

The Bandwidth and Cloud Services Group - 01/11/2024

KEEPING AFRICA CONNECTED

ENABLING A CONNECTED AFRICA



THINK BELIEVE CONNECT

BCS

**BANDWIDTH & CLOUD
SERVICES GROUP**



Our Footprint Map

Who We Are

BCS group is a Pan-African telecom infrastructure company that operates across the African continent and specializes in delivering fiber connectivity solutions to wholesale customers. Our network coverage spans over 80,000km+ of backbone and metro fiber, encompassing 17 countries in eastern, central, and southern Africa, which allows us to reach an estimated 80million+ end users. We offer a range of services, including fiber construction, carrier grade IP transit, global and regional connectivity, colocation services, and open access FTTX on EPC, co-build, own build and managed capacity models.

BCS group owns one of the largest terrestrial fiber networks in Africa.

BCS group operates under licenses in eight African countries including Angola, democratic republic of Congo, Kenya, Malawi, Rwanda, Uganda, Zambia and Zimbabwe. Additionally, we provide services at the border points for other countries such as Botswana, Burundi, Ethiopia, Mozambique, Namibia, Republic of Congo, South Africa, South Sudan and Tanzania.

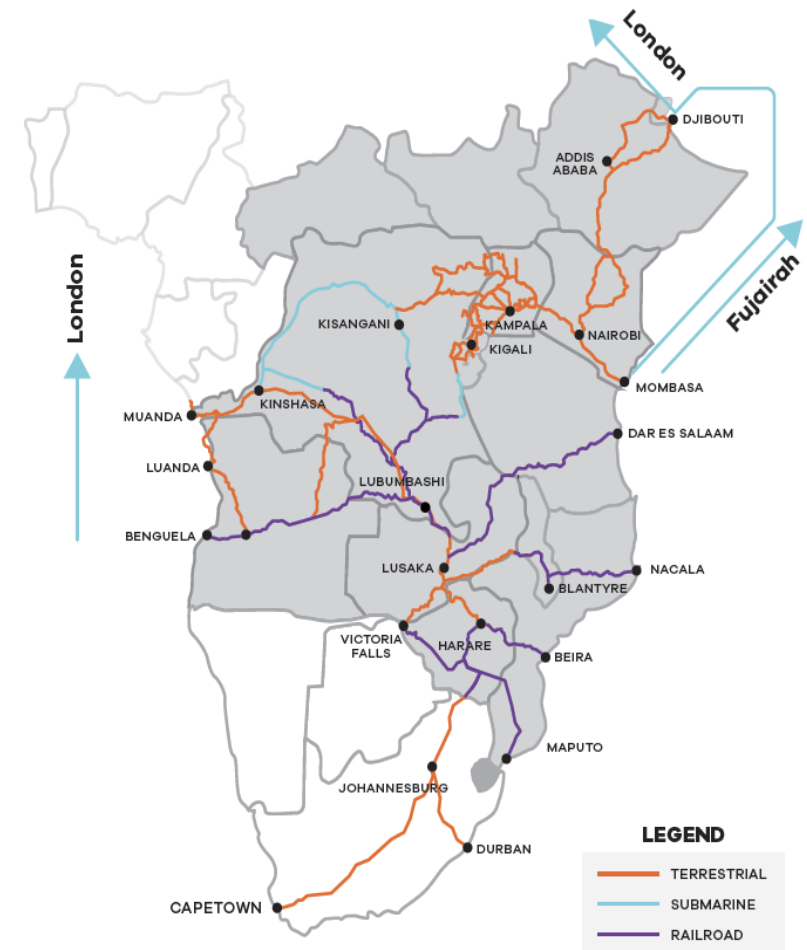
80,000KM Network Coverage

17 African Countries Ser

150K+ Buildings & Hc Connected

80M+ People Connected

2,500+ Towers Connected



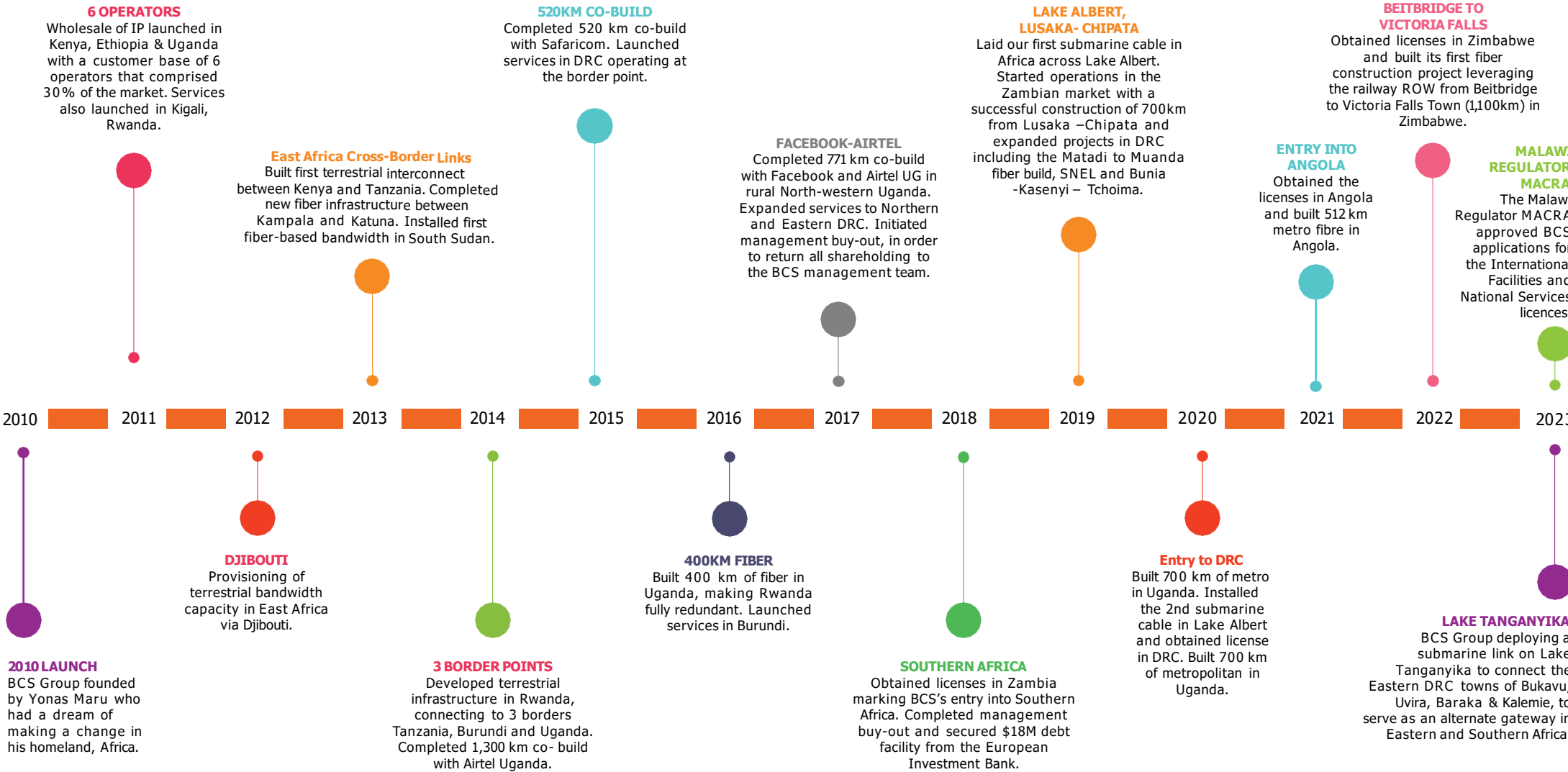
- **Carrier Grade IP Transit**
- **Fiber Construction**
- **Colocation Services**
- **Network Transmission**
- **Open Access FTTx**
- **Global & Regional Connectivity**

OUR PARTNERSHIP MODELS

- 1. CO-BUILD WITH BCS**
 - BCS and the client mutually fund CAPEX for fiber construction.
 - Each party owns a percentage of the fiber cores and share, in proportion, the cost of fiber maintenance.
 - The client owns fiber infrastructure at a fraction of the CAPEX that would be required to build their full fiber infrastructure.
- 2. LEASE OR PURCHASE BCS BUILT FIBER**
 - BCS fully funds fiber construction following a plan based on the client's need.
 - Once complete, client pays lease or IRU fee to BCS for Dark Fiber/Lit Capacity.
 - The client has access to fiber infrastructure, at competitive rates and best-in-class SLA, with minimum investment.
- 3. BCS AS EPC CONTRACTOR**
 - BCS is the EPC contractor, offering highly competitive rates.
 - The client owns the fiber and is responsible for all maintenance, may contract BCS for maintenance.
 - The client gains competitive advantage by procuring construction services at competitive cost and sole ownership over fiber.
- 4. DARK FIBER MANAGED SERVICES**
 - BCS provides Dark Fiber Managed Services in jurisdictions where the client is not licensed.
 - With this service, the client obtains ownership rights on the fiber and full benefits of dark fiber utilizing BCS licenses.
 - If the client later acquires a license, they have conversion rights to full ownership of the dark fiber.



Our Journey

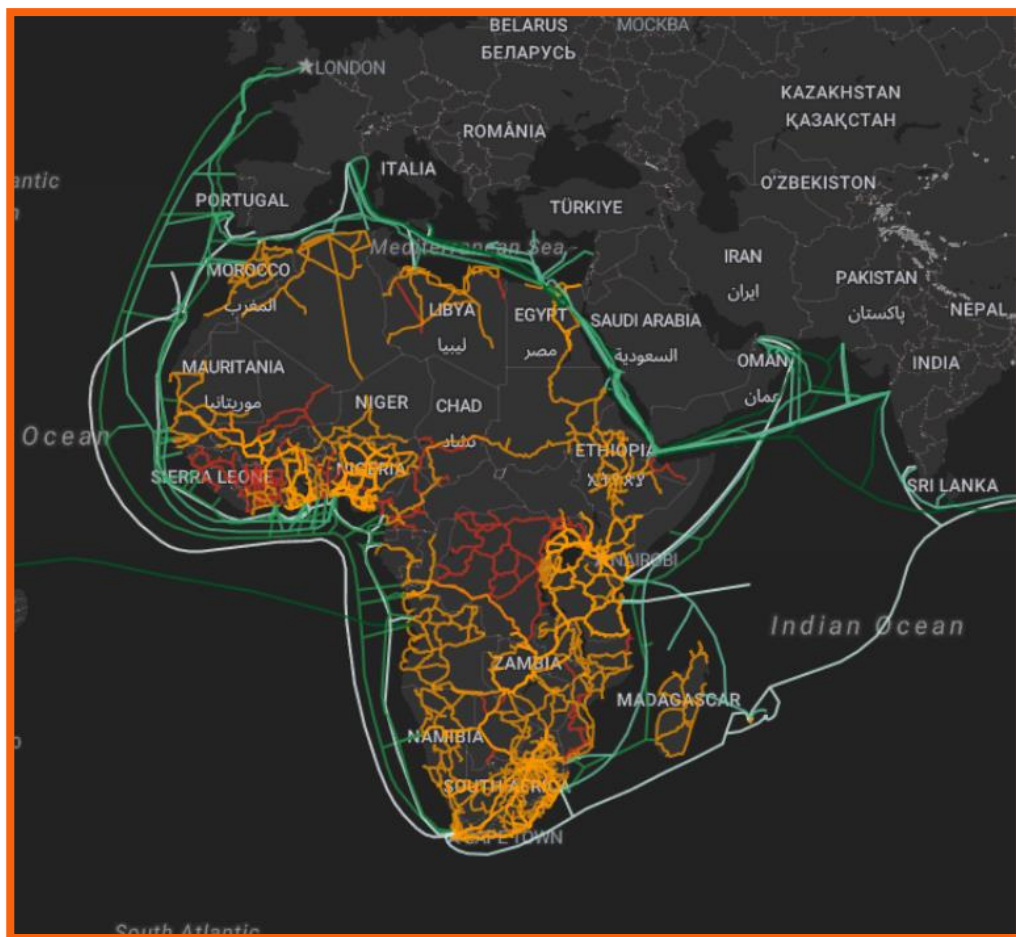


Keeping Africa Connected: Submarine connectivity

Africa is increasingly connected to the global internet infrastructure through submarine cables. These cables are crucial for data transmission, connecting various regions and enabling better internet access.

Submarine Cables Landing in Africa

As of 2024, there are over 40 active submarine cables that land in various countries across Africa. The following table lists some of the main submarine cables, their landing points, and additional details:



Cable Name	Landing Countries	Length (km)	Year of Launch
ACE	West Africa (17 countries)	17,000	2012
SAT-3/WASC	Portugal, Spain, UK, South Africa	14,500	2002
GLO-1	Nigeria, Ghana, UK	8,700	2009
WASC	UK, Portugal, Nigeria, Ghana, South Africa	14,000	2002
SEACOM	South Africa, Tanzania, Kenya, Mozambique	17,000	2009
TGN-Eurasia	South Africa, Mauritius	7,000	2001
MainOne	Nigeria, Portugal	7,000	2010
SACS	South Africa, Brazil	6,200	2018
DARE	South Africa, UK	8,000	2021
EASSy	East Africa (8 countries)	10,000	2010

Source - <https://afterfibre.nsrc.org/>

Keeping Africa Connected: Low Internet Penetration in Africa ☹️

Despite Africa being well connected through submarine cables, low internet penetration remains a challenge. One major reason is the limited terrestrial connectivity that underpins these connections.

As of 2023, only 36% of Africa's population has internet access, compared to a global average of 60%.

Current State of Internet Penetration

Rural internet penetration is particularly low, with only 24% of rural Africans having access compared to in urban areas.

Over 600 million people in Africa still lack mobile broadband access.

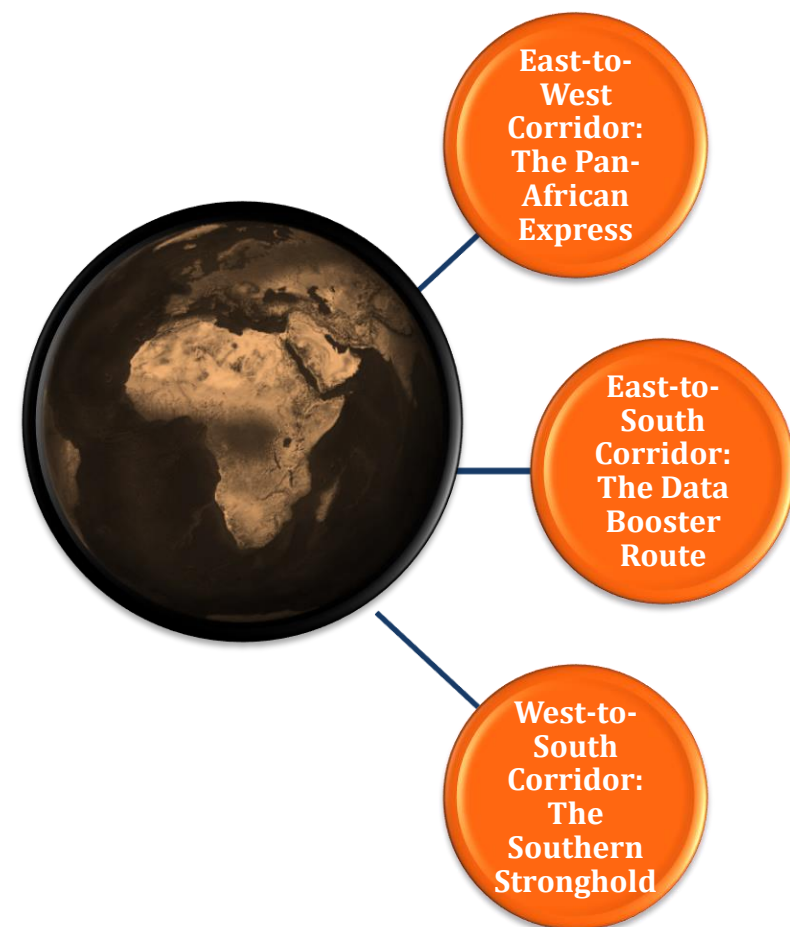
Keeping Africa Connected: Terrestrial Backbones to the Rescue!

Why Terrestrial Connectivity Matters

- Submarine cables provide excellent international connectivity but are vulnerable to outages due to repairs or environmental factors.
- When submarine cables go down, reliable terrestrial networks ensure uninterrupted data flow.

Gaps Terrestrial Connectivity Will Address

Meeting Market Demand	<ul style="list-style-type: none"> • MNOs increasingly rely on fibre backhaul networks to handle growing data volumes from smartphones and mobile apps • New fibre infrastructure enables efficient data transmission and supports the growth of mobile services • New fibre infrastructure presents opportunities for new connectivity through infrastructure leasing, wholesale services and retail offerings to consumers • Meeting this increasing demand for connectivity ensures market dynamics can better support a growing economy
Enhanced Connectivity and Internet Access	<ul style="list-style-type: none"> • Fibre infrastructure enables high-speed and reliable connectivity, extending into underserved areas more cost-effectively, thus connecting the previously unconnected and driving a digital economy
Bridging the Digital Divide	<ul style="list-style-type: none"> • By extending fibre infrastructure to rural and underserved areas, stakeholders play a crucial role in bridging the digital divide, enabling access to educational resources, healthcare services, e-commerce and e-government services for previously marginalized communities
Economic and Social Development	<ul style="list-style-type: none"> • Improved connectivity through fibre infrastructure stimulates economic growth, fosters innovation and attracts investments, by contributing to job creation, entrepreneurship and the overall socio-economic development of new communities coming online
Job Creation and Skills Development	<ul style="list-style-type: none"> • The construction and operation of fibre infrastructure creates employment opportunities for local communities, including during planning, installation, maintenance and customer support • Stakeholders contribute to skills development and the overall growth of the telecoms sector



Keeping Africa Connected: Challenges Facing Terrestrial Connectivity

Infrastructure Development

- **Limited Infrastructure:** Many regions in Africa lack the necessary infrastructure, such as roads, power supply, and fiber optic cables, which hinders the establishment of reliable terrestrial connectivity.
- **Urban vs. Rural Divide:** Connectivity is often concentrated in urban areas, leaving rural communities with inadequate or no access to the internet.

High Costs

- **Investment Costs:** The costs associated with building and maintaining telecommunications infrastructure can be prohibitive for many companies and governments.
- **Consumer Costs:** High prices for internet services can limit access for many citizens, particularly in low-income areas.

Regulatory and Policy Challenges

- **Complex Regulatory Environments:** The telecommunications sector in Africa often faces complicated regulatory frameworks that can slow down project approvals and deployment.
- **Intergovernmental Coordination:** Lack of coordination among different countries and regions can create barriers for cross-border connectivity initiatives.

Political Stability and Governance

- **Political Instability:** Ongoing conflicts and political instability in some regions can disrupt infrastructure projects and deter investment.
- **Corruption:** Corruption can undermine efforts to improve connectivity, as funds may be mismanaged or diverted.

Technological Barriers

- **Limited Technology Adoption:** In some areas, the adoption of new technologies is slow, hindering progress toward improved connectivity.
- **Capacity and Skills:** There is often a shortage of skilled professionals to maintain and develop advanced telecommunications systems.

Environmental and Geographic Challenges

- **Diverse Geography:** The continent's varied geography, including deserts, mountains, and forests, can complicate infrastructure development.
- **Natural Disasters:** Frequent natural disasters in some regions can damage existing infrastructure and disrupt services.

Sustainability and Energy Supply

- **Dependence on Fossil Fuels:** Many regions rely heavily on non-renewable energy sources, which can be unstable or unsustainable in the long term.
- **Energy Access:** Limited access to reliable energy sources can hinder the deployment and maintenance of telecommunications infrastructure.

Digital Divide

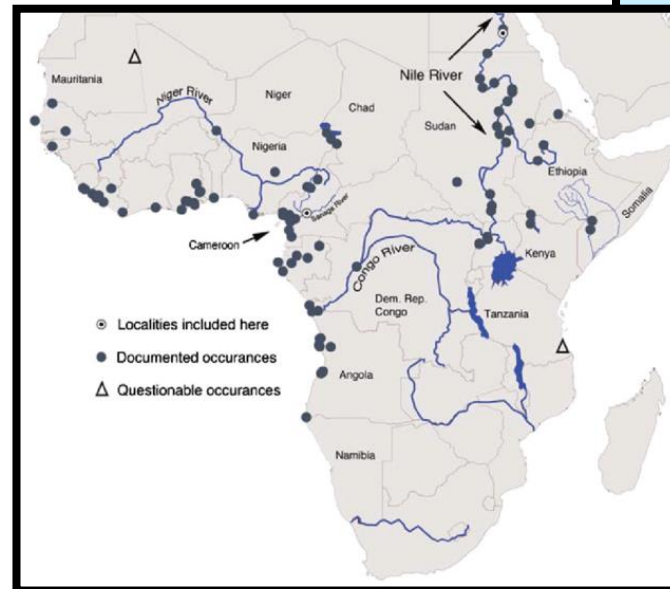
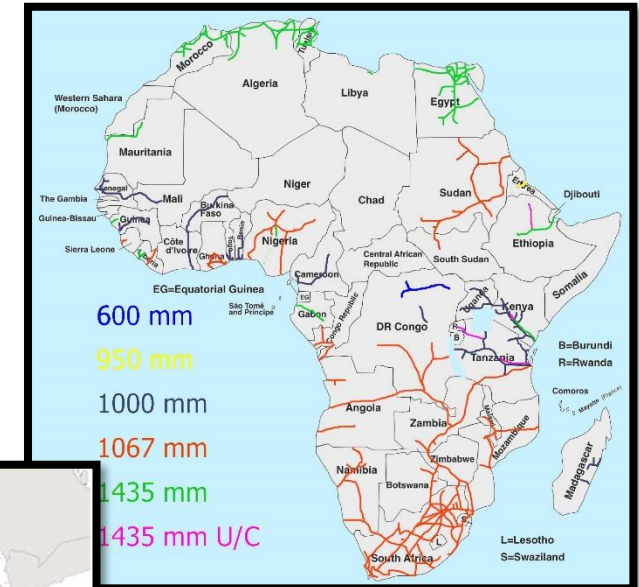
- **Inequality in Access:** There is a significant disparity in internet access between different socioeconomic groups, which can exacerbate existing inequalities.
- **Language and Literacy Barriers:** Language barriers and varying levels of digital literacy can limit access and usage of digital platforms.

Keeping Africa Connected: Solution through Innovation

At BCS Group, we believe that innovation is the key to unlocking hope and opportunity across Africa. Our mission is to bridge the digital divide by leveraging existing infrastructures, such as railroads, lakes, and rivers, to deploy efficient and sustainable digital connectivity solutions.

Railroad Connectivity

- **Maximizing Existing Networks:** By utilizing the extensive railway system in East, Central, and Southern Africa, we deploy fiber optic cables overhead and underground, ensuring seamless connectivity while minimizing disruption to rail operations.
- **Economic Efficiency:** Our innovative deployment methods reduce costs and accelerate project timelines, making it easier for communities to access vital digital resources.



Submarine Connectivity

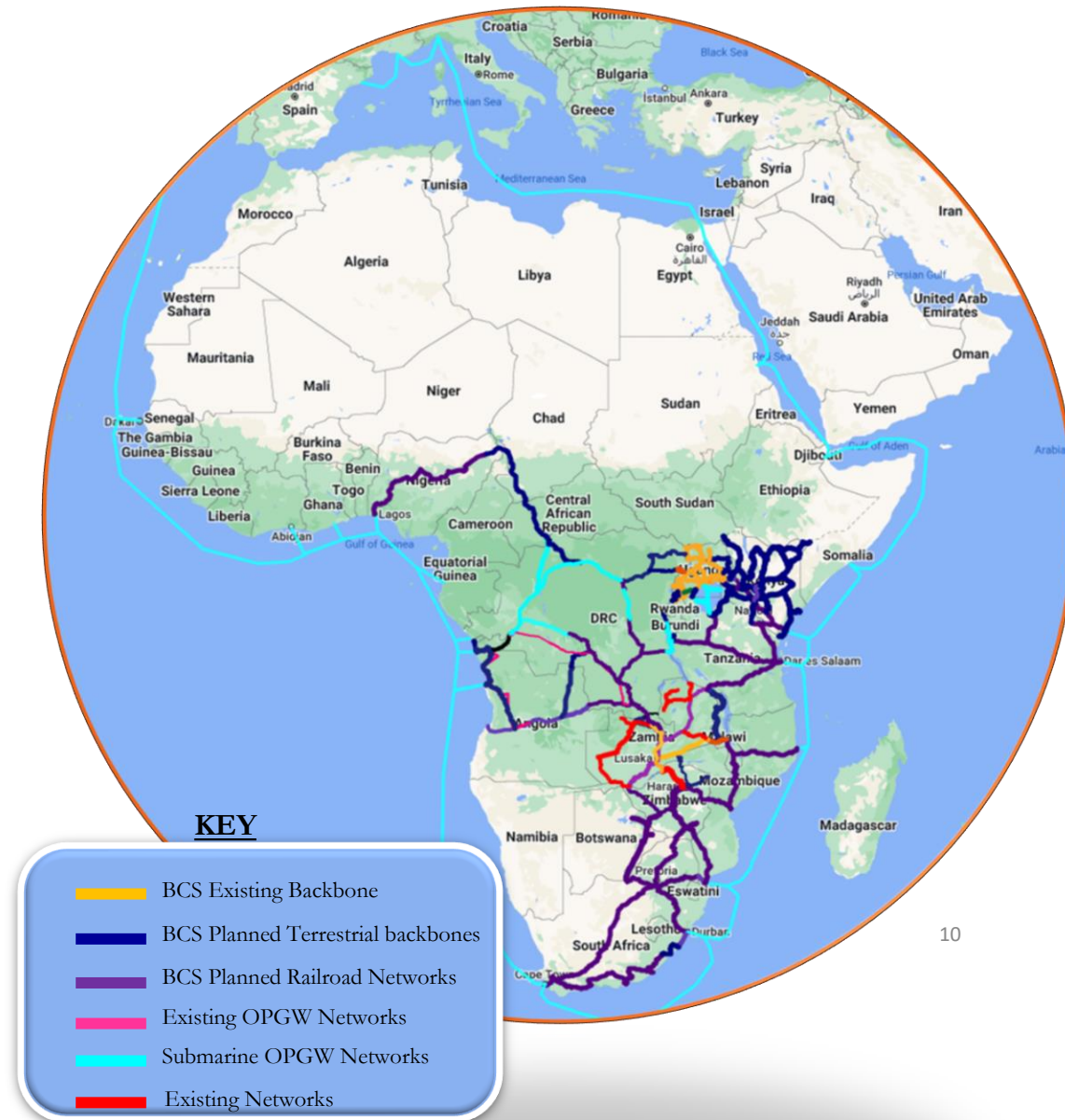
- **Harnessing Waterways:** Our methodologies for deploying digital infrastructure along Africa's lakes and rivers open new avenues for connectivity. We employ specialized equipment to lay submarine cables, effectively reaching underserved regions.
- **Sustainable Practices:** Our approaches prioritize environmental sustainability, using existing water bodies to minimize land disruption and protect natural habitats.

https://drive.google.com/file/d/1R_B0gLnuQS25kGhkm9ndkt4uyVZmVbZv/view?usp=sharing

Keeping Africa Connected: BCS is Doing it !

BCS Network Goals;

- Provide a national backbone for countries where there is no national backbone or the quality is very poor.
- Terrestrial country-to-country connectivity improves latency and quality between countries due to a reduction in the distance as opposed to existing subsea cables.
- Interlink major towns within countries terrestrially eliminating the expensive, unreliable microwave and satellite networks.
- Promote the employment of youth and women across all markets directly and indirectly.
- Eradicate poverty through the connectivity and empowerment of Africa through technology.
- Provide rural connectivity; fiber penetration to underserved areas.
- The New builds target the new subsea fiber cables 2 Africa(Facebook) and Equiano(Google) which will offer more international network capacity than the cables that currently serve the region due to Space-Division Multiplexing Technology.
- Provide redundancy to existing cable networks, and international gateways hence improving the national service experience.



After Backbone Connectivity: What's Next? 😊

Once backbone connectivity is established, the next crucial step is to enhance Metro and last mile connectivity within towns and urban areas. This will support education and is vital for creating learning opportunities, fostering economic empowerment, and ensuring inclusive growth..



1. Metro Connectivity

- **Connecting Schools and Learning Institutions and Community Centers.** Equip community centers and local gathering spaces with fiber-based internet, creating accessible learning hubs for students and lifelong learners in urban areas.

2. Last Mile connectivity

- **Reaching Underserved Schools and Communities.** Prioritize connectivity for schools and education centers in underserved or rural areas within urban boundaries, ensuring all students have access to digital resources and online learning opportunities.

3. Improving Access to Educational Services

- **Smart Education Solutions** Leverage connectivity to support smart education initiatives, such as virtual classrooms, online course platforms, and digital libraries, enriching educational opportunities.
- **Digital Literacy Programs for Students and Educators**

4. Supporting Educational and Economic Development

Empowering Local Educational Institutions

Develop a digital ecosystem where schools and education centers can thrive, offering e-learning, digital classrooms, and resources that expand students' access to global educational content.

Projects Gallery

BCS has been utilizing its expertise in the region since 2010 to build both overhead and underground fiber networks at a higher throughput and lower cost than our competitors. This has been made possible largely because of our highly mechanized operation.



Ground Ripping



Duct Installation



Fiber Splicing



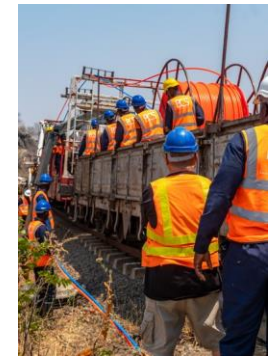
Fiber Blowing



Manhole Installation



Duct Integrity Test



Railway Fiber Laying



Pole Planting



Overhead Fiber Stringing



Nile Crossing



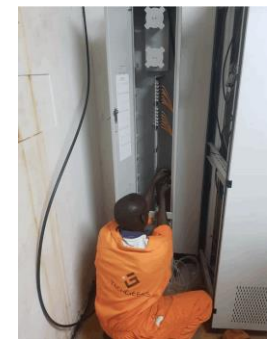
Site Entry Installation



Outdoor ODF Installation



Indoor ODF Installation



Fiber Termination

Railway Connectivity

Railway build



Plow machines



Ripper



Our Railway team



Splicing team



Submarine Connectivity

A fully prepared cable laying barge



Submarine cable being laid in water



A fully assembled marine joint being laid in the water



A submarine joint being spliced



Beach manhole construction



Submarine cable being pulled to the shore





Thank You

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