





# Oyo State Geographic Information Service Presentation

# Company Overview



- GIS/Transport was founded in 1994 to provide high end GIS planning services for the DOT (Department of Transport, hence the name) and was established in Nigeria in 1999.
- GIS/Transport is a leading provider of digital cartographic services and of highly customised Geographic- and Land Information Systems, and in the delivery of turnkey projects supporting the establishment of modern computerised government agencies, including analysis, long term strategies, design, software development, implementation and customisation, capacity building and support, organisational structures and standard operational procedures.
- **GIS/Transport** works with several international space agencies to provide high resolution satellite imagery and the required value added services and is the representative of almost all satellite imagery providers, PCI Geomatica and Vexcel (photogrammetric cameras) in Nigeria.

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# Company Overview



- GIS/Transport solutions are designed to meet the sector's needs:
  - Mapping and Cartography
  - Geographic Information Systems
  - Satellite Data
  - Remote Sensing and Digital Image Processing
  - Digital Orthophoto and Terrain Model
  - Land Administration
  - Applications Development

# Clients



### **Public Sector**

- Federal Ministry of Science & Technology: National Space Research and Development Agency (NASRDA)
- Federal Ministry of Aviation, Meteorological Department
- Office of the Surveyor general of the Federation (OSGOF)
- Delta State Government
- Nasarawa State Government (NAGIS)



- Gombe State Government (GOGIS)
- Kaduna State Government (KADGIS)
- Oyo State Government (OYOGIS)
- Edo State Government (EDOGIS)







### **Public Sector**

- Federal Ministry of Works
- Federal Ministry of Transportation
- Federal Ministry of Environment
- National Boundary Commission

### **Private Sector**

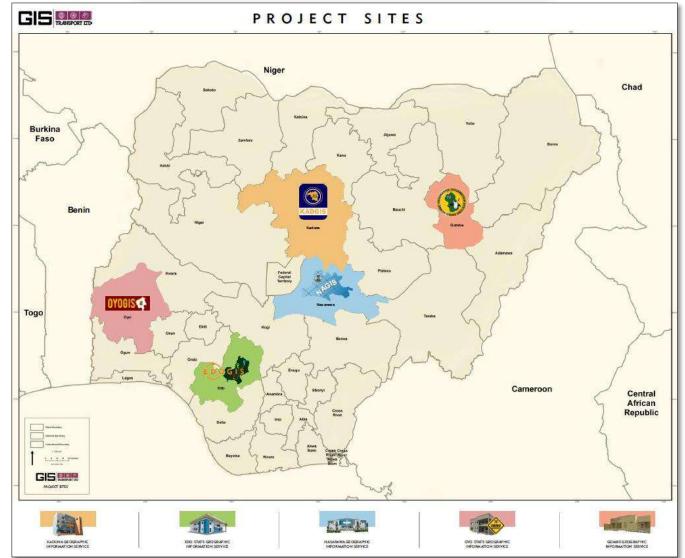
- Setraco Nigeria Limited
- Salini Nigeria Limited
- Jitto Construction Nigeria Limited
- ACE Consulting Engineers
- Julius Berger Nigeria Plc
- Dantata & Sawoe Ltd
- Sunrise Hills Development

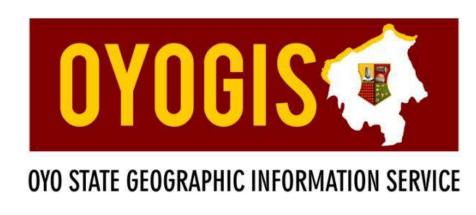
# Clients

### Digital Aerial Mapping and Land Administration Projects in Nigeria

- Nasarawa State Government (NAGIS)
- Gombe State Government (GOGIS)
- Kaduna State Government (KADGIS)
- Oyo State Government (OYOGIS)
- Edo State Government (EDOGIS)











# Oyo State Geographic Information Service Project Status



# **Executive Summary**

- The project aims to provide the Oyo state government with an Enterprise GIS solution that can support the delivery of services and products to all Oyo state government Ministries, Departments and Agencies (MDAs), professional bodies, stakeholder associations and the general public.
- Ultimately the OYOGIS Services will cover all areas and all technical, natural and socioeconomic aspects of Oyo state. In this first project the implementation is focused on comprehensive Digital Mapping of Oyo State, the Central Service Agency, E-Payment, specialised End-User units in Survey, Lands, Physical Planning, Environment, Budget Planning and IUFMP and selected Zonal Offices starting with Ibadan Zonal Office.
- To ensure quick operations, fast acceptance, visible results and early benefits, selected aspects of the OYOGIS are bundled in a Phase 1 package with training in technology and standard operating procedures for all participants, and an accelerated Data Services package.
- Project consists of 3 phases:
  - (i) Aerial Mapping (Ibadan) and GIS Fast Tracking
  - (ii) Central Services (Full Scale GIS Setup)
  - (iii) End-user Roll-out phase



# Motivation

- The Oyo Government vision is to imbed a modern service culture within the MDAs leading to the delivery of efficient services and products to the citizens of Oyo state, and to encourage and attract investors and entrepreneurs. Specific focus areas have been identified and include:
  - Health & Education
  - Agriculture & Agro allied industries
  - Infrastructure & Urban Renewal
  - Poverty alleviation
- A key development goal is to strategically define and develop Ibadan as a "twin city" to Lagos, and to encourage business, industry and private citizens to locate in the Ibadan Urban and Peri-urban areas as an alternative to Lagos. The completion of the Federal Lagos Ibadan highway will significantly improve communications and make commuting between the two cities a realistic endeavour.
- It is expected that the demand on land will increase dramatically and the efficient delivery of secure, bankable land titles will be a prerequisite to the expected increase in government internally generated revenue through land transactions and the subsequent investments by the private sector.
- The Oyo Geographic Information Service (OYOGIS) will provide the central core services for robust, fast computerized land administration, mapping and other data related services that can support development.



# Justification

- A number of MDAs have been active in gathering data and in the production of maps of various kinds. However, this has been undertaken in small, disconnected & incomplete initiatives and projects, with no guiding strategy.
- There is a need for a coherent and comprehensive gathering of data and the production of a common Base Map for the state, where different data sets from MDAs will be gathered on a common platform, and can produce information that will lead to informed decision making.
- In addition to the base map there are a number of other immediate needs, including the Automation of Processes in the Ministry of Lands, detailed maps to identify flood risk areas, buildings, roads and other infrastructure for the IU IUFMP PIU, and the gathering, collation and analysis of Socio-Economic Data to aid Economic and Budget Planning.



# Benefits

Enterprise GIS is an internationally accepted foundation for *Good Governance*, supporting Access to Information that can support decision making in all sectors.

### **Strategic Benefits**

- Sustainable Development
- Economic and budget planning
- Competitive advantage
- Improved public image

### **Operational benefits**

- Staff training leading to greater capacity and sustainability
- Increased efficiency
- Improved MDA organizational integration
- Improved decision making
- Information and knowledge advantage

### **External benefits**

- Professionals, business and industry and citizens using the published data etc. for their own planning & decision making
- Investment and Economic Growth



# Revenue Generation

The bulk of revenues will emanate from the Ministry of Lands, Housing and Urban Development. New application forms and billing for all services and products will be developed and implemented with the support of OYOGIS, and will include the following revenue heads:

### **Recertification of Certificates of Occupancy**

 Approximately 50,000 Certificates of Occupancy (C-of-O) have been issued by the Oyo State government during the last years. The automated Land Information System will require the recertification of all land titles, with the owners receiving a new C-of-O, secured and backed by the robust electronic database. A suitable charge will be applied to all C-of-O recertification's.

### **Statutory Right of Occupancy**

• All new applications for Statutory Right of Occupancy (R-of-O) will be processed and billed by OYOGIS systems, including the issuance of C-of-Os, with bills to include Application and Processing, Development Fee and Ground Rent, R-of-O Fees, Charting and C-of-O Premium.

### **Ground Rent**

The identification billing of outstanding Ground Rent.

### **Land Use Charge**

The Land use charge can be calculated by OYOGIS systems.

### **Land Transactions**

• All land transactions including the *Registration of Deeds and Assignments, Legal Searches*, and other specialised services such as *Site and Services* will be automated and bills produced.

### **Development Control**

• The linked GIS and LIS systems will enable the easy identification and billing of *Development Contraventions*.



# Revenue Generation

### **Compulsory Acquisition and Compensation**

 The implementation of the IUFMP will require the acquisition of land in areas identified as under threat of flooding and/or where project mitigation infrastructure will be constructed, with current titled land owners compensated. Land acquisition and compensation will also be undertaken to develop new government layouts.

### **Sale of Government Land (Plots)**

Fast processing of applications for government land.

### Maps and data products

- The primary clients for these products are Oyo State MDAs, professionals and citizens
- Sales of maps to public

### **Environment**

 Contraventions including the discharge of sewerage and effluent into water bodies, the dumping of waste, and air and noise pollution will be identified and billed.

### **Other OYOGIS Revenue Streams**

 The design of new districts for housing, business and industry can be undertaken in a strategic manner. Utilising the geospatial information and data, town planners will be able to develop new sustainable housing and business districts, addressing housing and socio-economic needs, and providing the facilities and services required by modern business.



# Revenue Generation References



### **EDOGIS**

60 professional staff

Now only "Block B", staff to double with "Block D", all for systematic programs

- Only "walk in" applications for title
- Systematic programs only just started

Land Use Charges, Systematic Registration & Recertification

• Monthly revenue pays for monthly instalment for loan, no budget use



### **KADGIS**

400 professional staff (150 for property registration)

Staff to triple in the next 2 years

- Mostly "walk in" applications for title
- Systematic property registration gives many CofO and little revenue (>1%)
- Revenue from direct allocations 60%
- Revenue from recertification 30%



### **NAGIS**

- 100 professional staff (60 NAGIS Office, 20 in the field, 20 Ministry)
- Mostly "walk in" applications for title
- Systematic property registration only just started
- Revenue from allocations only just starting

EDOGIS	2019	2,901 MN
KADGIS	2019	9,074 MN
NAGIS	2019	3,097 MN



# Milestones

• 2017 03 08 Award Letter **Contract Signed** • 2017 04 18 • 2017 08 18 First Phase 1 Payment • 2017 10 19 70cm satellite imagery on system • 2017 11 29 OYOGIS Project office opened – First OYOGIS staff (4) • 2018 12 15 10cm Orthophoto on system • 2018 01 23 Commenced Data Capture New digital Certificate of Occupancy forms delivered • 2018 01 28 • 2018 04 19 OYOGIS Logo submitted OYOGIS Merlin software platform launched • 2018 04 16 Second OYOGIS office opened – 18 computer seats • 2019 01 25 First Floor Offices opened – 32 computer seats • 2019 11 18



# Achievements and Deliverables

### Office Infrastructure

- Project Office opened November 2017
- Second Office opened 8 February 2018 including 3 temporary customer service desks
- Four new Offices added 18 November 2019 including temporary archive and map shop

### Technical Infrastructure

- Sever, network and peripherals
- 65 computer seats

### Staff Assessment, Capacity Building and Training

- 221 staff have been assessed
- 25 staff were transferred to OYOGIS from ministry of lands, have undergone training

### Data Capture

- Layouts plan, Survey plans, and TPWs
- Survey Beacons
- Index Cards
- Land Files

### Mapping

- Map Production and Ready for Map Selling
- End-User
  - CofO and concent processing

### Structured Reporting

- 120 detailed weekly Project Progress Reports
- Quarterly Deliverable and Achievement Reports

# Digital Mapping

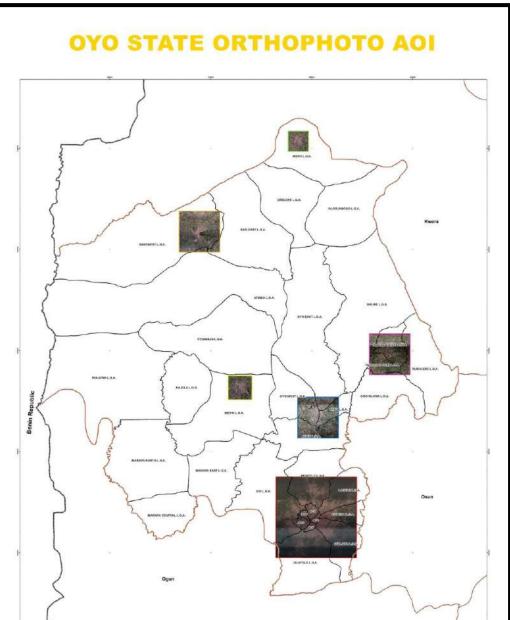
- Digital Aerial Mapping includes a State-Map 1:25,000 with Transportation, Hydrology, Placenames and Land-cover, an Orthophoto Map with 10 cm resolution covering the Ibadan Urban area and 5 major cities, a 70cm resolution satellite image map for the rest of the state.
- The Orthophoto coverage comes with the Terrain Model and the Contour Lines that are essential for the 3D representation of water courses and water bodies that are required for environmental and engineering planning. As well as necessary design required for erosion control for the entire state.





 Orthophoto images with 10 cm resolution covering the Ibadan Urban area and 5 major cities (Kishi, Shaki, Iseyin, Oyo, Ogbomoso) were captured using an aircraft Diamond DA42MPP and Vexcel Ultracam LP, Applanix 510 POS AV GPS / INS, SOMAG UltraMount.







 Ground Control Points were created before the commencement of the flight mission to increase Orth-mosaic accuracy and are placed homogeneously in the AOI.















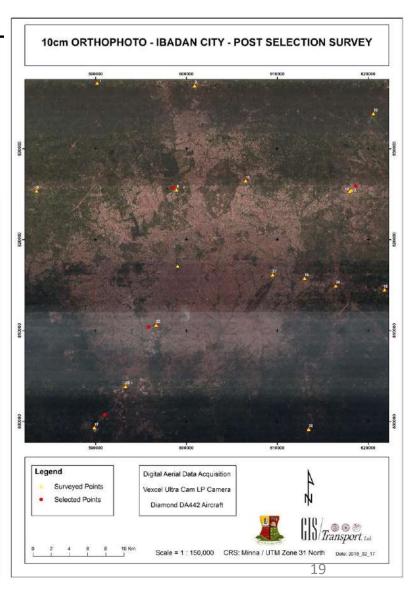
The orthophoto is compiled from a mosaic of corrected photographs, composing a continuous, accurate model of the entire state, at a consistent map scale; homogenous, all-encompassing, and encyclopaedic, then fixed in place by ground truth positions derived from careful, static, days-long GPS

measurements, processed by the Precise Point Positioning services of the American, Canadian, and Australian governments, providing an accurate georeferencing.

After that, the quality control work commenced together with ministry surveyors and was complete within 45 days.

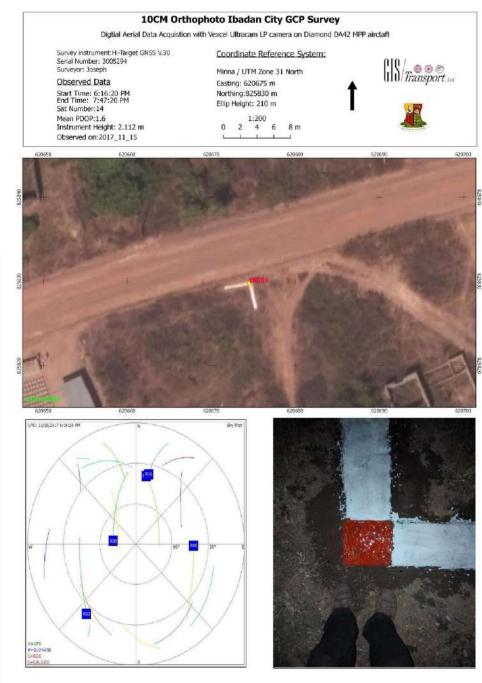






 Ground Control Points located on the Orth-photo using surveyed coordinates to confirm its accuracy.





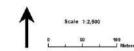
# Orthophoto Samples



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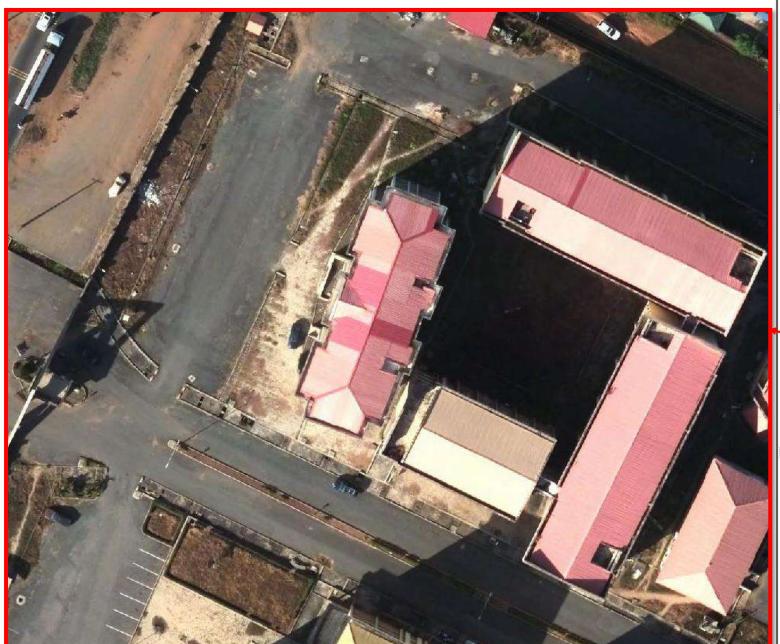
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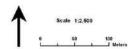




### **OGBOMOSO ORTHOPHOTO**









# Orthophoto Samples

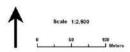
10 cm resolution



### OYO ORTHOPHOTO







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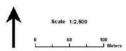
10 cm resolution

# **KISHI ORTHOPHOTO** GIS DO C

### **SHAKI ORTHOPHOTO**







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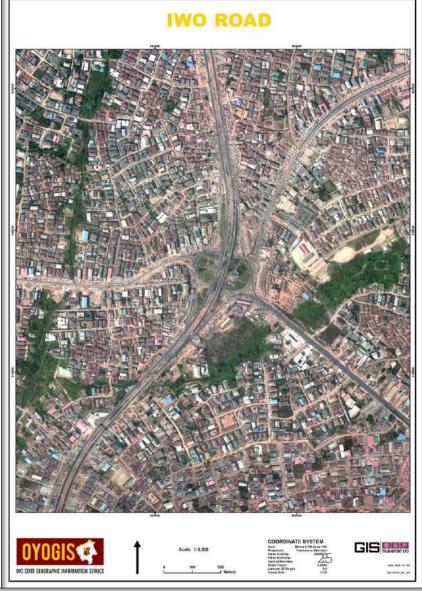




# Map Samples





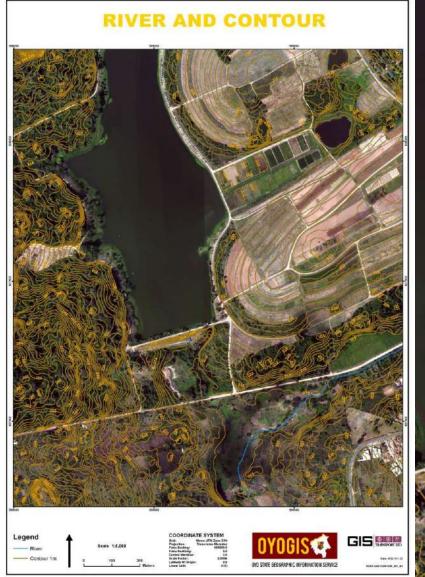






# Contour Lines

The Orthophoto coverage includes a digital terrain model and the contour lines that are essential for 3D representation of water courses and water bodies required for environmental and engineering planning.







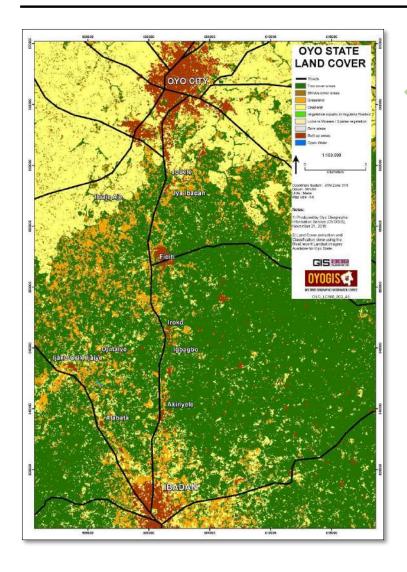
# OYO State Geospatial Database

 The data captured, together with other data sets, can provide decision makers with customised maps and analysis, particularly useful for resource allocation, utility management, cooperative development, professional materials for donor funding proposals.



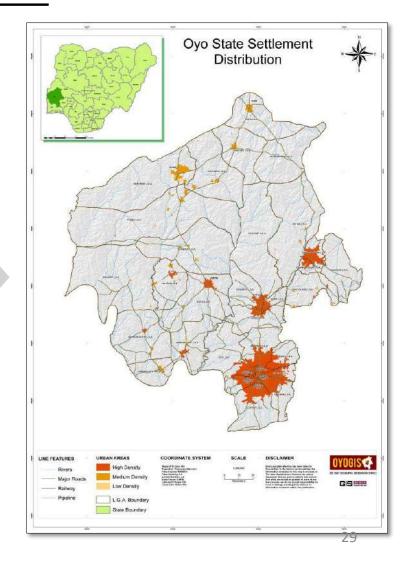


# Map Samples



Land Cover Land Use Map between Ibadan city and Oyo city

Settlement
Distribution Map
for Oyo state





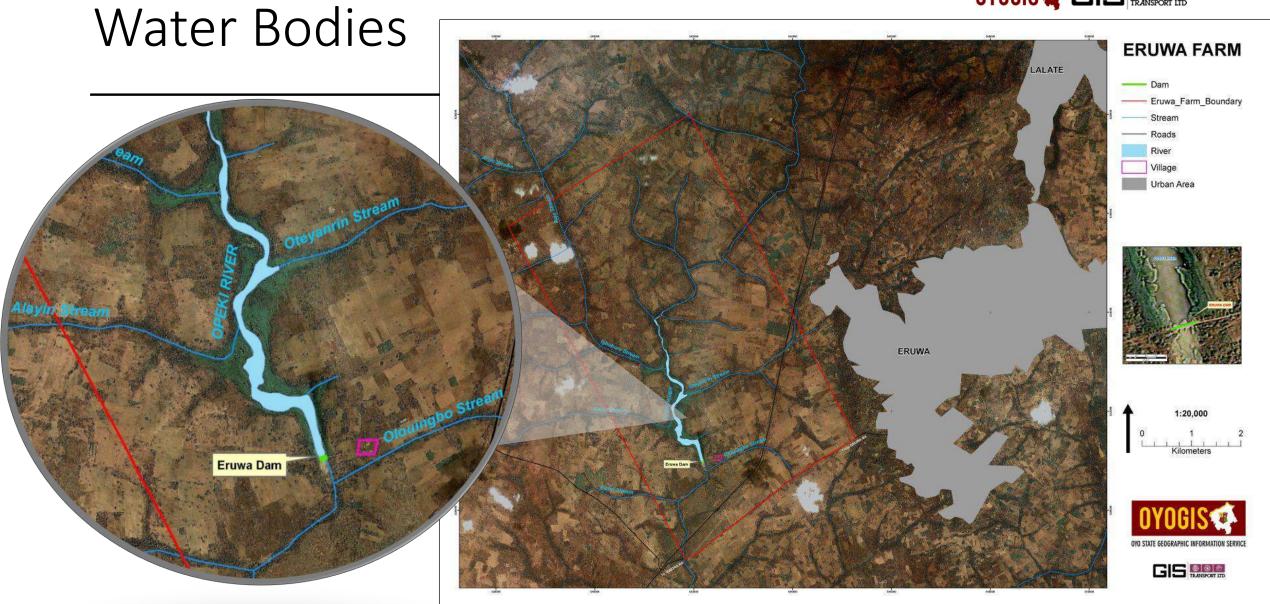
# Water Bodies

 Water bodies like lakes, rivers, streams, and dams are captured from the Orthophoto.



Eleyele Lake







# **Building Enumeration**

The number of buildings in Oyo State's major cities (Ibadan, Shaki, Iseyin, Kishi, Oyo, and Ogbomosho) was requested.

SN	Location	Coordinates		Buildings
	Name	X	Y	Estimate Number
01	KISHI	593380	1003497	9,838
02	IBADAN	602189	817483	516,560
03	ISEYIN	564514	881693	28,992
04	SHAKI	544503	958844	30,954
05	OGBOMOSHO	638554	898266	58,780
06	OYO	603127	867044	75,451
			TOTAL	720,575

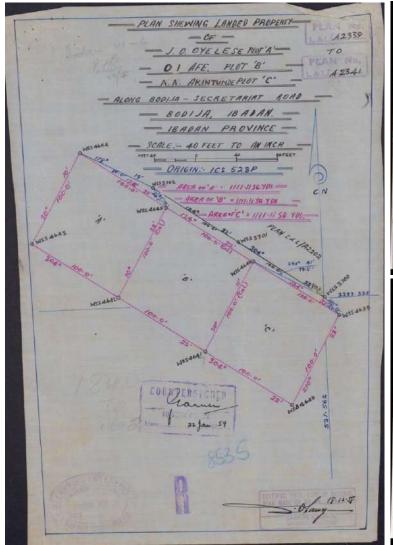


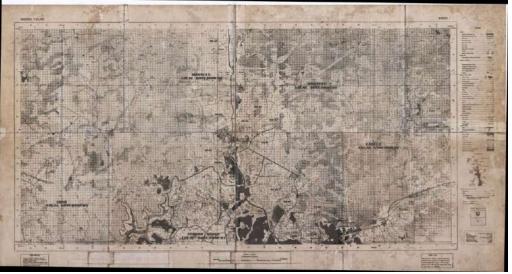
The process was done by creating point feature class on GIS software, digitizing the Houses falling in the 10 c.m orthophotos, and storing the data in OYOGIS database.

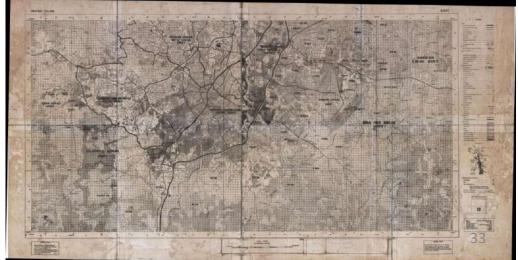


# Billing Areas

Using old maps, survey plans, and Orthophoto images, OYOGIS was able to create the billing areas and store them in the Database.

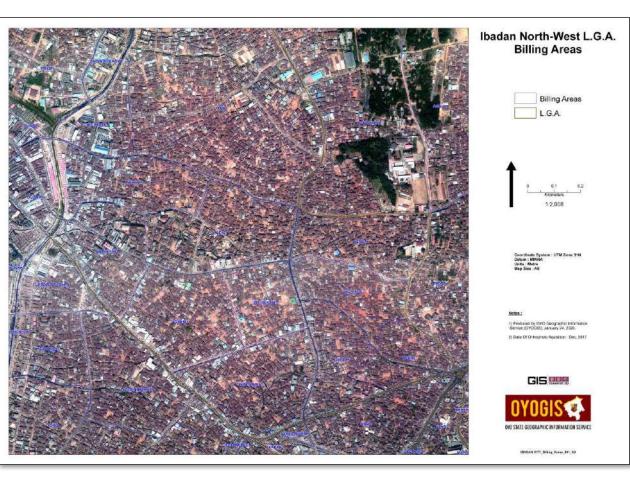


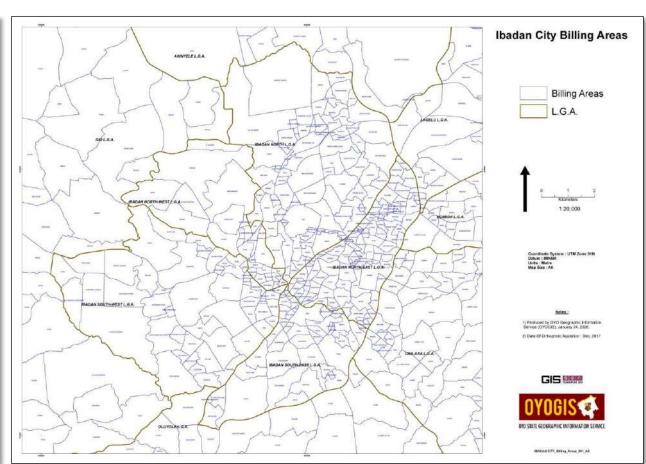






# Billing Areas

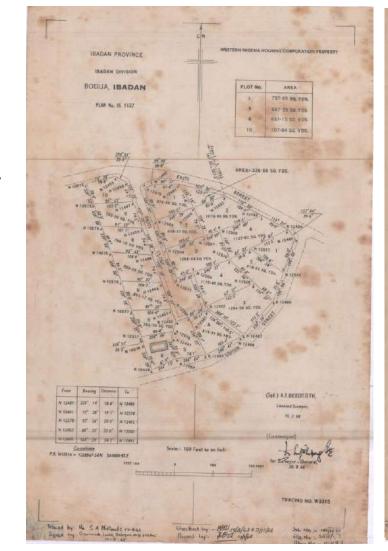


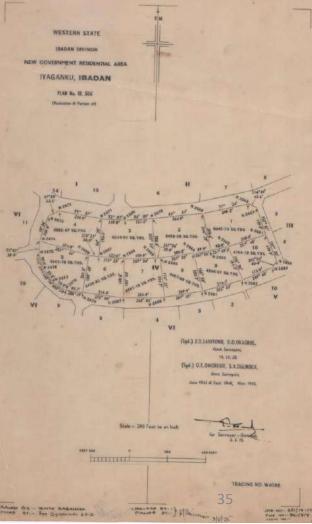




# Data Capture

 Layout plans, Survey plans, and TPWs are scanned then georeferenced based on the coordinates, bearings, and distances found on the plan. After overlaying them on the orthophotos we can confirm the data and correct locations.

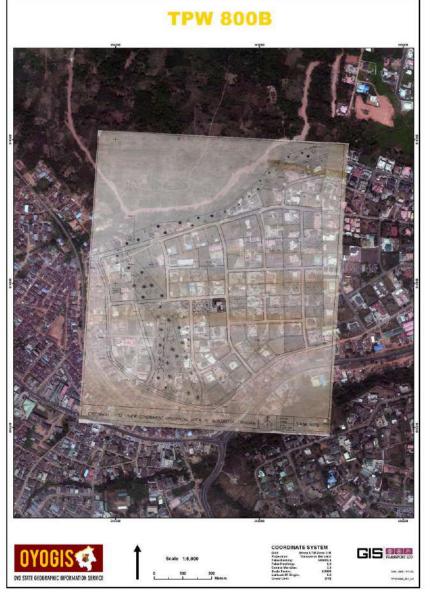


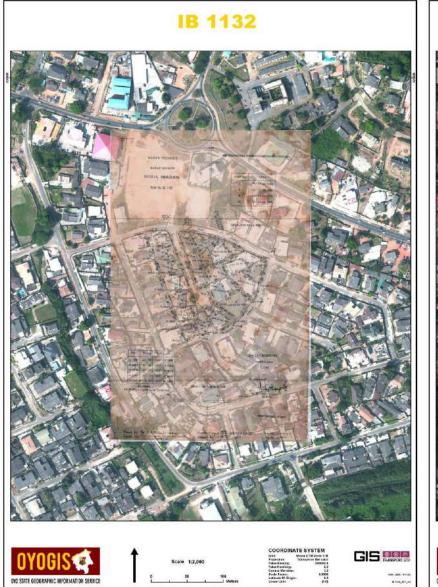


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### BODIJA, IBADN

### IYAGANKU, IBADAN



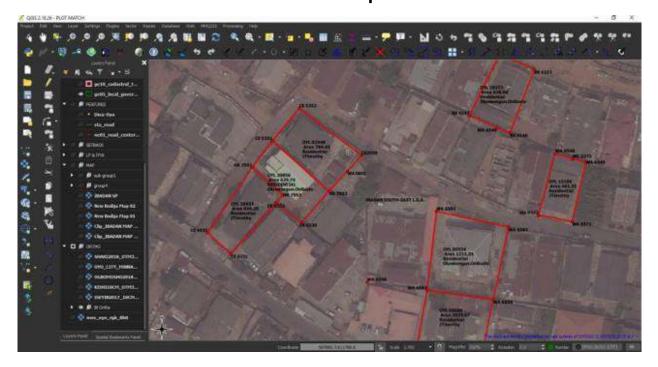






#### Land Parcels

 Every survey plan found within any land file as well as the survey plans received from the survey department are geocoded and plotted to a layer in the Database. The information of the property and the owner are then entered as attribute to the plot.





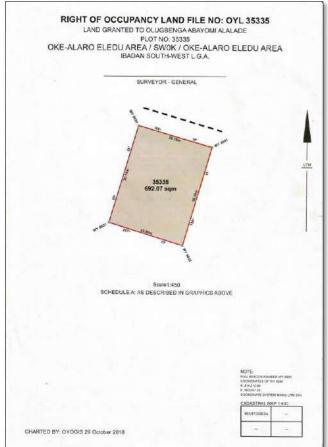


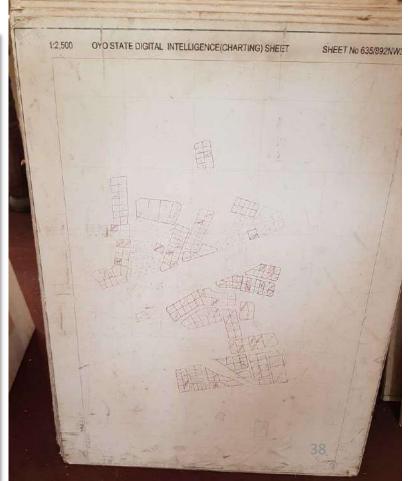
# Charting

• Using the information gathered and the digitized plots, now the charting can be done directly from the system

instead of the manual process.



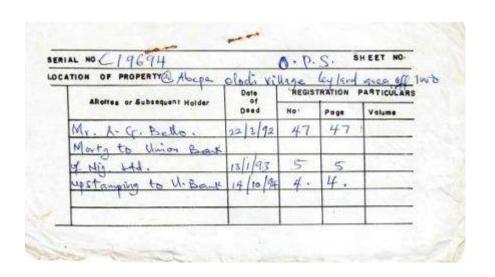


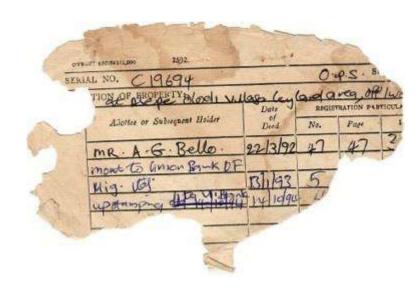




### Cards Captured

- C of O property card usually called **C-card** with transaction history of their specific property are being captured.
- More than 30,000 cards were entered in OYOGIS database. Which make searching for a card easier and save much time.



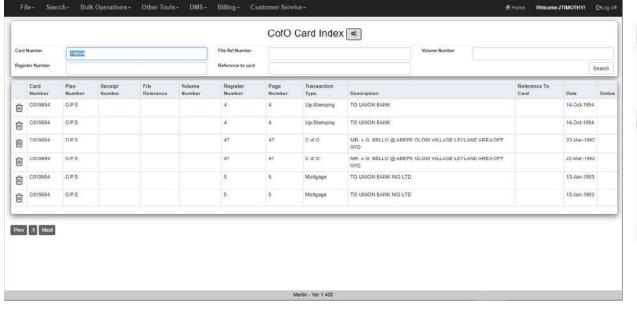


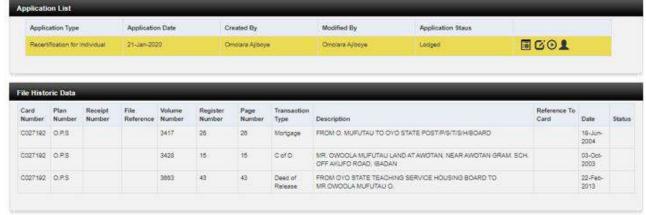
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4019 29 3 3	9



### Cards Captured

• Files created on Merlin are also linked to their card information at the point of creation. This will allow the user to see the transaction history of the property before proceeding with the file.

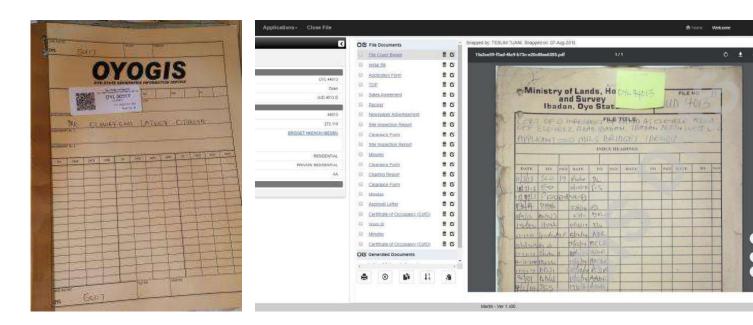






#### Land Archive

- Land files are collected from the old archives, Re-jacketed, snapped in the Document Management System, and sorted in the new archive.
- File Tracking Management System (FTMS) is used to keep track of the file's location.



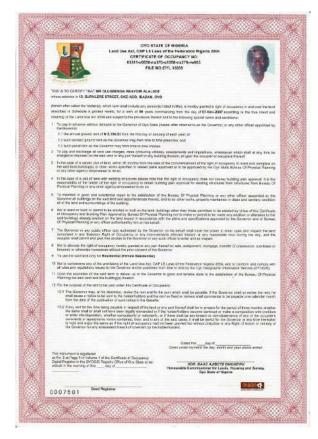


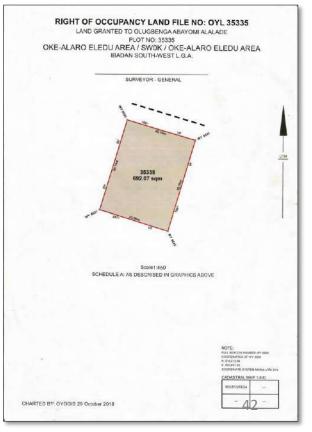




#### CofO

 After all the data is collected and keyed-in to the database together with geometry of the parcels, it will be possible to process a file and print an offer or certificate of occupancy (CofO).







#### Office Infrastructure

• Office Infrastructure in the annex to the ministry of Lands now known as GIS building, now comprising of 6 offices with furniture, A/C, electrics and network, toilets, etc. The Service Centre hosting temporary customer service, production offices, map shop, archive and management office. These facilities support 65 computer seats.



































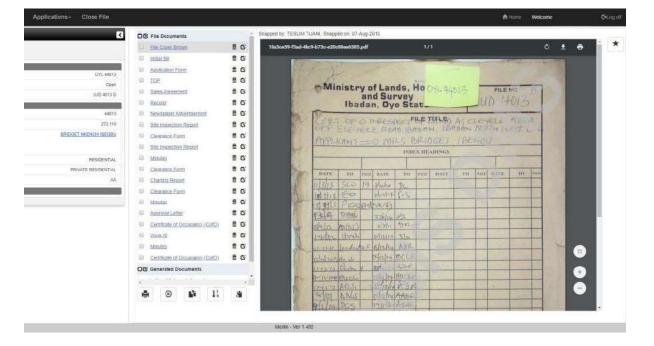


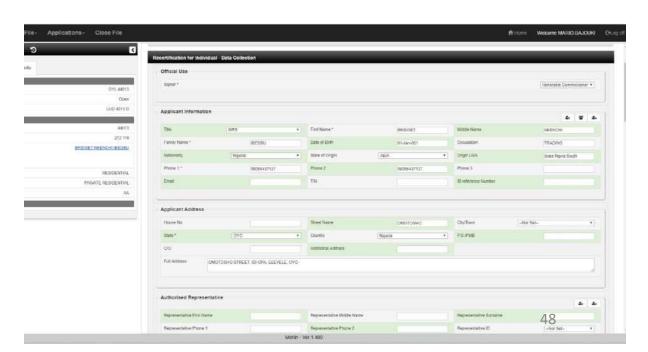
#### Technical Infrastructure

- The OYOGIS technical infrastructure comprises all the ICT hardware components (the network, servers, laptops, etc.) and the software systems – Merlin, Postges database, etc. All the network components are secure and robust, scalable as OYOGIS grows over the next years.
- Two critical ICT tools are laptops and document cameras. These are deployed in many situations, including customer service, data capture and the mailroom, and as such are a good indicator of system growth over time.
- The Merlin Software Platform has been configured, reconfigured and continuously optimised since deployment in early 2018. Merlin has always been set up for property registration, statutory recertification and direct allocation. Features have been added as required, sequenced to the introduction of service infrastructure (workflows, documentation, etc.) and trainings.
- Merlin is now one of the most advanced land administration software platforms in use.









#### OYOGIS GISTRANSPORT LITD

### Staff

• The OYOGIS staff comprises 25 professional and technical ministry staff, 5 GIS/T professional staff, and 2 GIS/T consultants.

• An assessment of 221 ministry staff was conducted early 2018.

• Continuous capacity building and 'on the job' training.







2 Servers delivered with UPS

6 Delivered

74 Captured

Furnished Office

**Furnished Office** 

1 Delivered

1 Delivered

Remark

For all offices including Firewall, switches,

Land Use Land Cover data classification

Total of 4 Offices, toilets, and store

Chairs, Cabinets, shelves...

Land management Software

50

Delivered for all offices including Tables,

patch pannels, cable organizer, cat6 cables,...

Deliverable

Monitor

Server

LULC

TPW

Toilets

1st Office GF +

2nd Office GF

First Floor

Furniture

New Roof Installed

Paper Shredder

Paper Trimmer

Logo design

Networking

Activity

ICT Platform

ICT Platform

ICT Platform

Land Cover

Mass Data Capture

Office Infrastructure

OYOGIS Logo Design

Technical Infrastructure | Merlin System

Deliverables (Completed)  Activity Deliverable Remark S/N				
Activity	Deliverable	Remark	S/N	

10,000 Form

1m

File Tracking Management System

10cm, coverong 3,000 km2

70cm, covering Oyo state

SRTM 30m elevation data

59 Topo Maps

1 Delivered

1 Delivered

1 Delivered

1 Delivered

1 Delivered

20 Delivered

Inside Ibadan Central

S/N

001 Archive Lands

003 Digital Aerial Mapping

004 Digital Aerial Mapping

005 Digital Aerial Mapping

006 Digitizing from Maps

007 Digitizing from Maps

008 Digitizing from Maps

009 External Maps & Data

010 ICT Platform

011 ICT Platform

012 ICT Platform

013 ICT Platform

014 ICT Platform

015 ICT Platform

002 Certificate of Occupancy CofO Forms

FTMS

Contour Lines

Orthophoto

SRTM

Topo Maps

A0 Printer

A0 Scanner

A3 Printer

A4 Scanner

Biometric Machine

Document Camera

Satellite Image

District Boundaries

DIVA & NGA GIS Data

Deliverables	(Completed)	OYOGIS GIS

016

017

018

019

020

021

022

023

024

025

026

027

028

029

Deliv	erable	s (Co	omple	eted		OYOGIS🧌 🗔 🚍

# Deliverables (Outstanding)



				•					
S/N	Activity	Status	Deliverable	Remark	S/N	Activity	Status	Deliverable	Remark
030	Digitizing from Maps	Ongoing	Billing Areas	603 Billing Areas	043	ICT Platform	Pending	Internet Access	Main Internet Link
031	ICT Platform	Ongoing	A3 Scanner	1 Delivered, 1 Remaining	044	ICT Platform	Pending	TV	1 Big TV for Meeting Room
032	ICT Platform	Ongoing	A4 Printer	3 Delivered, 12 Remaining	045	Office Infrastructure	Pending	3rd Office GF	
033	ICT Platform	Ongoing	Barcode Reader	5 Delivered, 1 Remaining	046	Office Infrastructure	Pending	Premises	Parking, Landscaping, Drainage, Signage, Bore Hole, Tank
034	ICT Platform	Ongoing	Label Printer	2 Delivered, 1 Remaining	047	Technical Infrastructure	Pending	Access Control	For Main Doors
035	ICT Platform	Ongoing	Laptops	72 delivered, 10 Remaining	048	Technical Infrastructure	Pending	ArcGIS	1 Remaining
036	ICT Platform	Ongoing	Projector	1 Delivered. 1 Remaining	049	Technical Infrastructure	Pending	сстv	
037	Mass Data Capture	Ongoing	Beacons	13,618 captured	050	Technical Infrastructure	Pending	GPS Camera	5 Remaining
038	Mass Data Capture	Ongoing	Index Cards	31,702 captured	051	Technical Infrastructure	Pending	Handheld GPS	5 Remaining
039	Mass Data Capture	Ongoing	Labelling & ReJacketing	5,971 rejacketed	052	Technical Infrastructure	Pending	Mobile GIS	3 Remaining
040	Mass Data Capture	Ongoing	Land Files	5,535 Captured	053	Technical Infrastructure	Pending	Mobile Phone	2 Remaining
041	Mass Data Capture	Ongoing	Layout plans	381 Captured	054	Technical Infrastructure	Pending	Power	Main Generator & Tank
042	Mass Data Capture	Ongoing	Survey Plans	7,493 Captured	055	Technical Infrastructure	Pending	TerraGO	1 Remaining
					056	Technical Infrastructure	Pending	VOIP Phone	10 Remaining
					057	Technical Infrastructure	Pending	Web Portal	
					058	Transportation	Pending	Pickup	1 Remaining
									51



# Questions?