the area.

The proposed Oshodi Transport Interchange Terminals will serve over 5,000 buses loading daily, over 100,000 commuters boarding daily (over 40 million/year) and about 1 million pedestrians. This mega usage of transportation land use in the project area invariably will lead to sound traffic management system.

Table 5.10: Project activities and Associated Impact

Impact ID	Project Phase	Project Activity	Project Impact	Impact Category - Likelihood	Impact Significance
B1	Pre-Construction and Construction	Site Clearing and Preparation, Civil Engineering and Construction Works	Increased employment opportunities for the people of Lagos State	Positive - High	**HIGH**
B2	Pre-Construction and Construction	Site Clearing and Preparation, Civil and Construction Works	Increase in local cash flow and macro/micro-economy	Positive - High	**HIGH**
B3	Operation	Interstate and intra-city transportation of passengers in and out of the three Terminals	Increase in local cash flow and macro/micro-economy; and Increased Tax Revenue for Lagos State and Oshodi-Isolo Local Governments	Positive - High	**HIGH**
B4	Operation	Interstate and intra-city transportation of passengers in and out of the three Terminals	Improvement in road transportation and other pertinent infrastructure, business climate, and accessibility to Oshodi from different parts of Lagos and Nigeria in general	Positive - High	**HIGH**
SC1	Pre-Construction	Site Clearing and Preparation: Removal of demolition wastes from the project site for disposal	Ambient air quality deterioration and dust emissions;	Negative – Low	**LOW**
SC2	Pre-Construction	Site Clearing and Preparation: Removal of demolition wastes from the project site for disposal	Increased ambient noise level;	Negative - Low	**LOW**
SC3	Pre-Construction	Site Clearing and Pre paration: Removal of demolition wastes from the project site for disposal	Transportation land use conflicts and disruptions on existing access roads;	Negative - Low	**LOW**
PP1	Pre-Construction	Physical Presence of Workers and Equipment on Project Site	Transportation land use conflict and disruptions due to increased pressure on existing access road to the site	Negative - Low	**LOW**
PP2	Pre-Construction	Physical Presence of Workers and Equipment on Project Site	Increased pressure on support services and infrastructure around the project site	Negative – Medium	**MEDIUM**
PP3	Pre-Construction	Physical Presence of Workers and Equipment on Project Site	Incidence of accident fatalities.	Negative – Low	**LOW**
PP4	Construction	Physical Presence of Workers	Ambient air quality deterioration and	Negative –	**MEDIUM**

Impact ID	Project Phase	Project Activity	Project Impact	Impact Category - Likelihood	Impact Significance
		and Equipment on Project Site	dust emissions;	Medium	
PP5	Construction	Physical Presence of Workers and Equipment on Project Site	Transportation land use conflicts and disruptions on existing access roads;	Negative – Low	**LOW**
PP6	Construction	Physical Presence of Workers and Equipment on Project Site	Increased pressure on existing access roads, support services and infrastructure around the project site	Negative – Medium	**MEDIUM**
CCW1	Construction	Civil engineering construction works	Increase in ambient noise and vibration level	Negative – Low	**LOW**
CCW2	Construction	Construction of Retaining Wall, Gate House, City Bus Terminals, Skywalk, Pedestrian bride, Bus Station, Drainage	Land use conflicts and disruptions on existing access roads	Negative – Low	**LOW**
PW1	Construction	Pile foundation works, sheet pile and steel pile works; loading, transportation and offloading of steel piles using heavy trucks and crane.	Ambient air quality deterioration	Negative – Medium	**MEDIUM**
PW2	Construction	Transportation and offloading of steel piles, concrete piles and sheet piles using heavy trucks and crane.	Increased pressure on existing access roads, support services and infrastructure around the project site	Negative – Medium	**MEDIUM**
PW3	Construction	Channel, fence, and Construction/Grading of Access Roads; Security Post, Surveillance and Telecommunication Tower	Increase in ambient noise and vibration levels	Negative - Medium	**MEDIUM**
EMW1	Construction	Electrical and Mechanical Works in Building Construction	Incidence of electrocution, accident fatalities, injury and fire explosion	egative - Low	**LOW**
OHE1	Construction	Operation of heavy trucks, cranes, equipment such as: Bulldozer, Crane, Heavy Trailer Trucks, etc.	Ambient air quality deterioration	Negative - Low	**LOW**
OHE2	Construction	Operation of heavy trucks, cranes, equipment such as:	Increased pressure on existing access roads, support services and	Negative - Low	**LOW**

Impact ID	Project Phase	Project Activity	Project Impact	Impact Category - Likelihood	Impact Significance
		Bulldozer, Crane, Heavy Trailer Trucks, etc	infrastructure around the project site		
WGHD1	Construction	Waste Management: Waste generation, storage, collection, transportation and disposal	Surface water and groundwater contamination from indiscriminate handling and disposal of solid waste	Negative - Medium	**MEDIUM**
WGHD2	Construction	Waste Management: Waste generation, storage, collection, transportation and disposal	Depletion in soil quality from toxic and hazardous contaminants in solid waste stream generated on the project site	Negative - Low	**LOW**
WGHD3	Construction	Waste Management: Waste generation, storage, collection, transportation and disposal	Deterioration in ambient air quality from indiscriminate handling and disposal of solid waste	Negative - Low	**LOW**
WGHD4	Construction	Waste Management: Waste generation, storage, collection, transportation and disposal	Depletion in the aesthetics and visual aspect of the project site and environ from inadequate handling and disposal of solid waste	Negative - Low	**LOW**
WGHD5	Construction	Waste Management: Waste generation, storage, collection, transportation and disposal	Increased pressure on existing access roads around the project site during collection and transportation of waste from the site to LAWMA approved disposal site in Lagos	Negative - Low	**LOW**
WGHD6	Construction	Waste Management: Waste generation, storage, collection, transportation and disposal	Incidence of accident fatalities or injury during waste collection and transportation for disposal	Negative - Low	**LOW**
SGM 1	Construction	Sewage generation and management	Soil contamination with faecal coliform from poor sanitation and indiscriminate defecation within the project site	Negative - Low	**LOW**
SGM2	Construction	Sewage generation and management	Increased pressure on existing access roads around the project site	Negative - Low	
OOTIT1	Operation	Interstate and intra-city transportation of passengers in and out of the three Terminals	Ambient air quality deterioration	Negative - Low	**LOW**
OOTIT2	Operation	Interstate and intra-city transportation of passengers in	Increase in ambient noise and vibration levels	Negative - Low	**LOW**

Impact ID	Project Phase	Project Activity	Project Impact	Impact Category - Likelihood	Impact Significance
		and out of the three Terminals			
ESHSWM1	Operation	Environmental sanitation, housekeeping and solid waste management	Depletion of the sanitary condition of the urban landscape due to indiscriminate littering of solid waste	Negative - Low	**LOW**
ESHSWM2	Operation	Environmental sanitation, housekeeping and solid waste management	Depletion of the aesthetics and visual aspect of the environment around the terminals	Negative - Low	**LOW**
ESHSWM3	Operation	Environmental sanitation, housekeeping and solid waste management	Increased pressure on existing access roads around the project site	Negative - Low	**LOW**
TM1	Operation	Traffic generation and management	Deterioration of ambient air quality	Negative - Low	**LOW**
TM2	Operation	Traffic generation and management	Increase in ambient noise levels	Negative - Low	**LOW**
TM3	Operation	Traffic generation and management	Increased pressure on existing access roads around the project site	Negative - Low	**LOW**
PW4	Construction	Pile foundation works, sheet pile and steel pile works; loading, transportation and offloading of steel piles using heavy trucks and crane; and pile hammer section operations	Increase in ambient noise and vibration from crane operations offloading and standing the pile; pile hammer section operation etc.	Negative - High	**HIGH**
PW5	Construction	Pile foundation works, sheet pile and steel pile works; loading, transportation and offloading of steel piles using heavy trucks and crane; and pile hammer section operations	Incidence of accident fatalities and injury	Negative - High	**HIGH**
OHE1	Construction	Operation of heavy equipment such as; Crane, Bulldozer, Front end loaders, Trailer Trucks for loading steel piles etc	Increased ambient noise and vibrations	Negative - High	**HIGH**
FSDHMH1	Construction	Fuel Storage and Dispensing;	Contamination of surface water	Negative - High	**HIGH**

Impact ID	Project Phase	Project Activity	Project Impact	Impact Category - Likelihood	Impact Significance
		and Hazardous Materials Handling.			
FSDHMH2	Construction	Fuel Storage and Dispensing; and Hazardous Materials Handling	Contamination of groundwater resources	Negative - High	**HIGH**
FSDHMH3	Construction	Fuel Storage and Dispensing; and Hazardous Materials Handling	Soil contamination from spillage of petroleum products and hazardous materials within the project site	Negative -High	**HIGH**
FSDHMH4	Construction	Fuel Storage and Dispensing; and Hazardous Materials Handling	Accident fatalities, fire explosion and injury to human health	Negative -High	**HIGH**
CCW3	Construction	Construction of Retaining Wall, Gate House, City Bus Terminals, Skywalk, Pedestrian bride, Bus Station, Drainage Channels, etc.	Accident fatalities and injury	Negative - High	**HIGH**
WSWM1	Construction	Waste water and storm water management	Contamination of surface water	Negative - High	**HIGH**
WSWM2	Construction	Waste water and storm water management	Contamination of groundwater resources	Negative - High	**HIGH**
SGM1	Construction	Sewage generation and management	Contamination of surface water	Negative - High	**HIGH**
SGM2	Construction	Sewage generation and management	Contamination of groundwater resources	Negative - High	**HIGH**
OOTIT3	Operation	Interstate and intra-city transportation of passengers in and out of the three Terminals	Accident fatalities, fire explosion and injury to human health	Negative - High	**HIGH**
PG1	Operation	Power generation and distribution	Deterioration of ambient air quality	Negative - High	**HIGH**
PG2	Operation	Power generation and distribution	Increase in ambient noise levels	Negative - High	**HIGH**
PG3	Operation	Power generation and distribution	Accident fatalities, fire explosion and injury to human health	Negative - High	**HIGH**
ESHSWM4	Operation	Environmental sanitation,	Contamination of surface water	Negative - High	**HIGH**

Impact ID	Project Phase	Project Activity	Project Impact	Impact Category - Likelihood	Impact Significance
		housekeeping and solid waste management			
ESHSWM5	Operation	Environmental sanitation, housekeeping and solid waste management	Contamination of groundwater resources	Negative - High	**HIGH**
ESHSWM6	Operation	Environmental sanitation, housekeeping and solid waste management	Deterioration of soil quality within the project site from inadequate management of solid waste	Negative - High	**HIGH**
ESHSWM7	Operation	Environmental sanitation, housekeeping and solid waste management	Deterioration of ambient air quality	Negative - High	**HIGH**
ESHSWM8	Operation	Environmental sanitation, housekeeping and solid waste management	Land use conflict and disruption from inadequate handling and disposal of solid waste and poor housekeeping/environmental sanitation	Negative - High	**HIGH**
SSS1	Operation	Safety and security services	Incidence of accident, fire explosion, crime, terrorist attacks, Boko haram bomb attacks, murder, armed robbery, kidnapping among others.	Negative - High	**HIGH**
TM1	Operation	Traffic generation and management	Increased pressure on existing access roads around the project site	Negative - High	**HIGH**
TM2	Operation	Traffic generation and management	Accident fatalities, fire explosion and injury to human health	Negative - High	**HIGH**
FSDHMH5	Operation	Fuel Storage and Dispensing; and Hazardous Materials Handling	Contamination of surface water	Negative - High	**HIGH**
FSDHMH6	Operation	Fuel Storage and Dispensing; and Hazardous Materials Handling	Contamination of groundwater resources	Negative - High	**HIGH**
FSDHMH7	Operation	Fuel Storage and Dispensing; and Hazardous Materials Handling	Deterioration of soil quality within the project site from inadequate management of solid waste	Negative - High	**HIGH**
FSDHMH8	Operation	Fuel Storage and Dispensing;	Deterioration of ambient air quality	Negative - High	**HIGH**

Impact ID	Project Phase	Project Activity	Project Impact	Impact Category - Likelihood	Impact Significance
		and Hazardous Materials Handling			
FSDHMH9	Operation	Fuel Storage and Dispensing; and Hazardous Materials Handling	Accident fatalities, fire explosion and injury to human health	Negative - High	**HIGH**
WSWM1	Operation	Storm water, waste water and sewage generation and management	Contamination of surface water	Negative - High	**HIGH**
WSWM2	Operation	Storm water, waste water and sewage generation and management	Contamination of groundwater resources	Negative - High	**HIGH**
WSWM3	Operation	Storm water, waste water and sewage generation and management	Deterioration of ambient air quality	Negative - High	**HIGH**
DTITD1	Decommissioning	Demolition of the Transport Terminals and Disposal of the wastes	Deterioration of ambient air quality	Negative - High	**HIGH**
DTITD2	Decommissioning	Demolition of the Transport Terminals and Disposal of the wastes	Increase in ambient noise levels	Negative - High	**HIGH**
DTITD3	Decommissioning	Demolition of the Transport Terminals and Disposal of the wastes	Topographic and landscape disturbance	Negative - High	**HIGH**
DTITD4	Decommissioning	Demolition of the Transport Terminals and Disposal of the wastes	Depletion of the aesthetics of the urban landscape and destruction of the visual effects of the Transport Interchange Terminals	Negative - High	**HIGH**
DTITD5	Decommissioning	Demolition of the Transport Terminals and Disposal of the wastes	Land use conflict and disturbance	Negative - High	**HIGH**
DTITD6	Decommissioning	Demolition of the Transport Terminals and Disposal of the wastes	Gross depletion in the value of infrastructure and economic activities in the vicinity of the Terminals	Negative - High	**HIGH**
DTITD7	Decommissioning	Demolition of the Transport	Boom bust and complete loss of a	Negative - High	**HIGH**

Impact ID	Project Phase	Project Activity	Project Impact	Impact Category - Likelihood	Impact Significance
		Terminals and Disposal of the wastes	huge macro/micro-economic infrastructure in Lagos State		
DTITD8	Decommissioning	Demolition of the Transport Terminals and Disposal of the wastes	Distortion in social and cultural structure created by the presence of the Transport Interchange Terminals	Negative - High	**HIGH**
DTITD9	Decommissioning	Demolition of the Transport Terminals and Disposal of the wastes	Physical and economic displacement of the NURTW businesses and the other associated shopping malls and commercial activities in the area	Negative - High	**HIGH**
DTITD10	Decommissioning	Demolition of the Transport Terminals and Disposal of the wastes	Increased pressure on existing access roads around the project site	Negative - High	**HIGH**
DTITD11	Decommissioning	Demolition of the Transport Terminals and Disposal of the wastes	Accident fatalities, fire explosion and injury to human health	Negative - High	**HIGH**
ROTIT1	Decommissioning	Rehabilitation of the Oshodi Transport Interchange site	Green and aesthetically pleasing landscape	Positive - Low	**LOW**

5.4 Project Negative Impacts

5.4.1 Impacts Associated with Site Clearing and Preparation

Site clearing and preparation marks the beginning of implementation of the construction phase of the proposed Oshodi Transport Interchange project. The project site will be cleared of the demolition waste, levelled and graded in preparation for the construction works. The topography of the project site does not necessitate importation of additional sand filling materials to the site. The vegetal cover in the project site is virtually sparse and non-existent. Hence, the removal of vegetation from the project site will be minimal as the landscape is a major urban land use generally devoid of much vegetal cover. However, the site clearing and preparation project activities as well as the construction, operation and decommissioning phases have significant project impacts which constitutes the focus of discussion in this section of the report.

5.4.1.1 Ambient air quality deterioration and dust emissions

Project Activity: Site clearing and preparation

The removal of demolition waste from the project site could result inautomobile combustion and dust/particulate matter emissions into the ambient air during the pre-construction. Dispersion and deposition of dust and particulate matters in residential and business premises in close proximity to the project site would then ensue. However, with appropriate control measures during the loading and transportation of the demolition wastes for disposal, the emission of gaseous emissions, dust and particulate matter to the ambient air will be greatly minimized.

The impact magnitude is low since the project area is already partly demolition by the Lagos State Government. The areal extent of the impact is medium due to possible dispersion of generated dust from the site clearing activity, frequency is medium and impact duration is low, the sensitivity of the resource to the impact is medium considering the location of the project activities which is majorly urban environment, impact severity is minor impact likelihood is medium while the overall impact significance is low.

IMPACT SIGNIFICANCE	**Temporal**	**Low**	**Low**	**Low Severity**
	Areal (Spatial)	**Medium**		
	Magnitude	**Low**		
Likelihood		**Medium**		

5.4.1.2 Increased ambient noise level

Project Activity: Site clearing and preparation

The additional removal of demolition wastes from the site will involve the use of earthmovers and heavy equipment that could increase ambient noise levels. Although the area extent of this impact will be limited to the project site vicinity where the waste is being removed for disposal, the impact severity is minor and the likelihood of occurrence is low. The overall impact significance is Low.

The impact magnitude is low since the site clearing is a one-off activity, and similarly the areal extent of the impact is low since the activity is limited to the project site. However, the frequency is medium and impact duration is low, the sensitivity of the resource to the impact is medium, impact severity is minor since the project area is within a business environment where several activities increase the noise level and the effect of the activity will be cumulative therefore impact likelihood is medium while the overall impact significance is low.

IMPACT SIGNIFICANCE	**Temporal**	**Low**	**Low**	**Low Severity**
	Areal (Spatial)	**Low**		
	Magnitude	**Low**		
Likelihood		**Medium**		

5.4.1.3 Transportation land use conflict and disruptions due to increased pressure on existing access road to the project site

Project Activity: Site clearing and preparation

The site clearing and preparation project activities will inevitably cause increase in vehicular traffic and congestions especially as materials, equipment and workers will be transported to the project site. In addition, the removal of demolition wastes from the project site for disposal will exacerbate this transportation land use conflict between the site clearing and preparation activities and other commuters on the Lagos – Apapa - Oshodi Expressway and Agege Motor Road – Oshodi. This impact will be continuous throughout the duration of the pre-construction phase. These traffic disruptions will negatively affect the movement of the resident community and could affect the social, economic and livelihood of the people. This project activity need to be carried out off the peak traffic periods according to the traffic study conducted to mitigate the worsening of the traffic condition in the area.

The impact magnitude is low, the areal extent of the impact is medium since the impact will occur in the general vicinity of the project area, and equipment and materials will be transported from other parts of Lagos to the project site and this would last for the 1 year period of the construction phase up to the operation phase of the Transport Interchange Terminals. The frequency is medium and impact duration is medium since increased traffic volume could occur from site preparation through 1-year construction phase of the project into the operation phase when the three proposed transport interchange terminals are fully operational. The sensitivity of the resources to the impact is lo and impact severity is minor. Impact likelihood is medium while the overall impact significance is low.

IMPACT SIGNIFICANCE	**Temporal**	**Medium**	**Low**	**Low Severity**
	Areal (Spatial)	**Medium**		
	Magnitude	**Low**		
Likelihood		**Medium**		

5.4.1.4 Increased pressure on support services and infrastructure around the project site

Project Activity: Site clearing and preparation

The physical presence of workers in the project site will exert increased demand on the available support services such as restaurants, eateries, hotels, mini-markets and stores during the site clearing and preparation activities. This could result in the incidence of inflation in the price of some commodities, goods and services hitherto enjoyed by residents and businesses in the area.

The magnitude of this impact is low, the areal extent of the impact is potentially low, and frequency is medium while the duration of such impact medium term since project activities continues from site preparation through 1-year construction phase of the project into the operation phase when the three proposed transport interchange terminals are fully operational.

The sensitivity of the resource to the impact is high as it could affect the wellbeing of the resident of Lagos in the area. The impact severity is medium, impact likelihood is high and the overall impact significance is medium.

IMPACT SIGNIFICANCE	Temporal	Medium	Low	Medium Severity
	Areal Extent	Low		
	Magnitude	Low		
Likelihood		High		

5.4.1.5 Incidence of accident fatalities

Project Activity: Site clearing and preparation

The physical presence of workers and equipment on the project site, performance of electrical and mechanical works, and in the process of handling, collection and transportation of demolition waste from the project site for disposal, accident fatalities and injury can occur. Consequently, appropriate safety measures and Standard Operating Procedures have to be put in place to mitigate such incidents.

The impact magnitude is low, the areal extent of the impact is low, frequency is low and impact duration is low, the sensitivity of the resource to the impact is low, impact severity is minor impact likelihood is low while the overall impact significance is low.

IMPACT SIGNIFICANCE	Temporal	Low	Low	Low Severity
	Areal (Spatial)	Low		
	Magnitude	Low		
Likelihood		Low		

5.4.1.6 Surface water and groundwater contamination from indiscriminate handling and disposal of solid waste

Project Activity: Site clearing and preparation

Inadequate handling and disposal of demolition waste stream, especially those waste containing hazardous/toxic chemicals could be mobilized through rainy season runoffs from the project site into both surface water in tertiary/secondary drainage channels as well as contaminate the typically shallow groundwater resources of the project area.

The impact magnitude is low, the areal extent of the impact is medium, frequency is low and impact duration is low, the sensitivity of the resource to the impact is low, impact severity is minor impact likelihood is low while the overall impact significance is low.

IMPACT SIGNIFICANCE	Temporal	Low	Low	Low Severity
	Areal (Spatial)	Low		
	Magnitude	Low		
Likelihood		Low		

5.4.1.7 Soil contamination with faecal coliform from poor sanitation and indiscriminate defecation and depletion of soil quality from toxic and hazardous contaminants in solid waste stream from the project site

Project Activity: Site clearing and preparation

In situation where inadequate sanitation facilities such as mobile toiletsare not provided on the project site during the site clearing and preparation activities, open-air defecation could occur. This is a direct contamination of both the soil and water resources of the area with faecal coliform. Hence, adequate measure has to be taken to forestall this situation.

The impact magnitude is low, the areal extent of the impact is medium, frequency is low and impact duration is low, the sensitivity of the resource to the impact is low, impact severity is minor impact likelihood is low while the overall impact significance is low.

IMPACT SIGNIFICANCE	Temporal	Low	Low	Low Severity
	Areal (Spatial)	Low		
	Magnitude	Low		
Likelihood		Low		

5.4.1.8 Depletion in the aesthetics and visual aspect of the project site and environ from inadequate handling and disposal of solid waste

Project Activity: Site clearing and preparation

Inadequate management of the collection and disposal of the demolition waste will result in depletion of the urban aesthetics and visual aspect of the project area. Proactive effort should be made by LAWMA on behalf of Lagos State Government to evacuate the demolition waste stream promptly from the project site immediately after the demolition of the old commercial land use in the project site took place. The impact magnitude is low since large portion of demolition had already taken place, the areal extent of the impact is medium, frequency is low since the activity is one-off during site clearing and preparation and impact duration is low, the sensitivity of the resource to the

impact is medium, impact severity is minor impact likelihood is low while the overall impact significance is low.

IMPACT SIGNIFICANCE	**Temporal**	**Low**	**Low**	**Low Severity**
	Areal (Spatial)	**Medium**		
	Magnitude	**Low**		
Likelihood		**Low**		

5.4.2 Construction Phase

5.4.2.1 Ambient air quality deterioration and dust emissions

Project Activity: Physical presence of Workers and Equipment on project site

For the construction of the proposed Oshodi Transport Interchange project, the physical presence of workers and equipment is an essential activity for the construction phase that has inherent potential and associated impacts. The movement of workers and equipment will impact on the ambient air quality in the project area. Dispersion and deposition of dust and particulate matters in residential and business premises in close proximity to the project site would then ensue. However, with appropriate control measures during the construction phase, the emission of gaseous emissions, dust and particulate matter to the ambient air will be greatly minimized.

The impact magnitude is low as the project area is known to be commercial activity center therefore the impact will only be cumulative. The areal extent of the impact is medium due to possible dispersion of generated dust from the presence of worker and equipment, frequency is medium and impact duration is medium is medium while the duration of such impact medium term since project activities continues through 1-year construction phase of the project, the sensitivity of the resource to the impact is medium considering the location of the project activities which is majorly urban environment, impact severity is minor impact likelihood is medium while the overall impact significance is medium.

IMPACT SIGNIFICANCE	**Temporal**	**Medium**	**Medium**	**Medium Severity**
	Areal (Spatial)	**Medium**		
	Magnitude	**Low**		
Likelihood		**Medium**		

5.4.2.2 Increased pressure on support services and infrastructure around the project site

Project Activity: Physical presence of Workers and Equipment on project site

The physical presence of workers on the project site will exert increased demand on the available support services such as restaurants, eateries, hotels, mini-markets and stores during the construction phase. This could result in the incidence of inflation in the price of some commodities, goods and services hitherto enjoyed by residents and businesses in the area.

The magnitude of this impact is low, the areal extent of the impact is potentially low, and frequency is medium while the duration of such impact medium term since project construction activity will run for 1-year construction phase of the project into the operation phase when the three proposed transport interchange terminals are fully operational.

The sensitivity of the resource to the impact is high as it could affect the wellbeing of the resident of Lagos in the area. The impact severity is medium, impact likelihood is high and the overall impact significance is medium.

IMPACT SIGNIFICANCE	**Temporal**	**Medium**	**Low**	**Medium Severity**
	Areal Extent	**Low**		
	Magnitude	**Low**		
Likelihood		**High**		

5.4.2.3 Depletion of the sanitary condition of the urban landscape due to indiscriminate littering of solid waste

Project Activity: Physical presence of Workers on project site

The sanitation condition of the urban landscape in close proximity to the project site could be affected by the construction activitiesif necessary sanitary arrangements for project workers are not made. Hence, adequate arrangement has to be made to ensure that specific Waste Management Plan is in place for the construction phase of the project.

The impact magnitude is low, the areal extent of the impact is low since the existing solid waste process currently under the supervision of LAWMA in Lagos will be adopted during the construction phase, frequency is low and impact duration is low, the

sensitivity of the resource to the impact is low, impact severity is minor impact and the likelihood is low while the overall impact significance is low.

IMPACT SIGNIFICANCE	**Temporal**	**Low**	**Low**	**Low Severity**
	Areal (Spatial)	**Low**		
	Magnitude	**Low**		
Likelihood		**Low**		

5.4.2.4 Increase in ambient noise and vibration from crane operations offloading and standing the pile; pile hammer section operation

Project Activity: Pile foundation works, sheet pile and steel pile works; using heavy trucks and crane.

The use of pile as backbone to support the construction of the multi-level Transport Interchange Terminals and other pertinent infrastructure proposed in the project is inevitable. As barriers that confines ground pressure and prevent unwanted movement, their installation into the ground, as evident in other similar construction activities, cannot be done without causing noise and vibration emissions. This is a source of concern considering the mixed residential, commercial/business premises, industrial and institutional land uses surrounding the project site. Since the pile driving activity is necessary for the proposed construction activity, appropriate mitigation and control measures has to be put in place to minimize this environmental concern.

Besides noise emissions from pile driving hammer actions, Power Generation during construction and operation phases as well as the transportation of demolition wastes from the project site during decommissioning phase are other sources of noise emission concerns. There is need to establish sound mitigation and control measures to minimize this impact.

The impact magnitude is low, the areal extent of the impact is medium, frequency is low and impact duration is low, the sensitivity of the resource to the impact is low, impact severity is moderate, impact likelihood is high while the overall impact significance is high.

IMPACT SIGNIFICANCE	**Temporal**	**Low**	**Medium**	**High Severity**
	Areal (Spatial)	**Medium**		
	Magnitude	**Low**		
Likelihood		**High**		

5.4.2.5 Deterioration of ambient air quality

Project Activity: Pile foundation works, sheet pile and steel pile works; using heavy trucks and crane.

Gaseous emissions from the heavy duty piling equipment and power generation, odorous emissions from decomposing pile of solid waste, emission of volatile and highly inflammable petroleum products, emissions from hazardous material are serious sources of concern for the ambient air quality during the piling activities for the construction phase. However, adequate mitigation and control measures will greatly reduce this concern.

The impact magnitude is medium since the piling activity will be done intermittently, the areal extent of the impact is medium due to possible dispersion, frequency is low since the piling work will be limited and impact duration is medium, the sensitivity of the resource to the impact is medium, impact severity is moderate, impact likelihood is medium while the overall impact significance is medium.

IMPACT SIGNIFICANCE	**Temporal**	**Low**	**Medium**	**Medium Severity**
	Areal (Spatial)	**Medium**		
	Magnitude	**Medium**		
Likelihood		**Medium**		

5.4.2.6 Increased pressure on existing access roads around the project site

Project Activity: Transportation and offloading of steel piles, concrete piles and sheet piles using heavy trucks and crane.

Demand on existing Lagos – Apapa - Oshodi Expressway and Agege Motor Road – Oshodi will be continuous throughout the duration of the construction phase. With appropriate mitigation control measures, the pressure on access roads could be minimized.

However, the impact magnitude is low, the areal extent of the impact is low, frequency is low and impact duration is low, the sensitivity of the resource to the impact is high, impact severity is moderate, impact likelihood is medium while the overall impact significance is moderate.

IMPACT SIGNIFICANCE	Temporal	Low	Low	Medium
	Areal (Spatial)	Low		
	Magnitude	Low		
Likelihood		Medium		

5.4.2.7 Increase in ambient noise and vibration levels

Project Activity: Construction of Retaining Wall, Gate House, City Bus Terminals, Skywalk, Pedestrian Bridge, Bus Station, Drainage.

During the construction phase, several civil works will be carried out and these include construction of bus terminals, Bus stations, drainages, sky-walk to mention. The civil works will increase noise level within the project area as evident in other similar construction activities. This is a source of concern considering the mixed residential, commercial / business premises, industrial and institutional land uses surrounding the project site. Since the civil works activity is necessary for the proposed construction activity, appropriate mitigation and control measures has to be put in place to minimize this environmental concern.

The impact magnitude is medium considering the nature of the project area, the areal extent of the impact is medium, frequency is high as the stage of development will be a long term and impact duration is medium, the sensitivity of the resource to the impact is medium, impact severity is moderate, impact likelihood is high while the overall impact significance is high.

IMPACT SIGNIFICANCE	Temporal	High	Medium	Medium
	Areal (Spatial)	Medium		
	Magnitude	Medium		
Likelihood		High		

5.4.2.8 Soil Contamination and deterioration of soil quality

Project Activity: Civil engineering construction works such asChannel, fence, and Construction/Grading of Access Roads.

Soil contamination and deterioration of soil quality could occur from the civil works activities, fuel/petroleum product storage and dispensing; hazardous materials handling; wastewater, storm water and sewage management; solid waste management during the construction phase of the project.

However, the impact magnitude is low, the areal extent of the impact is low, frequency is low and impact duration is low, the sensitivity of the resource to the impact is high, impact severity is moderate, impact likelihood is medium while the overall impact significance is moderate.

IMPACT SIGNIFICANCE	**Temporal**	**Low**	**Low**	**Medium Severity**
	Areal (Spatial)	**Low**		
	Magnitude	**Low**		
Likelihood		**Medium**		

5.4.2.9 Contamination of surface water

Surface water in tertiary drainage channels and canals in close proximity to the project site can be contaminated by the implementation of the following project activities: fuel/petroleum product storage and dispensing; hazardous materials handling; wastewater, storm water and sewage management; solid waste management during the construction phase of the project.

The impact magnitude is low, the areal extent of the impact is low, frequency is low and impact duration is low, the sensitivity of the resource to the impact is high, impact severity is moderate, impact likelihood is medium while the overall impact significance is moderate.

IMPACT SIGNIFICANCE	**Temporal**	**Low**	**Low**	**Medium Severity**
	Areal (Spatial)	**Low**		
	Magnitude	**Low**		
Likelihood		**Medium**		

5.4.2.10 Contamination of groundwater

Groundwater resources of the project area can become contaminated if hazardous chemicals or toxic contaminant is released during fuel/petroleum product storage and dispensing; hazardous materials handling; wastewater, storm water and sewage management; solid waste management, especially if such releases or spillage happens during the rainy season during construction phase. Considering the shallow nature of groundwater resources in Lagos, adequate control measures need to be put in place to prevent the occurrence of release of contaminants that could impact on groundwater quality in the project area.

The impact magnitude is low, the areal extent of the impact is low, frequency is low and impact duration is low, the sensitivity of the resource to the impact is high, impact

severity is moderate, impact likelihood is medium while the overall impact significance is moderate.

IMPACT SIGNIFICANCE	**Temporal**	**Low**	**Low**	**Moderate Severity**
	Areal (Spatial)	**Low**		
	Magnitude	**Low**		
Likelihood		**Medium**		

5.4.2.11 Accident fatalities, fire explosion and injury

Accident fatalities, fire explosion, armed robbery, Boko haram terrorist bomb attack, crime and other security risks can occur during anticipated project activities at virtually all phases of the project. There are inherent hazards associated with every construction activities such as Piling works; storage of petroleum products used for equipment operations; storage of hazardous materials used on construction site; civil construction works; electrical and mechanical works. Adequate mitigation and control measures have to be established to minimize the occurrence of accidents and related hazards during the lifecycle of the project.

The impact magnitude is high, the areal extent of the impact is low, frequency is low and impact duration is low, the sensitivity of the resource to the impact is high, impact severity is moderate, impact likelihood is medium while the overall impact significance is moderate.

IMPACT SIGNIFICANCE	**Temporal**	**Low**	**Low**	**Medium Severity**
	Areal (Spatial)	**Low**		
	Magnitude	**High**		
Likelihood		**Medium**		

5.4.3 Operational Phase

5.4.3.1 Contamination of surface water

Surface water in tertiary drainage channels and canals in close proximity to the Oshodi Transport Interchange project can be contaminated by the implementation of the following project activities: fuel/petroleum product storage and dispensing; hazardous materials handling at the Bus parks and terminal; wastewater, storm water and sewage management; solid waste management during the operational phase of the project.

The impact magnitude is low, the areal extent of the impact is low, frequency is likely to be low since the facility will be operated by private entity and impact duration is low, the

sensitivity of the resource to the impact is high, impact severity is moderate, impact likelihood is medium while the overall impact significance is moderate.

IMPACT SIGNIFICANCE	**Temporal**	**Low**	**Low**	**Medium Severity**
	Areal (Spatial)	**Low**		
	Magnitude	**Low**		
Likelihood		**Medium**		

5.4.3.2 Contamination of groundwater

Groundwater resources of the project area can become contaminated if hazardous chemicals or toxic contaminant is released during fuel/petroleum product storage and dispensing; hazardous materials handling; wastewater, storm water and sewage management; solid waste management, especially if such releases or spillage happens during the rainy season during operational phase. Considering the shallow nature of groundwater resources in Lagos, adequate control measures need to be put in place to prevent the occurrence of release of contaminants that could impact on groundwater quality in the project area.

The impact magnitude is low, the areal extent of the impact is low, frequency is low and impact duration is low, the sensitivity of the resource to the impact is high, impact severity is moderate, impact likelihood is medium while the overall impact significance is moderate.

IMPACT SIGNIFICANCE	**Temporal**	**Low**	**Low**	**Moderate Severity**
	Areal (Spatial)	**Low**		
	Magnitude	**Low**		
Likelihood		**Medium**		

5.4.3.3 Accident fatalities, fire explosion and injury

Accident fatalities, fire explosion, armed robbery, Boko haram terrorist bomb attack, crime and other security risks can occur during operational phase of the project. There are inherent hazards associated with some likely activities that could happen at the interchange if allowed such as storage of petroleum products used for equipment operations; Interstate /intra-city transportation of commuters from the Transport Interchange Terminals during operational phase; and vehicular movement and traffic generation. Adequate mitigation and control measures have to be established to minimize the occurrence of accidents and related hazards during the lifecycle of the project.

The impact magnitude is high, the areal extent of the impact is low, frequency is low and impact duration is low, the sensitivity of the resource to the impact is high, impact severity is moderate, impact likelihood is medium while the overall impact significance is moderate.

IMPACT SIGNIFICANCE	**Temporal**	**Low**	**Low**	**Medium Severity**
	Areal (Spatial)	**Low**		
	Magnitude	**High**		
Likelihood		**Medium**		

5.4.4 Decommissioning Phase

5.4.4.1Topographic and landscape disturbance

Project Activity: Demolition of the Transport Interchange Terminals

Besides the landscape distortions and disturbance the demolition of old market structures in the project site before the commencement of the site clearing and preparation, the demolition of the Transport Interchange Terminals during the decommissioning phase will destroy the beautiful landscape the facility created in the project environment. Consequently, sound decommissioning and rehabilitation plan has to be put in place to minimize this impact.

The impact magnitude is low, the areal extent of the impact is low, frequency is low and impact duration is low, the sensitivity of the resource to the impact is high, impact severity is moderate, and impact likelihood is medium while the overall impact significance is moderate.

IMPACT SIGNIFICANCE	**Temporal**	**Low**	**Low**	**Moderate Severity**
	Areal (Spatial)	**Low**		
	Magnitude	**Low**		
Likelihood		**Medium**		

5.4.4.2 Land use conflict and disruption

Project Activity: Collection and Disposal of demolished waste

Demand for the transportation land use will create conflict with other road commuters during the collection and transportation of solid wastes and demolition waste during the decommissioning phases.

The impact magnitude is low, the areal extent of the impact is low, frequency is low and impact duration is low, the sensitivity of the resource to the impact is high, impact severity is moderate, impact likelihood is medium while the overall impact significance is moderate.

IMPACT SIGNIFICANCE	**Temporal**	**Low**	**Low**	**Medium Severity**
	Areal (Spatial)	**Low**		
	Magnitude	**Low**		
Likelihood		**Medium**		

5.4.4.3 Depletion in the aesthetics of the urban landscape and visual aspect of the project site and environ during the decommissioning phase

The dismantling and demolition of the interchange terminals during the decommissioning phase could result in depletion of the urban aesthetics and visual aspect of the project area. The waste stream generated at this phase need to be collected for disposal promptly to minimize this impact

The impact magnitude is high, the areal extent of the impact is medium, frequency is low and impact duration is low, the sensitivity of the resource to the impact is medium, impact severity is minor and the impact likelihood is low while the overall impact significance is low.

IMPACT SIGNIFICANCE	**Temporal**	**Low**	**Low**	**Medium Severity**
	Areal (Spatial)	**Low**		
	Magnitude	**High**		
Likelihood		**Medium**		

5.4.4.4 Depletion in the value of infrastructure in the vicinity of the project site

Project Activity: Demolition of the Transport Interchange

The demolition of such world-class Transport Interchange Terminals can results in the depletion of the economic value of properties and infrastructures in the vicinity of the site.

The impact magnitude is high, the areal extent of the impact is medium, frequency is low and impact duration is low, the sensitivity of the resource to the impact is medium, impact severity is minor and impact likelihood is low while the overall impact significance is moderate.

IMPACT SIGNIFICANCE	Temporal	Low	Low	Medium Severity
	Areal (Spatial)	Medium		
	Magnitude	High		
Likelihood		Medium		

5.4.4.5 Boom bust and complete loss of a huge macro/micro economic infrastructure

Project Phase: Demolition of transport Interchange Terminals

The demolition of the Oshodi Transport Interchange Terminals during the decommissioning phase will be a huge drain in the macro/micro-economy of the State Government and the road transporters using the facility. It could result into outright loss of livelihood for some workers.

The impact magnitude is high, the areal extent of the impact is high, frequency is low and impact duration is high, the sensitivity of the resource to the impact is major, impact severity is minor impact likelihood is high while the overall impact significance is high.

IMPACT SIGNIFICANCE	Temporal	High	High	High Severity
	Areal (Spatial)	High		
	Magnitude	High		
Likelihood		High		

5.4.4.6 Distortion in social and cultural structure created by the presence of the TransportInterchange

Project Activity: Demolition of Transport Interchange

The demolition of the transport interchange terminals at the decommissioning phase will distort the social and cultural structure of the project area. Many businesses will be greatly affected. This situation is undesirable. Shopping malls, NURTW transporter, workers banking hall will be affected by the physical and economic displacement.

The impact magnitude is high, the areal extent of the impact is high, frequency is low and impact duration is high, the sensitivity of the resource to the impact is major, impact severity is minor impact and the likelihood is high while the overall impact significance is high.

IMPACT SIGNIFICANCE	Temporal	High	High	High Severity
	Areal (Spatial)	High		
	Magnitude	High		
Likelihood		High		

5.4.4.7 Accident fatalities, fire explosion and injury

Accident fatalities, fire explosion, armed robbery, crime and other security risks can occur during the decommissioning phase. There are inherent hazards associated with project activities such as spillage of petroleum products used for equipment operations; electrocution from electrical and mechanical dismantling works, accident from Vehicular movement and traffic generation; and dismantling and demolition of the Terminals during the decommissioning phase. Adequate mitigation and control measures have to be established to minimize the occurrence of accidents and related hazards during the decommissioning phase.

The impact magnitude is high, the areal extent of the impact is low, frequency is low and impact duration is low, the sensitivity of the resource to the impact is high, impact severity is moderate, and the impact likelihood is medium while the overall impact significance is moderate.

IMPACT SIGNIFICANCE	Temporal	Low	Low	Medium Severity
	Areal (Spatial)	Low		
	Magnitude	High		
Likelihood		Medium		

5.4.5 Residual Impacts

Residual Impacts are impacts of a project that still exists even after measures have been taken for mitigation. These are impacts that would exist as long as the project exist and would only change upon decommissioning of the project. Some residual impacts remain even after decommissioning of the facility. For this project, the residual Impacts include:

Land take or Land Availability

The land acquired for this project will not be available for other uses as long as this project exists. This is an impact that will only change when the facility is decommissioned, and the site is committed to other use(s). However, this project area is originally designated for projects of this nature, the significance of this impact is rated **low**

Change in Landform

Construction activities would to some extent result in change in the landform and natural aesthetics of the project environment with demolition of existing structures, clearing of vegetation and some land improvement activities.

Loss of Biodiversity

The construction phase of the project will no doubt result in loss of biodiversity. Even when the facility is decommissioned, and the site restored, it is practically impossible to restore the lost biodiversity that is native to the project site.

5.4.6 Cumulative Impacts

These are impacts resulting from contributions from other facilities within and around the project area. The identified cumulative impacts include:

Impact on Traffic

Activities of the market and businesses within the Oshodi area will also involve the movement of Personal, and Materials and Machineries by road and would impact on the traffic situation along the corridor.

Impact on Ambient Air Quality and Noise level

Construction and Operational activities of the proposed Oshodi Transport Interchange project will also impact on the ambient air quality and noise level within the project environment which already being impacted by existing market and bus parks facilities in the area. This cumulative impact will require commitment from the contractor and operator of the proposed project to put in place pollution abatement facilities.

CHAPTER SIX

MITIGATION MEASURES

6.1 Introduction

Typically, the acceptability and/or suitability of a particular project are premised on several considerations, not the least of which is the reduction of negative environmental and social impacts to tolerable levels. Impact significance reduction is usually achieved by introducing mitigation/amelioration measures to cater for the negative impacts identified. In this section of the report, we present a summary of those measures that are deemed adequate to achieve this objective as well as the residual impacts that will remain after the implementation of these mitigation measures. For ease of comprehension, the mitigation measures are presented based on the various impacts identified. It should be noted that no mitigation measures are necessary for positive impacts and as such they are not discussed in this section.

6.2 Mitigation Measures

Mitigation measures are options that can be used to either completely eliminate or minimize identified negative impacts of a development project.

The traditional approach to design and operations is to ensure compliance with the applicable safety codes and standards during design. However, compliance with regulations, codes and standards may not be sufficient to achieve an appropriate level of Health Safety and Environmental (HSE) performance in design. Design codes are generic and applicable to facilities in a number of geographical areas that face a wide range of technical challenges unique to the project. The design of the proposed project is based on the strictest of international codes and best practices.

The HSE objective with respect to the design and operation of the Project plan is to implement all cost effective measures to reduce the risk and effects from major hazards including accidents. The approach has been to use this as a goal rather than a prescriptive objective that cannot be achieved without following a documented process of identification, assessment, reduction and continuous monitoring.

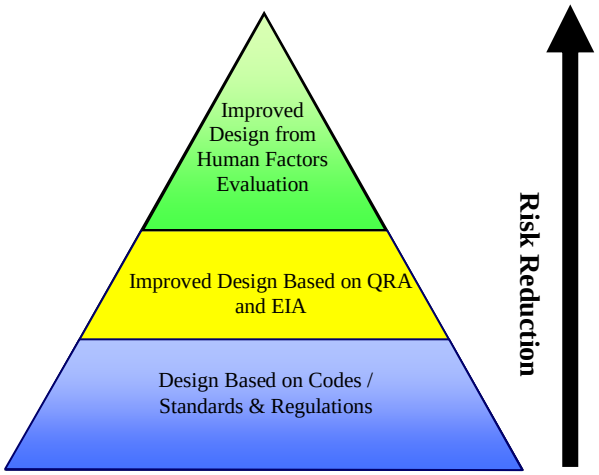
Thus the steps taken in the HSE process for the Project included the following:

- Design based on Codes, Standards and Regulations.
- Improved design based on Quantitative Risk Assessment and Environmental Impact Assessment

- Improved design from human factors evaluation

The hierarchical order of importance of these HSE design elements is illustrated in **Figure 6-1**

Figure 6-1
Risk Based Design Strategy



6.2.1 Pre-construction Phase

6.2.1.1 *Site Clearing and Preparation Activities*

The identified impacts of the site clearing and preparation activities for the pre-construction phase are listed below:

- *The removal of demolition waste from the project site could result in automobile combustion and dust/particulate matter emissions into the ambient air during the pre-construction phase;*
- *The additional removal of demolition wastes from the site will involve the use of earthmovers and heavy equipment that could increase ambient noise levels;*
- *The site clearing activities could lead to transportation land use conflict among other commuters on the Lagos – Apapa - Oshodi Expressway and Agege Motor Road – Oshodi and disruptions due to increased pressure on existing access road to the project site*
- *The physical presence of workers in the project site will exert increased demand on the available support services and infrastructure around the project site*
- *The physical presence of workers and equipment on the project site during the site clearing and preparation activities could lead to incidence of accident fatalities*
- *Possible surface water and groundwater contamination from indiscriminate handling and disposal of solid waste during the site clearing and preparation*

- *Inadequate sanitation facilities during the site clearing and preparation could lead to soil contamination with faecal coliform from poor sanitation and indiscriminate defaecation and depletion of soil quality from toxic and hazardous contaminants in solid waste stream from the project site*
- *Inadequate management of the collection and disposal of the demolition waste will result in depletion of the urban aesthetics and visual aspect of the project area.*

In order to mitigate these impacts, the project proponents shall ensure that:

- All vehicles and project equipment/machinery are maintained in top shape, such that their emissions comply with regulatory and international standards;
- Mobilization is a short-term activity and thus, even if noise levels exceed background, the duration is so short that the impact remains insignificant. Therefore, no further mitigation measure is required for noise impacts;
- In order to minimize traffic buildup impacts, project related transportation would be limited as much as possible to low traffic periods to avoid any conflict with other commuters;
- The project contractor will ensure appropriate support service and infrastructure is available onsite during the site clearing activities;
- To avert any possibility of accident occurrence, strict adherence to safety measures will be enforced;
- Wastes generated from the site clearing and preparation activities shall be properly stacked and disposed of. Disposal may include the use of third party waste handling contractors, in which case, such contractors must be registered and duly certified by the Lagos Waste management Authority (LAWMA);
- Effective waste management approach will be adopted for the generated demolition waste to prevent the depletion of the urban aesthetics and visual aspect of the project area.

6.2.2 Construction Phase

a. Movement and physical presence of workers and Equipment on project site

The impacts anticipated being associated with the movement and physical presence of workers and equipment on project site are as follows:

- *The movement and physical presence of workers and equipment on project site could lead to ambient air quality deterioration and dust emission*
- *The physical presence of workers and equipment on the project site will exert increased demand on the available support services and infrastructure around the project site*
- *The movement and physical presence of workers and equipment could lead to depletion of sanitary condition of the urban landscape due to indiscriminate littering of solid waste.*

In order to mitigate these impacts, the following measures shall be implemented:

i. All vehicles and project equipment/machinery are maintained in top shape, such that their emissions comply with regulatory and international standards;
ii. The project contractor will ensure appropriate support service and infrastructure is available onsite during the construction phase;
iii. The project contractor shall provide appropriate sanitary facilities during the construction phase;
iv. Appropriate measures (including watering or covering exposed areas) will be used to minimize or prevent air pollution and dust. Vehicles transporting waste or other materials that may produce odours or dust will be covered during transportation.
v. Suitable facilities will be provided to limit the tracking of dirt and soil off site. Stockpiles or areas that may generate dust will be managed to suppress dust emissions. The construction site compound will be established and operated to minimize emissions. Visual monitoring will be undertaken to verify the effectiveness of the controls.
vi. Wastes generated from the site clearing and preparation activities shall be properly stacked and disposed of. Disposal may include the use of third party waste handling contractors, in which case, such contractors must be registered and duly certified by the Lagos Waste management Authority (LAWMA).

b. Pile foundation works, sheet pile and steel pile works using heavy trucks and crane

The associated impacts with piling foundation works, and steel pipe works include the following:

- *Increase in ambient noise and vibration from crane operations offloading and standing the pile; pile hammer section operation*
- *The piling works and steel pipe works could lead to deterioration of ambient air quality;*
- *Transportation and offloading of steel piles, concrete piles and sheet piles using heavy trucks and crane could lead to increase pressure on existing access roads around the project site*

In order to mitigate these impacts, the following measures are recommended:

- All project equipment and machinery shall be regularly serviced and maintained to ensure that they comply with international emission limits. Also, the site shall be regularly sprinkled with water, especially during dry season work, to minimize the generation of dust during construction activities;
- As much as possible, the piling machinery used shall be operated with strict adherence to noise and vibration standards for such machinery,

- The operation of piling machinery such as the crane will be operated at specific period to reduce the effect of the vibration on the commuters and project site neighbors;
- Affected and potentially affected residents and businesses will be contacted prior to the commencement of the piling works and will be informed of the proposed works, working hours, and the period of construction. Affected residents and businesses will also be provided with a contact name and number should they wish to obtain further information;
- In order to minimize traffic buildup impacts, project related transportation during the piling works would be limited as much as possible to low traffic periods to avoid any conflict with other commuters.
- A Traffic Management Plan will be prepared to ensure traffic and access controls are implemented and maintained during all lane or road closures.

c. Construction of Retaining Wall, Gate House, City Bus Terminals, Skywalk, Pedestrian Bridge, Bus Station and drainage network.

The biophysical impacts associated with the various construction activities include the following:

i. Increase noise and vibration generated in the area during construction. The noise and vibration could constitute distraction to people in the neighbourhood communities;

ii. The introduction of fill materials such as laterite and gravel for the construction activities such City Bus terminal and Bus Station construction could lead to contamination of the soil and groundwater of the area, especially if the fill materials are contaminated with hydrocarbons and heavy metals;

iii. Cement dust will be generated from handling and use of bulk cement in the area. If inhaled by project workers, it could lead to ill health effects;

iv. The diversion of natural surface water flows is often inevitable in drainage construction and therefore could lead to erosive flows from the blockage of the ditches and damaged or inadequate water control structure;

v. Drainage construction can lead to sediment problems such as soil disturbance and exposure to erosive forces;

vi. Solid wastes especially iron cuts and fragments generated during construction. This will pose a problem in terms of waste handling;

In order to mitigate the above impacts, the following mitigation measures are recommended:

- As much as possible, all vehicles and machinery used for construction works shall have functional mufflers, which can contribute towards the reduction of noise emissions;
- Materials to be used for filling shall be tested and confirmed uncontaminated before being used;

- Wastes generated from construction activities shall be properly stacked and disposed of. Disposal may include the use of third party waste handling contractors, in which case, such contractors must be registered and duly certified by the Lagos Waste management Authority (LAWMA).

6.2.3 Operation Phase

a. Operation of Oshodi Transport Interchange facilities

A number of impacts associated with the operation of Oshodi Transport Interchange facilities were identified. They are reiterated below:

i. Surface water in tertiary drainage channels and canals in close proximity to the Oshodi Transport Interchange project can be contaminated by the implementation of the following project activities: fuel/petroleum product storage and dispensing; hazardous materials handling at the Bus parks and terminal; wastewater;

ii. Groundwater resources of the project area can become contaminated if hazardous chemicals or toxic contaminant is released during fuel/petroleum product storage and dispensing; hazardous materials handling; wastewater, storm water; and solid waste indiscriminate disposal, especially if such releases or spillage happens during the rainy season during operational phase;

iii. Accident fatalities, fire explosion, armed robbery, crime and other security risks can occur during operational phase of the project.

iv. Solid waste management could become a major issue within the transport interchange if not properly handled unless adequate handling arrangements are made.

In order to mitigate the foregoing impacts, the following measures shall be instituted:

- Adequate precautionary measures shall put in-place to avoid spillages during maintenance of the facilities and if it does occur, the spillages will be contained to avoid the spread of its impact on the environment;
- Strict compliance of the discharge limit shall be implemented throughout the period of transport interchange operations in order to prevent contamination of the surface water in tertiary drainage channels and canals;
- Proper arrangements shall be made for handling of domestically generated wastes. This will include proper sorting of wastes from source, safe stacking at transfer stations and proper disposal either in a location within the site, or to be hauled away by certified waste management contractors;
- In case of accident to the maintenance personnel, insurance policy that covers such incidents will be engaged for maintenance staffs in highly risk tasks;

- Precautionary measures shall be put-in place with strict operational procedures to avoid accidental occurrence. On other hand if the accident occurs, an effective emergency response procedures will be adopted;
- Wastes generated from transport interchange operation shall be properly stacked and disposed of. Disposal may include the use of third party waste handling contractors, in which case, such contractors must be registered and duly certified by the Lagos Waste management Authority (LAWMA).

6.2.4 Decommissioning Phase

The likely anticipated negative impacts to attend the decommissioning phase of this project. They include the following:

i. The demolition and removal of structures from the Oshodi transport Interchange site will lead to destruction of beautiful landscape the facility in the project environment;
ii. Demand for the transportation land use could create conflict with other road commuters during the collection and transportation of solid wastes and demolition waste during the decommissioning phases;
iii. The dismantling and demolition of the interchange terminals during the decommissioning phase could result in depletion of the urban aesthetics and visual aspect of the project area;
iv. The demolition of the Transport Interchange Terminals can results in the depletion of the economic value of properties and infrastructures in the vicinity of the site;
v. The demolition of the Oshodi Transport Interchange Terminals during the decommissioning phase will be a huge drain in the macro/micro-economy of the State Government and the road transporters using the facility
vi. Lost of huge macro/micro economic infrastructure
vii. Distortion of social and cultural structure created by the presence of the Transport Interchange

In order to mitigate these impacts, the following measures shall be applied:

- Adequate control measures shall be put in place to prevent destruction of the landscape during decommissioning;
- After the demolition and removal of structure, the project area will be properly landscaped;
- To reduce the effect of the decommissioning activities on the economic value of properties and infrastructure, appropriate measure shall be put in place to relieve the impacts;

6.3 Summary

In summary, the mitigation measures recommended in this section are deemed adequate to effectively ameliorate the negative impacts that may attend this project. From the assessment undertaken, if the measures are applied, all minor and moderate negative impacts will be reduced significantly and will leave, in all case, only negligible residual impacts.

In order to verify these assertions, and to ensure that the measures are effective, it is necessary to have in place a sound and cost-effective environmental management plan (EMP). This is presented in the next section of this report.

CHAPTER SEVEN

ENVIRONMENTAL MANAGEMENT PLAN

7.1 Introduction

An important objective of environmental assessment is to develop procedures and plans to ensure that the mitigation measures and monitoring requirements approved during the environmental compliance review will actually be carried out in subsequent stages of the project. As a result, strong emphasis is placed on the preparation of Environmental Management Plans during project processing and on setting out conditions and targets to be met during project implementation. The terms of reference for an ESIA thus require that Project contractor, Planet Projects Limited prepare an EMP as a major output of the environmental and social impact assessment.

The Environmental Management Plan (EMP) section presents a series of measures that will provide for mitigation of potential environmental impacts of project construction and operation which is in accordance with the Nigerian and applicable international standards and regulation. EMP guarantees an effective basis to determine the source and extent of impacts if they occur.

With this in mind, Planet Projects Limited the Proponent, will develop a plan to manage and monitor the environmental, socioeconomic, and health and safety impacts of the proposed Oshodi Transport Interchange project construction and operation. Consequently, a bilateral environmental management framework is adopted. The framework consists of an Environmental Management System (EMS) and an Environmental Monitoring Programme (EMP).

7.2 Objective of the EMP

This section provides and helps to:

1. To put in place a systematic procedure which will ensure that all project activities are executed in compliance with prevailing regulations.
2. To integrate environmental issues into overall planning, operation, audit and review to ensure that mitigation measures for all identified impacts of the project have been established and maintained during the project cycle.

7.3 Environmental Management System (EMS)

The Environmental Management System (EMS) and HSE-MS manual is developed as an integral part of the detailed engineering design stage. The plan will ensure protection of the environment, employees and the public from impacts related to construction and operational activities of the project. The major components of the EMS that will be developed for this project include:

- Commitment by leadership at all levels to promote operational excellence by assuring alignment of vision, expectations, resources and accountabilities;
- Comprehensive identification of high-level issues, risks, opportunities, and gaps in system and operating practices that can impact current or future ability to achieve the required level of performance;
- Establish processes to ensure documents and records that are critical to operational excellence are current, controlled, and accessible.
- Establish clear yardsticks to measure statistically significant performance improvement toward goals and targets;
- Implement a process to ensure that contractors ("agent") authorized to act on behalf of the company understand and comply with relevant company policies and procedure.
- Establish and maintain appropriate processes for management to regularly monitor the company's HSE performance, conduct regular HSE audits and evaluations to ensure that the system is implemented and maintained and remains effective.

7.4 EMP ROLES AND RESPONSIBILITIES

The construction team will constitute several professionals, from the Project Manager being the most important from an environmental perspective, the Project HSE Officer, Proponent and the developer.

The Project Manager is responsible for ensuring that the EMP is implemented during the **pre-construction** and **construction** phases of the project.

The Project HSE Officer is responsible for monitoring the implementation of the EMP during the **design**, **pre-construction** and **construction** phases of the project.

7.4.1 Project Manager (Environmental Management Officer)

It is necessary to ensure implementation of suggested mitigation measures. Management plan shall therefore be put in place to ensure this. Planet Projects Limited shall assign a Project Manager (Environmental Management officer (EMO)) with the responsibility to liaise with the engineering team towards review and implementation of the mitigation measure necessary. Major responsibilities of the EMO are to ensure the mitigation measures and monitoring programs are carried out as agreed, and reporting is completed in compliance with the National regulatory body requirements.

The Project Manager is responsible for overall management of the project and EMP implementation. The following include tasks that are under the purview of the Project Manager:

- Monitor site activities daily for compliance;
- Conduct internal audits of the construction site against the EMP;
- Be aware of the findings and conclusions of the EIA and the conditions stated within the EIA License issued by Ministry of the Environment;
- Be familiar with the recommendations and mitigation measures of this EMP, and implement these measures;
- Confine the construction site to the demarcated area; and
- Rectify transgression through the implementation of corrective measures.

7.4.2 Project HSE Officer

The Project HSE Officer is responsible for the implementation of the EMP during the construction phase as well as liaison and reporting to the Project Proponent and Lagos State Ministry of Environment. The following tasks will fall within his/her responsibilities:

- Be familiar with the recommendations and mitigation measures of this EMP;
- Be aware of the findings and conclusions of the EIA and the conditions stated within the EIA License;
- Conduct weekly /monthly audits of the construction site according to the EMP and EIA License conditions;
- Educate the construction team about the management measures of the EMP and EIA License conditions;
- Regularly liaise with the construction team and the project leader
- Recommend corrective action for any environmental non-compliance incidents on the construction site; and
- Compile a regular report highlighting any non-compliance as well as good compliance with the EMP.

7.4.3 Environmental Management Response

The following are the environmental management responsibilities of the various parties during construction and operational phases. The EMP will be adhered to unless otherwise stated as follows:

- The monitoring party will be Project HSE Office;
- Method of record keeping will be weekly to bi-weekly inspections depending on the stage of the project;
- The inspection technique will include a review of records that will be kept on site by Project HSE Officer and/or site inspections;
- The Project HSE Officer will be the responsible party for compliance with this EMP during the construction phase.

7.5 ENVIRONMENTAL MANAGEMENT PROGRAMME/ORGANISATION

Environmental and Social Management Organization

Lagos State Government is committed to provide resources essential to the implementation and control of the EMP. Resources include the appropriate human resources and specialized skills. This section focuses on the overall approach for EHS management, on the structures of project and subcontractor EHS departments, and on the respective responsibilities of each department and their individual positions. Lagos State Government is ultimately responsible for the management and supervision of the proposed Transport Interchange construction activities at the Oshodi project site while the project contractor, Planet Projects Limited will be responsible for the construction and implementation of the mitigation measures for the identified impact of the ESIA. Lagos State Government will have a dedicated EHS coordinator and CLO, competent on the basis of appropriate education, training, and experience that will manage and oversee the EHS aspects of project construction. The structure for the organization responsible for EHS management is depicted in ***Table* 7.1** as the facility's Management and Operations Manager. This will be accomplished through management controls over strategic project aspects and interaction with subcontractor staff where project activities take place. The Lagos State Government organization will be staffed at a level to allow for continuous effective supervision of subcontractor activities and work products.

The construction manager and EHS coordinator will be placed locally at the project site to supervise subcontractors during construction. The organization includes a CLO whose role is crucial to the successful implementation of the EMP and the continuation of liaison with the local community.

Table 7.1: Environmental and Social Management Organisation Roles and Responsibilities

Lagos State Government's Project Team	Organization Roles and Responsibilities
Facility Manager	Oversee and coordinate all activities pertaining to the project; ultimately responsible for EHS. Ensure delivery by the asset of its EHS and operational targets. Ensure effective communication with all stakeholders
Operations Manager	Technical aspects of the project including subcontractor supervision during operations. Responsible for the execution of Operations of emergency response plan including Spill Contingency Plan.
Construction Manager	Technical aspects of the project including subcontractor supervision during construction.
EHS Coordinator	Ensuring that the project and subcontractors operate in accordance with applicable regulatory environment, health and safety requirements and plans. Monitor implementation of environmental and social protection measures, and assist with technical input into oil spill response requirements.

Community Liaison Officer	Liaise with local communities, fishermen and government regulators on the project's behalf. Implement EHS awareness and education programmes with communities.
Subcontractor Project Manager	Responsible for subcontractor technical performance and compliance
EHS Manager	Ensure that environment, health and safety regulation requirements are met and that ESMP requirements are properly implemented.

7.6 SCOPE OF THE EMP

The Environmental Management Plan is intended to cover those activities described in *Chapter 3* of this ESIA report. It covers the project activities during construction, operations and decommissioning, and will be subject to thorough reviews prior to the commencement of activities to ensure completeness. The EMP does not cover activities related to equipment and facility fabrication that would be done offsite.

Management Plans

Environmental Management Plan

The goal of this EMP is to ensure full compliance with the project's policies and with mitigation, monitoring and other commitments made in the ESIA report. It outlines the actions necessary to attain this goal, and describes the means, and designation of responsibility required for compliance and conformance. The EMP provides the link for implementation of mitigation measures and monitoring actions.

Project Environmental and Social Management Plan

Lagos State Government shall develop a project-wide ESMP which will link with the project Safety and Environmental Protection (SEP) system by combining the elements of this overall ESMP with other environmental and social performance requirements currently being implemented for the development.

Related Management Plans

The SEP will also comprise a number of related detailed management plans and procedures that lay out the specifications for compliance with specific environmental and social elements and describe the plans and processes required for carrying out the necessary activities. The key management plans are outlined in ***Table 7.2*** with information on how these relate to the activities and impacts being discussed in the ESIA report, including reference to who has lead responsibility***.***

Table 7.2: EMP Hierarchy of Key Plans

Name of Plan	Respective duties	Plan Owner
Project Overall ESMP	Overarching plan linking all the other plans to the project SEP	Project Manager
Environmental and Social Monitoring Plan	Groundwater monitoring, routine effluent and discharge monitoring and air quality monitoring, noise monitoring and turtle surveys	EHS Coordinator
Waste Management Plan	Project-related waste handling procedures for hazardous and non-hazardous solid wastes. Including chemical handling procedure.	EHS Coordinator
Emergency Preparedness and Response Plan	Administration (policy, purpose, distribution, definition etc.), organization of emergency areas (command centres\ medicare, stations, etc.), roles and\ responsibilities communication systems, emergency response procedures, emergency resources, training and updating, checklists (role and action list and equipment checklist) and business continuity and contingency.	General Manager (Construction) (Operations Manager)
Spill Contingency Plan	preventative measures and spill response procedures	General Manager (construction) Operations Manager
Traffic Management transport rules. Plan and Marine Logistics Plan	Controls over prescribed routes, driver training, vehicle maintenance, speed restrictions, appropriate road safety signage, and vehicle loading and maintenance measures/ procedures. Marine transport risk assessment, water transport routes.	General Manager (construction) Operations Manager.
Preventive Maintenance Plan	Maintenance procedures and description of the maintenance management system	Operations Manager
Cultural Heritage Management Plan	Description of cultural heritage resources within the project area and their location. Description of protection measures and chance find procedures.	EHS Coordinator
Public Consultation and Disclosure Plans	Plan addressing interactions with community and other stakeholders, and the grievance procedure. Community and employment awareness training and code of conduct procedures.	Community Liaison Officer
Human Resources Strategy	Local hiring, training and procurement programme and procedures.	Human Resources Manager
Corporate Social Responsibility	Social and community investment programme framework and plans	Community Liaison Officer
Health and Safety Plan	Procedures on chemical hazards, fire and explosions, confined spaces and on site traffic hazards. Communication and training programmes. Safety analysis to and industrial hygiene surveys procedures. Monitoring, record-keeping and audit procedures	Construction manager, Operations manager

Subcontractor Environmental and Social Management Plan(s)

The proposed project will engage subcontractors to carry out project activities. The contractors are responsible for performing all works:

• in compliance with relevant national and international EHS legislation and regulations, and with other requirements to which the project subscribes;
• in conformance with the project's ESMP; and
• in accordance with contractual technical and quality specifications.

The project will also provide specifications for environmental compliance and performance (through the ESIA and ESMP and the associated plans) and, as a contractual requirement, the subcontractor will develop and provide to the project its own specific management plans demonstrating how they intend to comply with the stipulated requirements. The subcontractors will also provide documentation detailing their plans for implementing the measures required in the ESIA and this ESMP; local content, logistics; and community relations.

The subcontractor management plans must conform to the requirements of the project's overarching plans. Subcontractor plans will be reviewed and approved by Lagos State Government and incorporated into, and form part of, the project's overall ESMP.

Contractors will be required to self-monitor against their plans. Compliance will be routinely monitored either directly by Lagos State Government or Third-party. Contractors will be required to submit regular reports of monitoring activities and these will be review on a regular basis. An external assurance process will be conducted on an annual basis the results of which will be disclosed at completion of the process.

7.6.1 Communication

For successful implementation of the EMP and the management of environmental concerns during the construction phase of the project, effective communications among all the stakeholders and project team is required. Consequently, a definite line flow of environmental and social performance information has to be established and followed especially during the construction phase of the project. Hence, the flow of environmental and social information, including reporting and resolution of non-compliance situations during the construction phase is as shown in **Figure 7.1** below.

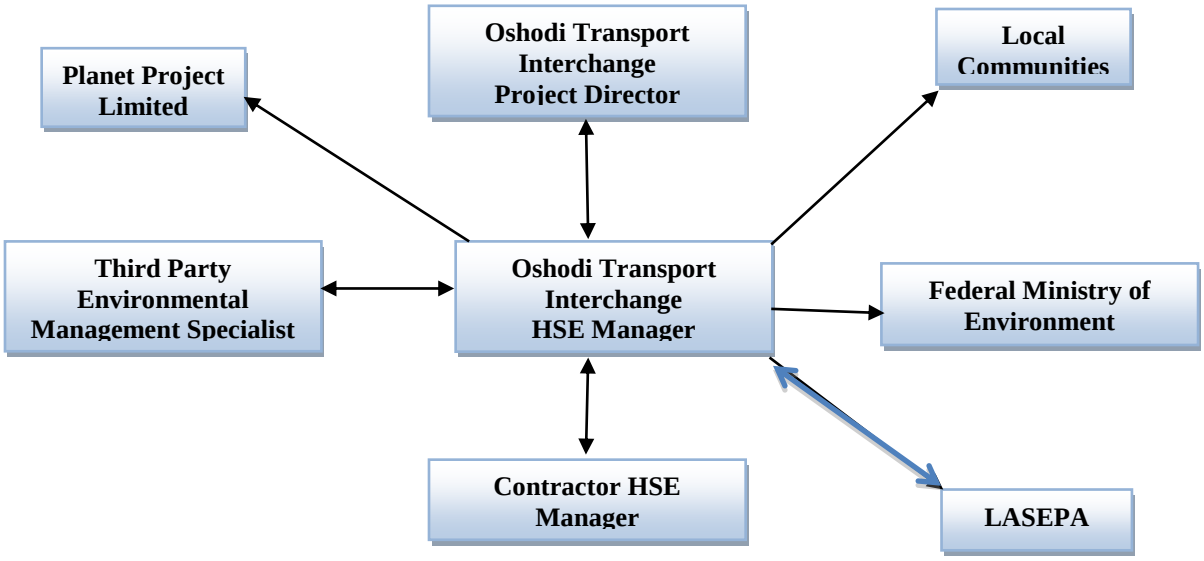


Fig 7.1: Proposed Communication flow for Oshodi Transport Interchange Project

Oshodi Transport Interchange HSE Department

The Oshodi Transport Interchange HSE Department is the central hub for environmental performance information on the project. All information and reports on the implementation of the EMP and compliance performance will be received by the HSE Department from the third party Environmental Management Consultant by the Contractor's HSE Manager. The Oshodi Transport Interchange HSE Manager shall be responsible for the dissemination of pertinent information and reports to the Project Director, the Local Communities, FMEnv, LMEnv, LASEPA and Planet Project Limited. The individual monitoring and auditing carried out on the EMP implementation by the third party Environmental Management Consultant shall also be communicated through the Oshodi Interchange HSE Manager and the HSE Department to relevant regulatory agencies as necessary.

Lagos State Government will maintain a formal procedure for communications with the regulatory authorities and communities. The EHS coordinator is responsible for communication of EHS issues to and from regulatory authorities. The facility management shall be kept informed of such communications. Pertinent information arising from such interactions will be communicated to subcontractors through the EHS coordinator. Meetings will be held, as required, between the Lagos State Government and the appropriate regulatory agencies and community representatives to review EHS performance, areas of concern and emerging issues. Dealings will be transparent and stakeholders will have access to personnel and information to address concerns raised. The entire project organization will be open to review and audit by Nigerian authorities.

Non-Compliant Situations

In situation where non-compliance with any of the requirements of this ESMP is recognized, the Oshodi Transport Interchange HSE department will communicate with the Project Director regarding the Contractor environmental and social performance. The Project Director in collaboration with the HSE Manager will interact with the Contractor's Project Manager and HSE Manager to involve the Contractor HSE Manager in corrective action discussions. The non-compliant situation may result in work stoppage until the issue is satisfactorily resolved. The following scenarios describes a number of cases of non-compliance information flow line patterns applicable to this project:

(a) In case the Construction Contractor HSE department discovers a non-compliant situation:

The Contractor HSE Manager will communicate directly to his Project Manager first, that will be responsible for correcting the situation in an appropriate manner. The situation will also be reported to the Oshodi Transport Interchange HSE Manager who communicates the situation to the Oshodi Transport Interchange HSE department and Project Manager.

(b) In case where the Oshodi Interchange HSE department discovers or observes a non-compliant situation:

The Oshodi Transport Interchange HSE Manager will communicate formally with the Oshodi Interchange Project Director who will in return communicate with the Contractor Project Manager.

(c) In the case a non-compliance situation is observed during an internal or external audit:

The situation shall be reported to the Oshodi Transport Interchange HSE department and the Project Director. The Oshodi Interchange HSE department will then communicate the issue with the Construction Contractor Project Manager.

(d) In case the non-compliant situation is observed by an external regulatory agency official:

The situation will be discussed with Oshodi Interchange HSE department and a formal report of this shall be communicated to the Oshodi Interchange HSE Manager who will examine the situation and communicate it to the Oshodi Interchange Project Manager to resolve the situation with the Construction Project Manager as deemed appropriate.

Contractor Communication

The Construction Contractor plays a crucial role in ensuring that the impact mitigation measures outlined in this ESIA are conformed with and implemented. Hence, the compliance and monitoring requirements of this EMP necessitates the maintenance of good communication among stakeholders. In that regard, the contractor HSE department shall be responsible for:

- Communicating informally with Oshodi Interchange Environmental Specialists during the construction phase on daily basis on mitigation measure compliance issues and other requirements of the ESMP;
- Communicate all compliance findings, non-compliance situations and the resolution of such concerns to the Oshodi Interchange Project Director through the Oshodi Interchange HSE Manager;
- Communicate on regular basis with Oshodi Interchange HSE department on compliance issues through meetings and discussions.

Non-Compliant Situations

The Construction Contractor HSE department is responsible for ensuring that the construction works are carried out in a manner that shows acceptable environmental performance. In situations of non-compliance with the requirements of this ESMP, it is the responsibility of the HSE department to communicate with the Contractor construction department about the situation. Such communication will be immediate on site between the Contractor's HSE Manager and the site construction supervisor. The Contractor's HSE Manager in such situation has the authority to stop work if a serious non-compliant situation is observed. All non-compliance situations will be documented with reports submitted to the Oshodi Transport Interchange HSE Manager.

7.6.2 Documentation

Lagos State Government will control EHS documentation, including management plans; associated procedures; and checklists, forms and reports, through a formal procedure. The document control procedure will describe the processes that the project proponent will employ for official communication of both hardcopy and electronic (through the internet) document deliverables. In addition, it will describe the requirement for electronic filing and posting and for assignment of a document tracking and control numbers (including revision codes). The EHS coordinator is responsible for maintaining a master listing of applicable EHS documents and making sure that this list is communicated to the appropriate parties. The EHS Manager is responsible for providing notice to the affected parties of changes or revisions to documents, for issuing revised copies and for checking that the information is communicated within that party's organization appropriately. The subcontractors will be required to develop a system for

maintaining and controlling its own EHS documentation and describe these systems in their respective EHS plans.

Operational Control Procedures

Each potentially significant impact identified in the ESIA will have an operational control associated with it that specifies appropriate procedures, work instructions, best management practices, roles, responsibilities, authorities, monitoring, measurement and record keeping for avoiding or reducing impacts. Operational controls are monitored for compliance and effectiveness on a regular basis through a monitoring and auditing procedure described in these EMP.

Operational control procedures will be reviewed and, where appropriate, amended to include instructions for planning and minimizing impacts, or to at least reference relevant documents that address impact avoidance and mitigation.

Compliance with EMP and Associated Documentation

A copy of the EMP will be kept on site during the construction period at all times. The EMP will be made binding on all contractors operating on the site and included within the Contractual Clauses. The Proponent will participate in audits, inspections and investigations. The proponent will also be responsible for regular review of the environmental performance of the site and site personnel and for the reporting on the implementation of commitments made in the EMP.

The Contractor is deemed not to have complied with the EMP if:

- within the boundaries of the site, site extensions and haul/access roads there is evidence of contravention of clauses;
- if environmental damage arises due to negligence;
- the contractor fails to comply with corrective or other instructions issued by the Project HSE Officer or Authorities within a specified time;
- the Contractor fails to respond adequately to complaints from the public.

Planet Projects Limited is deemed to be out of compliance with the EMP if:

- within the boundaries of the site there is evidence of contravention of clauses;
- environmental damage arises due to negligence;
- Planet Projects Limited fails to respond adequately to complaints from the public.

7.6.3 Emergency Preparedness and Response

Lagos State Government, the proposed project proponent has developed plans and procedures to identify the potential for and response to environmental accidents and health and safety emergency situations and for preventing and mitigating potentially adverse environmental and social impacts that may be associated with them.

Emergency preparedness and response for the proposed project activities will be reviewed by Lagos State Government relevant agencies on at least an annual basis and after the occurrence of any accidents or emergency situations to ensure that lessons learnt inform continuous improvement. The overall objective of an emergency response plan is to make use of combined resources internalized within project site and external sources for services to achieve the following:

- To minimize effects of accidents on people and property
- Safeguard other people (workers, neighbors, visitors and passers-by)
- Preserve relevant records and equipment for the subsequent enquiry into cause and circumstances of the emergency
- Investigate, implement corrective action plans and take steps to prevent reoccurrence

Emergency exercises will be undertaken on a regular basis to confirm adequacy of response strategies. Investigations of accidents or incidents will follow formal documented procedures.

Response In Case of Fire

To minimize losses during fire outbreak within the premises of the proposed Oshodi Transport Interchange Project, the following steps will be taken:

- Required actions to be taken in case of a fire will be described in signs, visible and located strategically
- On sighting a fire, the fire alarm will be activated
- If the fire is small, the nearest fire extinguisher would be engaged in extinguishing the fire
- Smoke alarms would be installed in the terminals
- Fire extinguishing facilities would be strategically placed for easiest accessibility
- In case of a big fire, calls would be made to the nearest Lagos State Fire Station

When the fire alarm goes off it is expected that employees, and commuters:

- Exit the terminal buildings as quickly as possible in an orderly manner
- If possible, cover their mouths to avoid inhaling the smoke and gases
- Close doors in each room or terminal after escaping to delay the spread of fire if it started in a room or any of the terminals
- Open a window to escape for fresh air while awaiting rescue
- Stay out of damaged buildings

Table 7.3: Emergency Contacts

Names/ Agency	Phone Number
Lagos State Command Centre/ Distress call	767, 112
Rapid Response Squad (RRS)	08056250710,08033482380,08023127350,08033355544 ,01-7750715,01-4970389,01-4970062,01-4931261 ,01-4920388
Ambulance service (LASAMBU /LASEMS}	O8022887777, 08022883678, 08022887788, 7413744, 01 – 7930490, 01 – 7639939
Distressed/ Collapsed Building	O1 – 5931947, 4933658, 4931940, 7630854
Emergency Management (LASEMA)	O8060907333, 08023127654, 01 – 6574706, 01 – 6574714
Environmental Monitoring	08033183477, 08043705057, 08023036632
Flooding Blocked Drainage (EFAG)	08056145481, 08023298197,
Radio Lagos Eko FM (NEWS ALART)	01726761
Open corpse (SHEMU)	08186510121, 08023356540,08081061497
Traffic Control (LASTMA)	08075005411,08023111742,08077551000
BRT	08023146096
LAGBUS	08033036816
Pot Hole/Collapsed Road	07060907493
Broken Pipe /Water Leakage	0800-LAGOS WATER{08005246793827)
Cutting of roads/Mast Erecting (UFRU)	0803306096
Environmental/Noise pollution (LASEPA)	07027951351
Lagos state Fire Service	08033235892, 08023321770, 080552824914
Lagos State safety Commission	08181002233
Environmental & Special offences Task Force	08033183477
Nigerian Police	08033011052, 08056250710, 08033183477
Waste Management (LAWMA)	5577 (Toll Free) 07080601020, 080231289099

Medical Emergency (chest pains, loss of consciousness, fall from a height, etc.)

i. Upon discovering a medical emergency, call 767 or 112.

ii. Call ("767 or 112") and report the nature of the medical emergency and location.

iii. Stay with the person involved being careful not to come in contact with any bodily fluids, unless properly trained and equipped.

Workplace Violence

- All employees will be implored to report the presence of firearms or other Weapons to the Project HSE Officer immediately regardless of the threat.
- Any employee who feels that she/he has been threatened will immediately report their concern to their manager and to Human Resources.

- If any person is observed exhibiting threatening behavior or making threatening statements, the person discovering the situation should warn others in the area and immediately notify the Project HSE Officer and stay away from the person exhibiting threatening behavior.
- Employees will be advised to never attempt to confront any person exhibiting threatening behavior.

Fire Prevention

1. Fire Extinguishers: Appropriate fire extinguisher type will be available on each project site within reasonable access to the work area. The use of extinguisher will be for controlling the fire danger and protection of workers.
2. Fire Prevention and Safety Employee Training: Employees will receive training in the prevention of fires and safety measures to be taken in the event that a fire should occur.
3. Flammable and Combustible Materials: Flammable and combustible materials will not be stored on the project site in large quantity. All contractors and subcontractors will be required to maintain a fire extinguisher within 20 feet or reaching distance of all welding and cutting operations. Compressed gas cylinders will be stored in an upright position with caps on and securely fastened to prevent them from falling over.
4. Fire Watch: A fire watch will be designated for 30 minutes following any hot work. Where circumstances required, fire blankets will be used.
5. Relevant certificates will be obtained from Lagos State Fire Service, Lagos State Safety Commission and Lagos State Building Control Agency

First Aid Procedures

Minor first aid treatment

First aid kit will be available at designated offices and areas on site, where adequate control of the kits will be maintained. If any worker sustain an injury or are involved in an accident requiring minor first aid treatment:

1. Worker will inform his supervisor, Project HSE Officer or the Site Nurse
2. Assigned first aider will administer first aid treatment to the injury or wound
3. The first aid register will be completed by the first aider and forwarded to Project HSE Officer for investigation
4. Access to a first aid kit is not intended to be a substitute for medical attention.

Non-Emergency Medical Treatment

For non-emergency work-related injuries requiring professional medical assistance, arrangement will be made for Site Nurse, who will attend to this. If any worker sustains injury that requires treatment other than first aid:

1. Injured worker will inform his supervisor
2. Proceed to the site clinic. The supervisor will assist with transportation, if necessary.
3. Site Nurse treat the injured worker
4. Appropriate medical treatment register is completed and forwarded to the Project HSE Officer for investigation.

Emergency Medical Treatment

If any worker sustains a severe injury requiring emergency treatment:

1. Call for help and seek assistance from a co-worker
2. The co-worker inform the supervisor to request assistance and transportation to the local hospital emergency room (provision will be made with local hospitals closer to each project sites)
3. The injured worker is treated and appropriate report forwarded to the Site Nurse and Project HSE Officer.

7.6.4 Environmental Reporting

A reporting mechanism, with proposed timing and procedures, will be included in the EMP to provide for modifications to the Project. The Environmental reporting acts as an internal control process to ensure that environmental protection and management procedures are vigorously enforced. It shall be conducted every 3 years to ensure that applicable environmental standards are maintained and the EMP is being adhered to.

7.6.5 Environmental Review/Audit

Environmental review process provides for regular assessment and evaluation of the environmental performance during the operation and maintenance phase of the project. Each environmental review/audit shall:

- Evaluate the management systems, plant operations, monitoring practices, plans and procedure;
- Identify current and potential environmental problems;
- Recommend improvement to the management of operations
- Evaluate company policy; and
- Evaluate compliance with regulatory requirements.

7.6.6 Training and Awareness

Lagos State Government will identify, plan, monitor, and record training needs for personnel whose work may have a significant adverse impact upon the environment or social conditions. The project proponent recognizes the fact that it is important that employees at each relevant function and level are aware of the project's environmental

and social policy; potential impacts of their activities; and roles and responsibilities in achieving conformance with the policy and procedures.

This will be achieved through a formal training process. Employee training will include awareness and competency with respect to:

- Environmental and Social Impacts that could potentially arise from their activities;
- Necessity of conforming to the requirements of the ESIA and ESMP, in order to avoid or reduce those impacts; and
- Roles and responsibilities to achieve that conformity, including with regard to change management and emergency response.

Planet Projects Limited (PPL) bears full responsibility of ensuring that the environmental obligations are met throughout the construction phase of the project, while transport interchange operator will be responsible during the operational phase of the project. Planet Projects Limited and the potential Oshodi Transport Interchange Operator shall establish schedules for responsibility and training on matters relating to the environment at the various phases of the project respectively. Environmental issues shall be a line responsibility for which all levels of personnel are accountable. Responsibility for Environmental management shall lie with top management that must ensure that all environmental considerations are integrated into project execution. The HSE department of PPL shall be required to offer expert advice on protection measures and monitor performance during the construction phase.

Similarly the project will require that each of the subcontractors institute training programmes for its personnel. Each subcontractor is responsible for their site EHS awareness training for personnel working on the job sites. The subcontractors are also responsible for identification of any additional training requirements to maintain required competency levels. The sub-contractor training program will be subject to approval by the project proponent and main contractor, Planet Projects Limited to ensure that:

• Training programs are adequate;
• All personnel requiring training have been trained; and
• Competency is being verified.

To ensure competence and awareness among the staff to be involved in the project, the management of PPL shall establish, maintain and operate a training and awareness programme. The awareness programme will include the:

i. Provision of Unsafe Act Auditing-booklet;
ii. Weekly Safety meeting;
iii. Tool box talks;
iv. Monthly Environmental lectures.

Training programmes that embraced the relevance of Health, Safety and Environment in the sector shall be carried out and reviewed periodically by management. Certificates of attendance shall be issued to successful participants. The company shall conduct awareness campaigns for the host communities with the aim of sensitizing them to the potential impacts and hazards associated with its operations and the appropriate response to the accidents/incidents. The public awareness campaigns shall be conducted periodically and the proceedings documented for auditing.

Health, Safety and Environmental Training

Health and Safety Orientation

Workplace Health, Safety and Environmental orientation begin on the first day of initial employment. Employees will receive HSE orientation prior to being assigned work. This orientation shall include the following training:

- Ropeways Transport commitment to HSE
- Site arrangement
- First aid
- Signage
- Standard site rules
- Safe Practices
- Personal Protective Equipment
- Personal hygiene
- Tools and equipment
- Manual handling
- Fire protection
- Incident reporting, recoding and investigation
- Emergency response and evacuation procedures

Each employee will have access to a copy of HSE manual, through his or her supervisor, for review and future reference. Supervisors will ask questions from employees and answer employees' questions to ensure knowledge and understanding of safety rules, policies, and job-specific procedures described in our workplace safety program manual. Their supervisors will instruct all employees that compliance with the safety rules described in the workplace HSE manual is required.

Job-Specific Training

1. The Project HSE Officer will initially train employees on how to perform assigned job tasks safely.

2. Supervisors will carefully review with each employee the specific safety rules, policies, and procedures that are applicable and that are described in the workplace HSE manual.
3. Supervisors will give employees verbal instructions and specific directions on how to do the work safely.
4. Supervisors will observe employees performing the work. If necessary, the supervisor will provide a demonstration using safe work practices, or remedial instruction to correct training deficiencies before an employee is permitted to do the work without supervision.
5. All employees will receive safe operating instructions on seldom-used or new equipment before using the equipment.
6. Supervisors will review safe work practices with employees before permitting the performance of new, non-routine, or specialized procedures.

Periodic Retraining of Employees

1. All employees will be retrained periodically on safety rules, policies and procedures, and when changes are made to the HSE manual.
2. Individual employees will be retrained after the occurrence of a work-related injury caused by an unsafe act or work practice, and when a supervisor observes employees displaying unsafe acts, practices, or behaviour.

Site Specific Hazard Awareness and HSE Training

Weekly safety awareness meeting will be conducted on site-specific hazards by the project HSE Officer. Employee will be informed of site-specific hazards, how to avoid them and how to perform assigned jobsite tasks safely.

7.7 ENVIRONMENTAL MANAGEMENT PLAN

The adverse environmental and social impacts and their mitigation measures had been identified in these Environmental and Social Impact Assessment document. These safeguard and environmental management measures shall be implemented during the construction and operation phases of the proposed Oshodi Transport Interchange project. Consequently, these impact mitigation measures shall be incorporated into the contractual arrangements that shall be signed between the Oshodi Transport Interchange Company and the Project Contractor/Operator. This section presents the details of the project impacts and their respective mitigation measures, the EMP implementation approach and responsibilities of stakeholders for their implementation.

The project impacts, their respective mitigation measures and other pertinent implementation details are as shown in **Table 7.4** below:

Table 7.4: Summary of Environmental Management Plan for the Oshodi Transport Interchange Project

PROJECT PHASE	POTENTIAL IMPACTS	RECOMMENDED MITIGATION / ENHANCEMENT MEASURES	RESPONSIBILITY	PARAMETER TO MONITOR	TIMING AND FREQUENCY
Pre-Construction Phase	Non-compliance with operational control measures	Operational controls - the appropriate procedures, work instructions, best-management practices, roles, responsibilities, authorities, monitoring, measurements and record keeping designed to mitigate, avoid or minimize environmental impacts throughout the life of the project – to be put in place by both Oshodi Transport Interchange Project Team and the Contractors include: ❑ Construction Traffic Management Plan; ❑ Construction Noise and Vibration Management Plan; ❑ Waste Management Plan, ❑ Waste Water Management Plan ❑ Storm Water Management Plan and ❑ This ESMP document.	Oshodi Transport Interchange Project Team, Planet Projects, the Third Party Consultant e.g. GIEC and the Contractors	Compliance documents	Once, before the construction phase just before the beginning of the site clearing and preparation activities when the demolition wastes shall be removed from the project site.
	General disruption to vehicular movement and access to the business premises in close proximity to the project site	All businesses and residences likely to be affected by the proposed project shall be notified at least five (5) working days before the commencement of the proposed project activities.	Oshodi Transport Interchange Project Team, Planet Projects, and the Project Contractors	Records of traffic situation in the immediate area	Daily
	Increased ambient noise and vibration emissions during site clearing	❑ Ear protective device to be provided to workers during the site clearing stage; ❑ Acoustic mufflers shall be installed on large equipment where necessary to limit noise levels at fence line ❑ Affected businesses or residents shall be contacted prior to the commencement of the site clearing and preparation works. They shall be informed about the works, the working hours, and the period of construction. ❑ Contact name and phone number shall be provided to affected residents and businesses should they wish to obtain further information	Oshodi Transport Interchange Project Team, Planet Projects, the Third Party Consultant e.g. GIEC and the Contractors	Noise and vibration level	Daily during the activity

PROJECT PHASE	POTENTIAL IMPACTS	RECOMMENDED MITIGATION / ENHANCEMENT MEASURES	RESPONSIBILITY	PARAMETER TO MONITOR	TIMING AND FREQUENCY
		or lodge complaints. ❑ If complaint is received regarding noise and vibration emissions, noise or vibration monitoring shall be undertaken; ❑ For activities with significant noise emissions, such (7am-6pm) activities shall be carried out during the day or evening (6pm-10pm) periods to minimize noise impacts			
	Dust emission and air quality deterioration during removal of demolition waste materials from site	❑ Use of equipment with high combustion efficiency shall be ensured ❑ Air Quality Management Plan prior to the start of the construction works shall be developed; ❑ Appropriate measures such as water spraying, especially under dry weather conditions or covering exposed areas shall be used to minimize or prevent air pollution or release of dust particulates; ❑ Vehicles transporting waste or demolition materials or other materials that may produce odours or dust shall be covered during transportation in and out of the site; ❑ Suitable facilities shall be provided to limit the tracking of dirt and soil off site; ❑ Stockpiles or areas that may generate dust shall be sited and managed to minimize the potential for dust emissions taking into consideration the prevailing wind directions and the locations of sensitive receptors. Dust generation should be controlled using wind shields and water spraying as necessary in dry periods ❑ If crushing of construction materials or waste is required, crushers shall be located away rom sensitive receptors; ❑ Equipment used on site shall be regularly maintained to keep them in good working condition and minimize exhaust gaseous	Oshodi Transport Interchange Project Team, Planet Projects, the Third Party Consultant e.g. GIEC and the Contractors	Air quality for particulate matter, volatile organic compound and noise	Weekly

PROJECT PHASE	POTENTIAL IMPACTS	RECOMMENDED MITIGATION / ENHANCEMENT MEASURES	RESPONSIBILITY	PARAMETER TO MONITOR	TIMING AND FREQUENCY
		emissions resulting from poor performance; ❑ The construction site will be established and operated to minimize emissions; ❑ Air quality monitoring shall be undertaken to verify the effectiveness of the ambient air quality control measures			
	Traffic disruption during collection and transportation of demolition wastes for disposal by LAWMA PSP	❑ The construction of the Oshodi Transport Interchange Project shall be implemented in phases to minimize impact on traffic disruption; ❑ Measures recommended in the Traffic Management Plan to be developed and implemented before the commencement of the project; ❑ Select Haulage routes to reduce disturbance to regular traffic flow where possible shall be selected; ❑ Block and reinstall interim tracks to original condition on completion of construction; ❑ Pedestrian and non-vehicle access ways shall be maintained	Oshodi Transport Interchange Project Team, LAWMA and Project Contractors	Records of traffic situation in the immediate area	Daily
Construction Phase	Construction noise and vibration impact	❑ Safeguard measures stipulated in the Construction Noise and Vibration Management Plan are to be developed at the pre-construction phase of the project and its adoption and implementation shall be ensured ❑ All affected businesses and residences shall be notified at least five (5) working days before the commencement of the proposed project activities especially through radio/TV announcement; ❑ Ear protective device to be provided to workers during the site clearing stage; ❑ Acoustic mufflers shall be installed on large equipment where necessary to limit noise levels at fence line	Oshodi Transport Interchange Project Team, the Third Party Consultant e.g. GIEC and the Contractors, Planet Projects Ltd	Noise level and vibration during the activity	Weekly

PROJECT PHASE	POTENTIAL IMPACTS	RECOMMENDED MITIGATION / ENHANCEMENT MEASURES	RESPONSIBILITY	PARAMETER TO MONITOR	TIMING AND FREQUENCY
		❑ Affected businesses or residents shall be contacted prior to the commencement of the site clearing and preparation works. They should be informed about the works, the working hours, and the period of construction. ❑ Contact name and phone number shall be provided to affected residents and businesses should they wish to obtain further information or lodge complaints. ❑ If complaint is received regarding noise and vibration emissions, noise or vibration monitoring shall be undertaken; ❑ For activities with significant noise emissions, such activities shall be carried out during the day or evening (6pm-10pm) periods to minimize noise impacts ❑ For out of hours project activity works required outside of the standard work hours, a procedure shall be developed to detail how this will be managed and measures to be adopted to minimize ambient noise emissions; ❑ Fixed operating plants will be located as far away from residence and business premises as possible. Equipment shall be subjected to pre-mobilization inspection and carefully selected to minimize noise emissions			
	Traffic disruptions during construction works	Safeguard and mitigation measures recommended in the Traffic Management Plan to be developed and approved by appropriate authorities before commencement of the project shall be adopted and implemented	Oshodi Transport Interchange Project Team, Planet Projects, LASTMA and the Project Contractors.	Records of traffic situation in the immediate area, ease of access to and from the site	Weekly

PROJECT PHASE	POTENTIAL IMPACTS	RECOMMENDED MITIGATION / ENHANCEMENT MEASURES	RESPONSIBILITY	PARAMETER TO MONITOR	TIMING AND FREQUENCY
	Impact on visual amenity and project site environ aesthetics during the construction phase	❑ Strategies to ensure the project site layout minimizes visual impact on businesses shall be adopted and residences in close proximity to the project site. Carefully construction site demountable structures, plant and materials ❑ Ensure the project site is left in a tidy manner at the end of each work day; ❑ Work areas shall be restored progressively with the construction work	Oshodi Transport Interchange Project Team, Planet Projects, and the Project Contractors.		Daily
	Siltation, sedimentation and degraded water quality in tertiary, secondary and primary drainage channels and canals from erosion of excavated materials and demolition wastes from the project site	❑ The safeguard measures in the erosion and sediment control plan to be developed prior to the commencement of the project shall be implemented; ❑ Erosion and sediment control measures shall be implemented and maintained until the works are completed; Disturbed areas should be progressively stabilized	Oshodi Transport Interchange Project Team, the Third Party Consultant e.g. GIEC and the Contractors, Planet Projects Ltd	Effluent Water Monitoring, turbidity etc.	Weekly
	Soil contamination or pollution of receiving waters from spillage of hazardous materials	Planet Projects shall: ❑ Ensure no hazardous materials are stored on the project site as much as possible; ❑ Securely keep hazardous materials that must be stored on the project site with appropriate safety measures; ❑ Ensure that transfer of fuels and other hazardous materials should be undertaken in designated location of the project site equipped with appropriate safety measures; ❑ Ensure that Spill containment kit shall be kept on site during construction works; ❑ Ensure that Construction personnel are trained on the use of spill containment kit; ❑ Implement Safety briefing and site induction to include the identification of the location of	Oshodi Transport Interchange Project Team, the Third Party Consultant e.g. GIEC and the Contractors, Planet Projects Ltd	Soil Quality	Monthly

PROJECT PHASE	POTENTIAL IMPACTS	RECOMMENDED MITIGATION / ENHANCEMENT MEASURES	RESPONSIBILITY	PARAMETER TO MONITOR	TIMING AND FREQUENCY
		spill containment kit and how to use it ❑ Make sure a Spill Containment Management Plan is developed detailing procedures for managing known and unknown contamination that could occur on the project site			
	Construction ambient air quality deterioration	Planet Projects shall: ❑ Use equipment with high combustion efficiency ❑ Develop Air Quality Management Plan prior to the start of the construction works; ❑ Use appropriate measures such as watering or covering exposed areas to minimize or prevent air pollution or release of dust particulates; ❑ Ensure that Vehicles transporting waste or demolition materials or other materials that may produce odours or dust are covered during transportation in and out of the site; ❑ Make sure that Suitable facilities are provided to limit the tracking of dirt and soil off site; ❑ Ensure that Stockpiles or areas that may generate dust are managed to suppress dust emissions; ❑ Ensure that the construction site are established and operated to minimize emissions; ❑ Ensure that Air quality monitoring is undertaken to verify the effectiveness of the ambient air quality control measures	Oshodi Transport Interchange Project Team, the Third Party Consultant e.g. GIEC and the Contractors, Planet Projects Ltd	Air quality for particulate matter, volatile organic compound and noise	Weekly
	Water quality deterioration in drainage channels and canals in close proximity to the project site	Planet Projects shall: ❑ Ensure that refueling and maintenance of plant and equipment is not undertaken within the construction area; ❑ Ensure that Daily inspection of plant and machinery is undertaken to prevent the occurrence of leakage of petroleum products; ❑ Ensure that An incident emergency response	Oshodi Transport Interchange Project Team, the Third Party Consultant e.g. GIEC and the Contractors, Planet	Effluent Water Monitoring	Weekly

PROJECT PHASE	POTENTIAL IMPACTS	RECOMMENDED MITIGATION / ENHANCEMENT MEASURES	RESPONSIBILITY	PARAMETER TO MONITOR	TIMING AND FREQUENCY
		plan is developed and incorporated into the ESMP;	Projects Ltd		
	Waste generation from construction activities	Planet Projects shall: ❑ Ensure that the solid waste generated by the project area handled and managed in accordance to the requirements of the Waste Management Plan (WMP) developed for the project and the Contractor's HSE Plan; ❑ Ensure that the construction wastes are collected and stored on site in accordance with the WMP in containers of a suitable size and design to be provided for secure storage and segregation of the waste stream.; ❑ Make the plan showing where wastes of different types should be stored or deposited is available to construction personnel on the project site.	Oshodi Transport Interchange Project Team, Planet Projects, LAWMA and Project Contractors	-Level of Waste generation and Disposal -Level of good housekeeping	Daily
	Traffic disruption during construction phase	Planet Projects shall: ❑ Implement the construction of the Oshodi Transport Interchange Project in phases to minimize impact on traffic disruption; ❑ Implement the measures recommended in the Traffic Management Plan to be developed before the commencement of the project; ❑ Select haulage routes to reduce disturbance to regular traffic flow where possible; ❑ Limit construction traffic at peak traffic hours; ❑ Block and reinstall interim tracks to original condition on completion of construction; ❑ Maintain pedestrian and non-vehicle access ways	Oshodi Transport Interchange Project Team, Planet Projects, LAWMA and Project Contractors	Records of traffic management, Ease of access to and from the site	Daily
	Water contamination from disposal of sewage generated on the project site	Planet Projects shall ensure that: ❑ Sewage collected from sanitary facility located on the project site and at portable WCs shall either be collected onsite and transported by tankers for disposal at the local sewage treatment works or discharged	Oshodi Transport Interchange Project Team, the Third Party Consultant e.g. GIEC and the	Effluent Water Monitoring, turbidity	Weekly

PROJECT PHASE	POTENTIAL IMPACTS	RECOMMENDED MITIGATION / ENHANCEMENT MEASURES	RESPONSIBILITY	PARAMETER TO MONITOR	TIMING AND FREQUENCY
		directly to sewers in accordance with regulatory requirements with a permit obtained from the appropriate government agency in Lagos State	Contractors, Planet Projects Ltd		
Operation Phase	Ambient air quality deterioration from automobile or vehicular emissions and power generating plants	Planet Project shall ensure: ❑ Use of equipment with high combustion efficiency ❑ Development of Air Quality Management Plan to the operation phase of the project; ❑ Vehicles transporting waste and other materials shall be covered during transportation in and out of the Transport Interchange Facility using appropriate and approved LAWMA waste collection facility; ❑ Air quality monitoring shall be undertaken to verify the effectiveness of the ambient air quality control measures	Oshodi Transport Interchange Project Team, the Third Party Consultant e.g. GIEC and Planet Projects Ltd	Ambient Air quality for particulate matter, volatile organic compound and noise	Quarterly
	Waste generation from operation phase	Planet Projects shall: ❑ Ensure that the solid waste generated by the Transport Interchange Terminals are handled and managed in accordance to the requirements of the Waste Management Plan (WMP) developed for the project and the Planet Projects Limited's HSE Plan; ❑ Ensure that the solid wastes generated during the operation phase are collected and stored on site in accordance with the WMP in containers of a suitable size and design to be provided for secure storage and segregation of the waste stream.; ❑ Make the plan showing where wastes of different types should be stored or deposited is available to all personnel working within the Oshodi Transport Interchange Terminals and the Shopping Malls.	Oshodi Transport Interchange Project Team, LAWMA and Planet Projects Ltd	-Level and record of Waste generation and Disposal -Level of good housekeeping	Weekly
	Traffic disruption during operation	Planet Projects shall: ❑ Implement the construction of the Oshodi	Oshodi Transport Interchange Project	Traffic Management	Daily

PROJECT PHASE	POTENTIAL IMPACTS	RECOMMENDED MITIGATION / ENHANCEMENT MEASURES	RESPONSIBILITY	PARAMETER TO MONITOR	TIMING AND FREQUENCY
	phase	Transport Interchange Project in phases to minimize impact on traffic disruption; ❑ Implement the measures recommended in the Traffic Management Plan to be developed before the commencement of the project; ❑ Select haulage routes to reduce disturbance to regular traffic flow where possible; ❑ Diver or limit construction traffic at peak traffic hours; ❑ Block and reinstall interim tracks to original condition on completion of construction; ❑ Maintain pedestrian and non-vehicle access ways	Team, Planet Projects Limited, LASTMA, Nigeria Police, Private Security Service and FRSC	of the entire project environment	
	Water contamination from disposal of sewage generated on the project site	Planet Projects shall: ❑ Ensure that sewage and waste water generated within the Interchange Terminals are handled and managed in accordance with the Sewage Management Plan and Waste Water Management Plan developed for the project	Oshodi Transport Interchange Project Team, Planet Projects Limited Third Party Consultant e.g. GIEC	Effluent Water Monitoring, turbidity etc.	Quarterly
Decommissioning phase	i. Dust from demolition activities ii. Noise from demolition activities and vehicular equipment iii. Emissions from hazardous gases like carbon monoxide, carbon dioxide, Sulphur dioxide from vehicles	Planet Projects shall: • Water spraying of the ground to reduce dust generation • Ensure strict adherence to traffic code of conduct • Ensure that vehicles that are in god condition to reduce gas emissions • Ensure proper wrapping of vehicles with plastic cover to avoid dust and material spreads during conveyance • Provide and ensure use of safety equipment such as nose mask, noise cover for employees who work near dusty location or operate heavy machinery	Oshodi Transport Interchange Project Team, Planet Projects Limited Third Party Consultant e.g. GIEC	CO_2, PM, Vehicle Maintenance, Environmental compliance	Monthly

PROJECT PHASE	POTENTIAL IMPACTS	RECOMMENDED MITIGATION / ENHANCEMENT MEASURES	RESPONSIBILITY	PARAMETER TO MONITOR	TIMING AND FREQUENCY
	i. Digging and burrowing leading to exposure of project area topsoil to erosion ii. Fuel and oil tank leaks from petroleum storage facilities	Planet Projects Ltd shall: i. Ensure appropriate drainage shall be built to accommodate adjoining surface water movement from rain and wind ii. Ensure the segregation of materials for traceability and proper stacking iii. Ensure the orderly arrangement of materials for safety iv. Control of access to the stacking area v. Ensure harvest of rain water to reduce runoff	Oshodi Transport Interchange Project Team, Planet Projects Limited Third Party Consultant e.g. GIEC	Free flow of water on the site,	Monthly
	Traffic disruption during the decommissioning phase	• Ensure regular checks and maintenance of access roads and vehicles to ensure low emissions • Train drivers to conform to local conditions • Ensure rubbles are removed and facilities are well arranged in proper locations	Oshodi Transport Interchange Project Team, and Planet Projects Limited	Ease of access in and out of site (Traffic management)	Monthly
	Contamination of receiving groundwater body from excavation and removal of underground tanks	• Ensure proper drainage of project site and immediate environment • Ensure removal of solid wastes and ensure storage in designated points be sold or reused • Ensure that oil and fuel leaks from storage locations are located separately with trap for oil and fuels	Oshodi Transport Interchange Project Team, and Planet Projects Limited	Turbidity, water quality tests	Monthly
	Waste generation from decommissioning phase	• Ensure proper stacking and placement of waste • Ensure all areas handling oil, grease, petroleum products are lined with water proof materials • Ensure monitoring for early detection of leaks and spills	Oshodi Transport Interchange Project Team, Planet Projects, LAWMA and Contractors	Level of good housekeeping	Monthly

PROJECT PHASE	POTENTIAL IMPACTS	RECOMMENDED MITIGATION / ENHANCEMENT MEASURES	RESPONSIBILITY	PARAMETER TO MONITOR	TIMING AND FREQUENCY
		• Ensure that the solid waste generated during the demolition of Transport Interchange Terminals are handled and managed in accordance to the requirements of the Waste Management Plan (WMP) developed for the project and the Planet Projects Limited's HSE Plan;			

7.8 ENVIRONMENTAL MONITORING PROGRAMS AND PARAMETERS

The Environmental Monitoring programs and parameters is the section of the EMP, which helps to outline the specific monitoring protocols, parameters, and expected frequencies. Environmental monitoring is the systematic collection of environmental data through a series of repetitive measurements. The three known types of environmental monitoring within the conceptual EIA framework as described by UNEP (1996) are as follows:

- Baseline monitoring: This refers to the measurements of environmental parameters in the pre-project period;
- Effects monitoring: This involves the measurements of environmental parameters during project construction and implementation so as to identify changes in these parameters which can be attributed to the project; and
- Compliance monitoring: It is the intermittent or incessant measurements of environmental parameters or discharges to ensure that regulatory requirements and standards are met. Compliance monitoring can further be broken down into:
    - Mitigation measures monitoring, which relates to the prescribed mitigation measures, and
    - Regulatory compliance monitoring, which has to do with existing regulatory monitoring requirements.

7.8.1 Post-EIA Environmental Monitoring

The Post-EIA monitoring plan for this project will comprise both effects and compliance monitoring plans. Baseline requirements already incorporated in section 4 of this report and are, therefore, not considered in this chapter. The Post ESIA Environmental Monitoring Plan described in this ESIA study has the wide goals of demonstrating whether an environmental change has taken place that is adducible to the construction and to alert of unanticipated adverse impacts or changes in impact trends.

7.8.2 Scope of Environmental Monitoring Plan

The Environmental Monitoring plan covers two types of monitoring activities: monitoring of compliance with mitigation measures during construction activities and effects environmental monitoring, which includes sampling and analyses of discharges and the recipient environment. The monitoring programme establishes the specifics of the environmental and socioeconomic monitoring parameters for each component of the environment that will be affected by the proposed project. The components are:

a) Construction phase

- Air quality
- Noise
- Dust

- Vibration
- Waste and site clean-up
- Traffic and transport
- Personnel health and safety
- Socioeconomic impact
- Land contamination
- Fire management
- Effluent disposal

b. Operational Phase

- Noise
- Air quality;
- Dust
- Waste management
- Water quality
- Visual amenity
- Traffic management and monitoring
- Landscape and character maintenance
- Safety
- Emergency situation management;
- Fire Prevention
- Effluent disposal
- Contingency plan for evacuation

c. Decommissioning phase

- Air quality
- Groundwater quality
- Waste management
- Visual amenity
- Dust
- Noise
- Vibration
- Land contamination
- Waste and site clean
- Emergency situation management
- Fire Prevention
- Safety
- Contingency plans for evacuation
- Landscaping, re-vegetation, stabilization and rehabilitation

- Removal of structures associated with the development

In support of the project activities, predicted impacts and recommended mitigation measures, the monitoring programme described below is considered adequate for the project. Regular data collection, audits, inspections, and related monitoring activities will be required for each category at a pre-determined frequency, either based on the schedule established in the regulations for Regulatory Monitoring or based on the Post-EIA monitoring schedule established specifically for the proposed project. Reports will be submitted to the Lagos State Ministry of the Environment and to other agencies quarterly and annually as appropriate.

All monitoring components will be subject to audit, internally by PPL during the construction phase and Transport Interchange operator during the operational phase and externally by the regulatory authorities. Project monitoring environment shall be monitored throughout the project cycle from pre-construction to decommissioning. Each monitoring programme will follow the established schedule; monitoring may be performed daily, weekly, quarterly, semi-annually, annually, biennially, or continuously, depending upon the resource, regulatory requirements for Regulatory Monitoring, and the project-specific requirements for other Post-EIA Monitoring. Monitoring results will be compiled when due and communicated to the Lagos State Ministry of the Environment and to other agencies as appropriate.

The detailed monitoring plan will follow Nigerian regulatory requirement as well as the World Bank's Environmental Performance Monitoring and supervision Guidelines. Successful environmental supervision requires a mechanism to:

(i) Determine whether the executing agency is carrying out the project in conformity with the EMP,
(ii) Identify problems, and
(iii) To develop plans for corrective action.

7.8.3. Monitoring Schedule and Parameters

Monitoring duration of all the parameters shall be for the life of the project. Much of the monitoring and data generation shall be on an on-site basis. The project environment shall be monitored throughout the project cycle from pre-construction to decommissioning. The parameters to be measured and the frequency of measurement are indicated below:

Air Quality and Noise

Air quality parameters that will be measured shall include:

- Particulates;

- Noxious gases (NO_2, CO, SO_2, VOC)
- Noise levels
- Vibration

The regularity of monitoring shall be as follow:
During Construction - *Weekly*
During Operation - *Quarterly for the first year and twice a year thereafter*

Locations for monitoring shall be within the project site, including upwind and downwind of the project area. As much as possible, in reporting the findings from the monitoring, measurements shall be compared with regulatory limits as well as the baseline data presented in Chapter four of this project

Groundwater Quality
Groundwater samples will be collected from the existing wells or borehole within the project area and analyzed for significant parameters. The parameters that will be measured include the following:

- pH, Conductivity, TDS, Dissolved Oxygen and Biochemical Oxygen Demand;
- Total Suspended Solids, Turbidity and Salinity;
- Total hydrocarbons;

Monitoring shall be conducted in at least 4 points: one point within the immediate vicinity of the facility, one point upstream (control point) and one point within the Oshodi community.

Sampling schedule shall be as follow:
During Construction -- *Weekly*
During Operations -- *Quarterly for first year and twice a year thereafter*

Socio-economics
Socio-economic parameters are not as easily measurable as physico-chemical and biological indices. Given the various interfaces between the project and the socio-economy, as described in chapter six of this report, the main socio-economic index that can be monitored is traffic. As such, the baseline traffic situation will be established, prior to commencement of construction activities. Traffic will be monitored on a weekly basis during construction and on a quarterly basis when the project is operational.

TABLE 7.4: Summary of Monitoring Schedule

Phase/Activity	Potential Impact	Parameters to be Monitored	Frequency
Pre-construction Phase	Non-Compliance with Operational Control Measures	Compliance Documents	Before the construction phase
	Disruption of vehicular movement	Records of traffic situation	Daily
	Increase ambient noise and vibration	Noise and vibration level	Daily
	Dust emission	Ambient air quality, VOC, PM, and Noise Level	
	Traffic disruption during waste collection by LAWMA	Record of traffic situation Levels of house keeping	Daily
Construction Phase	Construction Noise and Vibration Impact	Noise and Vibration Level	Weekly
	Traffic Disruption	Record of traffic situation during construction	Daily
	Water quality degradation	Effluent water monitoring	Weekly
	Soil contaminant	Soil quality	Monthly
	Ambient air Quality deterioration	Ambient air quality e.g. PM, VOC, etc.	Weekly
	Water Quality deterioration	Effluent water monitoring	Weekly
	Waste generation	Level of waste generation and disposal	Daily
Operation Phase	Ambient air quality deterioration	Ambient air quality and noise level	Quarterly
	Waste generation	Level and record of waste generation and disposal	Weekly
	Traffic disruption	Traffic management	Daily
	Water contamination	Effluent water monitoring	Quarterly
Decommissioning	Ambient air quality deterioration	Ambient air quality and noise level, vehicle maintenance	Monthly
	Soil contamination	Free flow of water on site	Monthly
	Traffic disruption	Traffic management	Monthly
	Groundwater contamination	Turbidity, Water quality	Monthly
	Waste generation	Levels of house keeping	Monthly

7.9 HEALTH AND SAFETY OF WORKERS

Operations at all work sites shall be subject to government and Planet projects policies and guidelines. All Project and contractor staff shall be well informed and trained on the Health and Environmental Safety policies and guidelines. All facilities shall also be designed to enhance safety planning and activities shall be executed within the confines

of relevant legislation and stakeholders' interests. All construction work by contractors shall be properly managed through careful planning and the application of relevant Healthy Safety and Environmental policies including the following:

- Use of Permit to Work (PTW)
- Job Hazard Analysis and toolbox meetings
- Use of PPE in designated hazard areas
- Prohibition of alcohol during work hours and at work sites and facilities
- Regular emergency drills;
- Prohibition of smoking in fire hazard areas; and

7.10 POLLUTION CONTROL

Air pollution

Planet Projects Limited shall utilize all practical methods and devices available to control, prevent, and otherwise minimize atmospheric emissions or the discharge of air contaminants. Good engine efficiency of equipment and vehicles shall be maintained.

Noise pollution

Planet Projects Limited shall comply will all requirements for noise control and regulatory standards during the construction phase. All equipment shall be employed to minimize noise. Earmuffs shall be provided for all workers and any other person present in the vicinity of high noise generating equipment or operation if noise level at any time gives rise to public complaint, the issue shall be treated, as public nuisance and Planet Projects Limited will take appropriate measure to resolve the problem with the appropriate authorities.

Soil Pollution

Planet Projects Limited shall perform construction and operation activities by methods that will prevent pollution of the soil media by accidental spill, relevant spill control measures shall be applied and contaminated soil shall be cleaned as appropriate.

7.11 WASTE MANAGEMENT GUIDELINE

Waste management is an important aspect of controlling, minimizing project impacts on the Environment. All project phases will involve waste generation, which will need to be adequately managed for minimal impact on the environment. The principle of waste reduction, recycling, recovery and reusing shall be practiced. All wastes, which cannot be reused, will be managed and disposed in accordance with standard waste management plan to reduce effects/impacts on the environment and must be upheld and implemented throughout the project cycle.

The handling, storage and disposal of wastes shall be according to the waste management guidelines in **Table 7.5** take into consideration the regulations of the Lagos State Ministry of Environment and other national and international environmental agencies and these standards are binding on all staff and contractors involved in the proposed project with respect to the:

- Emission or release of pollutant, exhaust and/or fugitive gases.
- Discharge or spill of effluent into land.
- Discharge of solid wastes (including domestic waste)
- Generation of noise and vibration

Table 7. 5: Waste Management Guidelines

S/N	TYPE	MANAGEMENT/TREATMENT
1.	Domestic Waste/Rubbish from base camps	Store in closed containers Follow local requirement for disposal
2.	Sanitary Wastes	Septic tank and use of the Lagos State PSP Sewage Disposal Companies
3.	Scrap metal	Small metal items to be stored in containers. Larger metal items and disused machinery to be inventoried for disposal
4.	Non-plastic combustible packaging materials	Containerized in designated containers and disposed in line with local regulator requirements
5.	Plastic packaging materials	Containerized in designated containers Reuse or dispose appropriately
6.	Hazardous substances • Waste oils • Hydrocarbon-based • Detergents • Hazardous chemicals • Solvents	Storage in containers/drums and labelled with contents. Managed in areas designed to control any loss of containment incidents; returned to PPL for re-use or disposal; waste oils to be recycled wherever possible.
7.	Cement slurries and mix	Confined and Dispose appropriately
8.	Kitchen wastes (organic)	Segregate and package for disposal Follow applicable local requirement for disposal
9.	Flush water	Treat before discharge
10.	Equipment/Engine wastes	Re-use
11.	Spills and leakages	• Put in place adequate control equipment for immediate containment and clean-up • Effective maintenance programme for pipelines • Site-specific contingency plans for oil/chemical spills to produced and active yearly • Regular practice of emergency drills
12.	Welds/radio-active materials waste	To be packaged and returned to manufacturer

Waste Handling Guidelines

For proper handling and disposal, wastes shall be well defined at source and ensured that the wastes get to final disposal points. Planet Projects Limited personnel and subcontractors shall define and document all wastes generated in the course of work. Basic information that must be provided, as a minimum, for adequate definition of wastes include:

- Waste type identification
- Proper waste categorization
- Waste segregation information
- Recommended management practices.

Waste Minimization Guidelines

Waste minimization implies reduction to the greatest extent possible of the volume or toxicity of waste materials. The four principles of waste minimization process: ***recycle, reduce, reuse, and recovery*** shall be adopted as applicable. Opportunities to achieve significant waste volume reduction during the proposed project are functions of activity level, age, depreciation and maintenance level of facilities and operating equipment.

A large proportion of excavated material shall be used for landscaping or other remedial works on site. In addition, all oils, hydraulic fluids, oily sump water, etc. shall be recycled or treated before disposal at an appropriate waste disposal facility.

Waste Segregation Guidelines

For effective implementation of appropriate waste disposal methods, it is important that wastes be segregated, preferably at source into clearly designated bins at strategic locations.

Waste Disposal Guidelines

All debris, spoil materials, rubbish and other waste, except excavated soil and rock shall be cleared regularly from the sites and disposed off using the services of the Lagos State Waste Management Authority (LAWMA) at designated areas and facilities. Instruction on materials safety handling sheet shall be strictly adhered to and shall be properly packaged and returned to manufacturers for proper disposal. Wastes in transit must be accompanied and tracked by consignment notes. The waste consignment notes shall contain the following as a minimum:

- Date of dispatch
- Description of waste
- Waste quantity/container type;
- Consignee/driver name and means of transportation; and
- Confirmation of actual disposal (time and date).

Operational Wastes and Disposal Methods

Solid wastes

Provision shall be made for the proper storage and subsequent disposal of all solid wastes generated from operation of the Oshodi Transport Interchange. These include but not limited to papers, Plastic bottles, glass bottles, and Vehicular parts. These wastes shall be collected, segregated and transported to an approved disposal facility. No dumping of wastes into any other water body or undesignated locations shall be allowed

Liquid Wastes

These will include wastewaters/hydrates water, hydrocarbon spills/leakages. All contingency plans for pollution control shall be maintained and where discharges are unavoidable, they shall be closely monitored and minimized. Wastewater and sewage shall be carefully treated and the effluent tested to have complied with regulatory requirement before discharge into the environment.

Hydrocarbon spills

Minor hydrocarbon spills shall be cleaned immediately using appropriate absorbent granules and powders. Direct flushing into public drains shall not be permitted until such measures have been taken and the majority of the spill absorbed.

7.12 NOISE MINIMIZATION GUIDELINES

Noise vibration generated by vehicles and equipment shall meet the ergonomic requirements of the Lagos State Ministry of the Environment and other National and International Standards, Codes of Practice and Statutory Regulations. Where noise level exceeds the stipulated limits, it shall be treated, as nuisance and the contractor concerned shall put in place adequate mitigation measures to ensure that the situation is properly addressed.

All personnel working for long periods in high noise shall be required to use earmuffs at all times. Permanent warning signs shall be posted at the boundaries of these restricted areas. The following noise limits shall be used in the design:

Machinery workshops	70 dB (A)
Temporary Shelters	60 dB (A)
Site offices	45 dB (A)
Site accommodation	40 dB (A)
Construction site	85 dB (A)

CHAPTER EIGHT

DECOMMISSIONING AND ABANDONMENT PLAN

8.1 Introduction

Projects are usually designed with an expected lifespan and so, no matter how long the design life, all projects eventually close out. The lifespan may sometimes be less than planned, while in some cases; it can be extended with proper planning and maintenance. The longevity of any development project is primarily dependent on a number of factors including:

- Availability of raw materials
- Durability of equipment and machinery
- Profitability of the project
- Usefulness and acceptability of project performance

This project is planned to last for at least 30 years. However, if and when the likely operator of the proposed Oshodi Transport Interchange project development is to be demolished, the project proponent would need to decommission the entire system. While this is not expected to occur within the next twenty to thirty years, it is, all the same, necessary to start planning, at this stage, for the closure stage, when the use of the terminals and bus parks and infrastrucrual facilities have to be discontinued. For this reason therefore, this chapter of the report discusses succinct plans for the closure/decommissioning of the proposed Oshodi Transport Interchange project.

8.2 Decommissioning and Abandonment Plan

The decommissioning and abandonment plan has its focus protecting public health and safety, eliminating environmental damage and liabilities and allowing the project site to be restored to its original state/ use or converted into other uses.

For the proposed Oshodi Transport Interchange Project, the following are planned to take place prior to decommissioning of the project:

- A preliminary site contamination /facility inventory will be carried out and documented to assist in the decommission process;
- Site inspections and hazard characterization will take place and concerns will be identified;
- Communication with relevant stakeholders to obtain necessary inputs into the final decommissioning plan; and
- Negotiation with relevant government authorities on the final decommissioning plan, including schedules, monitoring requirements and permits such as demolition permits

The proposed Oshodi Transport Interchange project has an anticipated life expectancy of a minimum of 30 years, during which time this facility will be maintained to operate safely and efficiently. At some point in the future upon completion of its operational life, the facility will be decommissioned and or abandoned. A decommissioning and abandonment plan will be developed to reduce and remediate environmental and social impacts associated with project infrastructure and operation decommissioning.

The decommissioning plan shall be executed at end of the Project life-span taking cognizance of all relevant regulatory requirements. This plan shall also take into account environmental rehabilitation. Environmental rehabilitation shall include the removal of all surface facilities and excess hydrocarbon waste, as well as re-vegetation of localized natural flora. Government approved hazardous material disposal sites shall be used if any hazardous materials are collected.

Associated decommissioning activities in accordance with Environmental Protection Measures and Standards of Good Practice are listed below:

- Removal of site infrastructure and waste;
- Removal of all civil structures and associated infrastructure;
- All remaining materials and hydrocarbons as well as hazardous waste shall be removed and stored appropriately for disposal
- All waste will be disposed off in an appropriate manner in line with regulatory requirements and
- Reusable materials shall be resold to other end user or where possible recycled.

Clean up and Transport:

- When decommissioned, all products within piping and storage infrastructure shall be removed from said system along with all associated infrastructure and possible contaminated soils; and
- Roadways and natural drainage patterns will be reinstated where practicable.

8.3 Facility Abandonment

Prior to abandonment, a review of the site infrastructure will be carried out to address items to be decommissioned and abandoned. The following issues will be addressed during abandonment process:

- All equipment deemed potentially hazardous will be removed from the site and disposed of in accordance with government regulations.
- Buildings, surface structures and other infrastructures, which will no longer be required will be properly dismantled, demolished and removed.
- Concrete foundations will be demolished to near surface grade and the concrete debris disposed of in an appropriate landfill. Buildings or foundations to be retained shall be subjected to Structural Integrity test and passed as fit

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for human habitation/use, failing which they shall be dismantled and removed as described above.

- An assessment of soil contamination in the location or vicinity of the buildings and other facilities shall be conducted and appropriate remediation measures will be implemented to treat or excavate and remove contaminated soil as required.
- Access and site roads deemed no longer required shall be reclaimed by removing the asphalt surface and scarifying the surface. Where erosion and sedimentation is a potential concern, suitable plant species shall be planted along the prepared roadway surface. For areas where erosion and sedimentation are not a concern, the scarified surface will be left to re-vegetate naturally.
- Culverts will be removed and natural drainage patterns will be restored wherever practicable.
- Power to the site shall be terminated and the service disconnected at the source.
- The electrical lines, Transformers, and other electrical installations shall be removed along with the poles.
- The equipment associated with the water supply will be removed and any drilled boreholes shall be plugged with concrete. The underground water line will also be removed and the area graded.
- The sewage holding tank and associated underground piping will be removed from the site.
- Site lighting will be removed along with all lighting hardware and poles.
- Underground pipes, conduits and cables will be terminated a minimum depth below the surface grade and allowed to remain unless there is a regulatory stipulation to remove them, in which case they will be removed and the areas graded and rehabilitated.

8.4 Wastes Management during Decommissioning

8.4.1 Gaseous Emissions

There will be minor air emissions from construction equipment associated with decommissioning and abandonment operations. Also particulate matters will be generated during decommissioning of civil structure. Appropriate mitigation measures as already indicated in chapter six of this report shall be implemented.

8.4.2 Liquid Wastes

Liquids wastes that could emanate from the decommissioning of the facility include sewage/ wastewater from septic tanks, waste transformer oil, waste oil from machineries. Sewage/ wastewater from septic tanks shall be properly dislodged using the Lagos State Wastewater Management Office (LASWAMO) approved PSP

dislodgers while all waste oils shall be carefully collected and containerized. The waste oil shall be resold to other end users for firing of furnaces.

8.4.3 Solid Wastes

Solid wastes from the decommissioning activities shall include all demolition wastes such as concrete debris, iron rods, metal cuttings, disused wooden materials etc., disused equipment/ machineries, disused vehicle parts, disused office furniture amongst others. All waste material will be sorted and material not deemed acceptable for reuse or recycling will be disposed off at approved landfill site through the use of LAWMA or her approved PSP Operators.

CHAPTER NINE

CONCLUSION AND RECOMMENDATION

9.1 Conclusion

The development of the proposed Oshodi Transport Interchange at Oshodi will change the way people travel by public transport in Lagos State. The Lagos State community will realize substantial benefits from the wider program of works associated with the Urban Renewal and Transport Program, under the Strategic Transport Master Plan (STMP) of which the proposed project is a necessary precursor.

This is further strengthened by the desire of the current administration in the State to transform Oshodi into a world-class Central Business District (CBD) with business, travel and leisure activities conducted in a serene, secure, clean, orderly and hygienic environment, a concept that is anchored on a 3-pronged approach – Transportation, Security and Urban Renewal & Environmental Regeneration**.**

This impact assessment has identified biophysical and social environmental impacts during construction and operation of the proposed project and proposes a range of mitigation measures to reduce identified impacts.

The key impacts identified are the deterioration of air quality and increase in noise level during the preconstruction and construction phase of the proposed project. Furthermore, increased pressure on support service and infrastructure around the project area, increase in travel time for commuters into and out of the project area as a result of the mode change requirement of the proposed project during construction phase. The assessment also identifies a number of risks and opportunities that would be further considered prior to commencement of construction and during detailed design. It is envisaged that careful implementation of the various mitigation measures suggested for this project will ensure that the remedial impacts are all essentially negligible.

Given the detailed description of baseline environmental characteristics of the project area, and the exhaustive impact identification that have been presented in earlier sections of this report, we can conclude that the development will lead to a number of significant positive impacts if all recommended mitigations strictly adhere to:

- Provide a world-class transport infrastructure to the people of Lagos State
- Increase employment opportunities to the people of Lagos State, especially in transport sector since the proposed project is Public-Private initiative

- Increase internally generated revenue for the Oshodi Isolo Local Government Area and Lagos State Government
- Reduce pressure on the existing access roads such as Oshodi-Apapa express road and Agege motor. In addition, it will boost the interstate and intrastate transportation business in the state especially in the Oshodi axis
- The various stages of the infrastructure development (construction and operational phase) would affect the socio-economic development of the people within the project area.
- The associated and potential negative impacts of the project, as identified in Chapter Five of this report, are far outweighed by the anticipated positive impacts that could attend the project;

Based on the foregoing therefore, it is our expectation that if appropriate mitigation measures, particularly those recommended in chapter six of these report are implemented, and if the monitoring and management program for the environment are equally handled in proper perspectives, the entire project can be implemented in a sustainable manner.

9.2 Recommendation

In addition to the identified mitigation measures, it is expected that during the construction stage of the proposed Oshodi transport Interchange project activities, all precautionary measures applicable to construction works like dust suppression measures, noise pollution control, drainage and watercourse protection, control of dispersion of filling materials and consultation with relevant stakeholders especially the Oshodi community will be implemented before and during the construction phase

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INDIVIDUAL/HOUSEHOLD INTERVIEW SCHEDULE FOR SOCIAL IMPACT ASSESSMENT OF THE PROPOSED OSHODI TRANSPORT

Husband or wife or senior member of household should be interviewed

Opening Statement:

My name is .....…….... I am working for Global Impact Environmental Consulting Ltd. (GIEC), an organisation that is committed to environmental safety and solutions. We are carrying out a Social and Economic Impact Assessment for the proposed Oshodi Transport Interchange in this area. You have been selected as one of the subjects for interview because you live/work in or commute through this area. We would like to ask about your views on the proposed project and how it may impact on you, your business/economy, environment and community.

Your response will assist us to understand your interests/concerns, how the project may affect you, and in planning to avoid or minimise any negative impact.

Your answers will be completely confidential. Only summary information will be used, and no individual questionnaire will be made available to any authority. If there is any particular question that you do not like to answer, that will, of course, be accepted.

CONSENT: Are you willing to be interviewed? Yes No

Questionnaire number			
SECTION 1: SURVEY IDENTIFICATION			
S/No	**Issues**	**Responses**	**Response codes**
1	Street Name	……	
2	Name of Enumerator/Interviewer	……	
3.	Name of Supervisor	……	
4.	Language of interview	English.....1 Pidgin English .....2 Yoruba.....3 Other language (specify) 4	
5.	Date of interview (ddmm e.g. 0405)	……..	
6.	Time interview started (hhmm, e.g. 1320)	……..	
7.	Time interview ended (hhmm, e.g. 0850)	…….....	
8.	Identity of person interviewed	Husband..... 1 Wife..... 2 Male senior member of household .. 3 Female senior member of household..4	
SECTION 2: SOCIO-DEMOGRAPHIC INFORMATION ABOUT RESPONDENT			
9	Sex of respondent (Interviewer indicate as appropriate)	Male..... 1 Female 2	
10	How old are you now? (Age last birthday in years)	…….. years	
11	What is your current marital status?	Single (never married)..... 1 Cohabiting ..... 2 Married..... 3 Separated ..... 4 Divorced..... 5 Widowed 6	

12	What is your highest level of education?	No formal education ..... 1 Quranic education ..... 2 Primary ..... 3 Secondary ..... 4 Post-Secondary (degree) ..... 5 Post-Sec (non-degree) ..... 6 Others (pls specify) 7	
13	What is your current occupational status?	Employed/self-employed .....1 Unemployed .....2 Retired .....3 Housewife .....4 Student/Apprentice .....5 Other (please specify) 6	
14	If employed/self-employed, ask: What is the nature of your main occupation?	Business/Trading .....1 Private Sector Employment .....2 Artisan (Mechanic, welder, etc .....3 Hair dressing/fashion designing, etc .....4 Teaching ..... ……5 Civil service .....6 Transport……..7 Porters (load carriers)……...8 Other self-employment .....9 Others (pls specify) 10	
15	What is the estimated total income of your household per month?	₦ ……..	
16	What is your religion?	Christianity .....1 Islam .....2 Traditional religion .....3 Atheist .....4 Other (please specify) 5	
17	What is your ethnic background?	…….	
18	What is your State of origin?	…….	
19	How long have you been living in this area? (number of years)	……. Years	
20	Do you plan to continue to live in this community?	Yes ..... 1 No 2	
21	If 'No', please mention why you may move out of this community?	…… …… …….	
22	For respondents who have been living in the community for five or more years, ask: What significant changes have taken place in this community over the past five or more years? Probe for both noticed Positive and Negative changes	…… …….	
23	Where is your business/work/office located?	Around Oshodi bus stop/market ...1 Within Oshodi and its environs .....2 Outside Oshodi, but within LGA …3 Outside .. LGA 4	
24	What mode of transportation do you usually use to get to your office or business place?	Private car ..... 1 Company/pool vehicle ..... 2 Private motorbike ..... 3 Public transport ..... 4 Private bicycle ..... 5 Walking ..... 6 Other mode (pls specify) 7	

25	Do you or other members of your household use public transportation?	Yes ..... 1 No..... 2			
26	How often do you or members of your household use public transportation?	Very often (5 or more days per week). 1 Often (3-4 days per week)..... 2 Not so often (1-2 days per week) ..... 3 Rarely (3 or less days a month)..... 4			
SECTION 3: COMMUNITY INFORMATION AND FACILITIES					
27	What are the common economic activities of people in this community?	…… …… ……			
28	Do you have any of the following in this community?	Yes	No	Don't Know	
	a) Post office	1	2	3	
	b) Recreational centre/space	1	2	3	
	c) Government/public primary school	1	2	3	
	d) Government/public secondary school	1	2	3	
	e) Market	1	2	3	
	f) Fire station	1	2	3	
	g) Police station	1	2	3	
	h) Government Hospital	1	2	3	
	h) Private hospital	1	2	3	
SECTION 4: AWARENESS, ATTITUDE AND OPINION ABOUT THE PROPOSED OSHODI TRANSPORT INTERCHANGE PROJECT					
29	Are you aware about the proposed Oshodi Transport Interchange project?	Yes .....1 No.....2			
30	If "Yes", how did you first know about the proposed Transport Interchange project?	…… …… ……			
31	What is your general opinion about the proposed Transport Interchange project?	…… …… ……			
32	How do you think the proposed Transport Interchange project could affect you as an individual or your family/household?	…… …… ……			
33	How do you think the proposed Transport Interchange project could affect your community?	…… …… ……			
34	What are the problems that the proposed Transport Interchange project could bring to this community? (Probe for impact on accommodation, transportation, social facilities and infrastructure, etc.)	…… ……			
35	What other problems do you think could arise from the proposed Transport Interchange project?	…… …… ……			

36	What solutions can you suggest to solve the above-identified problems?	…… …… ……	
37	Do you foresee any possible conflict between the residents of this community and the project?	Yes .....1 No.....2	
38	In what ways do you think the project activities could conflict with the life of the people?	…… …… ……	
39	What do you think can be done to avoid such conflicts?	…… …… ……	
40	What benefits do you think you and members of your household can derive from the proposed Transport Interchange project? (Probe for business and employment opportunities, transportation, etc.)	…… …… ……	
41	What benefits do you think this community can derive from the proposed Transport Interchange project? (Probe for business and employment opportunities, transportation, etc.)	…… …… ……	
42	Are there some groups of people who may be affected by the proposed Transport Interchange project?	Yes .....1 No 2	
43	If 'Yes', please mention such groups.	…….. …….. ……..	
44	How are they likely to be affected by the proposed Transport Interchange project?.	…….. …….. ……..	
45	Are there some vulnerable or particularly disadvantaged groups/groups of individuals (e.g. physically challenged people, the poor or destitute who may be affected by the proposed Transport Interchange project?	Yes .....1 No .....2 Don't know 3	
46	If 'Yes', please mention such groups.	…….. …….. ……..	
47	Where are such groups located?	…….. …….. ……..	

48	How are they likely to be affected by the proposed Transport Interchange project?.	…….. …….. ……..	
49	Are there some socio-cultural artefacts (e.g. shrines, religious or other sacred things) in this community that may be affected by the proposed Transport Interchange project?	Yes .....1 No 2	
50	If "Yes", please mention the socio-cultural artefacts and where they are located.	…….. ……..	
51	Can such socio-cultural artefacts/sacred places be transferred/relocated/replicated in a new location?	Yes.....1 No 2	
52	Do you think there could be some resistance/objections by people to the proposed Transport Interchange project?	Yes.....1 No 2	
53	If "Yes", why do you think people may resist/object the proposed Transport Interchange project?	…… …… …….	
54	Who are the people you think may resist/object to the proposed Transport Interchange project?	…… …… …….	
55	What do you think can be done to minimise or overcome such resistance/objections?	…… …… …….	
56	Do you have any fears or concerns about the proposed Transport Interchange project?	…… …… …….	
57	If your house or business premises were to be affected by the Transport Interchange project, what would be your reaction?	…….. ……..	
58	If your house were to be affected by the Transport Interchange project, what would be your concerns/fears?	…….. ……..	
59	What do you think could be done to assist you to reduce the effect of the project on you/ your household?	…….. ……..	
60	If you had to relocate because of the project, would you relocate to another place near here or move out of this area completely?	…….. ……..	
61	If would stay near here, why?	…… ……	

62	If would move out of this area completely, why?	…… ……	
SECTION 5: COMMUNITY STRUCTURES AND ARRANGEMENTS			
63	Are there Community Development Associations (CDAs) or Residents' Associations (RAs) in this community?	Yes .....1 No.....2	
64	If "Yes", please mention the names of the CDAs that you know in this area.		
65	Are there some Civil Society organisations/Community-Based Organizations/NGOs in this area?	Yes .....1 No.....2	
66	If "Yes", please mention the names of such organisations that you know in this area.	…… …… ……	
67	Are there youth-based groups in this community?	Yes .....1 No.....2	
68	Can you name such youth-based groups that you know exist in this community?	…… …… ……	
69	What kind of activities do male youth in this community engage in mainly?	…… …… ……	
70	What kind of activities do female youth in this community engage in mainly?	…… …… ……	
71	What kind of activities do male adult in this community engage in mainly?	…… …… ……	
72	What kind of activities do female adult in this community engage in mainly?	…… …… ……	
73	What other comment do you have to add to what we have discussed so far?		
SECTION 6: HOUSEHOLD SITUATION AND FACILITIES			
74	Type of house – Interviewer observe and record	Rooming house (face-to-face)……1 Bungalow/Self-contained .....2 Duplex.....3 Block of flats .....4 Other type (specify).....5	

75	Do you own the apartment/house in which you currently live or are you renting?	Own the house.....1 Rent-paying tenant .....2 Non-rent-paying tenant.....3 Official quarter .....4 Other (pls. specify).....5	
76	What is the main source of electricity supply to your house/apartment?	PHCN .....1 Private electricity provider .....2 Generator.....3 Solar/Inverter.....4 Other sources (specify).....5	
77	How regular is public electricity supply in this area?	Very regular.....1 Regular .....2 Just okay.....3 Irregular.....4 Very irregular 5	
78	How do you get most of the water you use here daily?	State water piped into house.....1 Borehole piped into house .....2 Water tanker/seller .....3 Yard piped……4 Public/street stand piped……5 Well……...6 Other (specify).....7	
79	How satisfied are you with water supply in this area?	Very satisfied (18 hours or more)..1 Satisfied (14 – 17 hours) .....2 Just okay (10 – 13 hours) .....3 Dissatisfied (6 – 9 hours).……..4 Very dissatisfied (less than 6 hours)...5	
80	What is the most commonly used mode of disposal of solid waste from this household? Or: How does your household dispose of most of its solid waste? (Tick only one)	Dumping ground in neighbourhood..1 Truck pusher/private refuse collector2 Neighbourhood bin/skip……3 PSP/LAWMA……..……4 Other types(Specify)……..5	
81	Interviewer check/confirm: Are there street lights on the street where respondent lives?	Yes .....1 No.....2	
82	If "Yes", ask: Do the street lights work regularly?	Yes .....1 No.....2	
83	Including your own household, how many households (families) live in this compound?	…….	
84	Now, I am going to ask some information about members of your household: Including you, how many people live in this household?	1. No. of males …….. 2. No. of females …… 3. Total …..……..…	
85	Including you, how many adults (18 or above) are there in your household?	……..	
86	How many persons (under 18) are there in your household?	……...	
87	How many members of your household are gainfully employed?	Males …….. Females ……..	
88	What is the most common health issue for members of your household?	…….	

THIS IS THE END OF THE INTERVIEW. THANK YOU FOR YOUR COOPERATION.

INTERVIEWER RECORD TIME INTERVIEW ENDED.

INDEPTH INTERVIEW SCHEDULE FOR SOCIAL IMPACT ASSESSMENT OF THE PROPOSED OSHODI TRANSPORT INTERCHANGE, MARCH, 2018

FOR COMMUNITY LEADERS, OPINION LEADERS AND GROUP LEADERS

(For Community/CDA Leaders, Religious Leaders, Women Leaders, Market Leaders, Trade/Association Leaders, Youth Leaders, etc.)

Opening Statement:

My name is .....…….... I am working for Global Impact Environmental Consulting Ltd. (GIEC), an organisation that is committed to environmental safety and solutions on Social and Economic Impact Assessment for the proposed Oshodi Transport Interchange in this area. You have been selected as one of the subjects for interview because you live/work in or commute through this area. We would like to ask about your views on the proposed project and how it may impact on you, your business/economy, environment and community.

Your response will assist us to understand your interests/concerns, how the project may affect you, and in planning to avoid or minimise any negative impact.

Your answers will be completely confidential. Only summary information will be used, and no individual questionnaire will be made available to any authority. If there is any particular question that you do not like to answer, that will, of course, be accepted.

CONSENT: Are you willing to be interviewed? Yes No

Questionnaire number			
SECTION 1: SURVEY IDENTIFICATION			
S/No	**Issues**	**Responses**	**Response codes**
1	Street Name	……	
2	Name of Enumerator/Interviewer	……	
3.	Name of Supervisor	……	
4.	Language of interview	English..... 1 Pidgin English..... 2 Yoruba ..... 3 Other language (specify)..... 4	
5.	Date of interview (ddmm e.g. 0405)	…….	
6.	Time interview started (hhmm, e.g. 1320)	……..	
7.	Time interview ended (hhmm, e.g. 0850)	…….....	
8	Identity/Category of person interviewed	Community leader ..... 1 Religious leader ..... 2 Business/Trade leader..... 3 Youth Leader ..... 4 Women Leader ..... 5 Market leader..... 6 Other (specify)..... 7	
9.	Sex of respondent (Interviewer indicate as appropriate)	Male……..1	

		Female……..2	
10	Please state your title/position	…….	
11	For how long have you been in this position?	……. Years …… Months	
12	Apart from Yoruba, which other ethnic groups live/work here in large numbers?		
13	How long have you been living or working in this community? (number of years)	……. Years	

Awareness about and Attitude to the Proposed Oshodi Transport Interchange Project

14. Are you aware of the proposed Oshodi Transport Interchange project in this area? If 'Yes', probe: How did you get to know about the project? Probe for source of information

15. What is your opinion about the proposed Oshodi Transport Interchange project?
    - How do you think the proposed project could affect people in this community?
        - Probe for effects on individuals (residents, traders/business operators, commuters)
        - Probe for income-earning opportunities, business opportunities, transportation, commuting, noise, environmental pollution, traffic congestion, security, accommodation, cost of living, etc.

16. What are the problems that the proposed Oshodi Transport Interchange project could bring to this community?
    - Probe for income-earning opportunities, business opportunities, transportation, commuting, noise, environmental pollution, traffic, security, accommodation, cost of living, etc.)

17. What solutions can you suggest to solve these problems?

18. Are there some individuals or groups who may oppose the Oshodi Transport Interchange project? Who are these individuals or groups?
    – Why do you think these people may oppose the project?

19. What do you think can be done to overcome the opposition of these people to the project?

20. How is the project likely to affect women, children, youth, etc.

21. What concerns/fears/problems do you think people may have about the Oshodi Transport Interchange project?

22. If houses/business premises were to be affected by the Oshodi Transport Interchange project, what do you think would be the people's reaction? What would be people's concerns/fears?

23. What do you think can be done to assist the affected people to reduce the effect of the project on them?

24. If people's houses/business premises had to be relocated for the Oshodi Transport Interchange project, what do you think would be their reaction?
    – What do you think would be their fears/concerns?

25. How do you think they can be assisted to minimise the effects of relocation on them?

COMMUNITY STRUCTURES AND ARRANGEMENTS

26. Are there traditional leaders in this area?
    – Who is/are the traditional leaders?

27. Is there a ruling chieftaincy house in this community? (If 'Yes', please mention the name)

28. Are there some influential personalities, associations/clubs/social groups in this area?
    - (Probe for business/trade/ occupational groups, social groups/clubs, religious groups, etc).
        -

29. If you were to rank these groups in terms of importance for community mobilisation and development, which would you rank as most important, which would come next, etc.?

30. Are there youth-based groups in this community?
    - Probe for the names and activities of such youth-based groups that exist in the community?

31. If there are disputes between people in this community, how are such disputes usually resolved? (Probe for community conflict resolution mechanisms/structures in the community).

32. Are there some socio-cultural artefacts (e.g. shrines or other sacred things) in this community that may be affected by the proposed project?

– If there are, probe for the name, location, and activities around such socio-cultural artefacts (including rituals and ceremonies).

33. Can such socio-cultural artefacts/sacred places be transferred/relocated/replicated in a new location?

34. What other comment do you have to add to what we have discussed so far?

THIS IS THE END OF THE INTERVIEW. THANK YOU FOR YOUR COOPERATION.

INTERVIEWER RECORD TIME INTERVIEW ENDED.

FOCUS GROUP DISCUSSION (FGD) GUIDE FOR OSHODI TRANSPORT INTERCHANGE SOCIAL AND ENVIRONMENTAL IMPACT ASSESSMENT, MARCH, 2018

NOTE TO RESEARCH TEAM
There should be at least two research team members, namely; a moderator and a note-taker.

Each FGD should be made up of 6 – 12 (maximum 15) discussants.

Moderator's guide:
Below is a general guide for the moderator for all the groups. This guide may be modified a little on the field to suit each of the FGDs.

Introduction

- Introduction of research team members (moderator and note-taker)
- The moderator should explain the purpose of the research (see general introductory statement).
- Re-assure participants of confidentiality; no names will be attached to any written documents and tapes will be kept safe and not shared outside the research team
- Explain the "ground rules":
- There are no right or wrong answers
- It is not necessary to raise hands but only one person talks at a time and don't interrupt each other
- We are recording so that we don't miss any information; please speak clearly and slowly so we get everything
- All opinions are very important to us to help in understanding the situation

Self-introduction by participants in the discussion:

- Ask each participant to introduce himself (FIRST NAME ONLY); record age and other required information about discussants.

YOU MIGHT WANT TO INTRODUCE AN "ICEBREAKER" HERE – NON-THREATENING QUESTIONS THAT WILL HELP TO GET DISCUSSION GOING… SUCH AS WEATHER CONDITION, ETC.

Then, move on to the FGD.

FOCUS GROUP DISCUSSION GUIDE

SECTION A: IDENTIFICATION

VARIABLES	VALUES
Category	Male Traders/Business Operators .....1 Female Traders/Business Operators.....2 Members of Trade Associations .....3 Transport Workers 4
Specific venue for FGD	
Number of participants	
Moderator's Name	
Note-taker's Name	
Date of FGD	
Time FGD Started	
Time FGD Finished	
Language of Discussion	English .....1 Pidgin English .....2 Yoruba.....3 Other (please specify) 4

Give a general description of:

1. the venue:
   - sitting arrangement,
   - weather condition
2. the participants: occupation
3. level of participation:
   - did everybody participate freely?
   - did any particular person(s) try to dominate?

Give other useful information about FGD.

SOCIO-DEMOGRAPHIC CHARACTERISTICS OF DISCUSSANTS

The following is to be filled for each member of the group.

Characteristics of discussants	1	2	3	4	5	6	7	8	9	10	11	12	13
Age													
Current Marital status													
Religion													
Education													
Occupation													
Number of years working/living in area													

Key

Age - State exact age

Current Marital status 1. Married;2. Single; 3. Divorce/Separated;
4. Widow/widower

Religion - 1. Christian; 2. Moslem; 3. Traditional

Education - 0. None; 1. Primary/Arabic; 2. Secondary;
3. Post-secondary/Tertiary; 5.Other (specify) …….

Occupation - 1. Formal wage; 2. Self-employed; 3. Other (specify) ……

FGD GUIDE

Awareness about and Attitude to the Proposed Oshodi Transport Interchange Project

1. Are you aware of the proposed Oshodi Transport Interchange project in this area? Probe how they got to know about the project. Probe for source of information.

2. What is your opinion about the proposed project?
   - How do you think the proposed project could affect people in this community? (Probe for income-earning opportunities, business opportunities, transportation, commuting, noise, environmental pollution, traffic congestion, security, accommodation, cost of living, etc.)

Potential Effects of the Proposed Oshodi Transport Interchange Project

3. What are the problems that the proposed project could bring to this community? (Probe for impact on accommodation, social facilities and infrastructure, etc.)

4. What solutions can you suggest to solve these problems?

5. Are there some individuals or groups who may oppose the project?
   - Who are these individuals or groups?
   - Why may they oppose the project?

6. How is the project likely to affect women, children, youth, etc. (Probe for economic impact, social impact, environmental impact, etc.)

7. If houses/business premises were to be affected by the Oshodi Transport Interchange, what do you think would be the people's reaction?
   - What would be people's concerns/fears?
   - What do you think can be done to assist the affected people to reduce the effect of the project on them?

8. If people's houses/business premises had to be relocated for the Oshodi Transport Interchange, what do you think would be their reaction?
   - What do you think would be their fears/concerns?
   - How do you think they can be assisted to minimise the effects of relocation on them?

9. If these improvements result in increases in rents/rates in this area, would you still stay in this community? Probe for reasons why discussants may leave or stay.

10 Which groups or organisation/association do you consider to be important for community mobilisation and development in this community?
   - Probe for the activities of each group and why they consider them important
   - If you were to rank these groups, which would you rank as most important, which would come next, etc.?

11. What other comment do you have to add to what we have discussed so far?

THIS IS THE END OF THE DISCUSSION. THANK YOU FOR YOUR COOPERATION.
RECORD TIME FGD ENDED.

BUSINESS OPERATORS INTERVIEW SCHEDULE FOR SOCIAL IMPACT ASSESSMENT OF THE PROPOSED OSHODI TRANSPORT

Only Shop/Business Owners/Operators or Responsible Staff should be interviewed

Opening Statement:

My name is .....…….... I am working for Global Impact Environmental Consulting Ltd. (GIEC), an organisation that is committed to environmental safety and solutions. We are carrying out a Social and Economic Impact Assessment for the proposed Oshodi Transport Interchange in this area. You have been selected as one of the subjects for interview because you live/work in or commute through this area. We would like to ask about your views on the proposed project and how it may impact on you, your business/economy, environment and community.

Your response will assist us to understand your interests/concerns, how the project may affect you, and in planning to avoid or minimise any negative impact.

Your answers will be completely confidential. Only summary information will be used, and no individual questionnaire will be made available to any authority. If there is any particular question that you do not like to answer, that will, of course, be accepted.

CONSENT: Are you willing to be interviewed? Yes No

Questionnaire number			
Section 1: Survey Identification			
S/No	**Issues**	**Responses**	**Codes**
1	Street Name	……	
2	Name of Enumerator/Interviewer	……	
3.	Name of Supervisor	……	
4.	Language of interview	English ..... 1 Pidgin English ..... 2 Yoruba ..... 3 Other language (specify) 4	
5.	Date of interview (ddmm e.g. 0405)	……..	
6.	Time interview started (hhmm, e.g. 1320)	……..	
7.	Time interview ended (hhmm, e.g. 0850)	…….....	
8.	Identity of person interviewed	Business Owner ..... 1 Responsible staff/Assistant. ..... 2 Other category (pls specify) 3	
Section 2: Socio-Demographic Information about Respondent			
9.	Sex of respondent (Interviewer indicate as appropriate)	Male ..... 1 Female 2	
10.	How old are you now? (Age last birthday in years)	…….. years	
11	What is your religion?	Christianity ..... 1 Islam ..... 2 Traditional religion ..... 3 Atheist ..... 4 Other (please specify) 5	
12	What is your highest level of education?	No formal education ..... 1 Quranic education ..... 2 Primary ..... 3 Secondary ..... 4 Post-Secondary (degree) ..... 5 Post-Sec (non-degree/vocational) . 6 Others (pls. specify) 7	

13	What is your ethnic background?	…….	
14	What is your State of origin?	…….	
15	Nationality (if not a Nigerian)?	…….	
16	Which ethnic groups are here in large numbers? Mention the ethnic groups		
17	Number of employees	1-2 employees .....1 3-4 employees .....2 5-10 employees .....3 11 or more 4	
18	Type of business facility (Interviewer observe and record)	Vendor table..... 1 Vendor stall..... 2 Store shop ..... 3 Artisan table..... 4 Workshop..... 5 Residence..... 6 Transport (coaster/large bus)……...7 Transporter (minibus/cab)..... 8 Transporter (okada)/tricycle..... 9 Bicycle, wheel barrow, umbrella, etc..... 10 Other (please specify) 11	
19	Scale/Volume of business (Interviewer observe and record)	Very small scale (value of goods/equipment less than N20,000)……1 Small scale (value of goods/equipment N20,001 – N50,000).....…2 Medium scale (value of goods/equipment N50,001 – N100,000).....3 Large scale (value of goods/equipment N100,001 – N500,000).....…4 Very large scale (value of goods/equipment over N500,000).....…5	
20	Type of material used for shop/stall	Iron/Steel.....1 Plywood/Wood .....2 Cement.....3 Aluminium/Corrugated sheet.....5 Other (specify). 5	
21	Shop/stall/equipment movable or immovable	Movable .....1 Immovable 2	
22	Who owns this shop/premise/space/structure?	Self (respondent).....1 Family.....2 Individual landlord.....3 Local government .....4 State government .....5 Other (specify). 6	
23	If "self", who allocated the space to you?	Family .....1 Individual landlord.....2 Local government .....3 State government .....4 Other (specify). 5	
24	How long have you been operating business in this location? (number of years)	……. Years; …….. months	
25	Do you plan to continue to operate your business in this area?	Yes .....1 No 2	
26	If 'No', please mention why you may move out of this area?		
27	What is your estimated income from this premises?	Per day: …….. Per week: …….. Per month: ……..	
28	How many days a week do you work here?	…….. days	

29	How many hours in a day on the average do you work here?	……. Hours	
Section 4: Awareness about and Attitude to the Proposed Oshodi Transport Interchange			
30	Are you aware about the proposed Oshodi Transport Interchange?	Yes ..... 1 No 2	
31	If "Yes", how did you first know about the proposed Oshodi Transport Interchange project?		
Section 5: Potential Effects of the Proposed Oshodi Transport Interchange Project			
32	How do you think the proposed Oshodi Transport Interchange project could affect you as an individual or your business? (Probe for effects on transportation, business and trade, employment opportunities, etc.)		
33	How do you think the proposed project could affect this community? (Probe for effects on transportation, business and trade, employment opportunities, etc.)		
34	What are the problems that the proposed project could bring to this community? (Probe for impact on accommodation, social facilities and infrastructure, etc.)		
35	What solutions can you suggest to solve the above-identified problems?		
36	Do you foresee any possible conflict between the shop/business owners/traders of this community and the project?	Yes ..... 1 No 2	
37	In what ways do you think the project activities could conflict with the business of the people?		
38	What do you think can be done to avoid such conflicts?		
39	What benefits do you think you and members of your business can derive from the proposed Oshodi Transport Interchange project? (Probe for business and employment opportunities, transportation services, etc.)		
40	What benefits do you think this community can derive from the proposed project? (Probe for business and employment opportunities, provision of health services, etc.)		
41	Are there some groups of people who may be affected by the proposed Oshodi Transport Interchange project?	Yes .....1 No 2	
42	If 'Yes', please mention such groups.		
43	How are they likely to be affected by the proposed Oshodi Transport Interchange project?		
44	Are there some vulnerable or particularly disadvantaged groups/groups of individuals (e.g. physically challenged people or destitute) who may be affected by the proposed project?	Yes .....1 No 2	
45	If 'Yes', please mention such groups.		

46	Where are such groups located?		
47	How are they likely to be affected by the proposed Oshodi Transport Interchange project?.		
48	Do you think there could be some resistance/objections by people to the proposed Oshodi Transport Interchange project?	Yes..... 1 No..... 2	
49	If "Yes", why do you think people may resist/object the proposed Oshodi Transport Interchange project?		
50	Who are the people you think may resist/object to the proposed project?		
51	What do you think can be done to minimise or overcome such resistance/objections?		
52	Do you have any fears or concerns about the proposed Oshodi Transport Interchange project?		
53	If your business premises were to be affected by the Transport Interchange project, what would be your concerns/fears?		
54	What do you think could be done to assist you to reduce the effect of the project on you/ your business?		
55	If your business premises had to be relocated for the project, what would be your concerns/fears?		
56	If you were to relocate, what would be your fears/concerns?		
57	If you were to relocate, how can you be assisted to minimise the effects of relocation on you?		
58	If you had to relocate because of the Oshodi Transport Interchange project, would you relocate to another place near here or move out of this area completely?		
59	If would stay near here, why?		
60	If would move out of this area completely, why?		
61	If you had to be relocated, where would you prefer to relocate? (Please list three places in order of priority, ranking the most preferred relocation as 1st, the next one 2nd, etc.)		

62	What do you think could be done to assist you to reduce the effect of the project on you/ your business?		
63	Please mention the important groups or associations in this area		
64	Are you a member of any trade group or association in this area?		
65	Please mention the groups or associations you belong to in this area		
66	Are there some socio-cultural artefacts (e.g. shrines or other sacred things) in this community that may be affected by the proposed Oshodi Transport Interchange project?	Yes.....1 No 2	
68	If "Yes", please mention the socio-cultural artefacts.		
69	Can such socio-cultural artefacts/sacred places be transferred/relocated/replicated in a new location?	Yes.....1 No.....2	
70	What other comment do you have to add to what we have discussed so far?		

THIS IS THE END OF THE INTERVIEW. THANK YOU FOR YOUR COOPERATION.

INTERVIEWER RECORD TIME INTERVIEW ENDED.

ANNEX 3

A1. Scope of Work and Field Methodology

Nine gaseous pollutants monitored during the study. These were ammonia (NH_3), carbon monoxide (CO), hydrogen sulphide (H_2S), nitric oxide (NO), nitrogen dioxide (NO_2), sulphur dioxide (SO_2), Ozone (O_3), methane (CH_4) and volatile organic compounds (VOCs). Particulates with diameter less than 2.5 microns ($PM_{2.5}$), 10 microns (PM_{10}) and Total Suspended Particles (TSP) were also monitored. Also measured were ambient noise levels and meteorological parameters.

A1.1 Meteorological Parameters

The EXTECH 45170 Environmental Meter was used for the measurements of some meteorological parameters. It is a multi-function environmental monitoring instrument used to measure major environmental conditions including air temperature, relative humidity, wind speed, and light intensity.

A1.2 Air Sampling for Particulate Matter

Particulate matter (PM) was measured with AEROCET 531S Particle Mass/ Particle Count Monitor, an equipment from Met One Instruments. It is handheld, battery operated and completely portable unit measuring five mass ranges of TSP: PM_1, $PM_{2.5}$, PM_4, PM_7, PM_{10}, and TSP with a concentration range of 0 – 1000 µg/m^3 and 0 – 3000000 particle cubic foot (and resolution of 0.1 µg/m^3). The PM Monitor samples at a flow rate of 2.83 l/min. To measure, the monitor is placed at 1 m above the ground level, switched on in the environment of interest and the measured concentration read directly on the screen after particle capturing. The respirable fractions of the total particulates were the focus of this measurement.

A1.3 Air Sampling for Gaseous Pollutants

Oxides of nitrogen (NO and NO_2), sulphur dioxide (SO_2) carbon monoxide (CO), Volatile organic compounds (VOCs), hydrogen sulphide (H_2S), ozone (O_3), methane (CH_4) and ammonia (NH_3) were measured with the *insitu* Aeroqual Series 200 gas monitor. It has facility from which concentration for the last 5 minutes can be determined. For measurement, the monitor is placed at 1 m above the ground level, switched on and measure the concentration which is displaced on the screen. Ammonia (NH_3) was measured with sensor ENG-1808140-005 having detection range of 0 – 100 ppm and 0.1 ppm resolution while NO and NO_2 were measured with sensor ENW-2402150-009 having a detection range 0 – 1 ppm and 0.001 ppm resolution. Aeroqual Head sensor ESO-2502155-007 was used to monitor SO_2 but EHS/EHS2 was used for H_2S during the fieldwork with both having detection limit of 0 – 10 ppm with 0.01 ppm resolution. Both VOCs and CO were monitored with sensors VM-2305142-025 and ECN-2811140-015 respectively. While the VOCs sensor has a detection limit of 0 – 25 ppm, CO sensor's limit is 0 – 100 ppm with both having a resolution of 0.1 ppm.

The Aeroqual monitor was supported with the WolfPackTM Modular Area Monitor, an Indoor Air Quality and other environmental air monitoring applications equipment. It is embedded with WinCE® computer that runs GrayWolf's WolfSense® 2009 application software for displaying, documenting, and logging key parameters. It monitors up to 20 sensors and simultaneously generates 30 readings and runs on rechargeable battery that can lasts 15 hours of continuous measurements. It has facility for but not limited to Short Term Exposure Limit (STEL) from which the carbon monoxide concentration for the last 15 minutes can be determined; the Time Weighted Average (TWA) from which the accumulated reading of the gas concentration since the monitor was turned on is divided by 8 hours; and the Peak Reading, which is the highest reading since the monitor was turned on. Its resolution for NO, NO_2, and O_3 is 0.01 ppm and 0.1 ppm for H_2S, CH_4, SO_2, NH_3, VOCs, and CO.

A1.4 Noise Measurements

Noise measurements were taken with a digital, battery-powered, sound pressure level meter (EXTEC Instruments, US Model 407730). It has both A and C weighting and 0.1 dB resolution with fast/slow responses. The meter is also equipped with a build-in calibration check (94 dB), tripod mount, and analogue DC/AC conditioned outputs of 10mV/dB and utilized a 0.49 " (12.3 mm) condenser microphone. To measure the noise levels at any of the sampling locations, the sound level meter was placed at a distance of at least 3 m from any barrier or other sound reflecting sources and at about 1.2 – 1.5 m above ground level. Measurements were taken by setting the sound level meter to the "A" weighting network.

All these methods are as recommended by the Federal Ministry of Environment (FEPA, 1991).

A2 Ambient Air Quality and Noise Assessment Study Approach

The present air quality status and airshed classification according to the World Bank Guidelines were determined using the national and World Bank standards (Table A1). The measured noise levels were also compared with the permissible noise levels of the Federal Ministry of Environment (Table A2) and that of the World Bank (Table A3).

Table A1: Ambient Air Quality Standards Considered in the Study

Air Pollutant	Time Average	Limit (µg/m3)	
		FMEnv	World Bank
NH_3	24-hr	0.28 ppm	-
CO	24-hr	11,400 (10 ppm)	-
SO_2	1-hr	260 (0.1 ppm)	-
	24-hr	26 (0.01 ppm)	20
NO_X	1-hr	-	200
	24-hr	75 – 113 (0.04 – 0.06 ppm)	-
VOCs	1 hr	5 ppm	
	24-hr	1.6 ppm	-
$PM_{2.5}$	24-hr	-	25
PM_{10}	24-hr	-	80
TSP	24-hr	250	-

Table A2: Nigeria's Standard Noise Levels (FEPA, 1991)

Duration per Day, hour	Permissible Exposure Limit, dB (A)
8	90
6	92
4	95
3	97
2	100
1.5	102
1	105
0.5	110
0.25 or less	115

Table A3: Maximum Allowable Log Equivalent (hourly measurements), in dB (A)*

Receptor	Day-time (7:00 – 22:00)	Night-time (22:00 – 7:00)
Residential, institutional, educational	55	45
Industrial, commercial	70	70

*(World Bank, 1999)

A3 Classification of the Proposed Project Airshed

The present air quality status of the proposed project site was combined with the World Bank Group Airshed Classification to classify its airshed.

OSHODI TRANSPORT INTERCHANGE PROJECT

STAKEHOLDERS ENGAGEMENT FORUM
ATTENDANCE REGISTER

DATE: 18th SEPT, 2018.

GROUP :

S/N	NAME	ORGANISATION	POSITION	TEL. NO./EMAIL	SIGN
1	Olubunmi Goodluck	Planet Projects Ltd	Ext Relation Manager	bunmi.goodluck@planetprojectsltd.com	
2	AGBENLA. O.O (MRS)	FMENV	FCE	ooagbenla2013@gmail.com	
3	Toubere, E.C.	FMEnv	SSO	ectombere@yahoo.com	
4.	Engr. Promise Obinna	Planet Projects	Supervisor	08069353227	
5	ABASS Adeyemi	✓ ✓	Ass. Supervisor	08099277124	
6-	Oyewumi O.A.	✓ ✓	Supervisor	08060705398	
7.	Oyerinde Emmanuel	✓	Actg. Manager	08036326288	
8	CHIMA OGUODELE	✓	ENGINEER	07039099774	
9-	NOAH-AMUDOWO, SBA	OLUSHI ONIGBESA ROYAL FAMILY	SECRETARY	08053796637	
10-	PRINCE KABIR ENITAN IBA	✓ ✓ ✓ ✓	OLORI/HEAD	08080205527	
11.	HIGH CHIEF W. OSENI	✓ ✓ ✓ ✓	ALAKOSO EBI	08022208420	
12	Prince K. Babatunde	P.A. to V. Chan	P.A.	08061324600	
13	Akanda Abiodun	✓ ✓ ✓	✓	08035629407	

OSHODI TRANSPORT INTERCHANGE PROJECT

STAKEHOLDERS ENGAGEMENT FORUM
ATTENDANCE REGISTER

DATE: 18th September, 2018 **GROUP :**

S/N	NAME	ORGANISATION	POSITION	TEL. NO./EMAIL	SIGN
14	Tpl Bisi Ojedokun	Min of Phy Plg & Urban Development, Lagos	Director (Urban Development)	08033022008	
15	Ibraheem Saheed	Oshodi Mosque	Secretary	08185557276	
16	ADEYEMI, ALEXIUS SOJI	PLANET PROJECTS LTD	HSE MANAGER	08055710359	
17	Frank, oshodi (SDO) media crew	Oshodi media crew	Publicity officer	08123712892	
18	Solomon J.O	Lagos State Min Envi.	Assist Director	08022981802	
19	Temeng .O.A.	Ministry of Environment	SOE	08038319633	
20	Agoro Olayemoke	Lcapa office	P A Lcapa	07014880223	
21	ELDER ALABI KOLAWOLE	MARKET ASSOCIATION	SECRETARY-GENERAL	08024131845	
22	MR M- BOLAJI	TEMIDIRE MARKET IKAWU-OLASO OSHODI	SEC	08028344235	
23	MR G-OLAIYA		VICE-BABA LOJA	08030827023	
24	MR MUIBALLA-AGUNBIADE		CHAIRMAN TASK-ENVIRO	08039098016	
25	AYORINDE WAHEED	C.H. MARUWA.		08034199147	
26	Adebowale M. Yussuf	P.A. Hon Mustapha		07084760819	

OSHODI TRANSPORT INTERCHANGE PROJECT

STAKEHOLDERS ENGAGEMENT FORUM
ATTENDANCE REGISTER

DATE: 18th Sept., 2018

GROUP :

S/N	NAME	ORGANISATION	POSITION	TEL. NO./EMAIL	SIGN
27	Ogunkunle Toyin	IMC Oshodi	~~Asst~~ Registrar	08022010778	
28	Onikeniwura. M.M	Youth Organ	Member	08023893884	
29	Shorunmu-Jelili	Youth Member	Member	08035237902	
30	Idiata Saiah	GIEC LTD	~~Environmental~~ Officer	08068993184	
31	Osho Babatunde	〃	M.D	08023148085	
32	Tomilola Amuni	〃	Field Assistant	〃	
33	Osho Sakiru	〃	〃	〃	
34	Idris Yakub	〃	〃	〃	
35	Oto Sunday	〃	〃	〃	
~~36~~	~~Osho Y. Babatunde~~	〃	——	——	——
36	Ogundimu Oluwaseyi	Ministry of Environ	PRO	07082561018	
37	Pastor Olyimi Asiru	Religious	Proprietor	08023551057	
38	Afeez Raheem	political party	member	07026105653	

OSHODI TRANSPORT INTERCHANGE PROJECT

STAKEHOLDERS ENGAGEMENT FORUM
ATTENDANCE REGISTER

DATE: 18th September, 2018 **GROUP :**

S/N	NAME	ORGANISATION	POSITION	TEL. NO./EMAIL	SIGN
39 40	ATiyah - Adiyat	Oyf	Member	08184144375	
40	Olawunmi Busayo	oyf	member	08122714209	
41	ODEFEmi Foloshayo	oyf	member	08085007544	
42	Olanrewaju Sunday	OYF	Member	08023545905	
43	Adedoyin Tajudeen	Mamuva	Chairman	08023897614	
44	Abdul-A Ogunkunle	OYF	member	07058347658	
45	OLAYEMI-KABIRU	OIF	member	07086702133	
46	Sanata-Ayeni	OIF	member		AA
47	OLUWA Femi	OIF	OJA	07069242470	
48	Caroline Thelma	Oshodi Council	LGA	08035174409	
49	Lilian Nzeh	✓ ✓	✓	08064752627	
50	Akano Musilia	✓ ✓	✓	08036832735	
51	Lanre Adenegan	— —	—	08060587599	

STAKEHOLDERS ENGAGEMENT FORUM
ATTENDANCE REGISTER

DATE: 18th September, 2018 **GROUP :**

S/N	NAME	ORGANISATION	POSITION	TEL. NO./EMAIL	SIGN
52	Owoma Lekan	Oshodi	LGA	08024269495	
53	ALESILOYE	OPEYEMI		08023060026	
54	ADEOYE OLUYEMI	LASTMA	HEAD OF OPERATION	08066775754	
55	ADELUSI ADESINA	PLANET PROJECTS LTD.		080 85021931	
56	ADEYEMI TAIWO	PLANET PROTECTS LTD	ADMIN OFFICER	08023202156	
57	Joseph Abimbola	Planet Projects limited	TPD Analyst	07064520081	
58	Victoria Fullah	Oshodi	LGA	09096965264	
59	AYOKU Adewumi	LSETF	LO	08089196222	
60	Jimoh Rasak	Lshedi	LO	08100248249	
61	EGBEYEMI IDOWU	LMC	Chief clerical off	08030833903	
62	Salca Rukayat	Oshodi	Edu	08122674313	
63	Adeyanju Mojeed	LNSC	Oshodi	08038180092	
64	Akebede .S.	C.J.C	Oshodi	08023919159	

OSHODI TRANSPORT INTERCHANGE PROJECT

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S/N	NAME	ORGANISATION	POSITION	TEL. NO./EMAIL	SIGN
65	RAFIM ADENOPO	Local Govt	PA Vice chairman	08023734427	
66	Ghonibare Ahmed	LocalGovt	Revenue Committee	08024721313	
67	Joseph Bangode	C-DC-	Treasurer	08033069450	
68	Olasumbo Tubi	C.D.C	Ex-offi	08037220051	
69	Mrs. V. AjiBadu	C.D.C.	Ex-offi	08092131268	
70	Alh JAMIU AKINDE	✓	✓	08055607819	
71	Alh R.O. Afamuta	✓	Chairman	08228746797	
72	Deacon J.A. Adewale	—	SOC/SEC	08033930956	
73	DR T.O Salisu	MOT	PS	08033315666	
74	Abaton Jamiu	MOT	PA	08023249370	
75	Rev Otebode	Oshodi CDC	PRO	08033713526	
76	Adeleye I.A	YIS	CPM	8096889652	
77	Salau Jelili-Basirat	Local Govt	en Virn	07086736709	

OSHODI TRANSPORT INTERCHANGE PROJECT

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S/N	NAME	ORGANISATION	POSITION	TEL. NO./EMAIL	SIGN
78	REV. BODE BANKOLE	CDC	ANDITAR	08034099596	
79	Oulido Semiu	C.D.C	Welfare Office	07038545575	
80	Amos Adesola	C.D.C	"	08038770047	
81	Anike Popoola	CDC	Member	09023817646	
82	[illegible]	CDC.	EXOFFICIO	07032653454	
83	Mrs S.O. Erinfolami	C.D.C	Exco	08023948699	
84	Okunlola Williams	CDC	"	08026993649	