



Telecommunication
Development Bureau (BDT)



ZICTA

Africa BB Maps Project – Zambia National Event

Report

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I. Executive Summary

The Africa Broadband Mapping Project aims to support Zambia in strengthening its capacity to plan, regulate, and monitor broadband development through the establishment of a nationally anchored broadband mapping system. The National Africa Broadband Maps Event provided a platform for public sector institutions, private operators, and development partners to review the project objectives, assess existing national systems, and engage in structured discussions on technical, policy, and data-related considerations relevant to broadband mapping.

The discussions confirmed the strategic importance of reliable, authoritative broadband data for evidence-based decision-making, regulatory oversight, infrastructure investment planning, and digital inclusion. Participants emphasized that broadband mapping should function as a national public good, supporting transparency, coordination, and efficient deployment, while respecting data confidentiality and national legal frameworks.

Project Objectives:

The Africa Broadband Mapping Project is being implemented across eleven African countries, with technical assistance provided by the International Telecommunication Union (ITU) and financial support from the European Union. In Zambia, the project is intended to complement ongoing national digital transformation initiatives and existing ICT infrastructure mapping efforts.

The core objectives discussed during the event were to:

- Enhance national capacity to collect, validate, and analyse broadband-related geospatial data.
- Support regulatory and policy processes through improved visibility of infrastructure, coverage, and service availability.
- Enable coordinated planning across government institutions and private sector stakeholders.
- Lay the foundation for a sustainable, nationally owned broadband mapping system.

Approach:

- The project will be implemented through a nationally coordinated structure anchored by a National Working Group, supported by policy, technical, and data management sub-groups, subject to approval by the relevant national authorities.
- Deployment of geospatial system that will provide accurate, actionable geospatial data on digital infrastructure, services, and coverage to support evidence-based planning, regulatory oversight, and digital inclusion initiatives.
- Government ownership with ZICTA as system custodian, ensuring security, interoperability, and national control.

- Robust data governance framework covering classification, access control, validation, and updating processes.

Capacity Building:

- Multilayered training targeting GIS, data management and policy.
- Delivered through the ITU Academy in online and in-person formats.
- Goal: A sustainable, skilled team to manage and maintain the mapping system.

Project Phases (2025–2028):

1. 2025 – Identify: Foundation and readiness.
2. 2026 – Improve: System development and capacity building.
3. 2027 – Innovate: Operationalization and policy integration.
4. 2028 – Manage: Sustainability and regional leadership.

II. Opening and Introduction

The event commenced with opening remarks from senior representatives of ZICTA, the International Telecommunication Union (ITU), and the European Union, who underscored the critical role of reliable broadband data in bridging the digital divide. Speakers emphasized that broadband mapping is essential for identifying infrastructure gaps, guiding public and private investments, and achieving universal access objectives. Zambia is one of eleven African countries participating in the Africa Broadband Maps (Africa BB Maps) initiative, which aligns closely with national digital transformation and inclusive development goals.

Africa Broadband Maps Project Overview

The Project Manager provided a comprehensive overview of the Africa BB Maps initiative, highlighting its objectives, technical framework, and timeline. The project aims to establish and operationalize national broadband mapping systems across participating African countries, enabling the collection of authoritative data to inform policy, regulation, and investment decisions. Key strategic pillars include:

1. Policy and Regulation: Establishing a governance framework to guide broadband mapping.
2. Technology: Deploying a state-of-the-art GIS platform for data collection and analysis.
3. Capacity Development: Delivering tailored training to ensure sustainability and national ownership.

The initiative adopts an integrated approach combining people, processes, and technology, starting with baseline assessments to tailor solutions for each country. Zambia's participation will culminate in a fully operational national broadband mapping system by 2027, positioning the country as a regional leader.

Policy and Regulatory Framework

The Project Officer elaborated on the policy and regulatory dimensions, emphasizing that effective technical implementation requires a strong policy foundation. The work focuses on establishing clear mandates for ZICTA, formalizing partnerships, and ensuring alignment between national and regional broadband policies. Expected outputs include:

- Comprehensive policy analysis and guidelines for Zambia’s broadband mapping system.
- Strengthened national and regional dialogue on data collection standards, formats, and cooperation mechanisms.
- Alignment with international best practices, leveraging EU frameworks such as the European Electronic Communications Code and the European Gigabit Infrastructure Act.

National and regional workshops serve as key platforms for stakeholder engagement, knowledge sharing, and policy harmonization, ensuring coherent deployment across participating countries. By embedding broadband mapping within Zambia’s ICT strategy and fostering regional alignment, the project aims to support sustainable digital transformation and evidence-based decision-making.

III. Context and Current State Interventions by ZICTA, Government and Public Sector, Private sector and international partners.

Panel Discussion 1: Public Sector Perspectives and Regulatory Interface

The panel underscored the pivotal role of accurate, reliable broadband data in closing the digital divide, guiding investment, and targeting underserved communities. Zambia’s national broadband mapping system was framed as a “single source of truth,” consolidating data on infrastructure, population, demand, and service coverage, addressing inefficiencies experienced in prior gap analyses. The initiative aligns with the Eighth National Development Plan, ZICTA’s Universal Access mandate, and the Smart Zambia digital transformation agenda.

Public Sector Contributions

Key government entities highlighted their roles and datasets critical for broadband planning:

- Infratel: Manages over 1,250 telecom towers, securing statutory approvals and facilitating infrastructure deployment.
- ZAMSTATS: Provides detailed population and infrastructure mapping from the 2022 Census, supporting coverage estimation and spatial planning.
- Presidential Delivery Unit (PDU): Coordinates across government agencies, aggregates connectivity data through the Navigator platform, and identifies investment gaps while mitigating duplication.

The session emphasized integrated planning and regulatory collaboration, with ZICTA providing oversight, policy alignment, and support for co-location and resource optimization.

Private Sector Mapping Practices

Private operators presented their internal mapping and data management approaches:

- Paratus, FiberCom, Liquid, Baobab, Simba Fiber, SmartNet, Airtel, Zamtel, Zamren: All collect, validate, and manage detailed network and client data using GIS tools, Google Earth, and bespoke platforms. Practices include route verification, as-built documentation, and contractor oversight.
- Operators highlighted challenges with siloed systems, data inconsistency, and verification of co-located infrastructure.

Data Quality and Harmonization

The discussion stressed that accurate broadband mapping requires high-quality, validated data at the source, standardized methodologies, and regulatory oversight. Regulatory-enabled co-location, quality assurance, and consolidated datasets were highlighted as mechanisms to reduce duplication, improve planning, and support evidence-based investment. Smaller operators noted that centralized, harmonized data would significantly improve deployment speed and market visibility.

IV. Case Studies

Poland- Regulatory-Led Broadband Mapping

Poland's broadband mapping journey, spanning over a decade, demonstrates the value of a centralized, regulatory-driven approach in a highly fragmented telecom market. The Broadband Act of 2010 established the legal basis for a national infrastructure inventory, managed by the Office of Electronic Communications. Key features of the system include:

- Comprehensive mapping of infrastructure, services, investments, and demand.
- A Single Information Point to standardize data collection, simplify administrative processes, and enforce reporting obligations with financial penalties for non-compliance.
- High-resolution address-based data forming the foundation of planning and network deployment.
- Integration with multiple national databases and stakeholder inputs to enrich coverage and quality assessments.
- Rigorous quality assurance processes, including automated validation and iterative corrections by operators.

Poland's experience highlights the benefits of regulatory oversight, stakeholder collaboration, and structured data management in improving network planning, avoiding duplication, allocating state aid effectively, and enhancing broadband access for citizens, while navigating challenges related to data completeness, standardization, and security considerations.

Romania – Mobile Broadband Coverage and Quality Assessment

Romania's case focuses on service-level and mobile broadband mapping. Following liberalization and market consolidation, regulatory obligations required 98% population coverage. Key insights include:

- Independent national measurement campaigns to verify operator-reported coverage, spanning tens of thousands of kilometers.
- Integration of population density and terrain classification (geotypes) into coverage analysis, guiding investment prioritization and cost assessments.
- Annual collection of extensive measurement data (2.4 terabytes) to assess both coverage and quality of service, with public-facing interactive platforms enabling transparency and localized insights.
- Voluntary operator collaboration for site sharing, reducing costs and supporting multiple service delivery.
- Enforcement of mandatory data submissions and systematic tracking of deployment patterns to ensure regulatory compliance and historical monitoring.

Romania's experience demonstrates the critical role of rigorous, measurement-based monitoring, regulatory verification, and public transparency in driving broadband expansion, particularly in rural and hard-to-reach areas.

V. National ICT Infrastructure and Digital Mapping systems

The session highlighted Zambia's current ICT and digital mapping capabilities, which focus on providing visibility of infrastructure and services rather than delivering a fully developed broadband-specific platform.

ZICTA ICT Infrastructure System

ZICTA operates an ICT infrastructure and services mapping system, procured from ATDI (France) in 2024, designed to enhance regulatory oversight of mobile networks, fibre infrastructure, and related services. Primarily mobile-centric, the system supports radio network planning, licensing processes, and controlled data submissions from mobile network operators. Implementation began in August 2024, with planned expansion to integrate additional GIS layers, population data, and other sectors such as postal services, contingent on policy guidance regarding public data release.

Presidential Delivery Unit (PDU) Navigator System

The PDU presented the Navigator platform, a database-driven system tracking digital inclusion initiatives nationwide. Navigator integrates data from government ministries, mobile operators, fibre providers, public Wi-Fi telemetry, and other digital infrastructure systems. The platform provides location-level visibility of schools, health facilities, markets, telecom towers, fibre points of presence, and Wi-Fi hotspots, with role-based access controls to protect sensitive data. It supports project planning, overlap detection, progress tracking, and reporting, enabling policymakers to identify digitalisation gaps and prioritize connectivity interventions. Features include exportable datasets, automated administrative boundary assignment, analytics dashboards, and telemetry-based monitoring, with potential future integration of crowdsourced quality-of-service data.

Key Challenges

System deployment faces several constraints, including limited digital literacy among contributors, data storage and scalability requirements, cloud versus local hosting considerations, and the absence of a dedicated development team. Enhancements are implemented incrementally, based on priority needs.

VI. Technical deep dive and upcoming policy analysis work

The session provided a comprehensive technical and policy-oriented examination of broadband mapping solutions, emphasizing both system design options and strategic policy considerations for Zambia.

Technical Deep Dive

- **Geospatial Platforms and Deployment Models:** The session highlighted multiple deployment approaches for GIS-based broadband mapping systems:
 - On-Premise (ArcGIS Enterprise): Full local control and management, requiring technical expertise.
 - Platform-as-a-Service (PaaS): Cloud-hosted, providing middleware and application layers without local infrastructure management.
 - Software-as-a-Service (SaaS): Fully cloud-based, requiring only data submission from users, enabling rapid application development.
- **Open-Source Alternatives:** Solutions such as QGIS, GeoServer, PostGIS, and OpenLayers were discussed as flexible but requiring integration expertise. The distinction was made between enterprise-ready platforms like Esri and component-based open-source systems.
- **Open Data Integration:** Emphasis was placed on using accessible datasets (e.g., OpenStreetMap, Copernicus imagery) and platforms like Africa GeoPortal to support broadband mapping, enhance analytical capabilities, and promote public contributions over time.

- **Data Governance and Quality:** Key considerations included timeliness, accuracy, and reliability, with upstream controls emphasized to avoid poor-quality outputs.

Policy Analysis Framework

- **Co-Creation Approach:** The policy work is stakeholder-driven, leveraging insights from government, regulators, and private sector participants to define Zambia-specific priorities, objectives, and concerns.
- **Benchmarking and Best Practices:** State-of-the-art practices from Europe and ITU experiences inform the framework, with selective adoption aligned to Zambia's context.
- **Key Policy Focus Areas:**
 - Data quality, confidentiality, and sources
 - Reporting obligations and regulatory compliance
 - Stakeholder costs, co-location arrangements, and success factors
 - Long-term sustainability and system maintenance post-project
- **System Scope and Ambition:** Minimum requirements include comprehensive infrastructure and service mapping for fixed and mobile networks. Advanced modules may include demand mapping, quality-of-service data, and investment mapping to inform resource allocation.
- **Sustainability and Value Creation:** Broadband mapping systems are designed to deliver economic benefits, enabling decision-making efficiency and potential recovery of investment costs through evidence-based planning. Hybrid solutions combining proprietary and open-source components were highlighted as viable for longer-term capacity building.

VII. Co Creation Dialogue

Participants were informed that the co-creation phase would be conducted through three parallel working groups, each focusing on a core pillar of the Africa BB Maps initiative:

1. **Systems Architecture and Deployment Models** – focused on technical design, deployment strategies, and long-term sustainability.
2. **Data Governance** – addressed policies, procedures, roles, responsibilities, and standards for managing data as a strategic national asset.
3. **Policy and Regulatory Issues** – concentrated on legal, regulatory, and institutional considerations to enable broadband mapping implementation.

The session emphasized that policy discussions were intended to support technical implementation rather than replicate detailed legal briefings. Africa BB Maps aimed to strengthen the mandate of the National Regulatory Authority, with the expectation that broadband mapping systems would be housed within the regulator, while national

authorities would clarify their legal and policy mandates. ITU's role was to facilitate dialogue and share international experience, with Zambia retaining responsibility for establishing an enabling framework.

Report of the Policy and Regulatory Co-Creation Group

The policy group began by establishing a shared understanding of policy in Zambia, recognizing the National ICT Policy as the overarching framework governing ICTs. Complementary instruments, such as the ICT Act, e-Government Act, Electronic Communications and Transactions Act, and the National Digital Transformation Strategy, were noted.

However, the group concluded that Zambia lacks a national broadband policy and no legal framework explicitly addresses broadband mapping. Data submission obligations were weak, fragmented, and generally confidential unless formally requested. There was no binding framework for inter-agency data sharing or system interoperability, and the Data Protection Act created additional ambiguity regarding geospatial data.

Key recommendations included:

- Formulation of a national broadband policy with broadband mapping as a critical pillar.
- Alignment of existing ICT strategies with the proposed policy.
- Development of enabling legal and regulatory instruments defining responsibilities, timelines, and resources.
- Clear institutional placement to ensure data sharing, system access, and sustainability.
- Parallel development of technical implementation and policy frameworks to achieve operational readiness.
- Regional harmonization with SADC and COMESA standards to avoid cross-border inconsistencies.

Report of the Systems Architecture and Deployment Models Group

The technical group recommended a phased software approach, starting with proprietary software for rapid deployment, transitioning to open-source solutions as local capacity increased.

Deployment preferences and considerations included:

- On-premises deployment under government control (ZICTA).
- Use of Infrastructure-as-a-Service (IaaS) to enhance scalability and flexibility while retaining hardware ownership.
- Classification of the system as Critical Information Infrastructure (CII) due to sensitive national data.
- Interoperability through APIs with robust security and secure data transmission.

The group emphasized rapid deployment, scalability, security, national ownership, and long-term sustainability.

Report of the Data Governance Co-Creation Group

The data governance group highlighted that strong data governance is foundational for a successful broadband mapping system.

Data Classification and Access Control:

- Public: Accessible without authentication (e.g., presence of fibre infrastructure).
- Internal/Private: Accessible to authorized stakeholders for planning and analytics.
- Confidential: Sensitive commercial or strategic information requiring controlled access.
- Role-based access ensures users can access only relevant data.

Data Standards and Interoperability:

- Adoption of standardized data structures for seamless integration of existing systems.
- Clear definition of mandatory and optional fields for infrastructure assets.
- Development of a national nomenclature and unique identification system for assets.

Data Submission, Validation, and Updating:

- Initial bulk data import and cleansing, followed by quarterly submissions.
- Biannual validation by the system host, supported by internal verification by contributors.
- Single-window regulatory approvals could feed directly into data validation processes.

Data Quality, Compliance, and Sustainability:

- Penalties for late, incomplete, or inaccurate submissions.
- Use of automated and AI-based tools for data quality scoring and risk-based validation.
- Sample verification and cross-checking against external sources.
- Comprehensive documentation, including a data dictionary, to support long-term continuity and system management.

VIII. Alignment of Stakeholders responsibilities

The session included a presentation outlining ZICTA's perspective on the Africa Broadband Mapping Project, focusing on progress to date and the collaborative path forward with all stakeholders. Technical support was expected from the ITU, while financial support would be provided by the European Union.

National Working Group Structure

To ensure effective coordination, it was proposed that a National Working Group (NWG) be established, modelled on ITU working structures. The NWG would serve as the main coordinating body, subject to approval by the relevant national authorities, given the involvement of high-level stakeholders.

The NWG would be supported by three sub-working groups, reflecting the co-creation discussion structure:

1. Policy Sub-Working Group – tasked with analysing existing legal and policy provisions and recommending enhancements to support broadband mapping activities.
2. Technical Sub-Working Group – responsible for reviewing solution types, deployment architectures, and technical specifications to tailor high-level requirements to Zambia's context.
3. Data Management Sub-Working Group – focused on data governance, protocol standardization, collection, validation, and operational procedures.

Each sub-working group would be assigned a chairperson, who would also serve on the main NWG, ensuring close coordination. Detailed mandates and work plans for each sub-group were to be developed subsequently.

Preliminary discussions had already been conducted with the parent ministry and the Public-Private Dialogue Unit to define the modalities for establishing an officially recognized NWG, with the goal of creating a credible national structure to oversee the project to completion.

An interactive Mentimeter exercise helped stakeholders reflect on their functional roles within the broadband mapping ecosystem. Roles were defined across the project lifecycle, from data provision to capacity building. The agreed responsibilities were as follows:

SN	Role	Responsible
1.	Data Providers	MNOs, ISPs, Ministries, Local Authorities, Towercos, Presidential Delivery Unit
2.	Data Stewards	ZICTA
3.	Data Custodian	ZICTA
4.	Data Owners	ZICTA
5.	Data Consumers	All Stakeholders
6.	System Hub Lead	ZICTA
7.	Policy and Regulation Oversight	Ministry of Technology and Science
8.	Training Providers	ITU, EU Experts, Regional Experts, Academia

IX. Training

The training program for the Africa Broadband Mapping Project is designed to develop expertise across multiple layers of GIS and data policy, targeting participants from administrative staff to advanced technical experts. The training will primarily focus on building capacity for the Data Custodian role, ensuring that ZICTA has a team capable of sustaining and managing the broadband mapping system effectively.

Key Features of the Training Program:

- Scope: GIS fundamentals, advanced geospatial analysis, and data policy governance.
- Target Audience: Primarily the Data Custodian (ZICTA staff), with provisions for relevant stakeholders.
- Delivery Formats:
 - Online, self-paced modules
 - Online instructor-led sessions
 - In-person workshops and practical exercises
- Provider: ITU Academy, leveraging international expertise and best practices.
- Expected Outcome: Development of a sustainable team of well-trained experts capable of managing, updating, and analysing broadband mapping data, supporting long-term operational effectiveness and institutional continuity.

X. Next steps

The project timelines and key activities for the Africa Broadband Mapping Project in Zambia were shared, highlighting the phased approach designed to ensure a structured rollout, capacity development, and long-term sustainability. The following milestones were emphasized:

SN	YEAR	ACTIVITY
1	2025	Identity – Foundation and readiness
2	2026	Improve – System development and Capacity Building
3	2027	Innovate – Operationalization and Policy Alignment
4	2028	Manage – Sustainability and Regional Leadership

XI. Conclusion

The Africa Broadband Mapping Project represents a critical step toward strengthening Zambia’s digital infrastructure planning and regulatory oversight. By integrating robust technical systems, clear data governance, and supportive policy frameworks, the project ensures that broadband mapping becomes a sustainable, nationally owned asset. Through stakeholder collaboration, capacity building, and phased implementation, Zambia is positioned to improve connectivity, support evidence-based decision-making, and take a leadership role in regional digital development.