

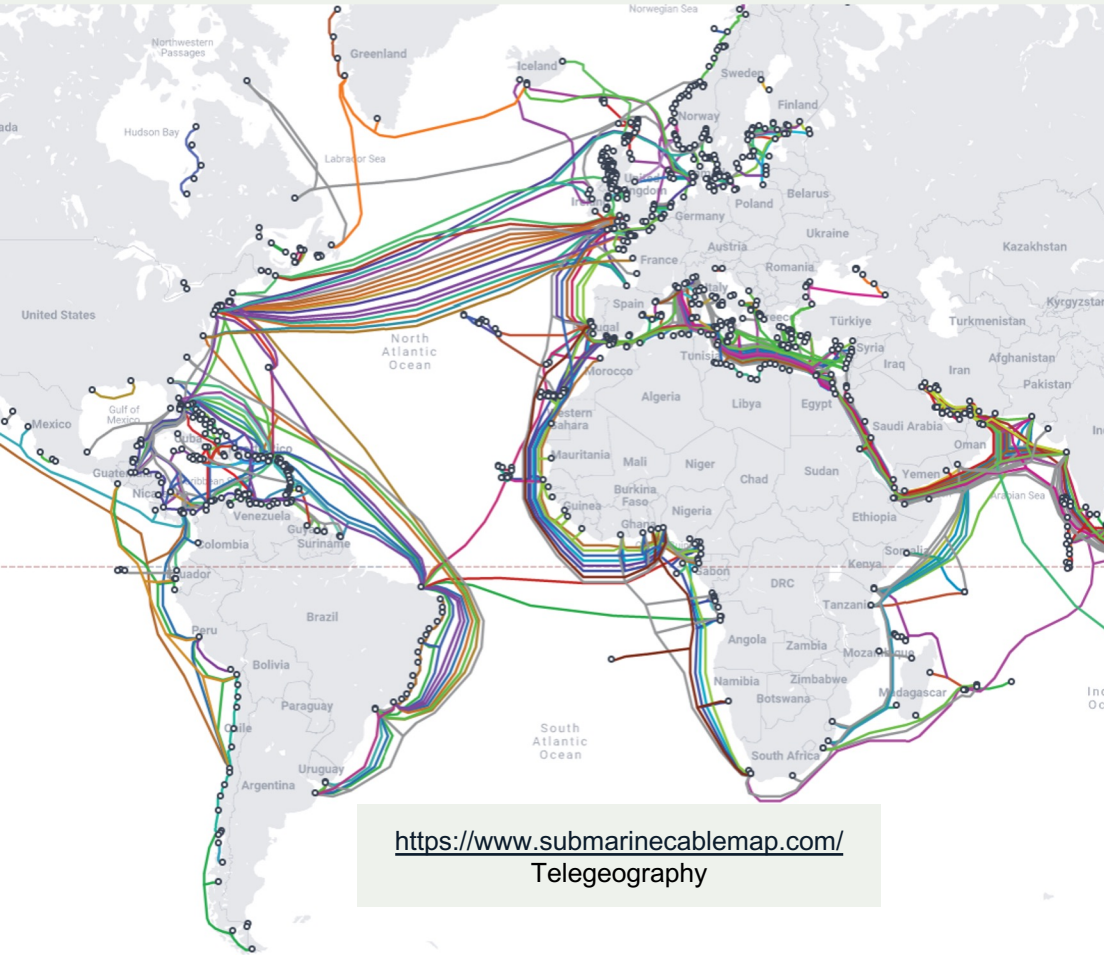
Introducing the Open Fibre Data Standard

Steve Song
song@isoc.org

RIPE NCC SEE Roundtable
7 April 2025



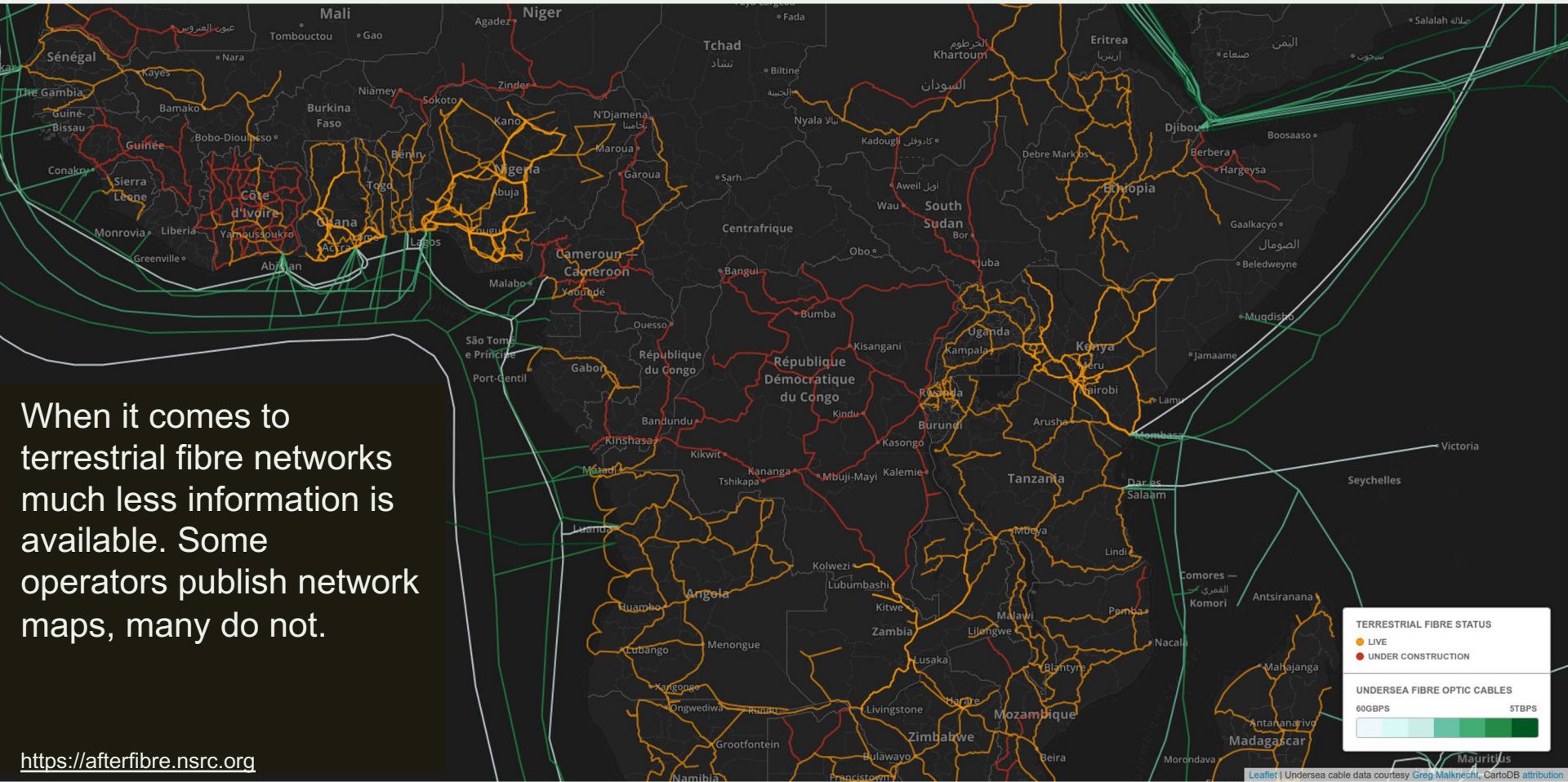
The Evolution of Fibre Infrastructure



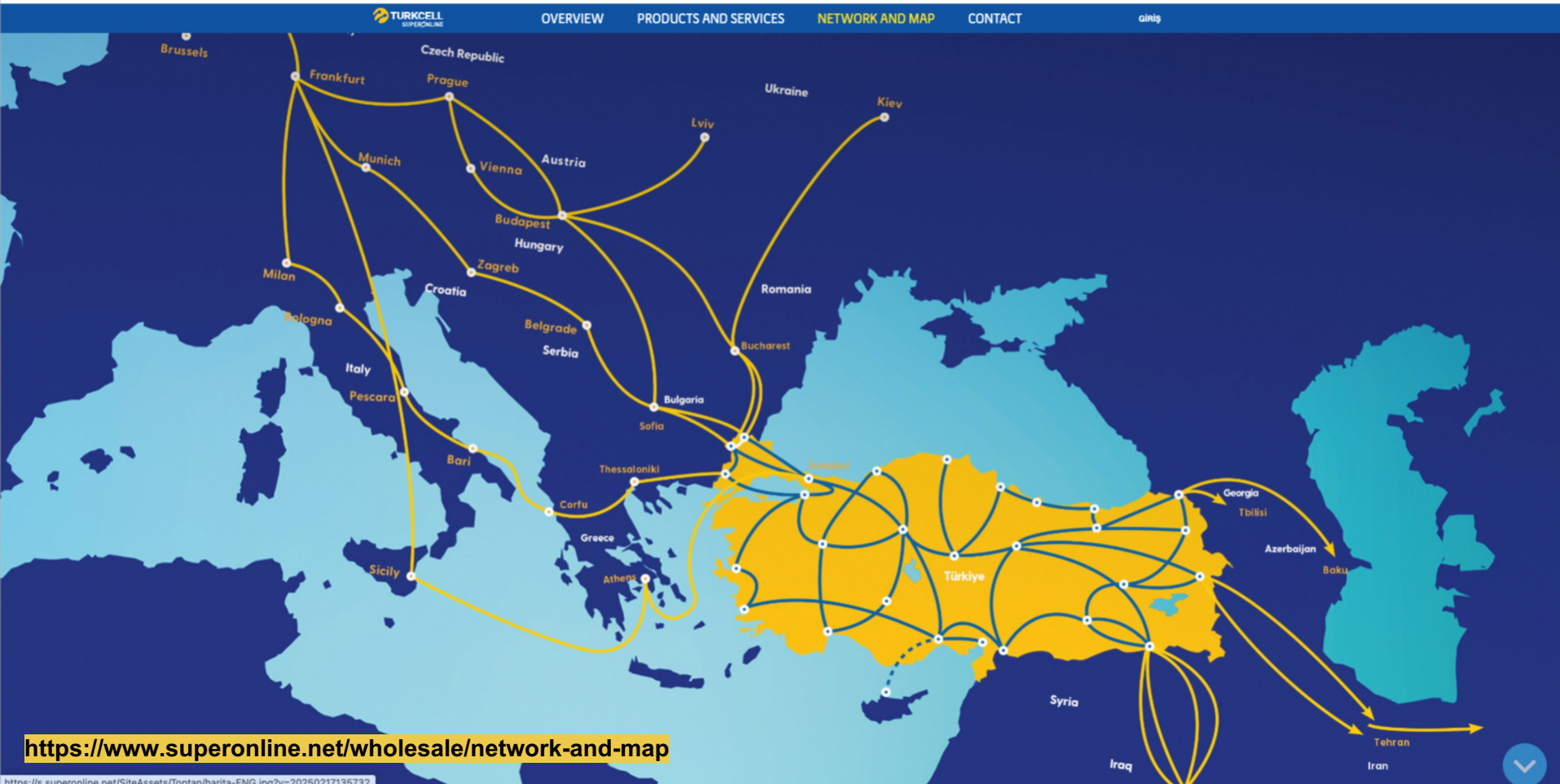
<https://www.submarinecablemap.com/>
Telegeography

- As of 2025, there are more than 550 undersea fibre optic cables, representing nearly 1.4 million kilometres of cable.
- A single cable can now carry over 300 Tbps.
- Undersea cable maps are readily available.

Growth of Terrestrial Fibre



Turkey: Turkcell



Sweden: Easy Fibre

[NEWS](#)[PARTNERS](#)[ASSOCIATED PARTNERS](#)[SERVICES](#)[DARK FIBRE MAP](#)

As a network operator, you now have access to a new fibre network covering the whole of Sweden, Norway, Denmark, Finland and the northern part of Germany, via:

A single contact person

A single contract

A single service agreement

You will have greater freedom, easier day-to-day operation and, perhaps most importantly, a better product to offer your customers!

Thanks to a unique collaboration between network owners Tele2 Wholesale, IT Norrbotten, Triangelbolaget, GlobalConnect, Eidsiva bredbånd and Cinia Group Oy, the network provides entire north to south and east to west coverage – city networks included therein.

We call it Easy Fibre.



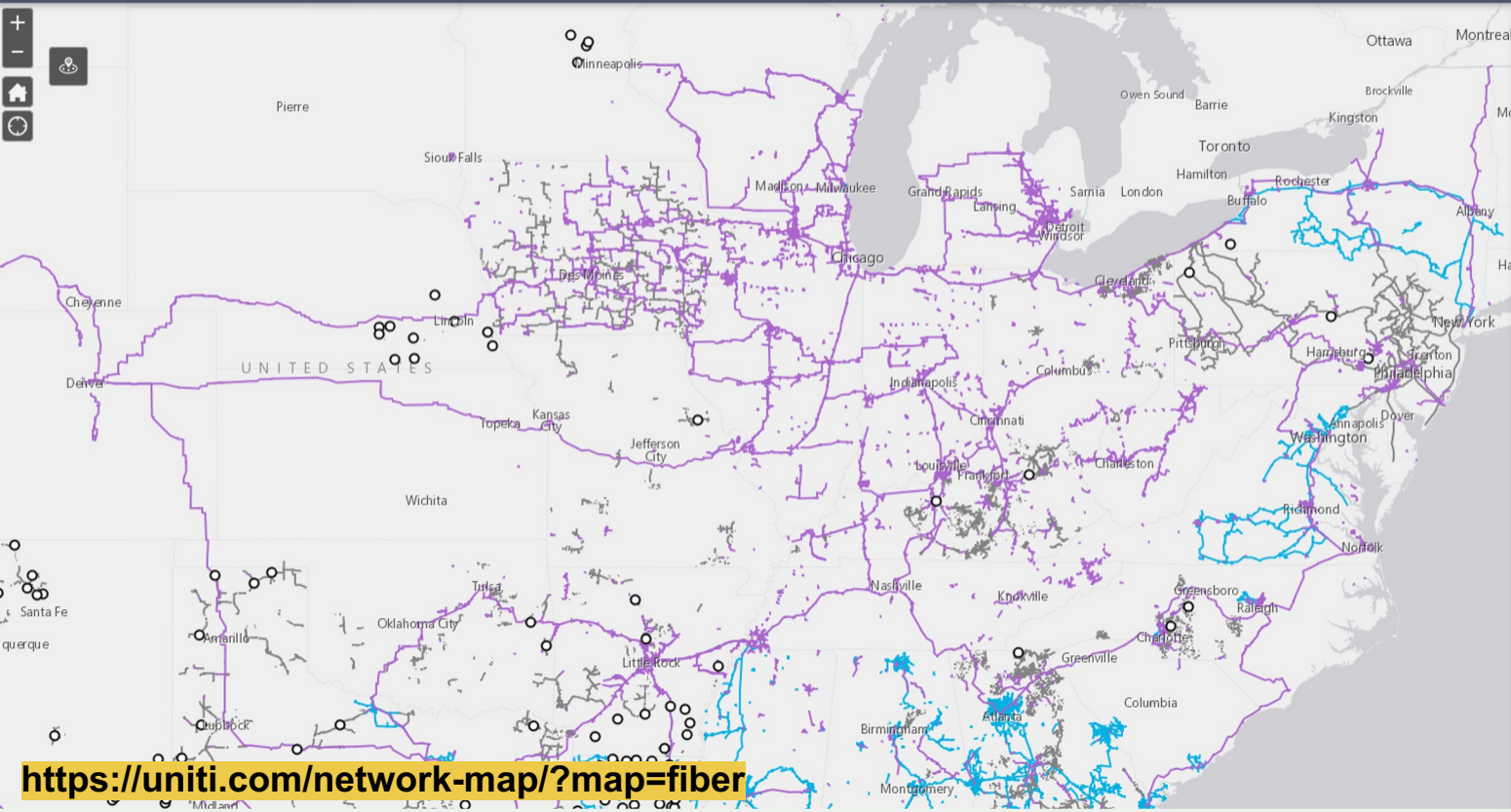
<http://easyfibre.se/dark-fibre-map/>



United States: Uniti

[About Us](#)[Uniti Services](#)[Contact Us](#)[Network Map](#)[Careers](#)[OneView](#)

Uniti Network Map



Layer List

Layers

- ☒ Uniti Tower Sites
- ☒ Dark Fiber Available
- ☒ Dark Fiber Fully Leased
- ☒ Network Services



NETWORK MAP

SEE OUR NETWORK

<https://uniti.com/network-map/?map=fiber>

Canada: Coopérative de télécommunication d'Antoine-Labelle (CTAL)



The banner features a woman with long blonde hair looking at a smartphone. The background is a dark, scenic landscape. The CTAL logo is in the top left, and a yellow 'Menu' button is in the top right. The main text is in large yellow font, and a smaller text block is in the bottom right of the image area. The bottom of the banner has an orange background with a pattern of yellow Wi-Fi symbols.

CTAL - Forfaits Internet haut... x +

ctal.ca

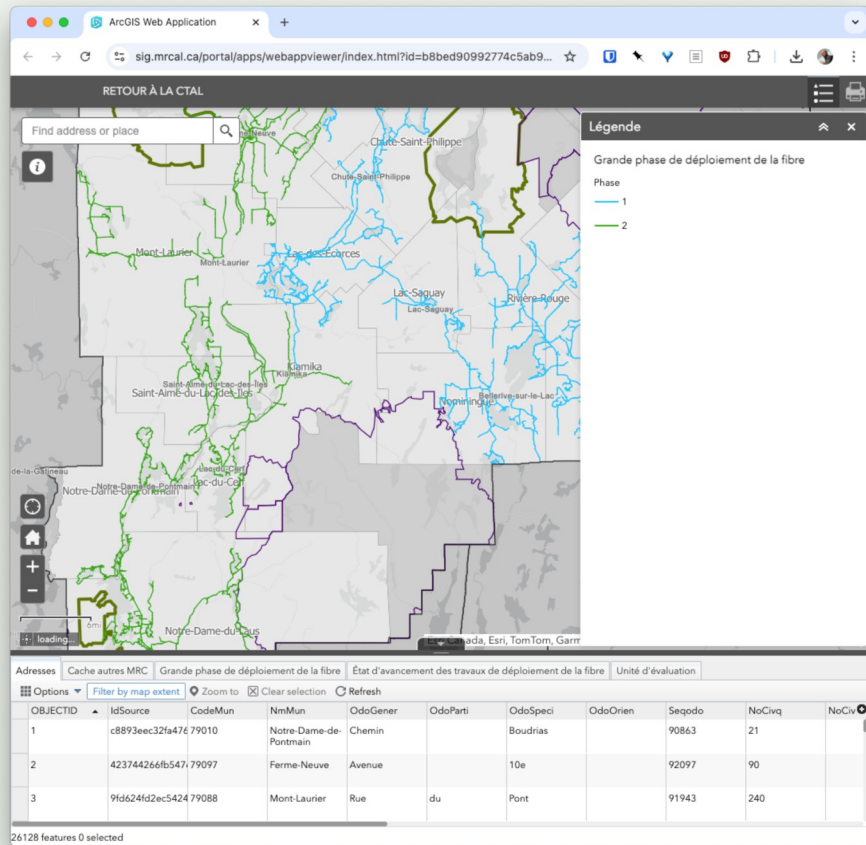
Menu

Une région connectée

Les résidents de la MRC d'Antoine-Labelle ont enfin accès à Internet par fibre optique

Une fierté pour notre région

<https://ctal.ca/>



The screenshot shows a web application for fiber deployment. It includes a map with various colored lines representing different phases of deployment. A legend on the right explains the colors. Below the map is a table with columns for object ID, source, code, municipality, name, type, and various codes. The table has 3 rows of data. The bottom of the page shows '26128 features 0 selected'.

RETOUR À LA CTAL

Find address or place

Légende

Grande phase de déploiement de la fibre

Phase

1

2

Adresses

Cache autres MRC

Grande phase de déploiement de la fibre

État d'avancement des travaux de déploiement de la fibre

Unité d'évaluation

Options

Filter by map extent

Zoom to

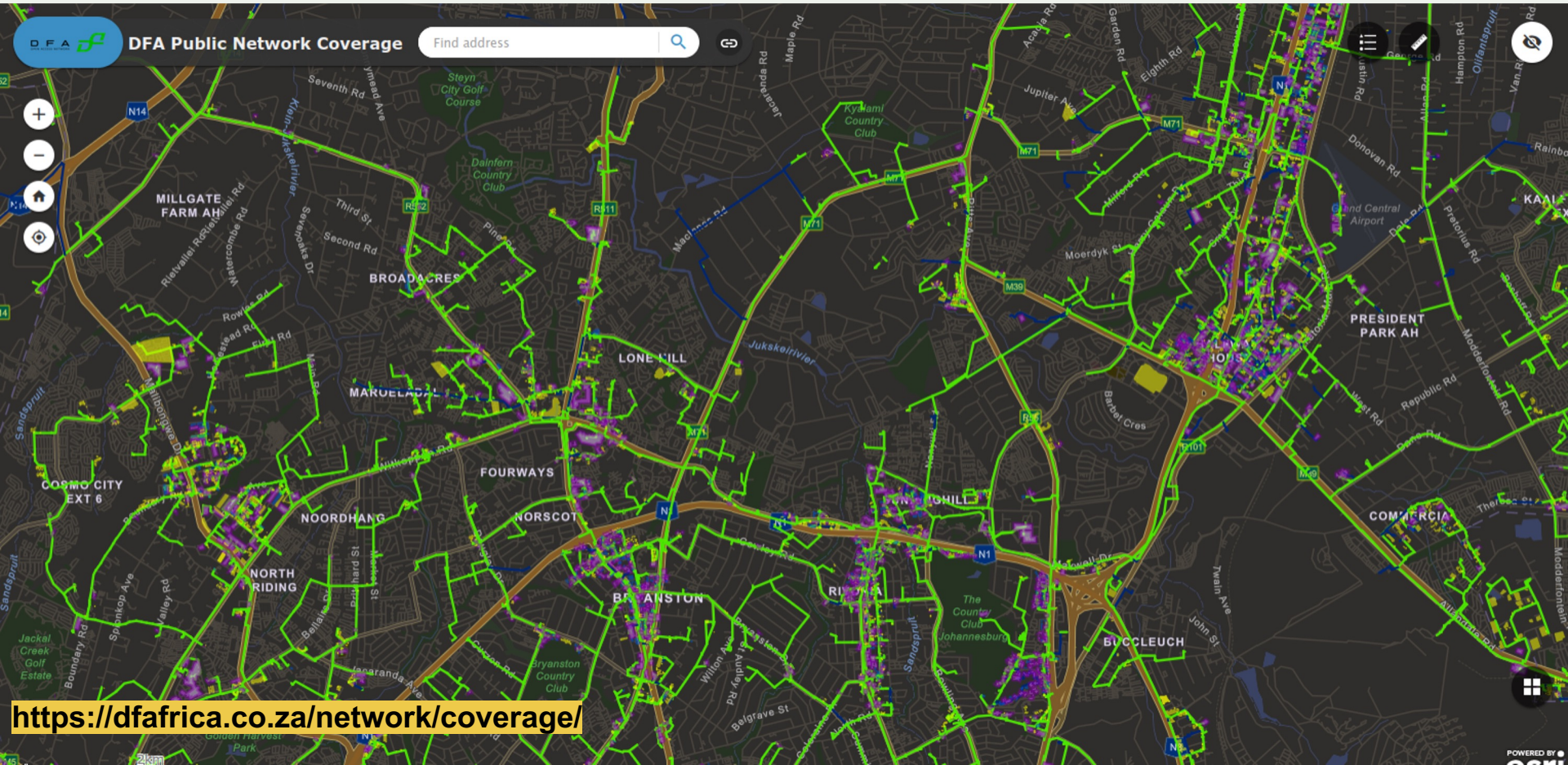
Clear selection

Refresh

OBJECTID	IdSource	CodeMun	NmMun	OdoGener	OdoParti	OdoSpeci	OdoOrien	Seqodo	NoCivq	NoCiv
1	c8893eec32fa47c799010	799010	Notre-Dame-de-Portmain	Chemin		Boudrias		90863	21	
2	423744266fb547c799097	799097	Ferme-Neuve	Avenue		10e		92097	90	
3	9fd624fd2ec5424799088	799088	Mont-Laurier	Rue	du	Pont		91943	240	

26128 features 0 selected

South Africa: Dark Fibre Africa



Brazil: Eletronet



<https://www.eletronet.com/rede/>

National Backbone

GCN Network / Bulgarian backbone

National backbone



International backbone



BG Network

Request additional
information

REQUEST INFO

Download Map Image



Download BG Map



Download EU Map

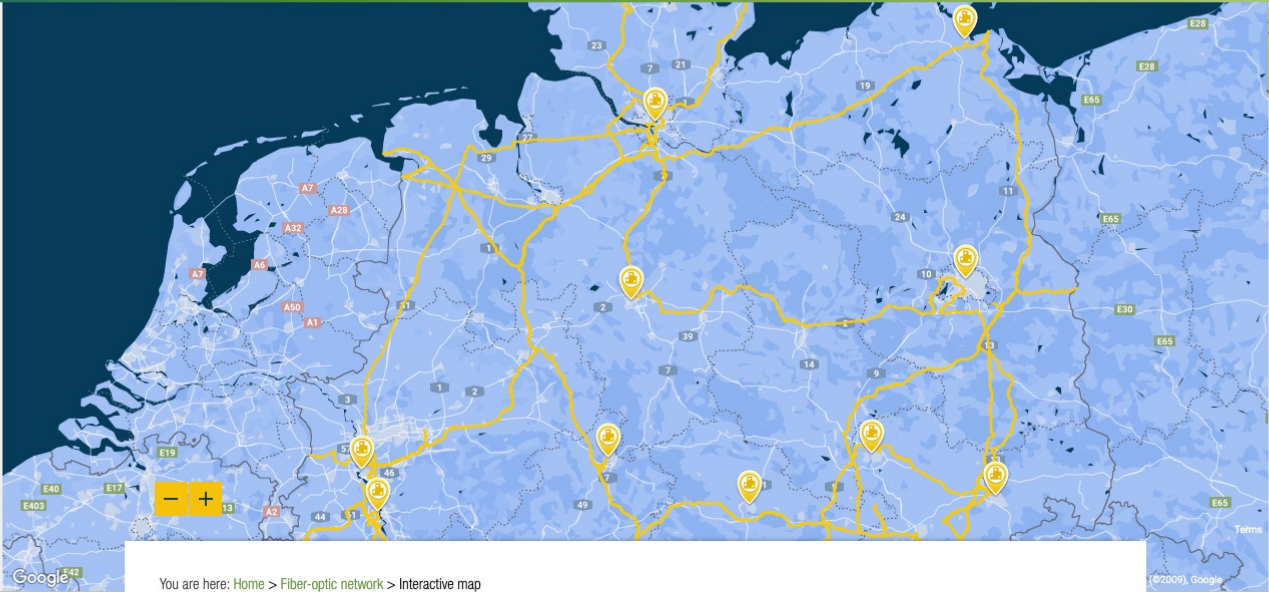
BULGARIAN OPTIC FIBER NETWORK

GCN owns and operates a national backbone comprised of more than 3100 km of fiber-optic lines as well as international interconnections to Turkey, Greece, Romania, Macedonia and Georgia. GCN has full servitude rights for its network.



BENEFITS

Germany – SEFE Fiber



You are here: Home > Fiber-optic network > Interactive map

SEFE Interactive Fibre Optic Network

ABOUT 8,500 KILOMETERS OF FIBRE-OPTIC CABLES IN GERMANY

Explore our fibre-optic grid with our interactive map: Zoom into the map in seven steps (zoom levels) to view the route in detail or search directly for your location using the search function. Filter by city connections, districts and fibre-optic routes.

Did we pique your interest? We look forward to receiving your requests!

Your contact person

Nick Schieferdecker
Account Manager
Königstor 20
34117 Kassel
Phone.: +49 (0) 561
99858-7262
E-Mail:

<https://www.sefe-fiber.eu/>

Poland: Hawe Telekom

HAWE
TELEKOM

Contact  

About us Network map Services News R&D

Home

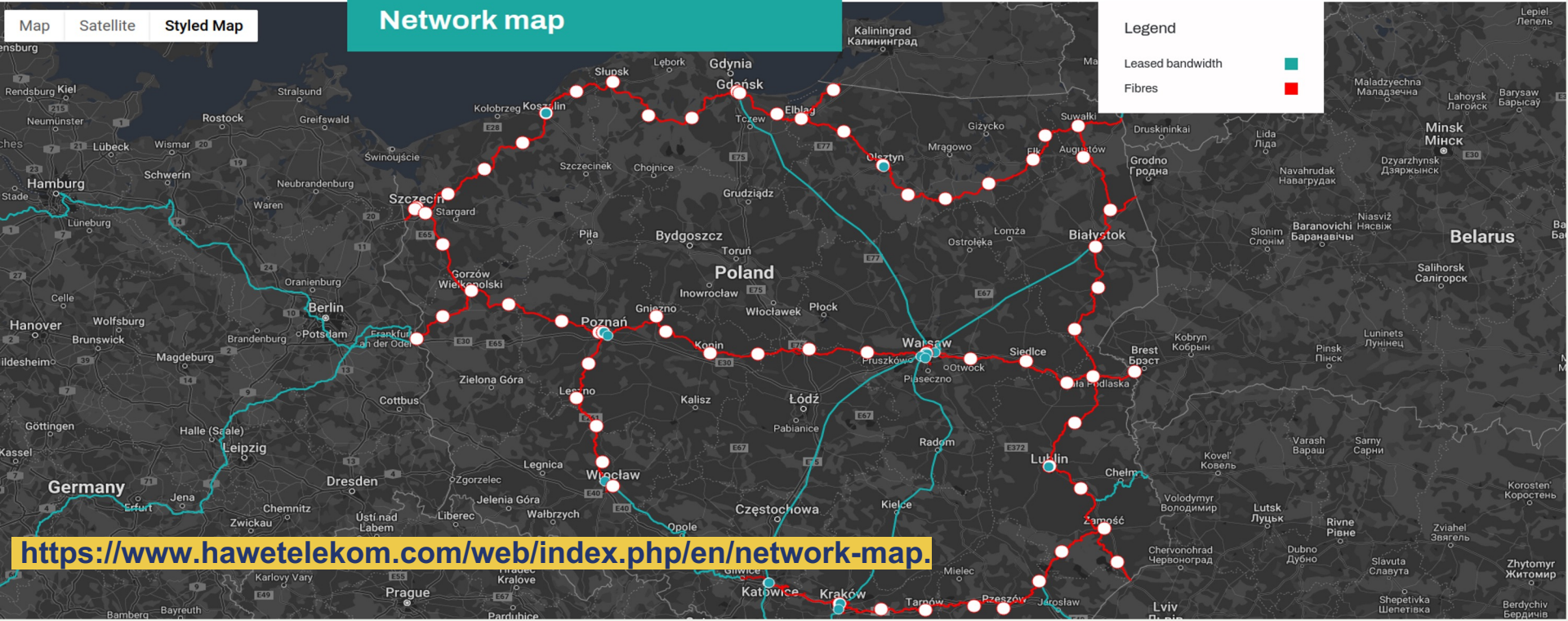
Network map

Legend

Leased bandwidth



Fibres



[https://www.hawetelekom.com/web/index.php/en/network-map.](https://www.hawetelekom.com/web/index.php/en/network-map)

Europe: EU Networks

ENG DEU

NETWORK MAP

INVESTOR RELATIONS

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CAREERS

CUSTOMER PORTAL

SUPPORT



Network

Services

Why choose us

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Search here



Network

☒ Metro

☒ Long Haul

☐ euTrade

Locations

☒ Data Centres

☐ Buildings

Solutions

<https://map.eunetworks.com>

euNetworks ColoCentre
Magdeburg

Erzberger Strasse, Magdeburg, 39104, Germany

[get directions](#) [street view](#)

Long Haul Wave
Colocation

Ethernet
Cloud Connect

Internet

get in touch

X

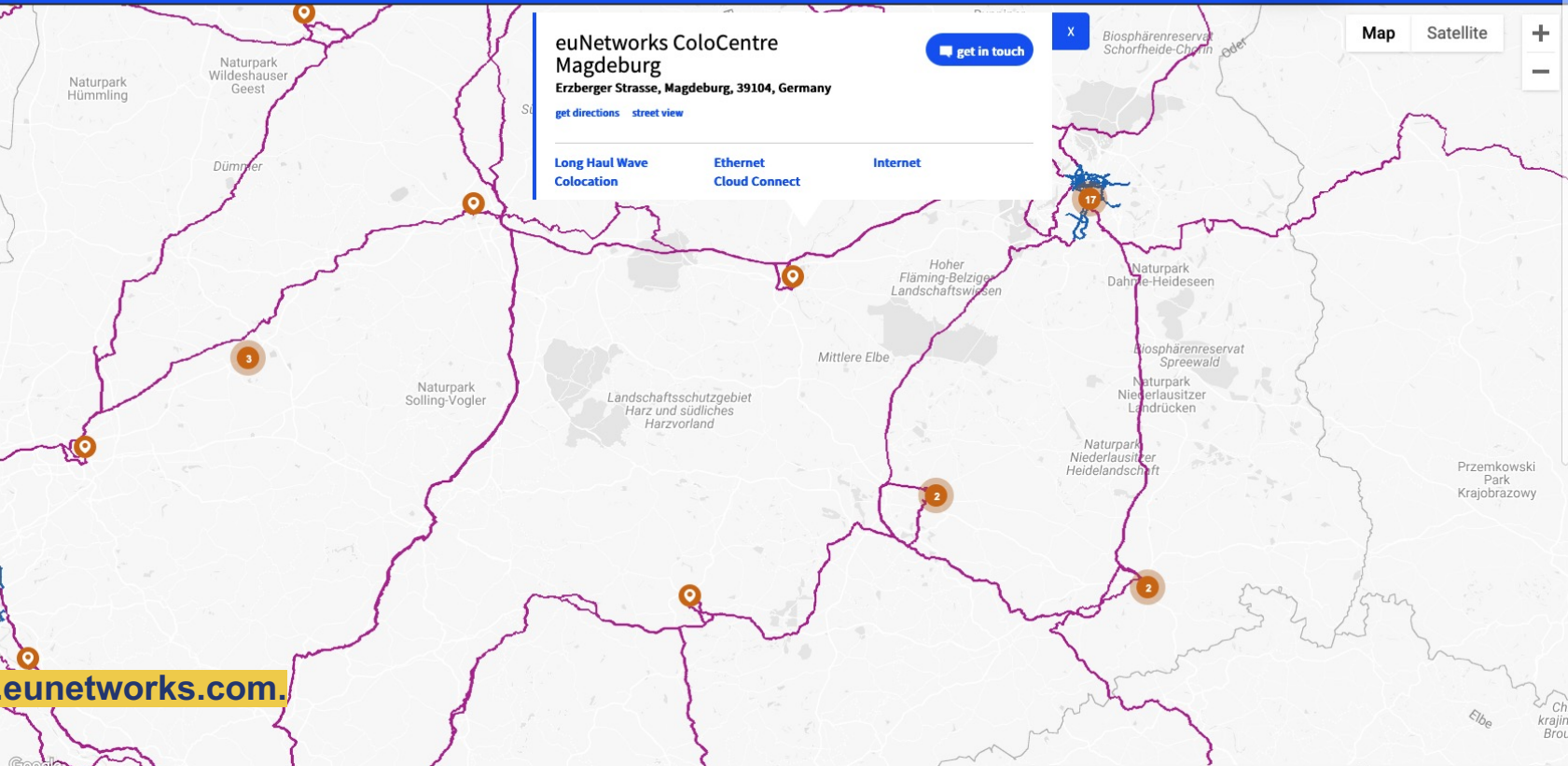
Biosphärenreservat
Schorfheide-Chorin

Map

Satellite

+

-



Ukraine: RETN

RETN®

CUSTOMER PORTAL

EN ▼



Search



Network



Long Haul Fibre



Metro Fibre



Leased



Spectrum



Buildings



Data Centers



Business Centers



RETN Offices



Other



Services



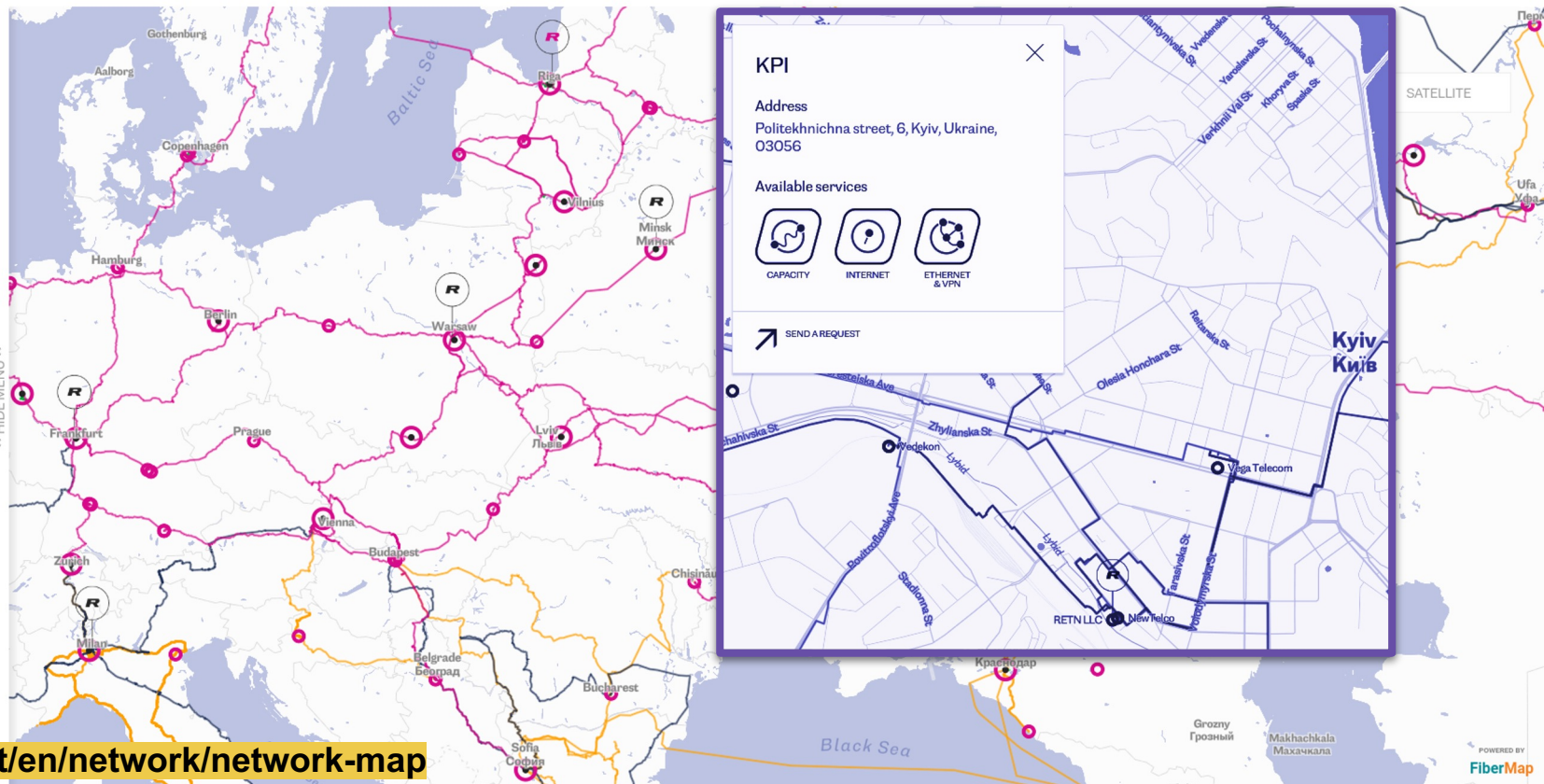
Capacity



Internet



Ethernet & VPN



<https://retn.net/en/network/network-map>



GET IN TOUCH WITH RETN

PDF

Download network map



POWERED BY
FiberMap


Canada: Connected Coast

News FAQ Galleries Contact Search [icon] [icon] [icon] [icon] [icon]

CONNECTED COAST About Maps Schedule First Nations Operations Connect My Home

Bringing high-speed Internet accessibility to rural & remote communities along coastal BC, Haida Gwaii & Vancouver Island.

Welcome to the Connected Coast Project



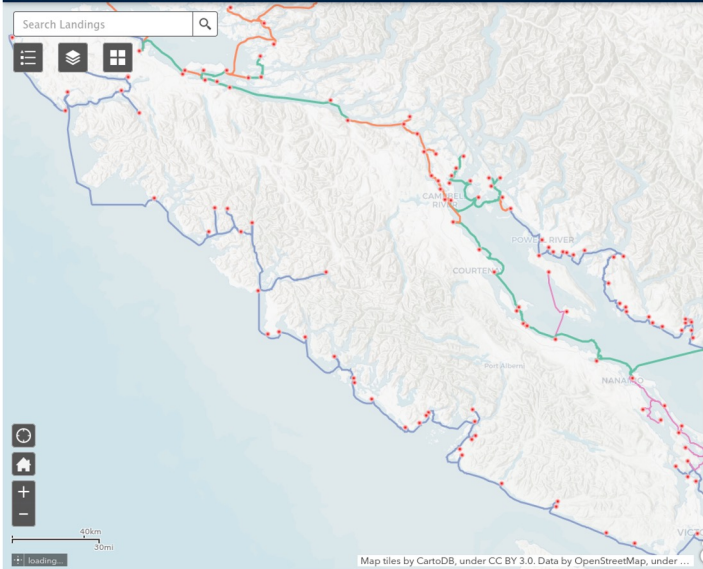
Watch on YouTube

The Connected Coast project will bring new or improved high-speed internet accessibility to 139 rural and remote coastal communities, including 48 Indigenous communities – representing 44 First Nations – along the BC coast from north of Prince Rupert, to Haida Gwaii, south to Vancouver, and around Vancouver Island.

<https://connectedcoast.ca/map/>

Connected Coast Network

Search Landings [input] [icon]



Map tiles by CartoDB, under CC BY 3.0. Data by OpenStreetMap, under ...

Build Status Map – PDF

[View/Download PDF Here.](#)

Landing Sites Map – PDF

[View/Download PDF Here.](#)

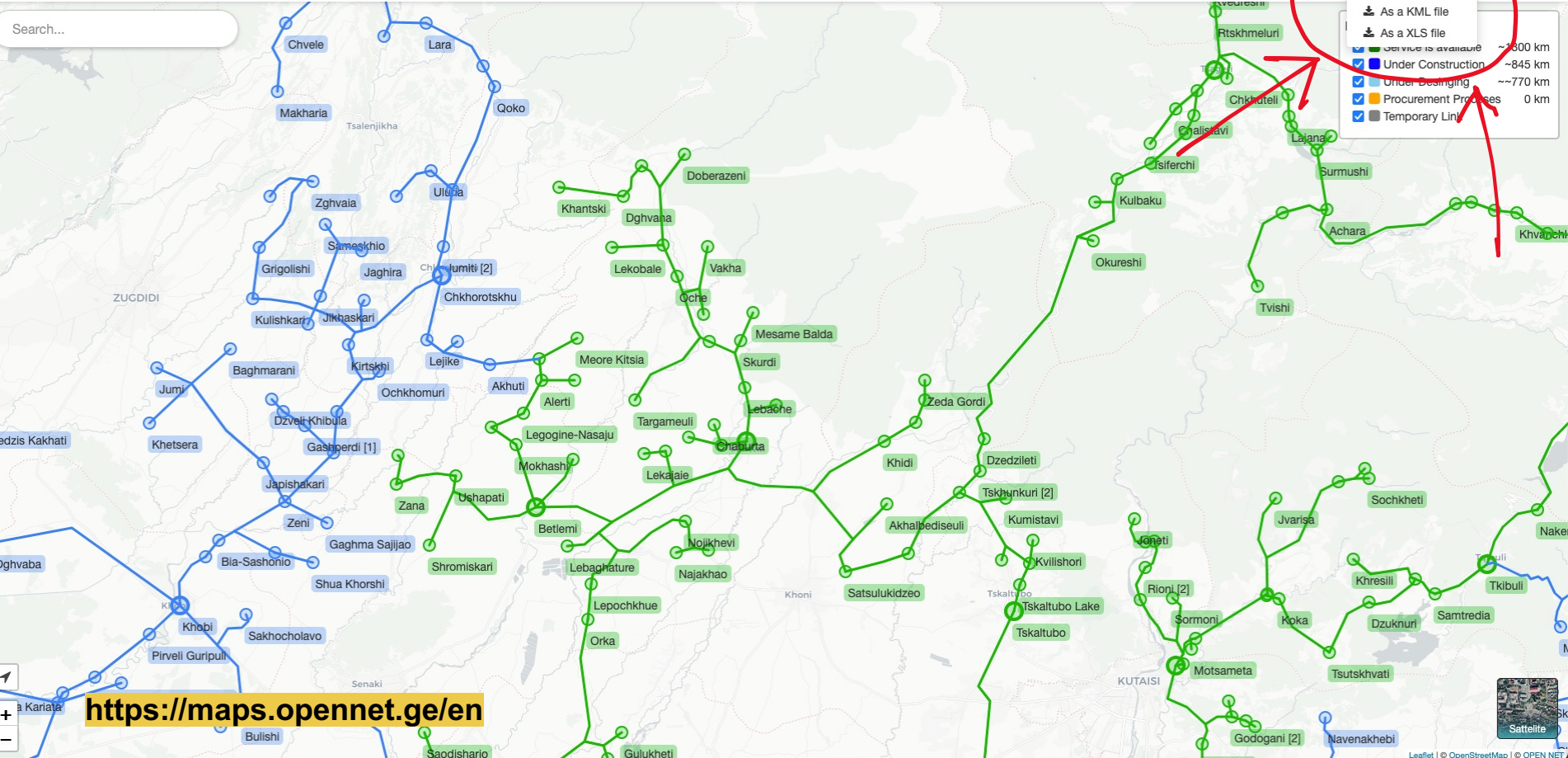
Cable Location Map – KMZ FILE

As-built cable location files in KMZ (Google Earth file format) & GPX (navigation file) are available. To receive a copy and future file updates, please fill out the form on our Operations page.

Open Data

Georgia - OpenNet

Search...



Download About

As a KML file

As a XLS file

☒ Service is available

☒ Under Construction

☒ Under Designing

☒ Procurement Processes

☒ Temporary Link

~800 km

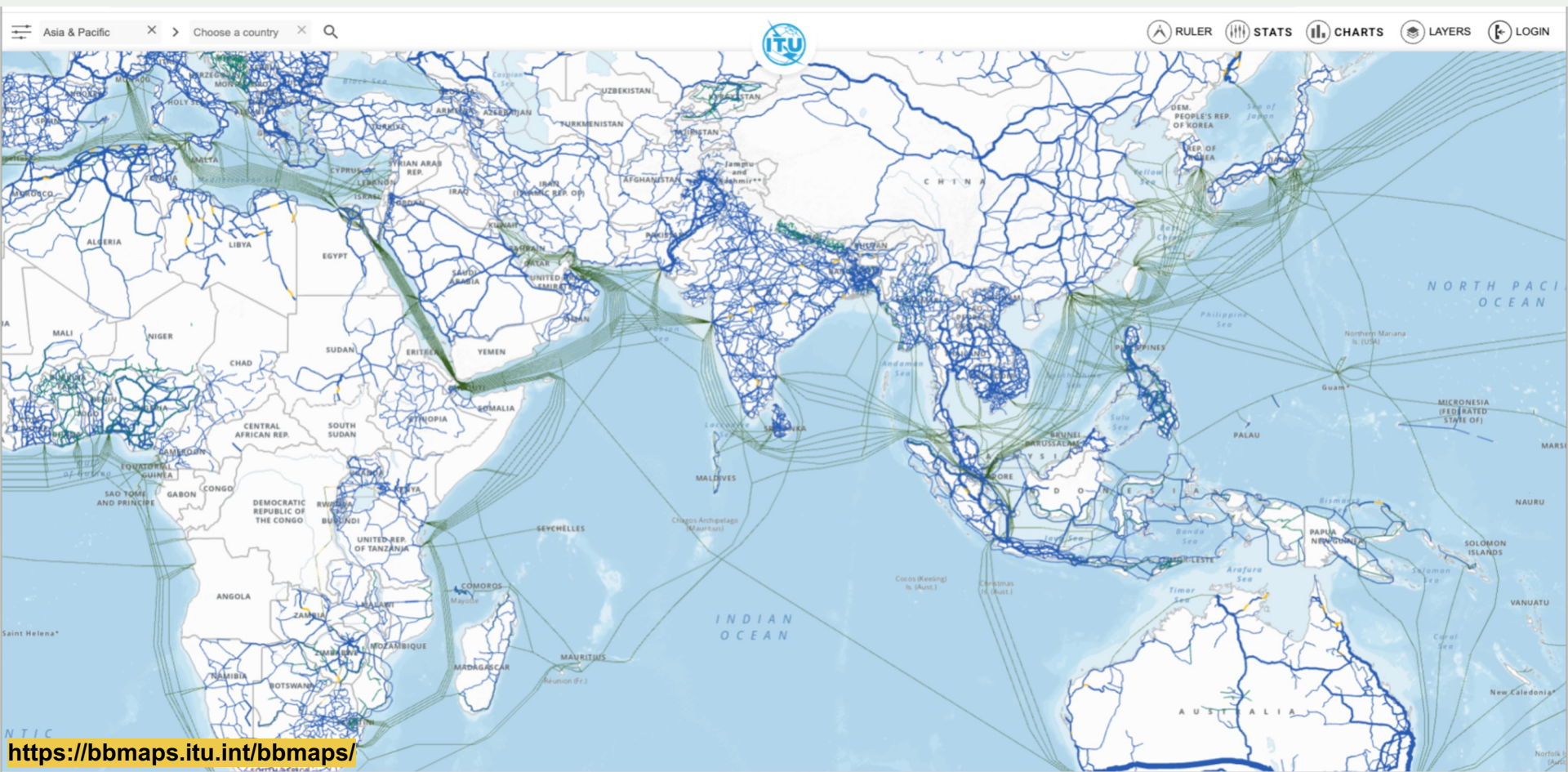
~845 km

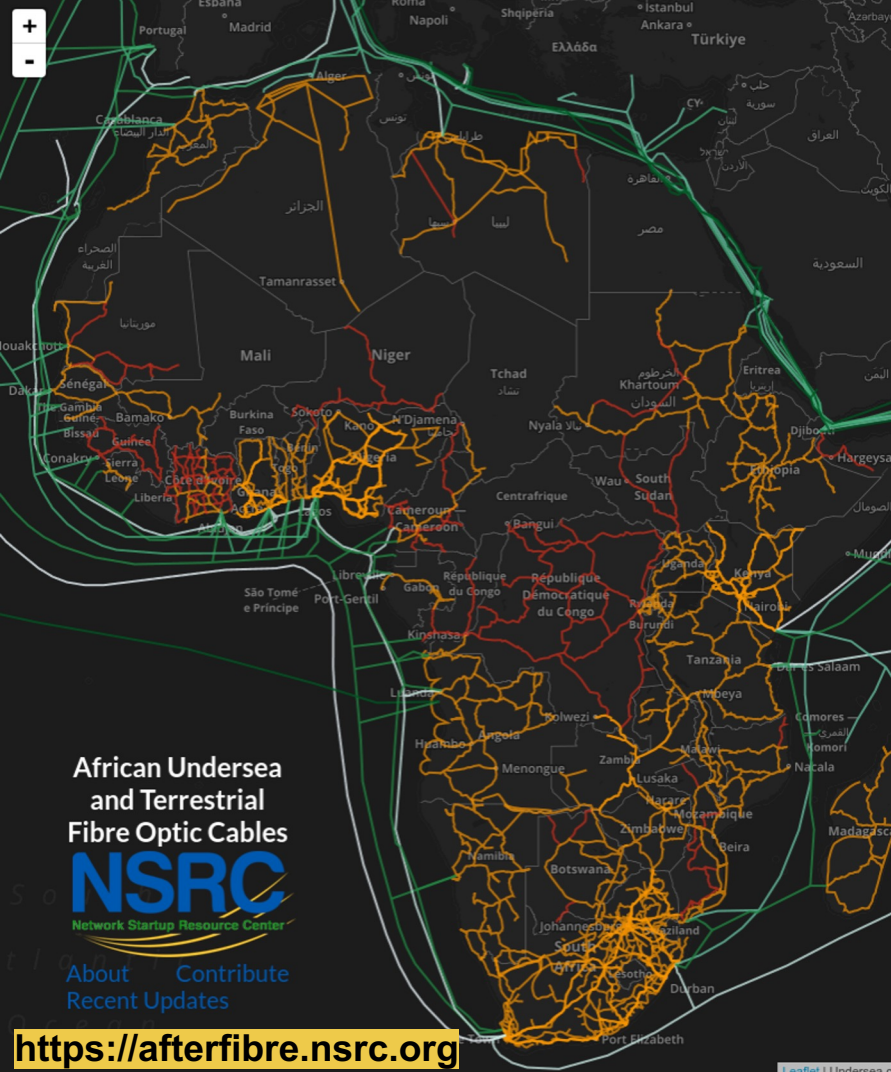
~770 km

0 km

<https://maps.opennet.ge/en>

ITU Infrastructure Connectivity Map





Lessons from mapping fibre in Africa

- ◆ Map compiled via official maps (from some operators), shareholder reports, World Bank studies, and other 'informal' sources over 10 years
- ◆ Probably about 70% complete and many networks require updating

"The Arrival of Fast Internet and Employment in Africa"
2019, Hjort and Poulsen

Journal of Economic Surveys (2019) 53, 1–35. © 2019 The Authors. Journal of Economic Surveys © 2019 Blackwell Publishing Ltd

The Arrival of Fast Internet and Employment in Africa

By JONAS HJORT AND JONAS POULSEN

We show how fast Internet affects employment in Africa, we explain the gradual arrival of submarine Internet cables on the coast and map of the terrestrial cable network. Robust difference-in-differences estimates from 3 datasets, covering 12 countries, show large positive effects on employment rates, also for less educated worker groups, with little or no job displacement across space. The sample size is large due to increased employment in high-skilled occupations, but less educated workers' employment gains less as firm-level data available for some countries indicate that increased firm entry, productivity, and exporting contribute to higher net job creation. Average income rise (JEL J14, J24, J31, J46, O53, O55)

Traditional trade theory predicts a decrease in inequality in developing countries during periods of integration in the global economy. The slow economic progress of poor workers in many parts of Africa, Asia, and Latin America during the last few decades, therefore, surprised economists. Two potential explanations were proposed and compared: skill-based technological change (SBTC) and features of international trade—such as outsourcing (see e.g., Feenstra and Hanson 1996, 1999, 2000) and quality upgrading (see e.g., Verhoogen 2008, Fatas, Kaplan, and Verhoogen 2009)—that could alter the basic underlying expectation of job growth and greater equality in specialized labor-market countries post-integration (Feenstra and Hanson 2003; Goldberg and Pavcnik 2007; Harrison, McLaren, and McLaren 2011; Goldberg 2015). Two decades of research led to wide agreement that both explanations play a role, and that they probably interact (Wood 1995; Acemoglu 2003; Ataman, Goldberg, and Pavcnik 2004; Barro, Cusack, and

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<https://www.aeaweb.org/articles?id=10.1257/aer.20161385>

Multistakeholder Initiative

The World Bank, the International Telecommunications Union (ITU), Mozilla Corporation, the Internet Society (ISOC), Liquid Intelligent Technologies, CSquared, and Digital Council Africa are partnering to promote the collaborative development of open data standards for describing telecommunications infrastructure.



The Open Fibre Data Standard (OFDS) is a standard for publishing data on terrestrial fibre optic broadband infrastructure.

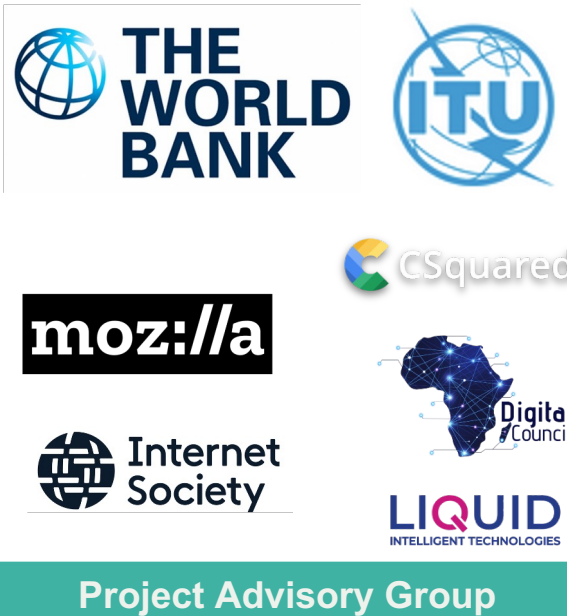


Open Data Services

We worked with the Open Data Services (ODS) who were contracted by the World Bank to provide technical support in the development of the standard. ODS are international experts in data standards

- International **Aid Transparency** Initiative (IATI)
<https://iatistandard.org/en/iati-standard/>
- Open **Contracting** Data Standard
<https://standard.open-contracting.org/>
- **Beneficial Ownership** Data Standard
<https://standard.openownership.org/>

<https://opendataservices.coop/>



Benefits to Governments and Regulators

- More effective network investments by accurately targeting the unserved.
- Improved coordination across infrastructure sectors e.g. road, electricity, rail, oil & gas.
- Reduction of physical network interruption and destruction.
- Opportunity for national and regional benchmarking

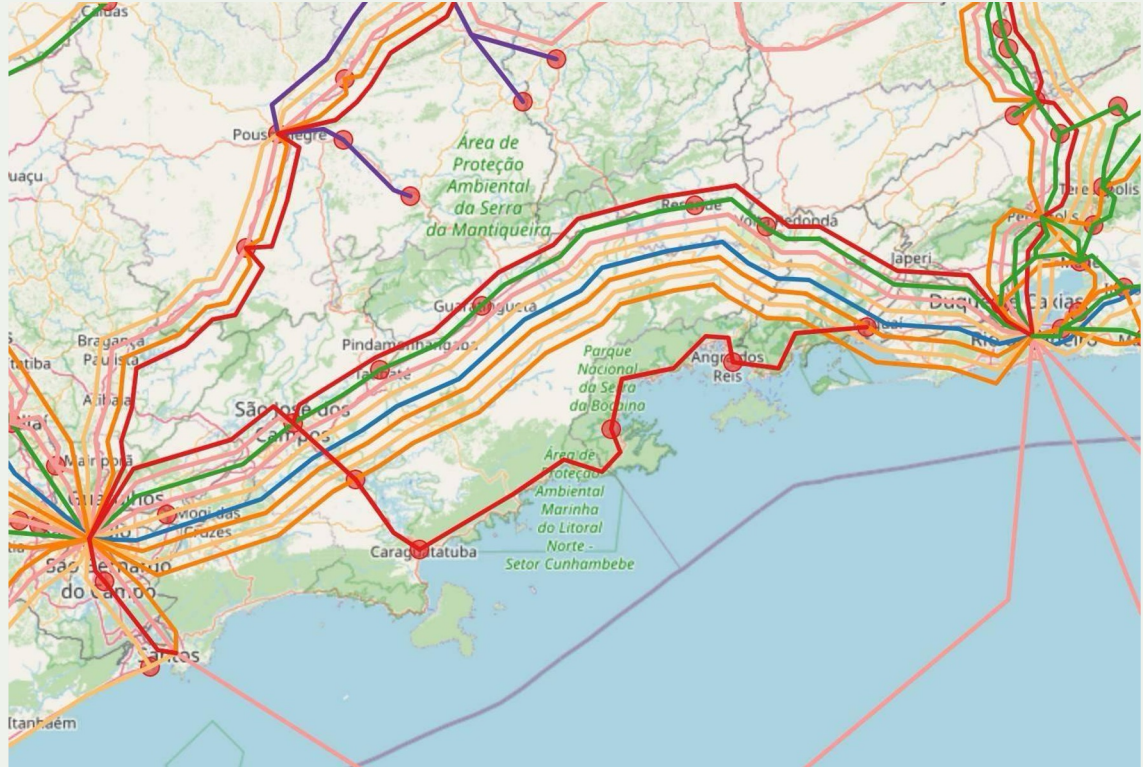


<https://www.bbc.com/news/science-environment-65174512>

Benefits to Governments and Regulators

- Understanding the true extent of national fibre infrastructure
- Benefits to cyber security. Redundancy is key to network resilience.

Resilience has less to do with failsafe networks than networks that are safe when they fail.

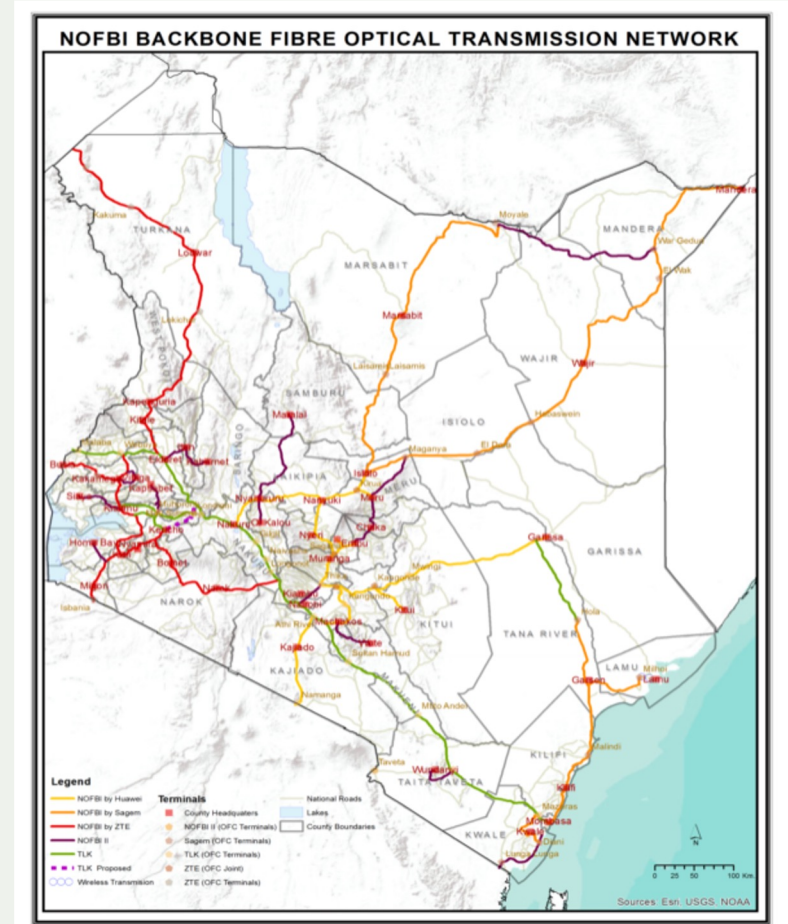


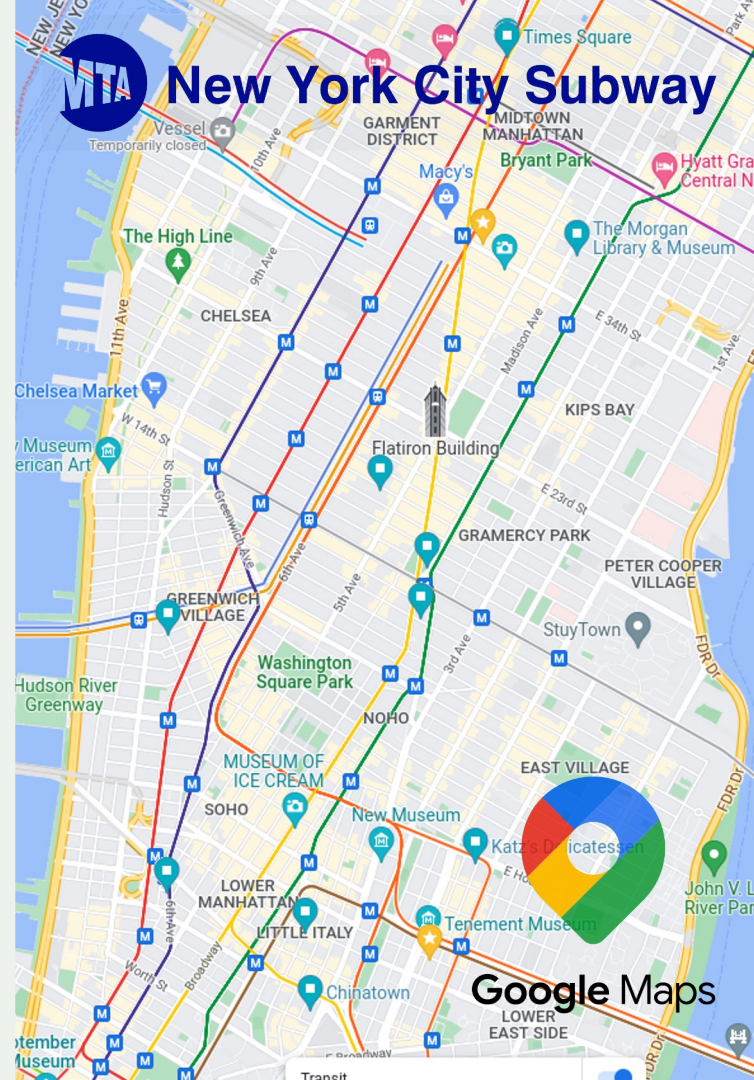
Map of fibre networks from Sao Paulo to Rio de Janeiro



Benefits to Operators

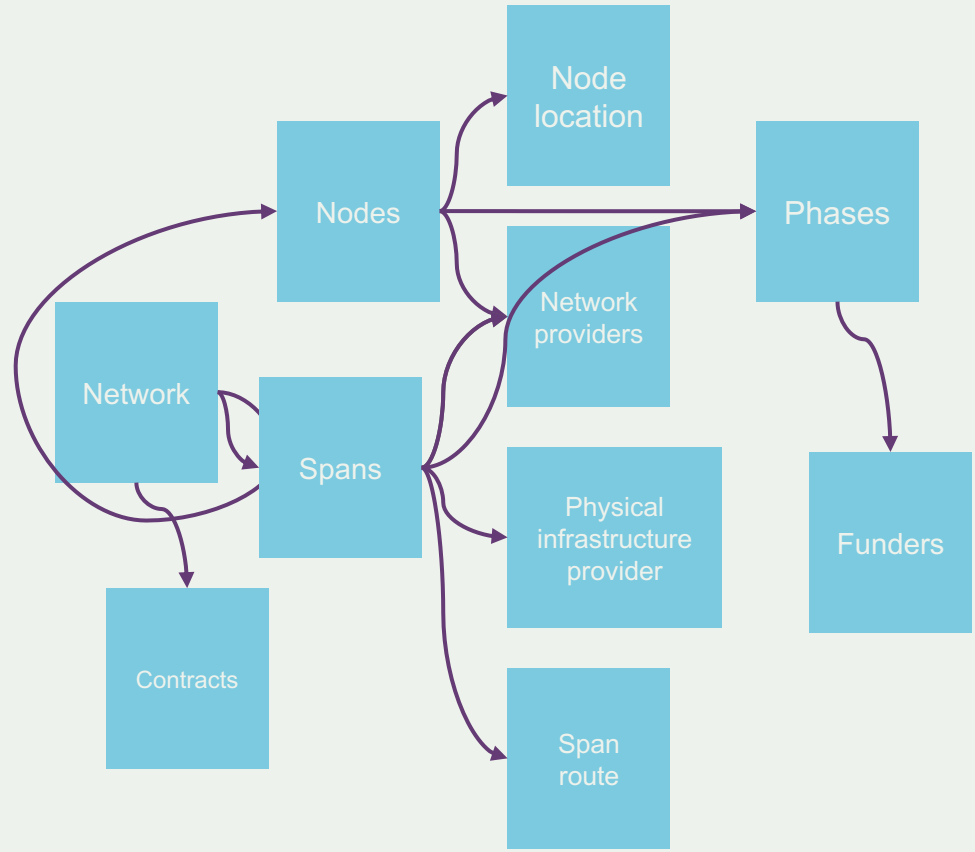
- Opportunities for small ISPs, rural operators in particular.
- More strategic information for investors
- Levelling the playing field in terms of information sharing and building trust
- Better evidence of the socio-economic impact of their networks
- Better network analysis tools





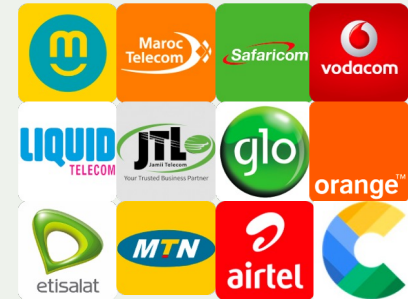
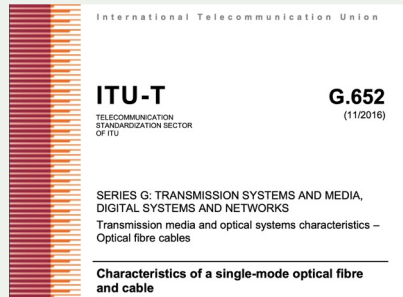
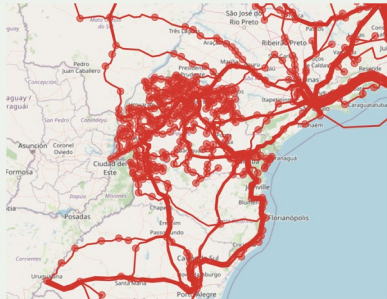
Open Fibre Data Standard

- ◆ Describes what data to publish about fibre networks
- ◆ Provides a vocabulary and structure for fibre network data
- ◆ Offers guidance and software tools for publishers and users



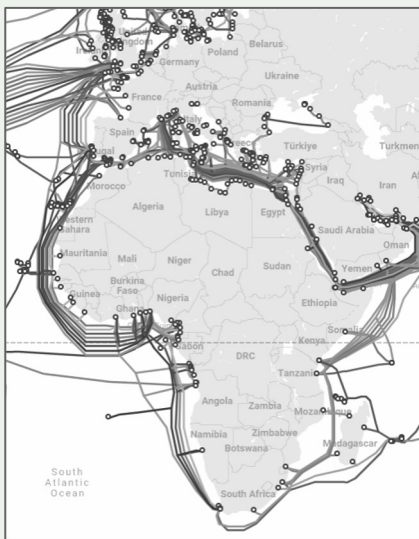
Categories of Data

Location data	Technical data	Administrative data
The route of fibre cables, the coordinates of PoPs, towers and IXPs.	Capacity, ITU fibre standards, power availability.	The organisations that own and operate infrastructure, the status of infrastructure, dark fibre availability.

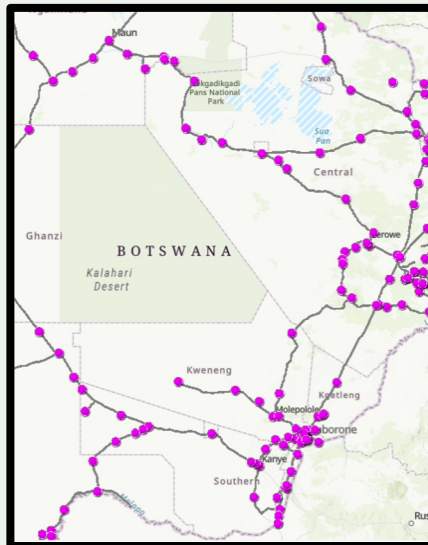


Reach

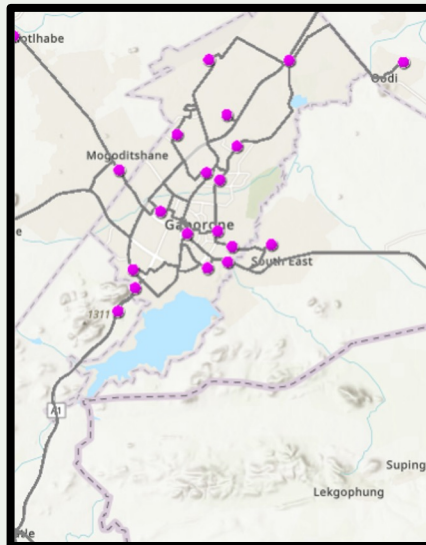
The initial focus of OFDS lies in describing **national and middle mile** networks but will ultimately encompass **last mile** networks.



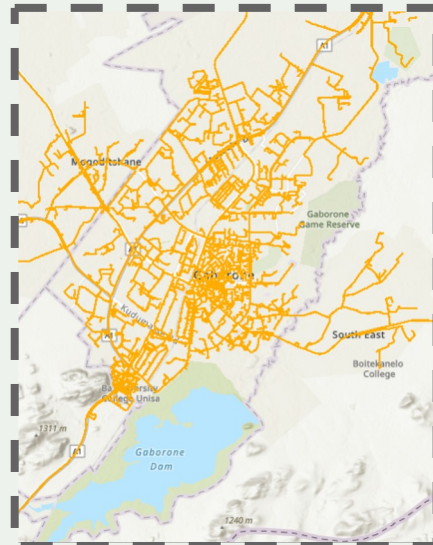
Undersea



National



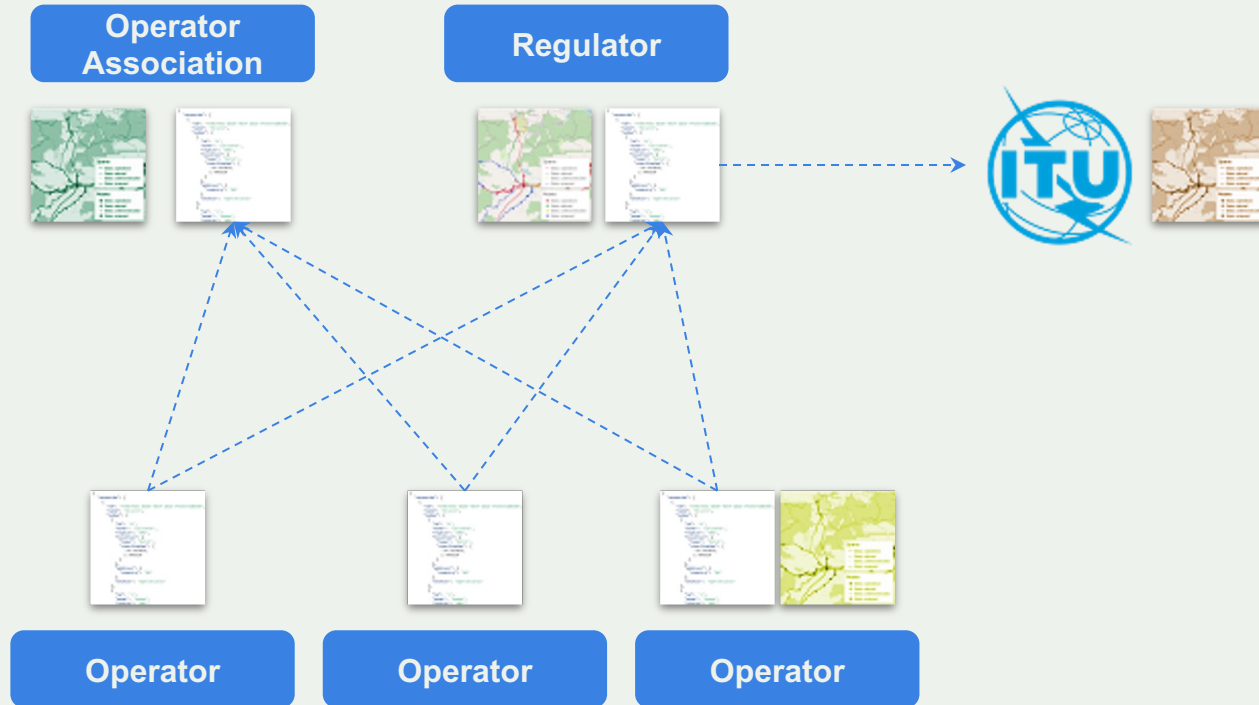
Middle mile



Last mile



Data sharing possibilities



Different organisations may combine Open Fibre Data with various data sources to serve their individual missions.



Further Reading

Articles

World Bank - [Making it Possible for the World to Log On](#)

Internet Society - [A Standard to Increase Availability, Accessibility of Terrestrial Fiber Infrastructure Data](#)

Internet Society - [Mapping Terrestrial Fibre Optic Networks is Essential for Measuring Internet Resilience](#)

Open Data Services Cooperative - [Open Fibre Data Standard: opening up fibre optic broadband infrastructure](#)

Mozilla - [Open Fibre Data Standard: Understanding the True Extent of the Internet](#)

The State of Open Data - [Telecommunications and the State of Open Data](#)

Canonical sources

Documentation

<https://open-fibre-data-standard.readthedocs.io/en/latest/reference/schema.html>

Repository for the standard

<https://github.com/Open-Telecoms-Data/open-fibre-data-standard>



Get involved!

Please get in touch if you are interested in:

- Learning more about OFDS
- Hosting an OFDS workshop
- Participating in standard development and governance

Steve Song
song@isoc.org

Thank you!

