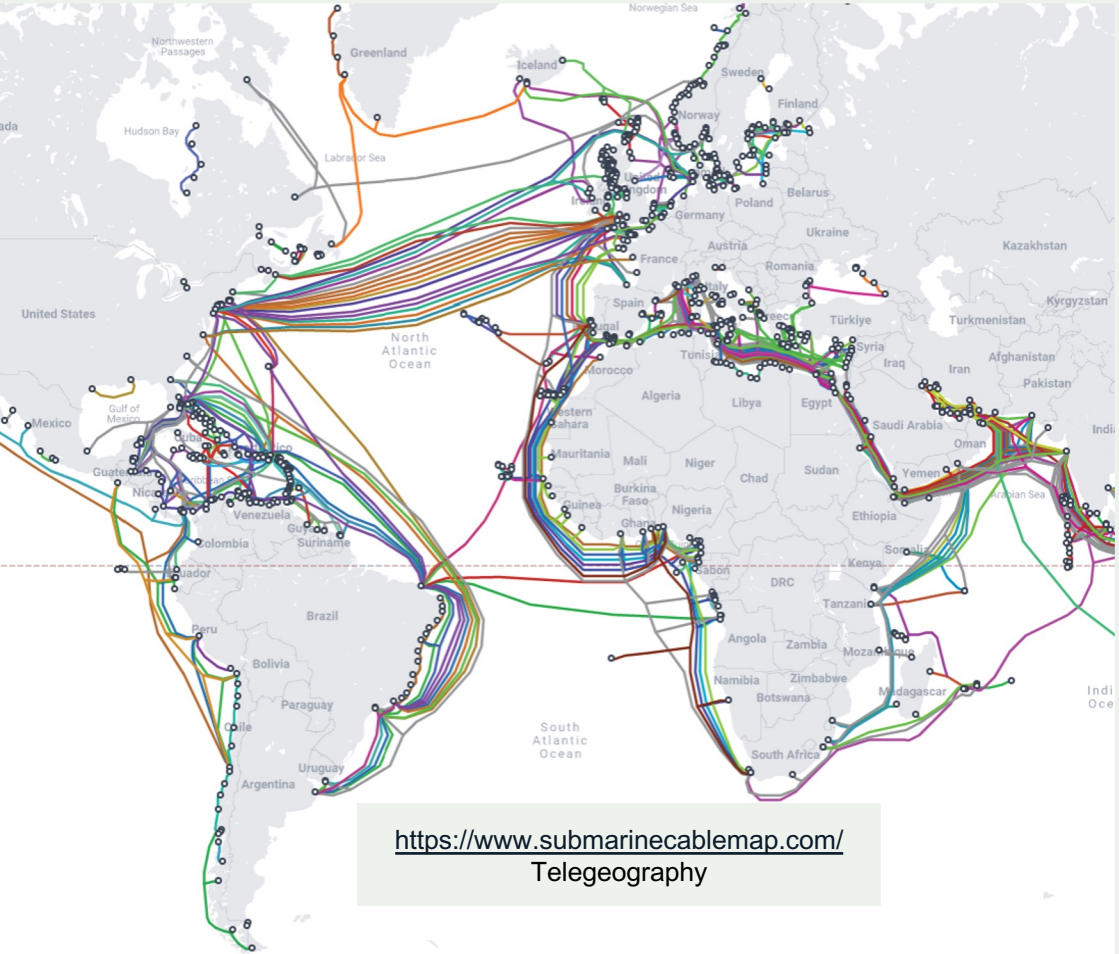
Introducing the Open Fibre Data Standard

Steve Song
song@isoc.org

RIPE NCC SEE Roundtable
7 April 2025

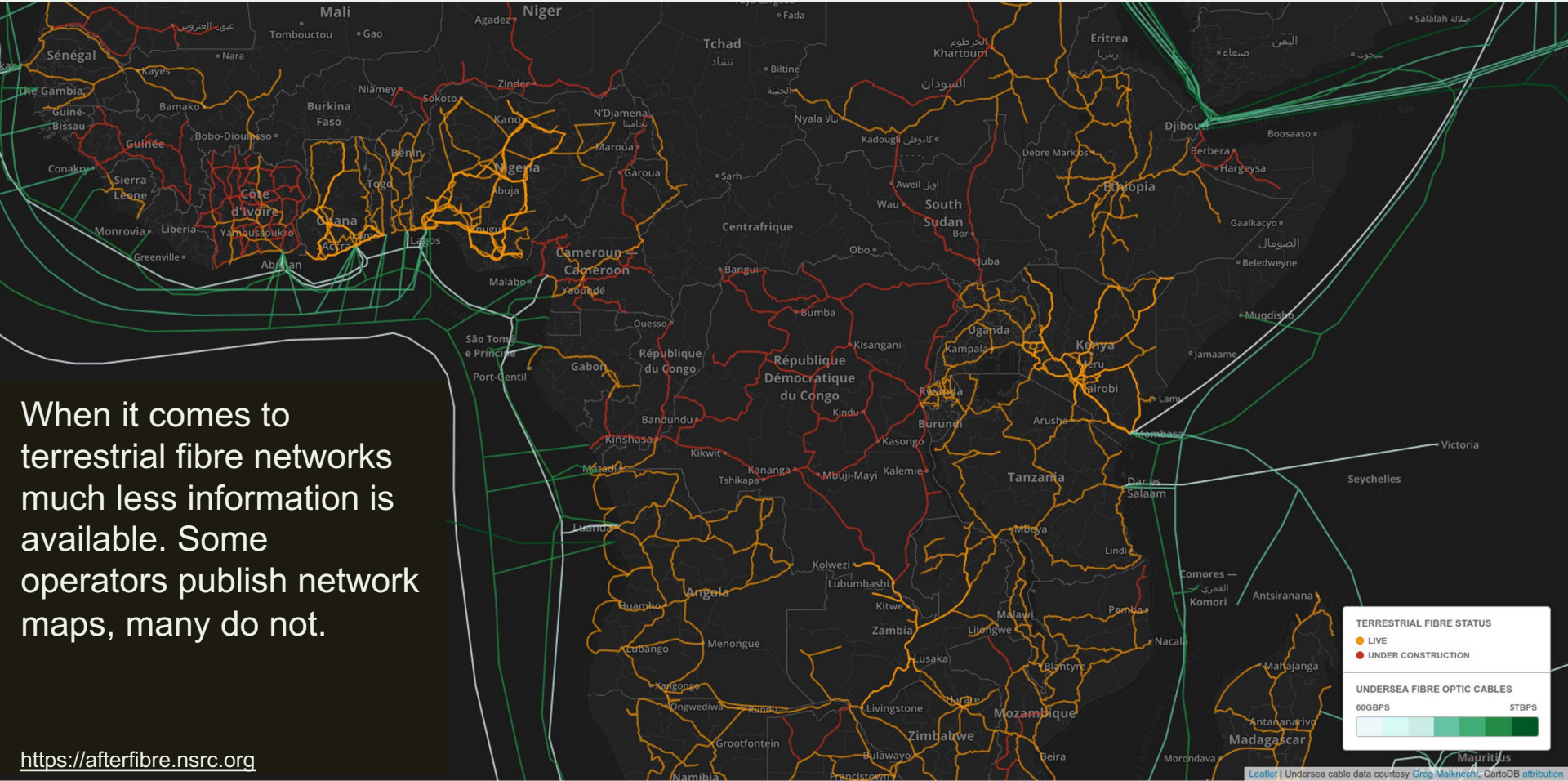
The Evolution of Fibre Infrastructure



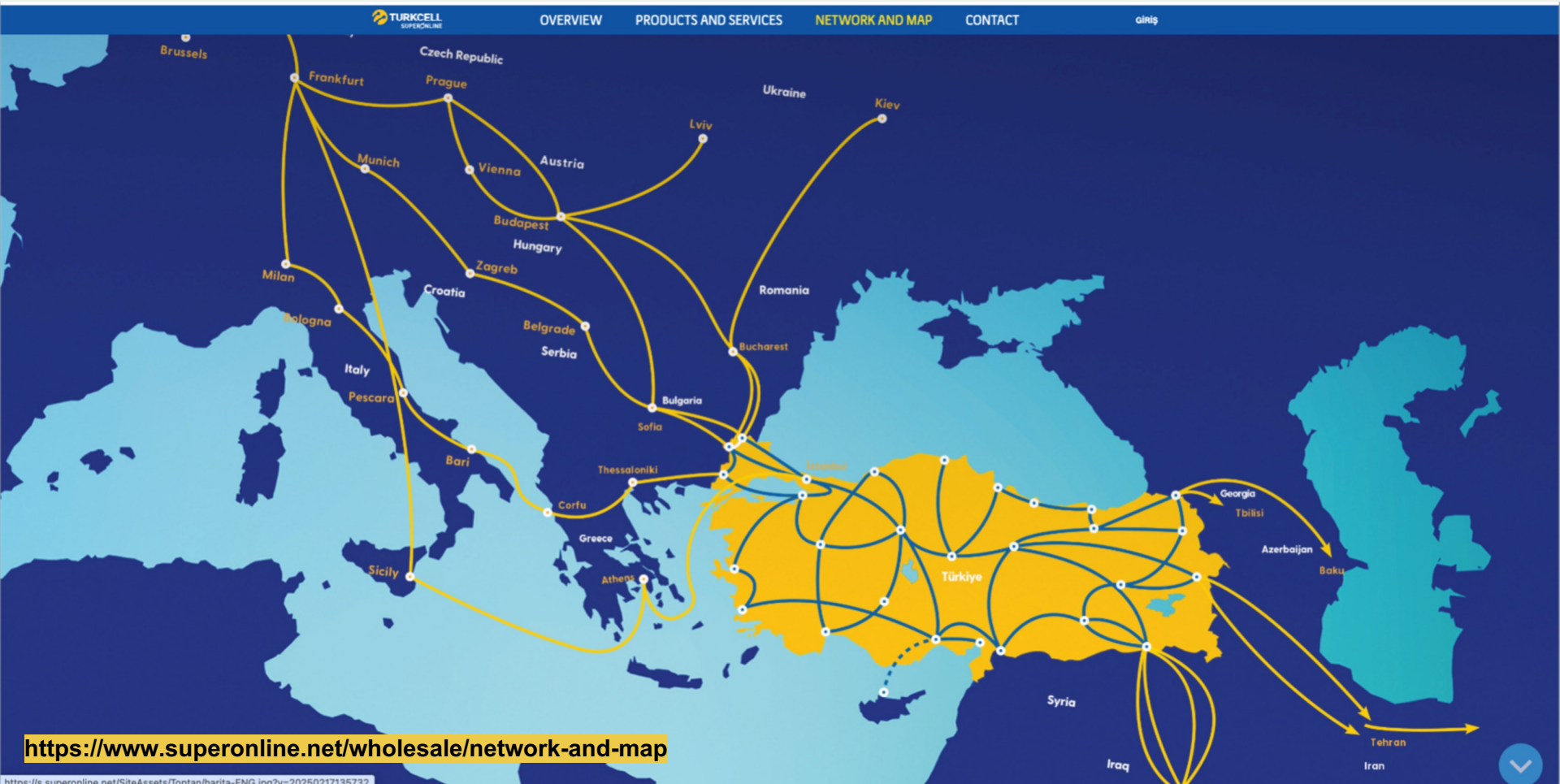
https://www.submarinecablemap.com/
Telegeography

- 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



https://www.superonline.net/wholesale/network-and-map

Sweden: Easy Fibre

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:

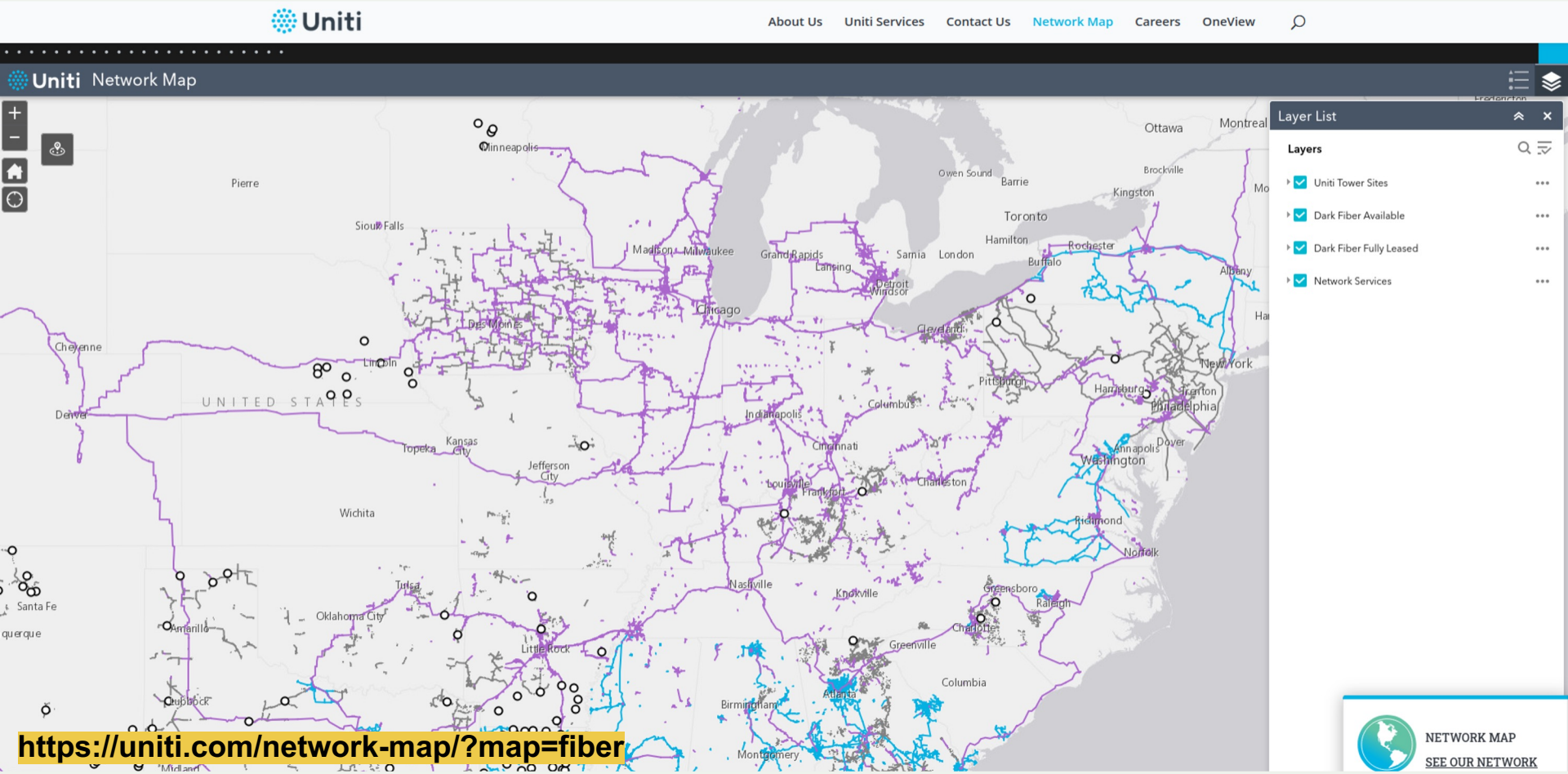
A single contact person
A single contract
A single service agreement

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.

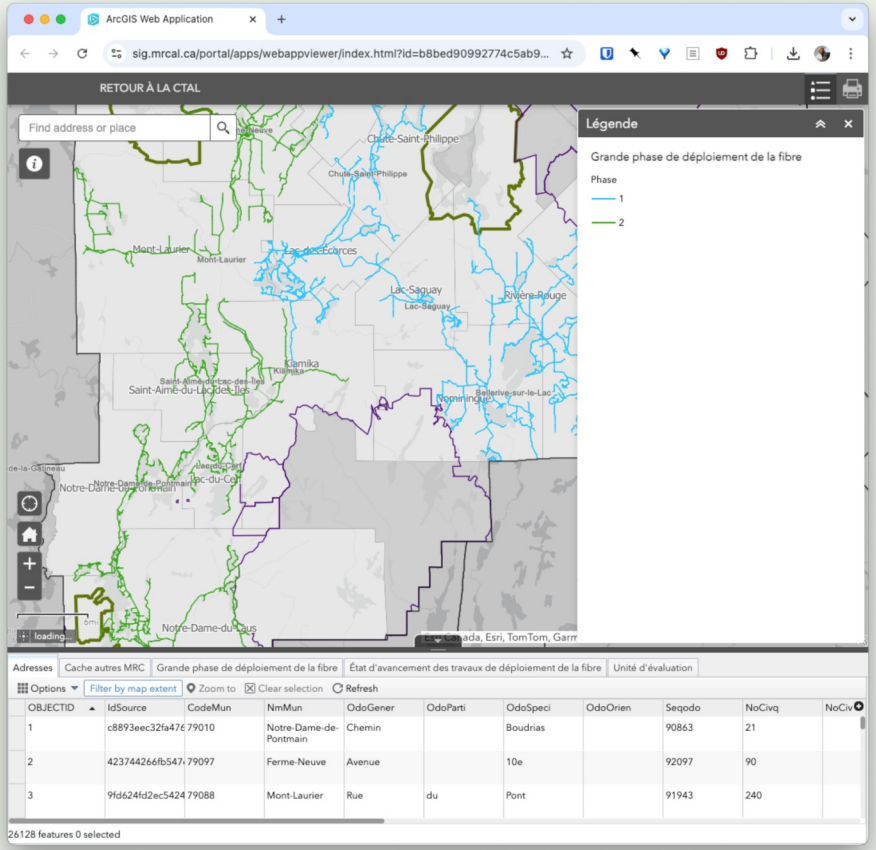
http://easyfibre.se/dark-fibre-map/.

United States: Uniti

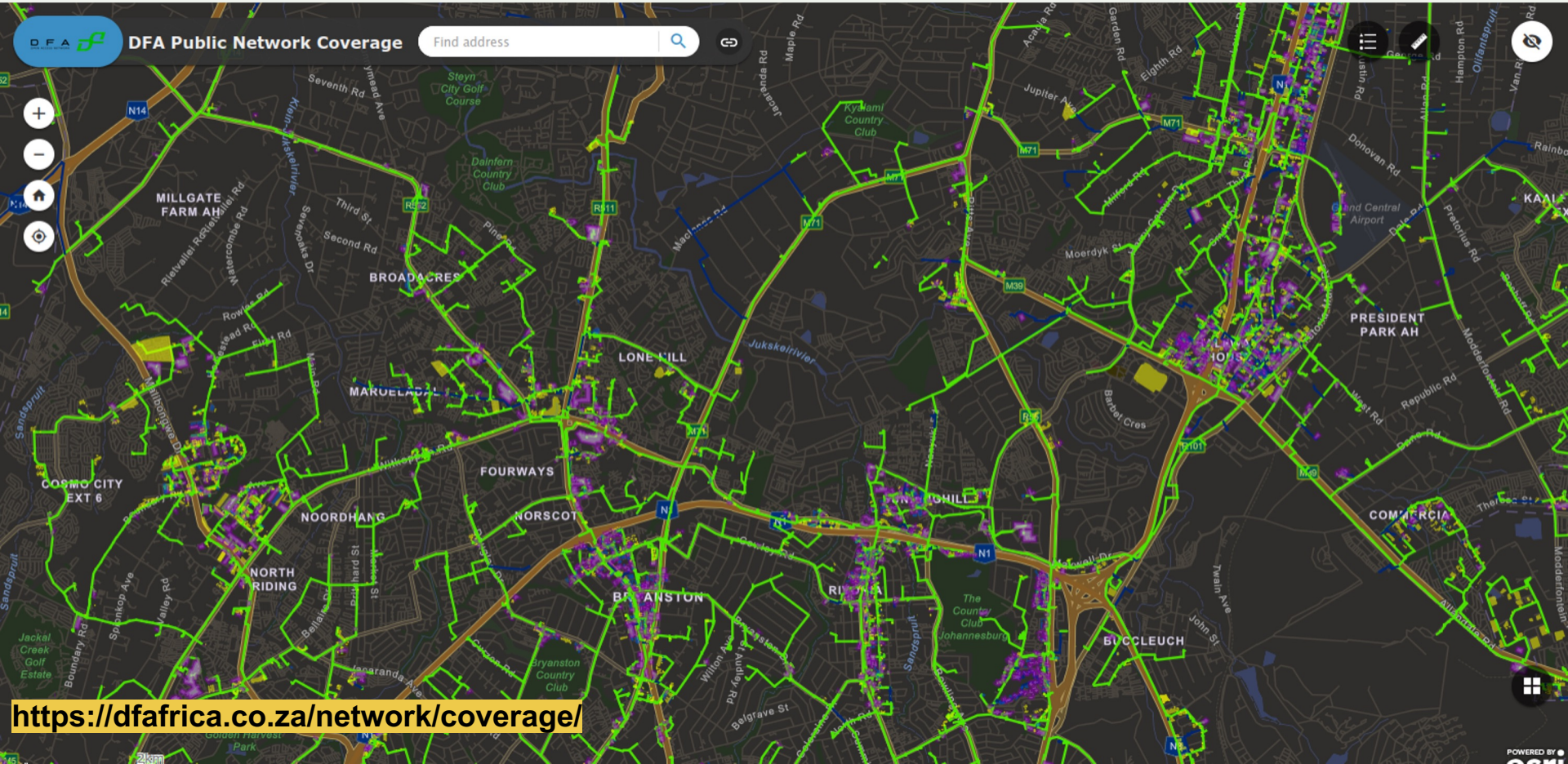


https://uniti.com/network-map/?map=fiber

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



South Africa: Dark Fibre Africa



Brazil: Eletronet

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

Bulgaria - GCN

GCN | EXA GCN is now part of EXA Infrastructure. Please visit exainfra.net for more information

HOME SERVICES NETWORK ABOUT US CONTACT US

National Backbone

GCN Network / Bulgarian backbone

National backbone >

International backbone >

BG **BG Network**

Request additional information

REQUEST INFO

Download Map Image

Download BG Map

Download EU Map

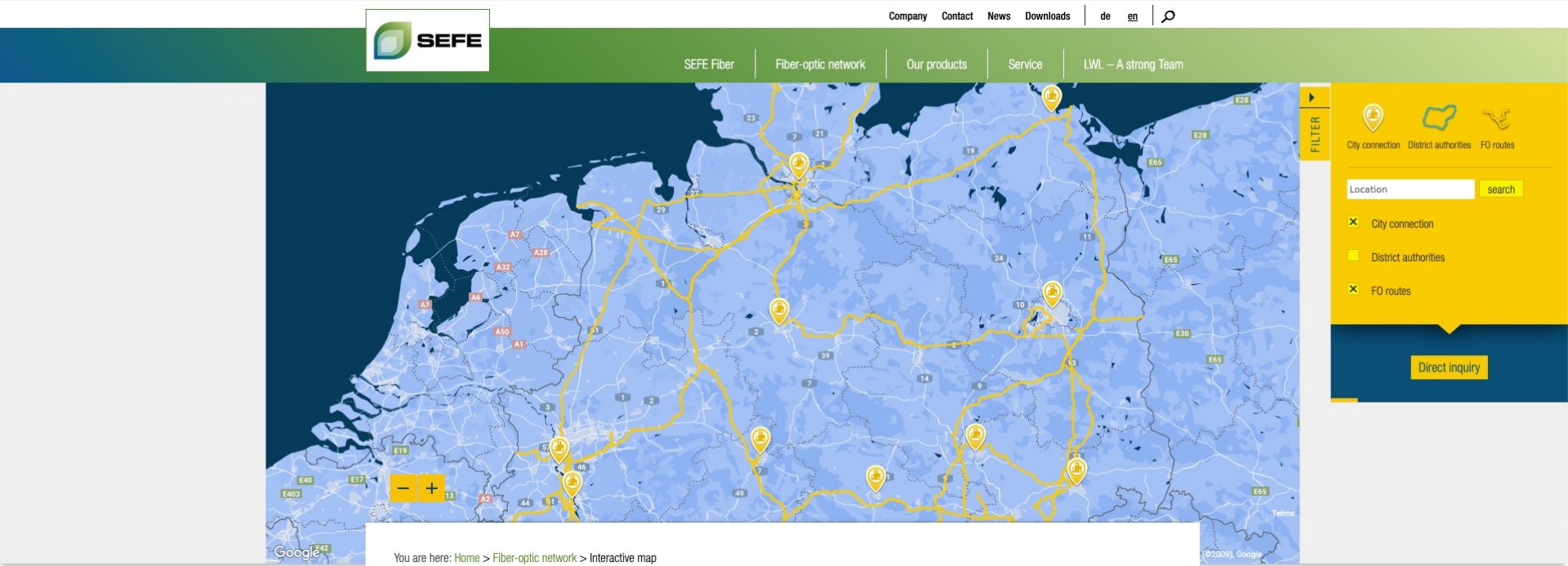
https://gcn.bg/

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



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

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

SEFE Interactive Fibre Optic Network

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

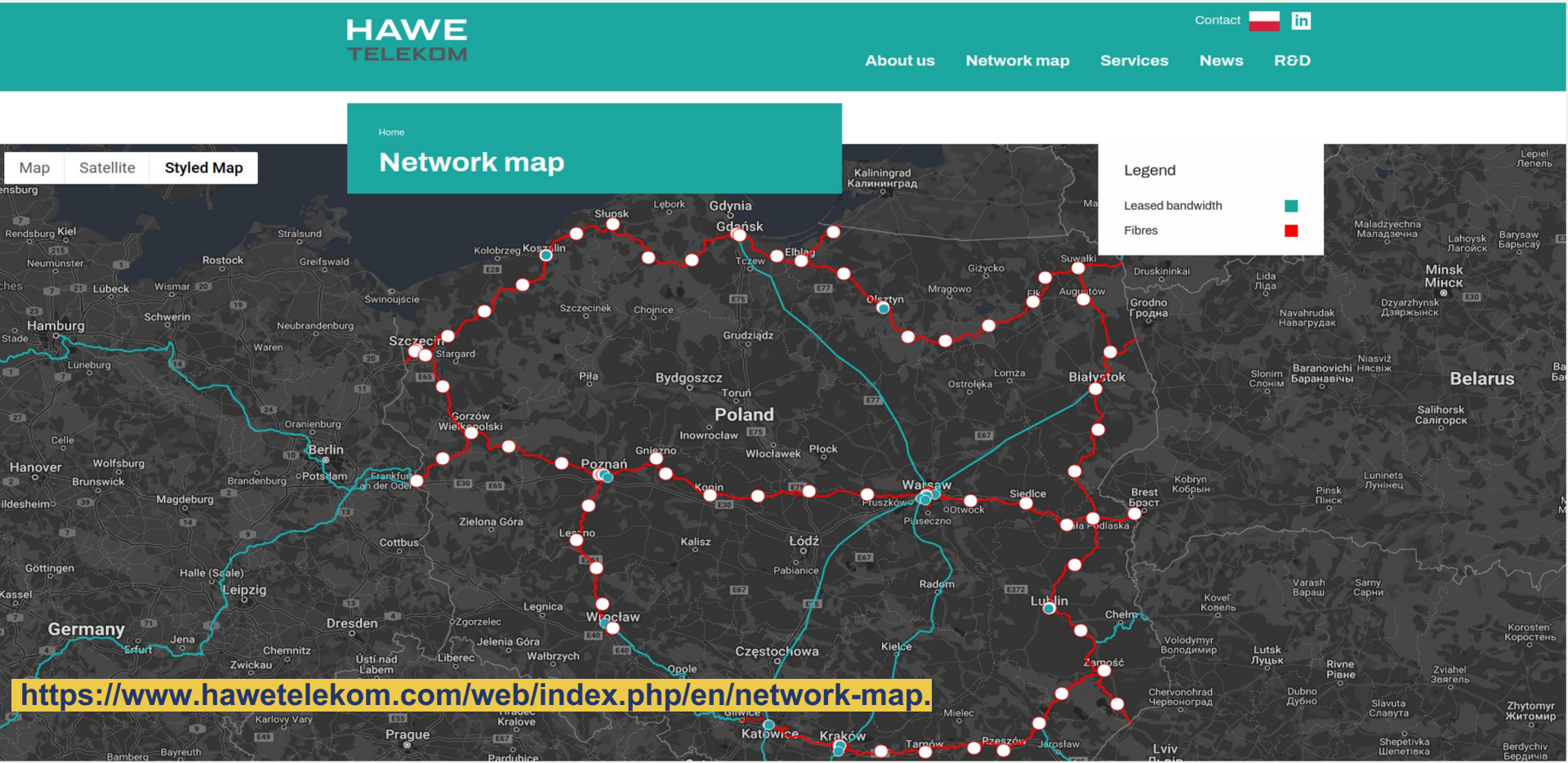
Explore our fibre-optic grid with our interactive map: Zoom into the map in seven steps (zoom levels) to view the route in detail or search directly for your location using the search function. Filter by city connections, districts and fibre-optic routes.

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

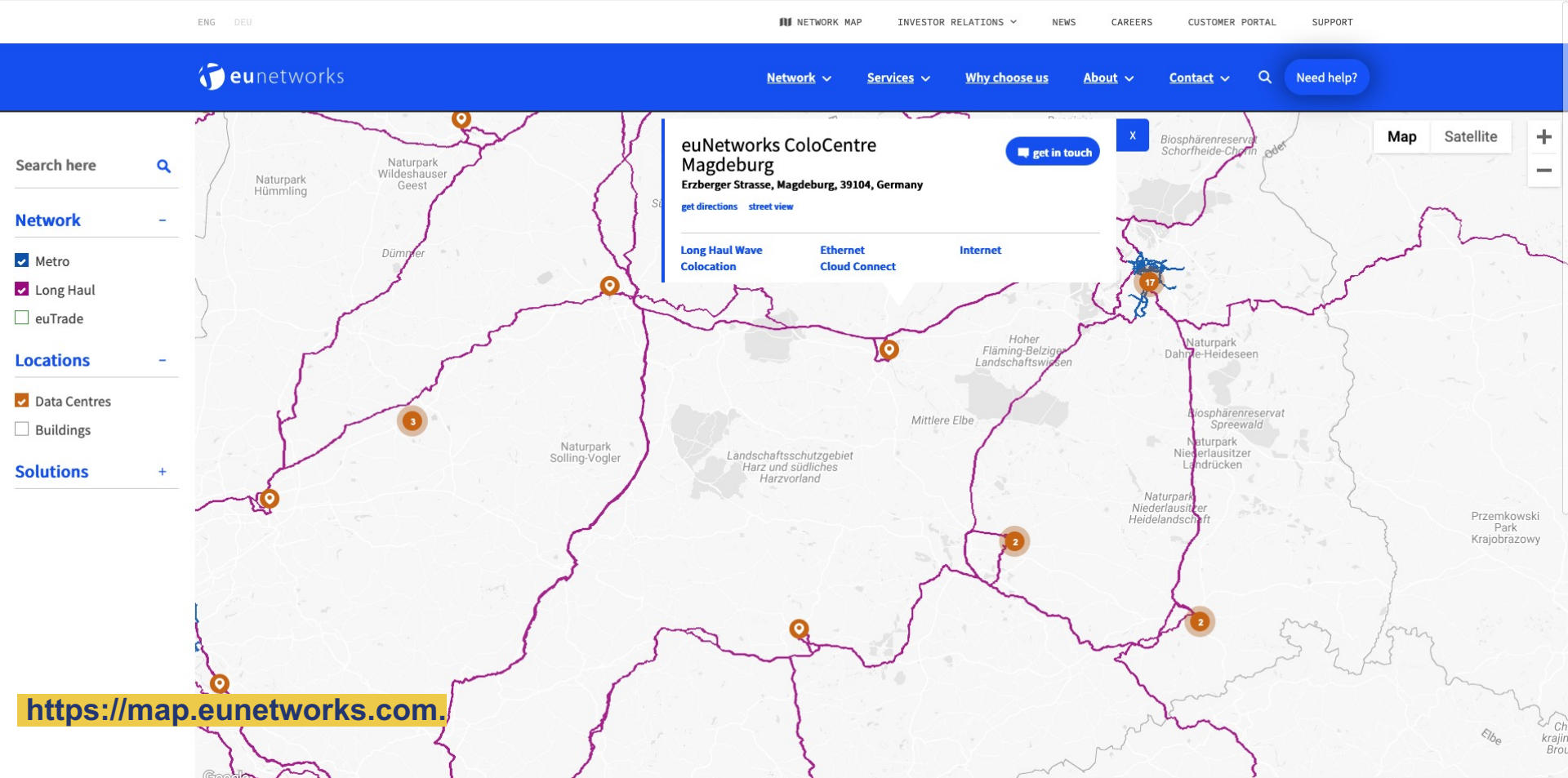
Your contact person

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

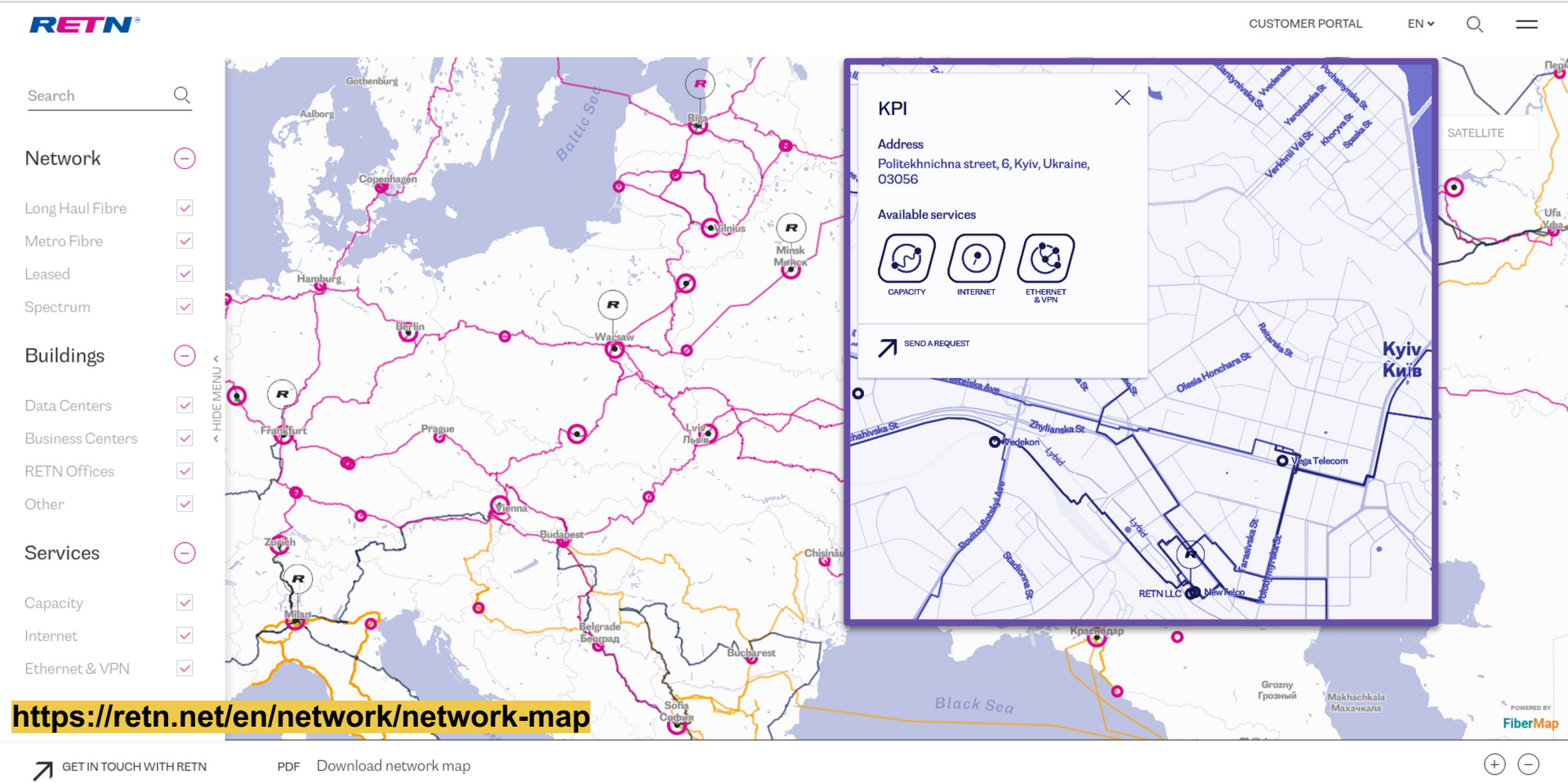
Poland: Hawe Telekom



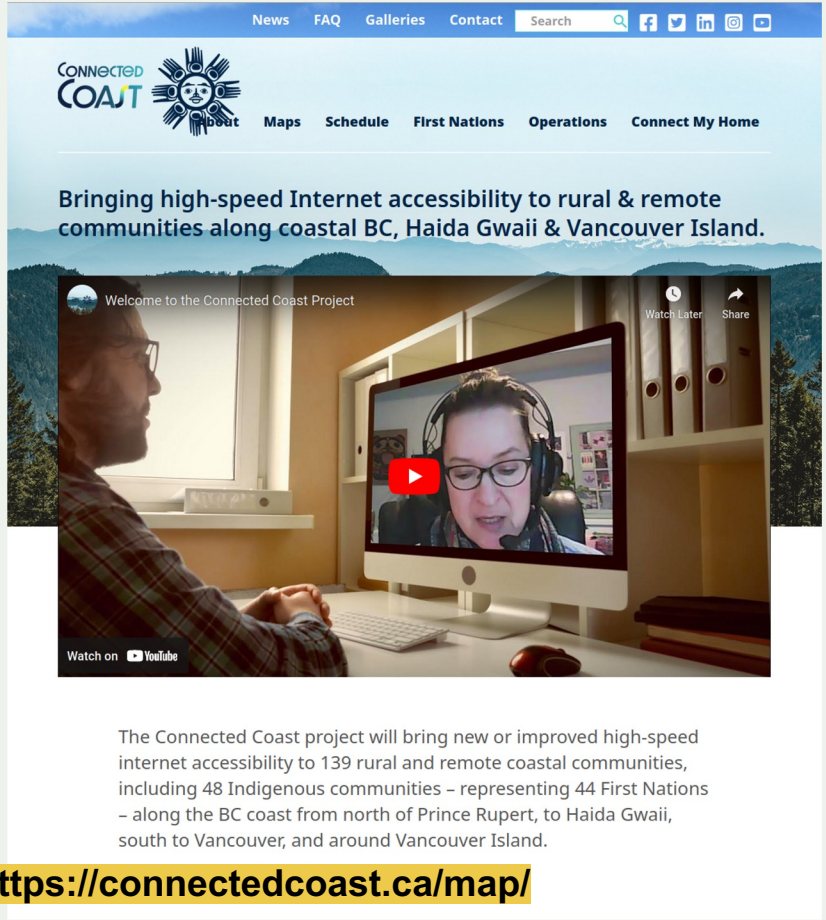
Europe: EU Networks



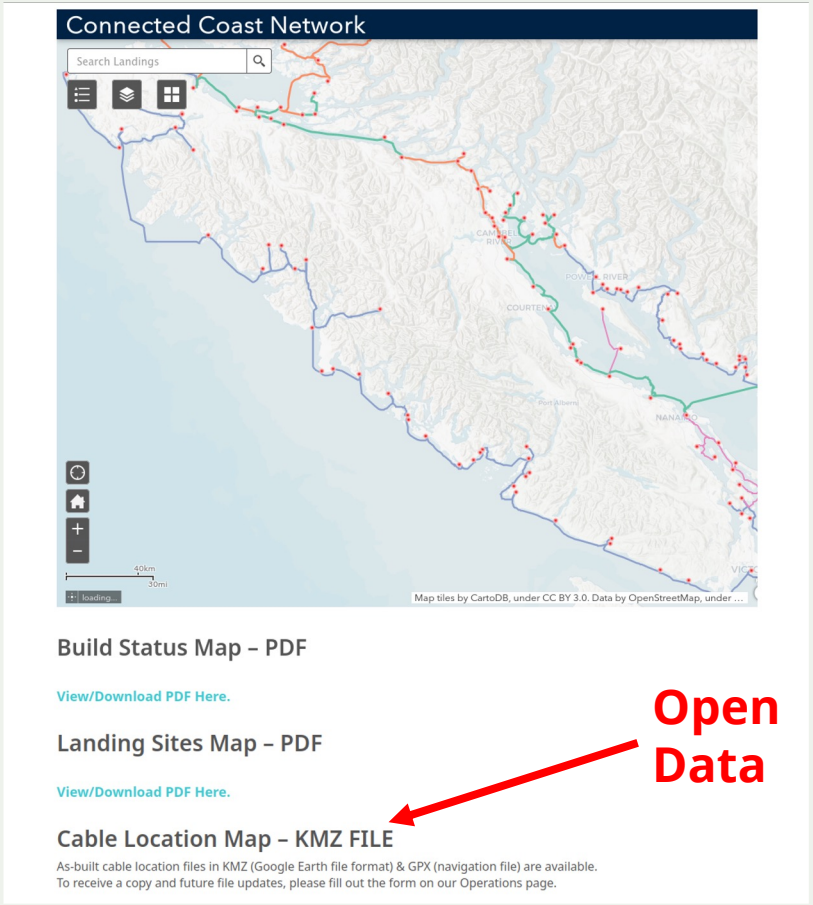
Ukraine: RETN



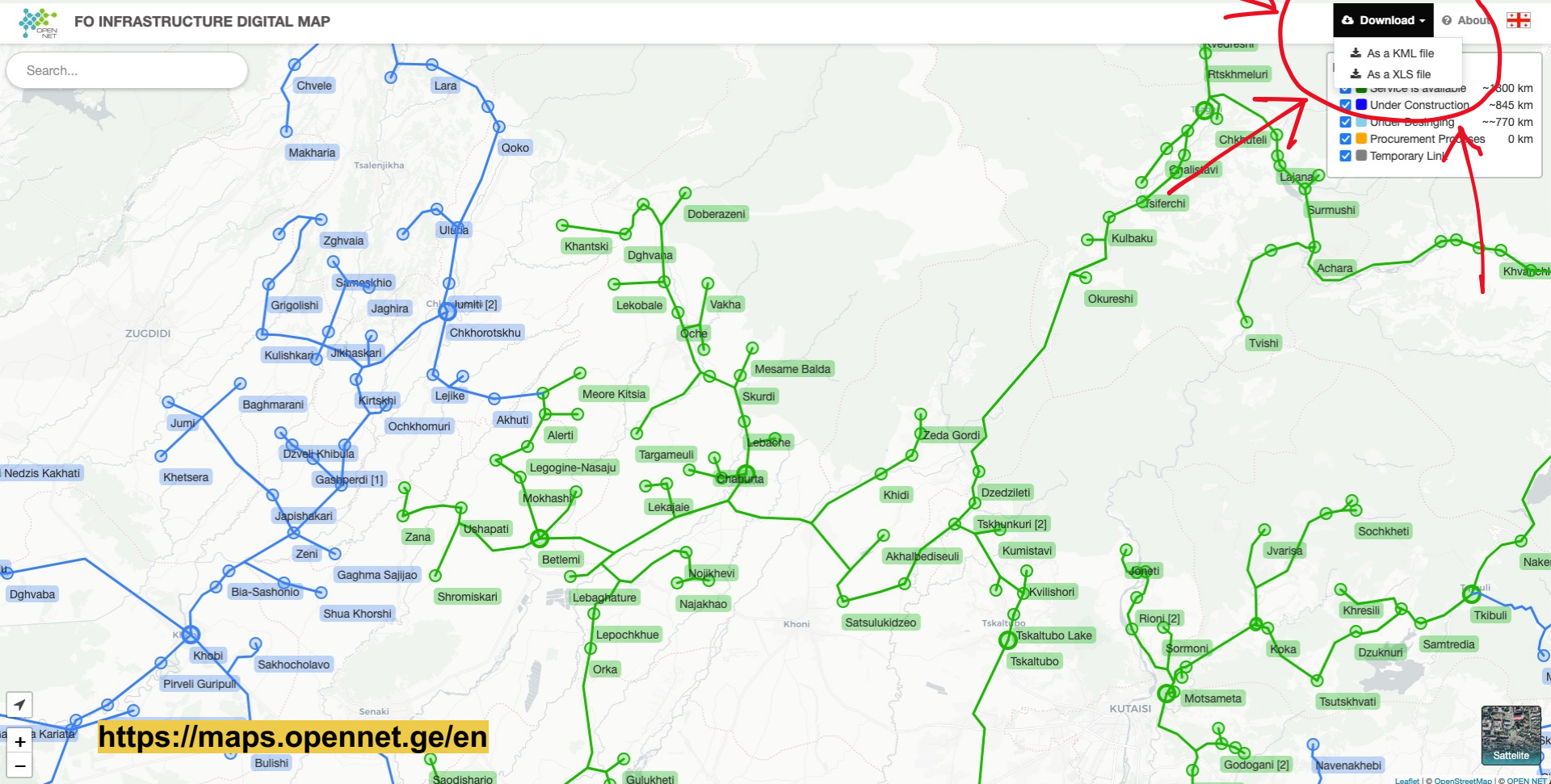
Canada: Connected Coast



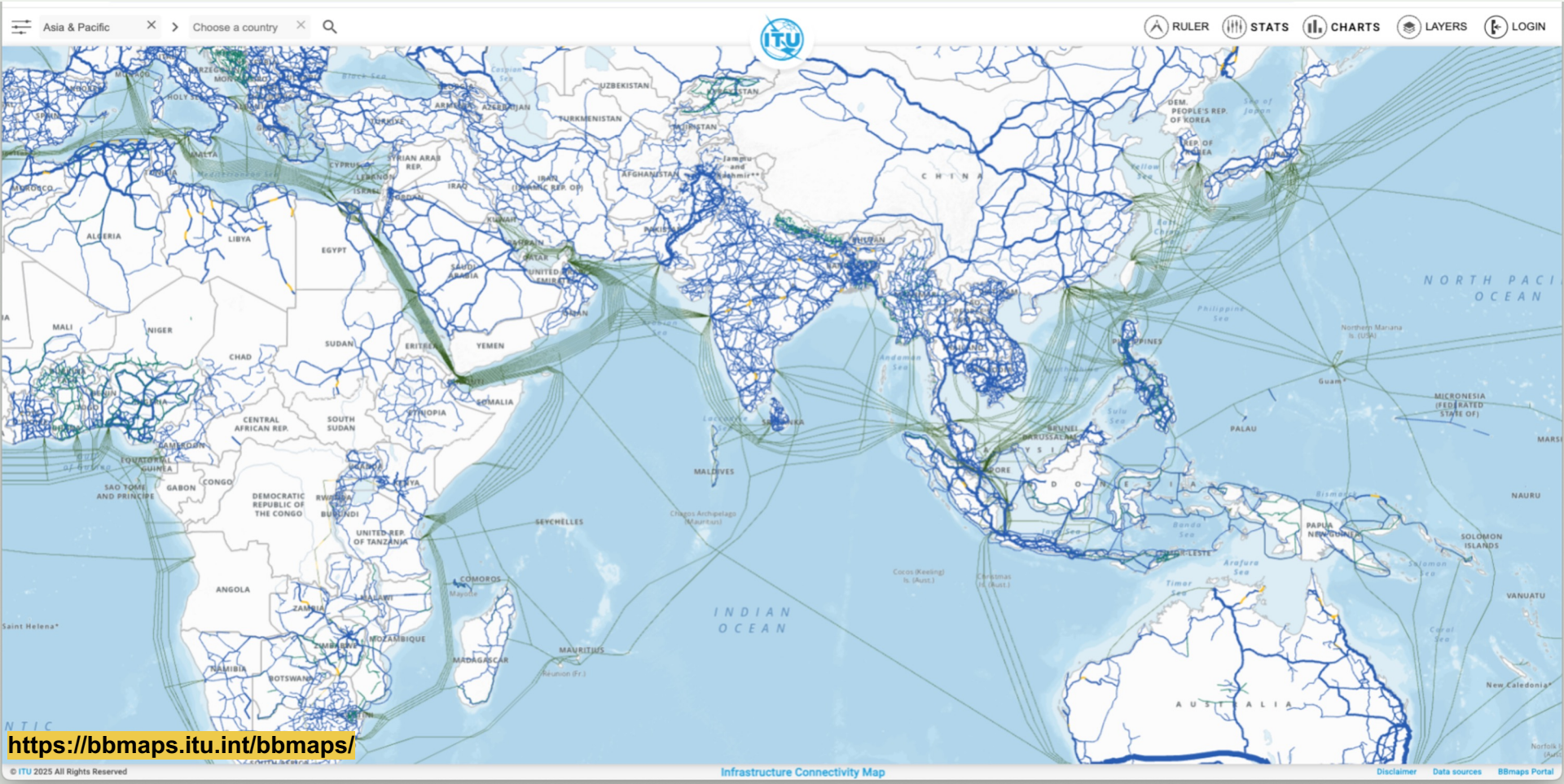
https://connectedcoast.ca/map/

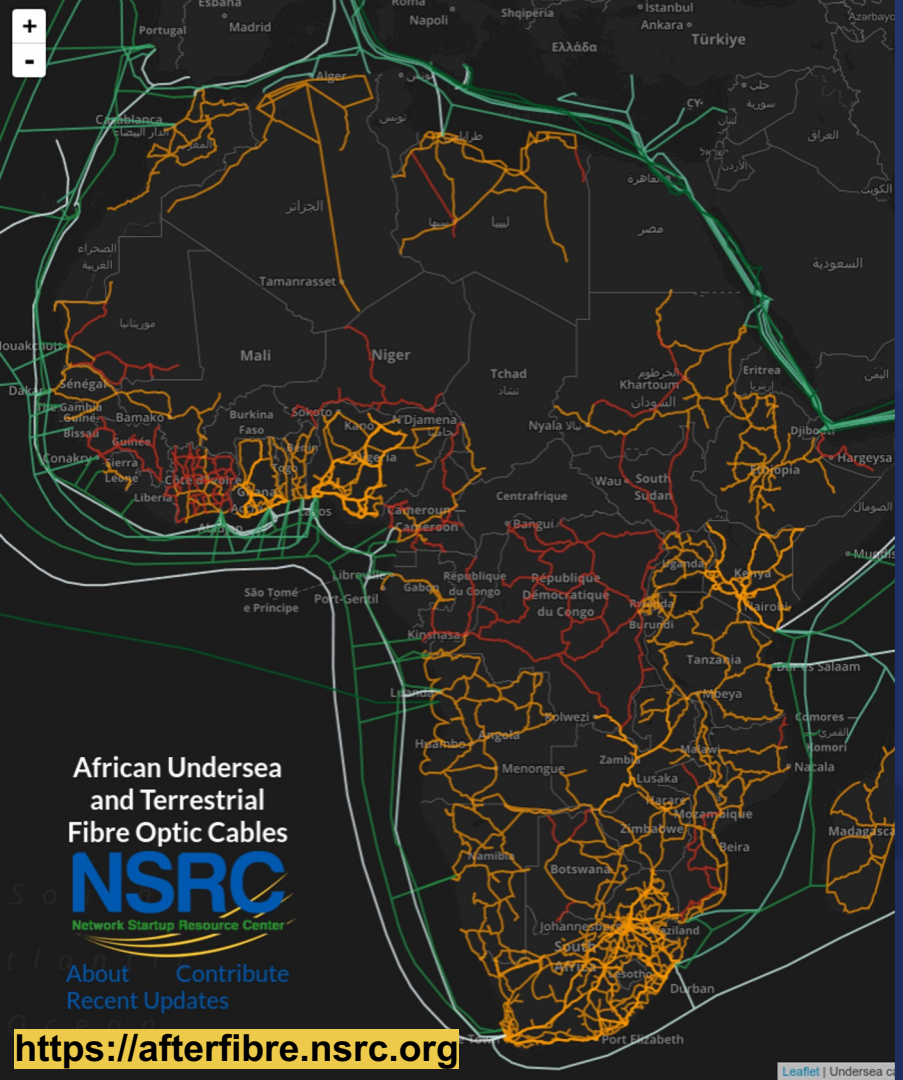


Georgia - OpenNet



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


The Arrival of Fast Internet and Employment in Africa

By Jonas Hjort and Jonas Poulsen

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/

open data services

https://opendataservices.coop/

Benefits to Governments and Regulators

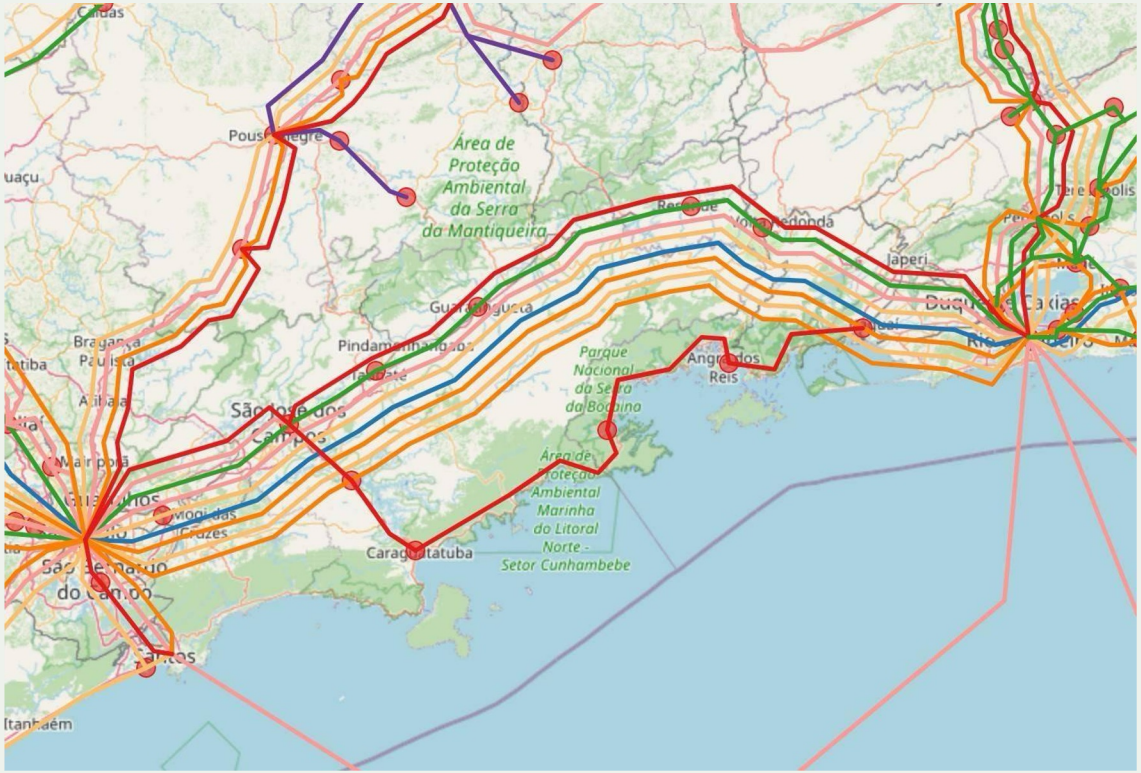
- More effective network investments by accurately targeting the unserved.
- Improved coordination across infrastructure sectors e.g. road, electricity, rail, oil & gas.
- Reduction of physical network interruption and destruction.
- Opportunity for national and regional benchmarking

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.

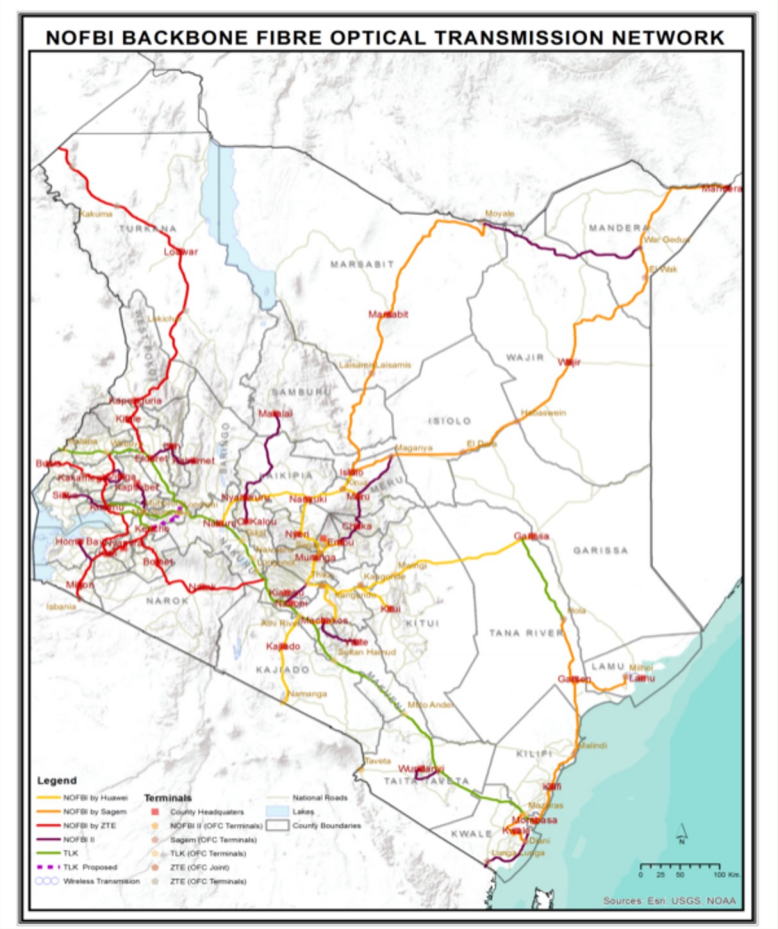
Resilience has less to do with failsafe networks than networks that are safe when they fail.



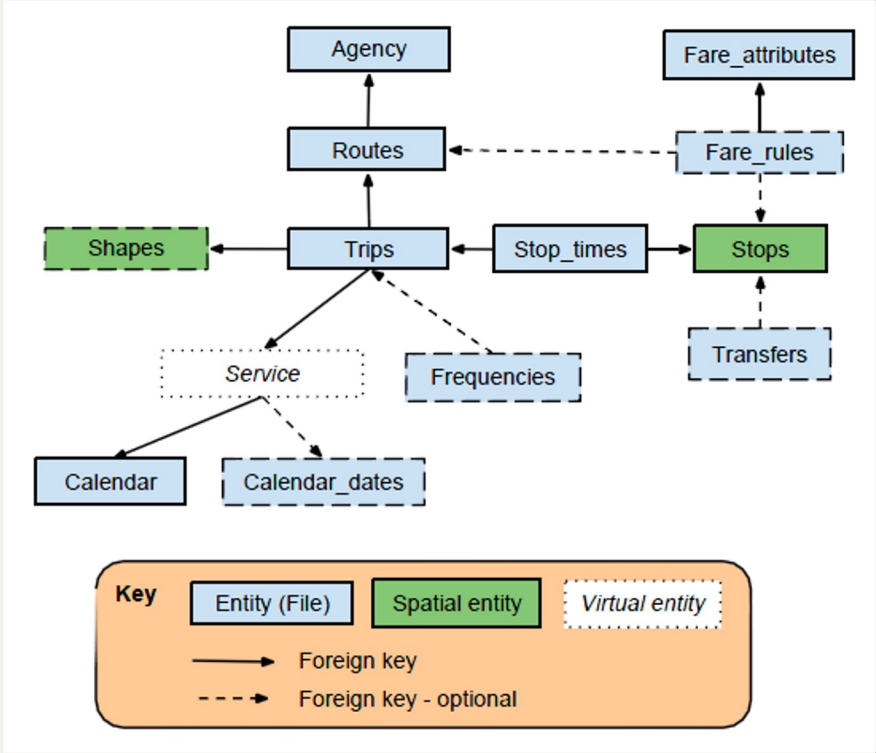
Map of fibre networks from Sao Paulo to Rio de Janeiro

Benefits to Operators

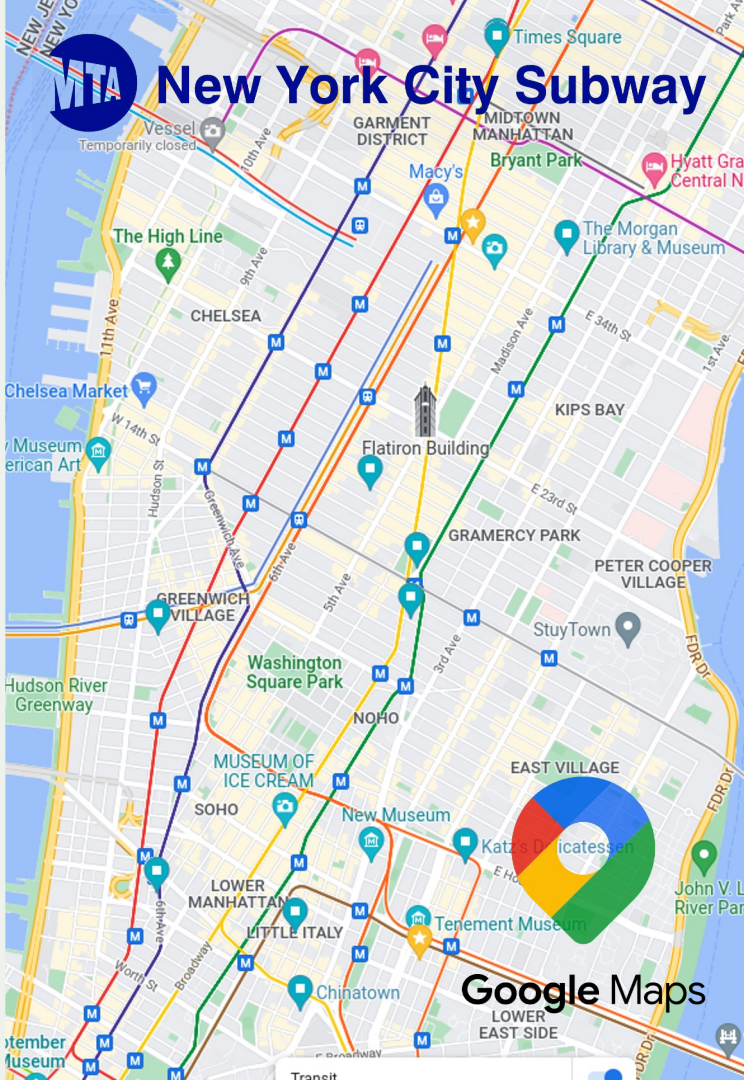
- Opportunities for small ISPs, rural operators in particular.
- More strategic information for investors
- Levelling the playing field in terms of information sharing and building trust
- Better evidence of the socio-economic impact of their networks
- Better network analysis tools



Open Data Standard Example

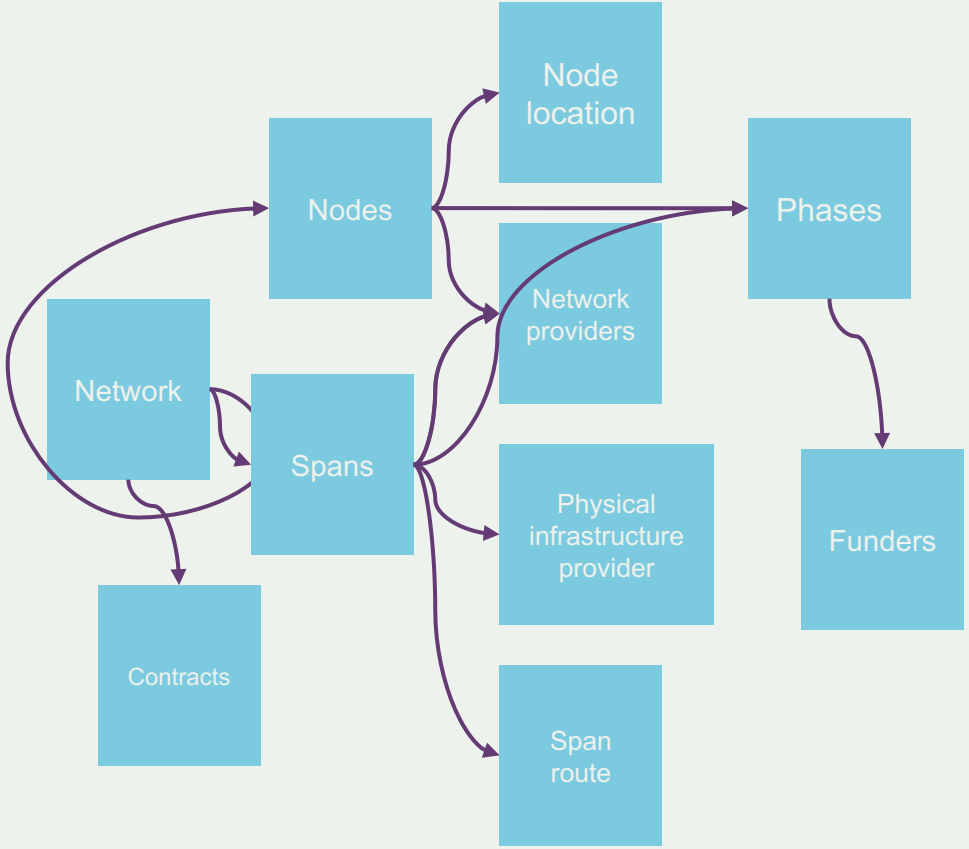


General Transit Feed Specification



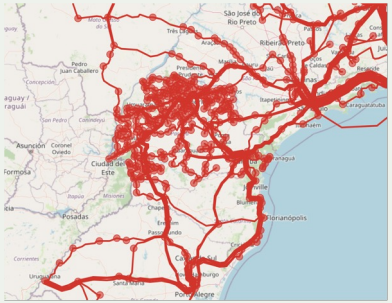
Open Fibre Data Standard

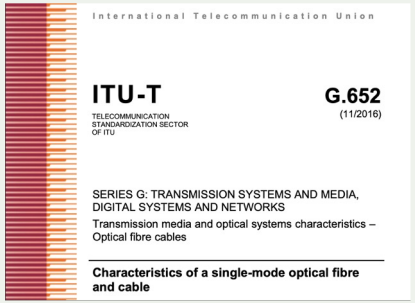
- Describes what data to publish about fibre networks
- Provides a vocabulary and structure for fibre network data
- Offers guidance and software tools for publishers and users



Categories of Data

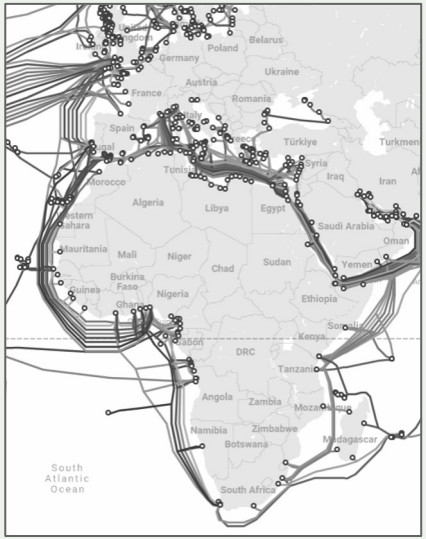
Location data	Technical data	Administrative data
The route of fibre cables, the coordinates of PoPs, towers and IXPs.	Capacity, ITU fibre standards, power availability.	The organisations that own and operate infrastructure, the status of infrastructure, dark fibre availability.



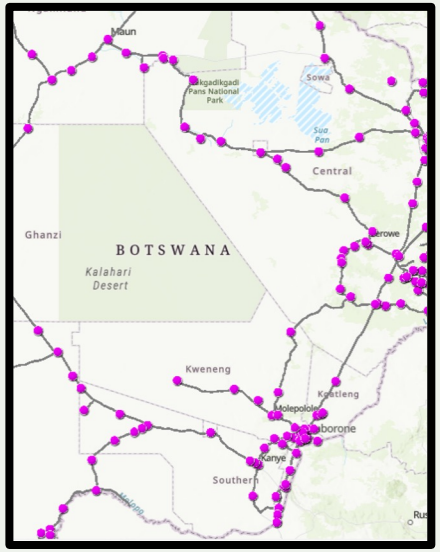


Reach

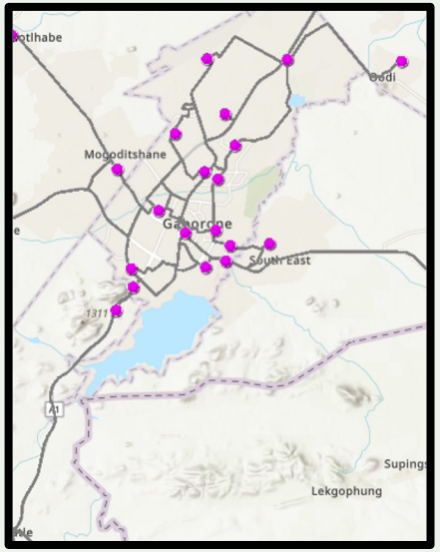
The initial focus of OFDS lies in describing **national and middle mile** networks but will ultimately encompass **last mile** networks.



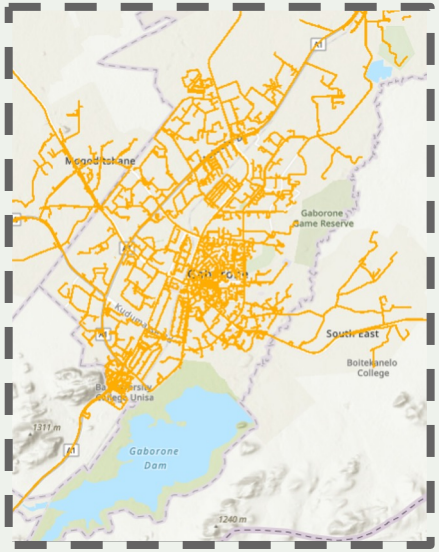
Undersea



National



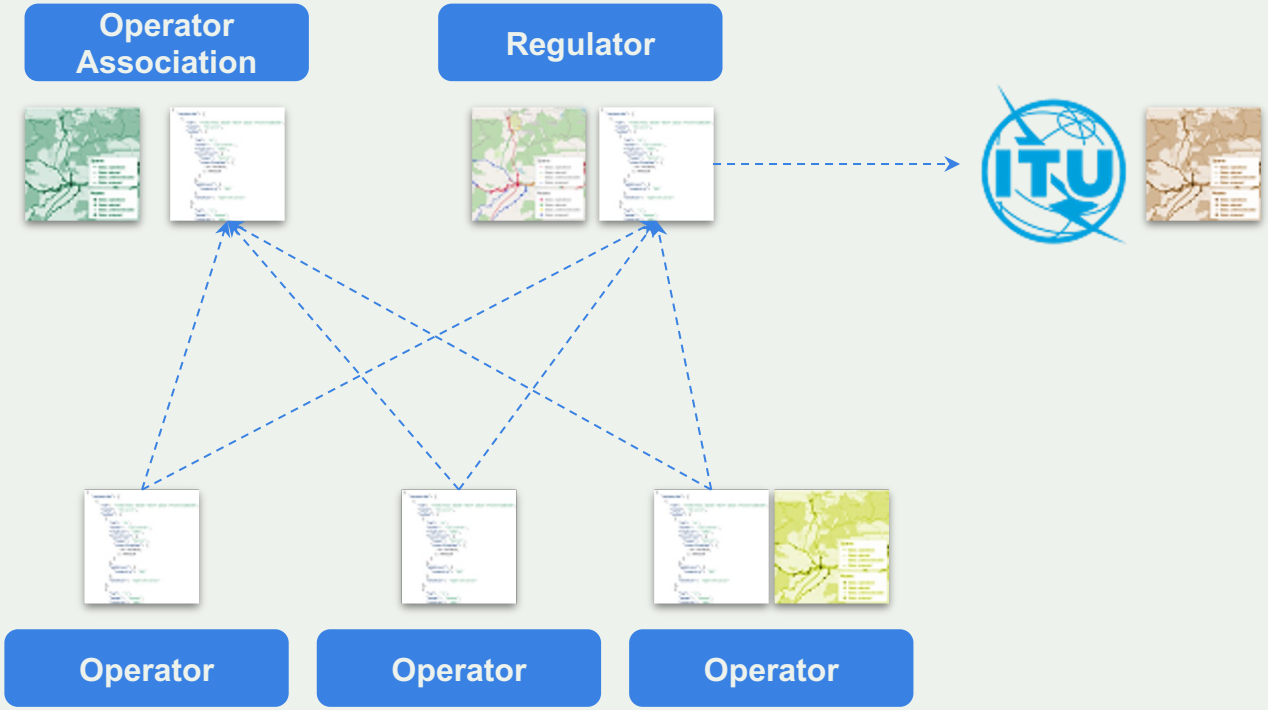
Middle mile



Last mile

Sources: submarinecablemap.com, BoFiNet GIS portal

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!