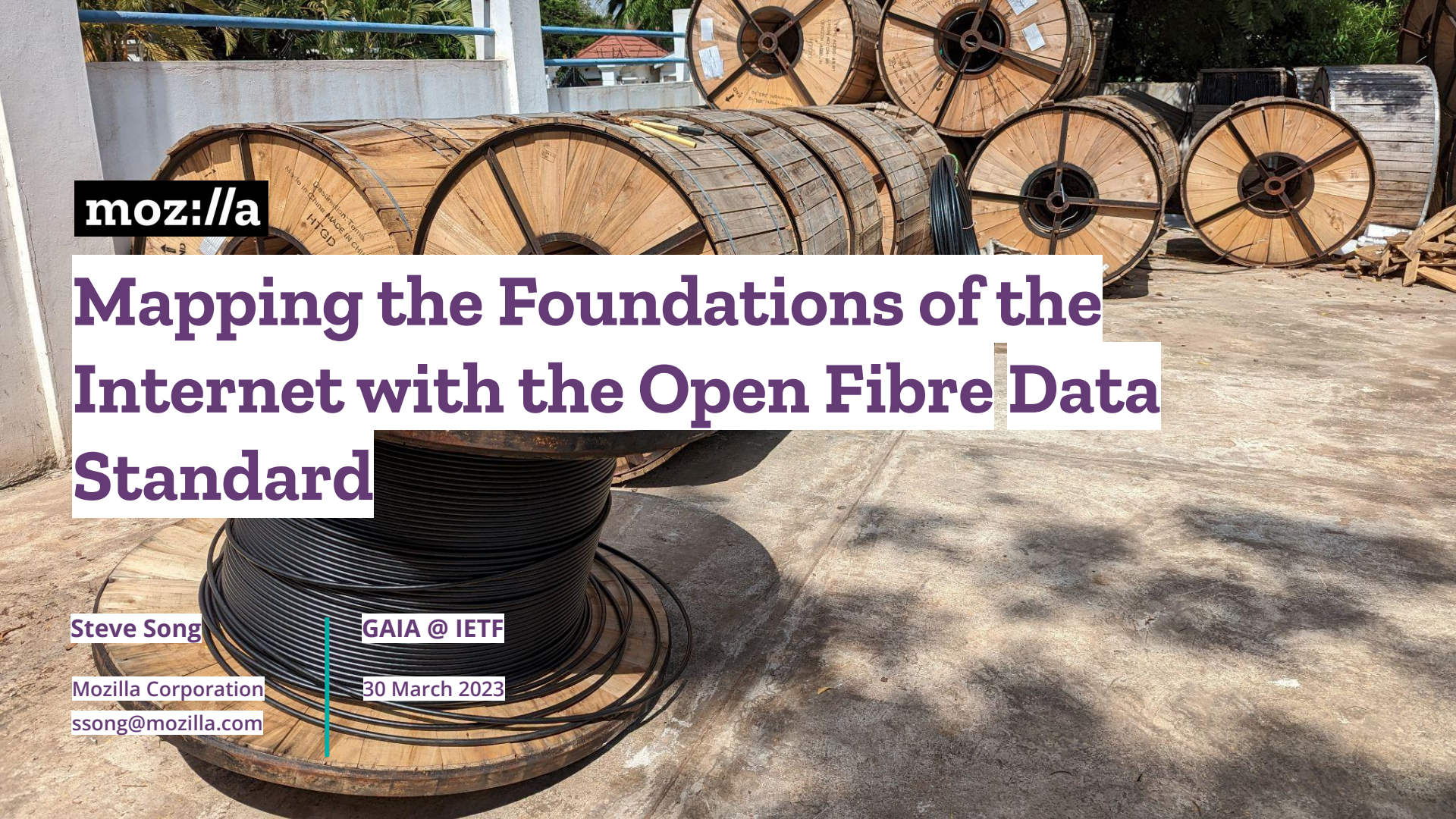

moz://a

Mapping the Foundations of the Internet with the Open Fibre Data Standard

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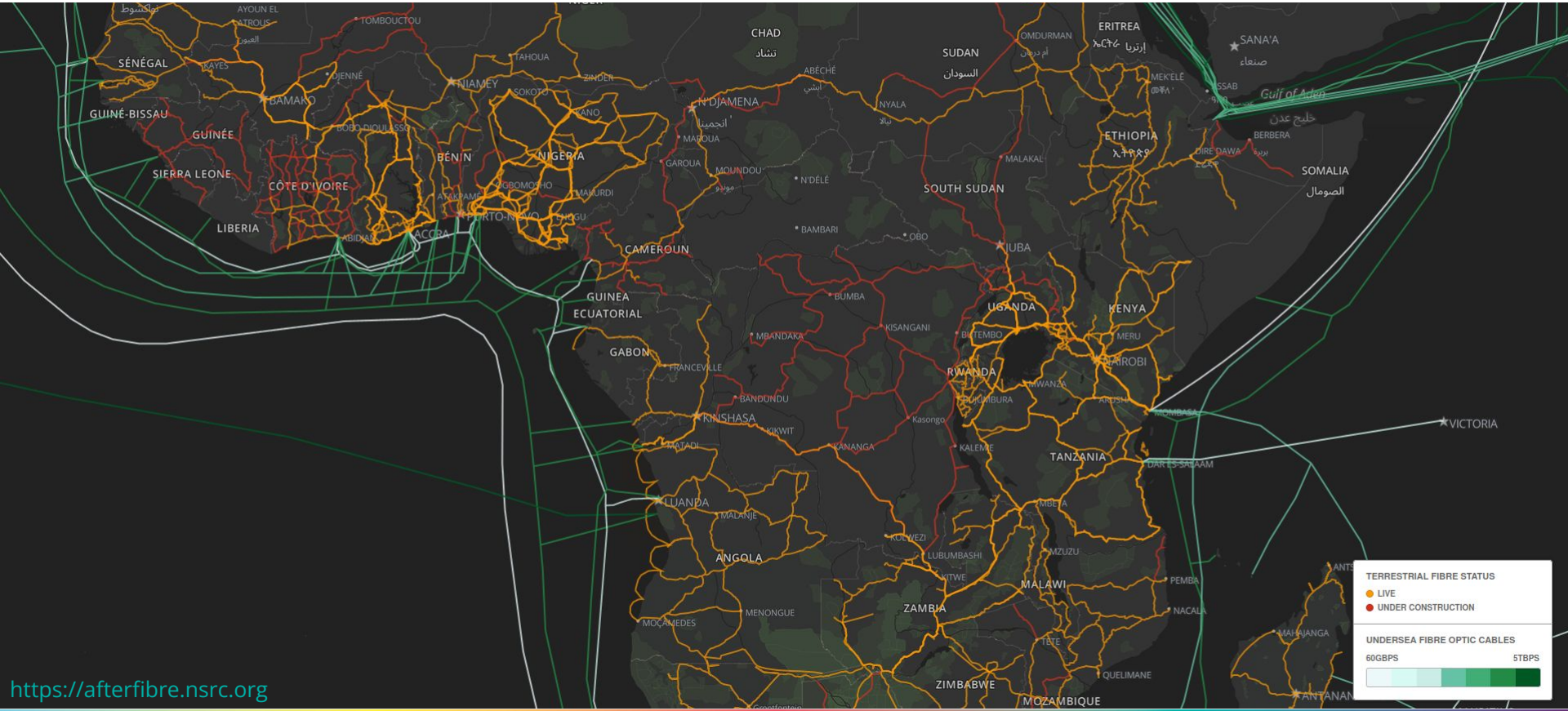
GAIA @ IETF

30 March 2023

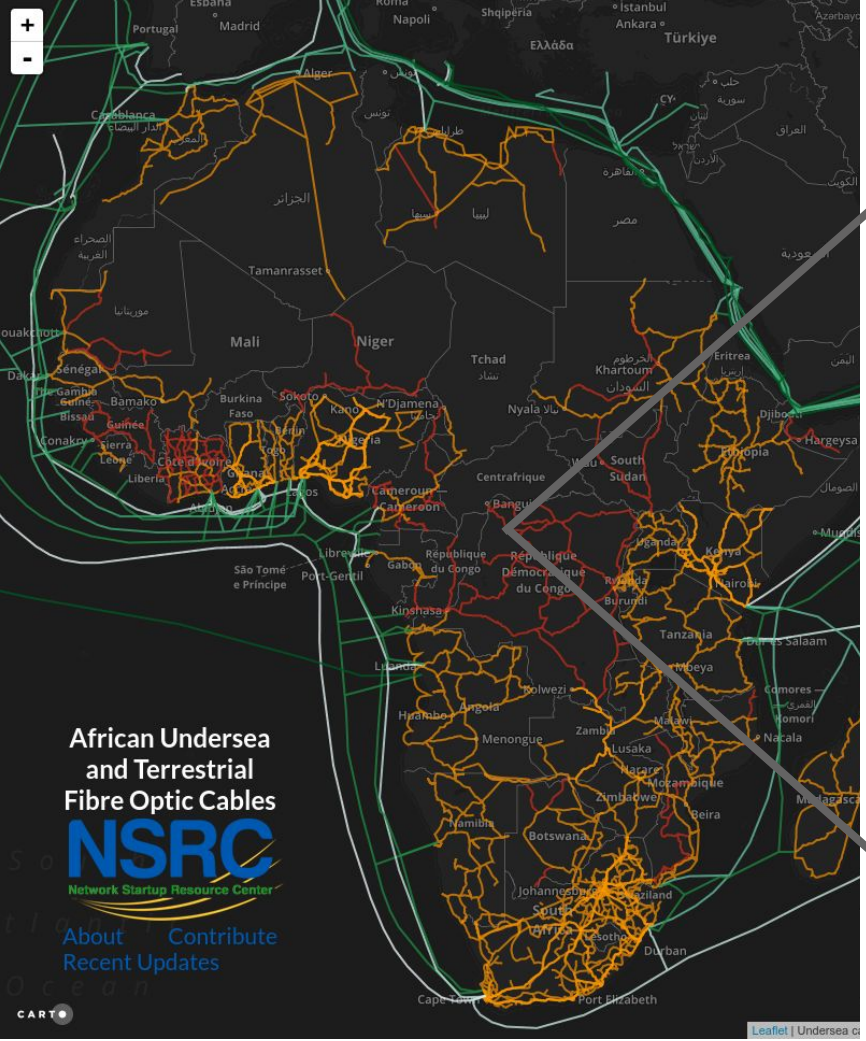
Growth of Terrestrial Fibre



https://afterfibre.nsrc.org

More transparency is needed to understand how physical internet infrastructure is shaping our digital world.

That begins with the foundation on which the modern internet depends, fibre optic infrastructure.



American Economic Review 2019, 109(3): 1032–1079
https://doi.org/10.1257/aer.20161385

The Arrival of Fast Internet and Employment in Africa[†]

By Jonas Hjort and Jonas Poulsen[*]

To show how fast Internet affects employment in Africa, we exploit the gradual arrival of submarine Internet cables on the coast and maps 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-wide impact is driven by increased employment in higher-skill occupations, but less-educated workers' employment gain less so. Firm-level data available for some countries indicate that increased firm entry, productivity, and exporting contribute to higher net job creation. Average incomes rise. (*JEL* F14, J23, J24, J63, L86, O15, O33)

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

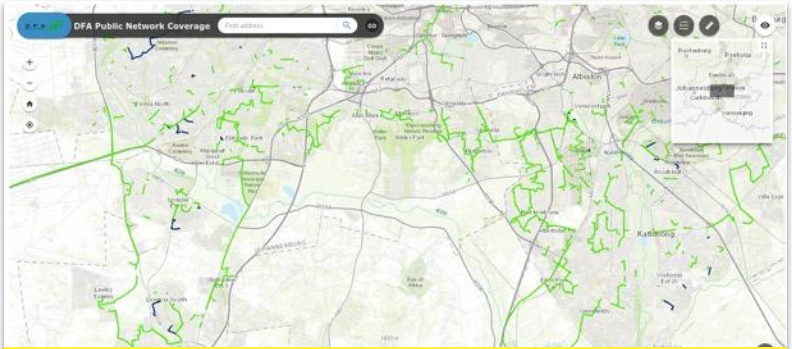
2019

Acemoglu 2003; Attanasio, Goldberg, and Pavcnik 2004; Burstein, Cravino, and

*Hjort: Columbia University, Uris Hall 622, 3022 Broadway, New York, NY 10027, BREAD, CEPR, and NBER (email: hjort@columbia.edu); Poulsen: Uppsala University, Box 514, 751 20 Uppsala, Sweden (email: jonas.poulsen@nek.uu.se). This paper was accepted to the *AER* under the guidance of Marianne Bertrand, Coeditor. We are grateful to five anonymous referees for insightful comments that significantly improved the paper. We also thank Adrian Adermon, Sebastian Axbard, Niklas Bengtsson, Martina Björkman-Nyqvist, Greg Bruich, Esther Duflo, Ray Fisman, Oded Galor, Francois Gerard, Amit Khandelwal, Erik Lindqvist, Mushfiq Mobarak, Kalle Moene, Eva Mörk, Anders Olofsgård, Michel Serafinelli, Kjetil Storesletten, Eric Verhoogen, Tim Waters, Frank Windmeijer, Chris Woodruff, and especially Henrik Sigstad and Matthieu Teachout for many helpful conversations, and seminar participants at the Barcelona Summer Forum, Bocconi, Brown, Columbia, Harvard, IGC Growth Week, NBER Summer Institute, Oslo, Oxford, Stockholm School of Economics, UBC, and Uppsala for comments and suggestions. Sawal Acharya, Patrick Kennedy, and Roxanne Rahmana provided great research assistance. We thank Akamai, Steve Song, and the World Bank for data access. Hjort thanks the Center for Development Economics and Policy at Columbia University for financial support. Any errors are our own. The authors declare that they have no relevant or material financial interests that relate to the research described in this paper.

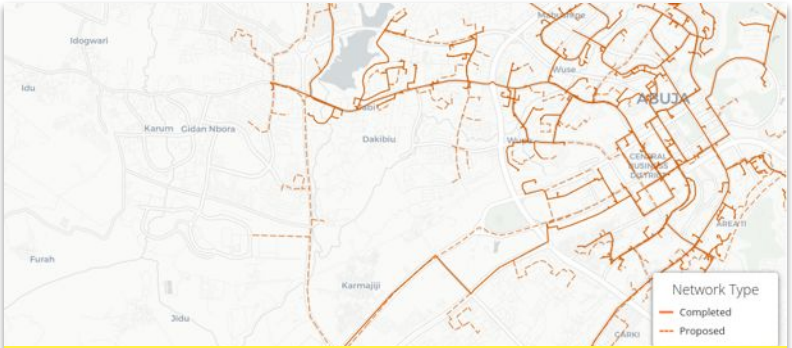
[†]Go to https://doi.org/10.1257/aer.20161385 to visit the article page for additional materials and author disclosure statement(s).

Good Practice in Sharing Exists Today



South Africa: https://dfafrica.co.za/network/coverage/

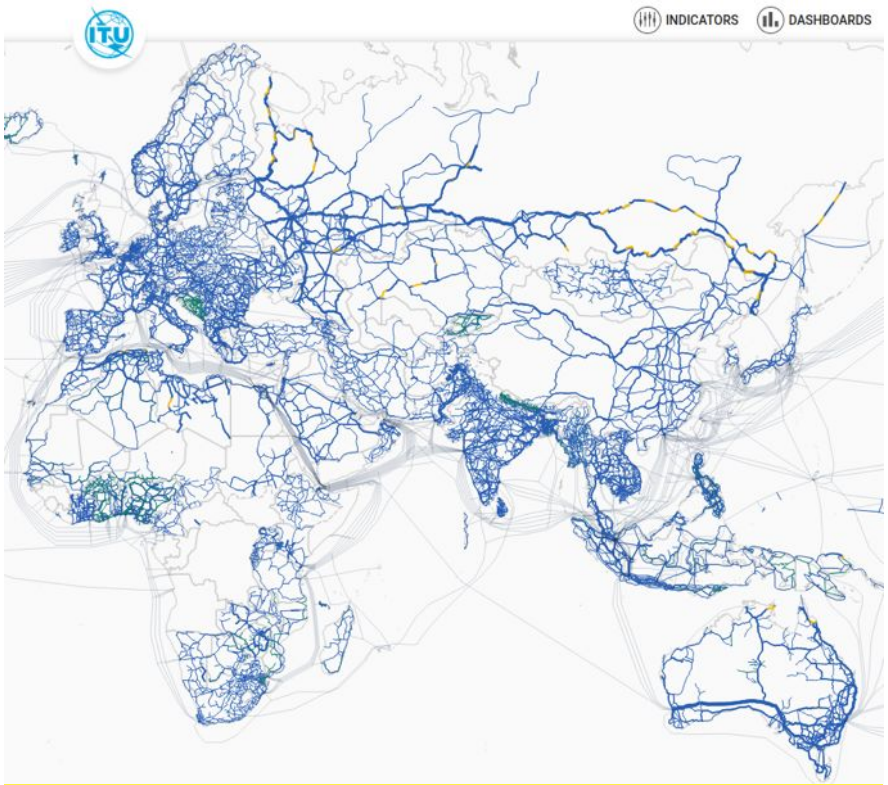
Many fibre network operators around the world share their network maps, although they are still in the minority. There is no normalised practice of network information sharing.



Nigeria: https://bcnnigeria.net//index.php/our-network/

Ukraine: https://retn.net/en/network/network-map

ITU Transmission Map



https://www.itu.int/itu-d/tnd-map-public/

ITU has maintained a global map of terrestrial fibre optic network infrastructure through its partnership with regulators and operators around the world.

In the absence of Open Data norms for network information sharing, operators often default to sharing under an NDA.

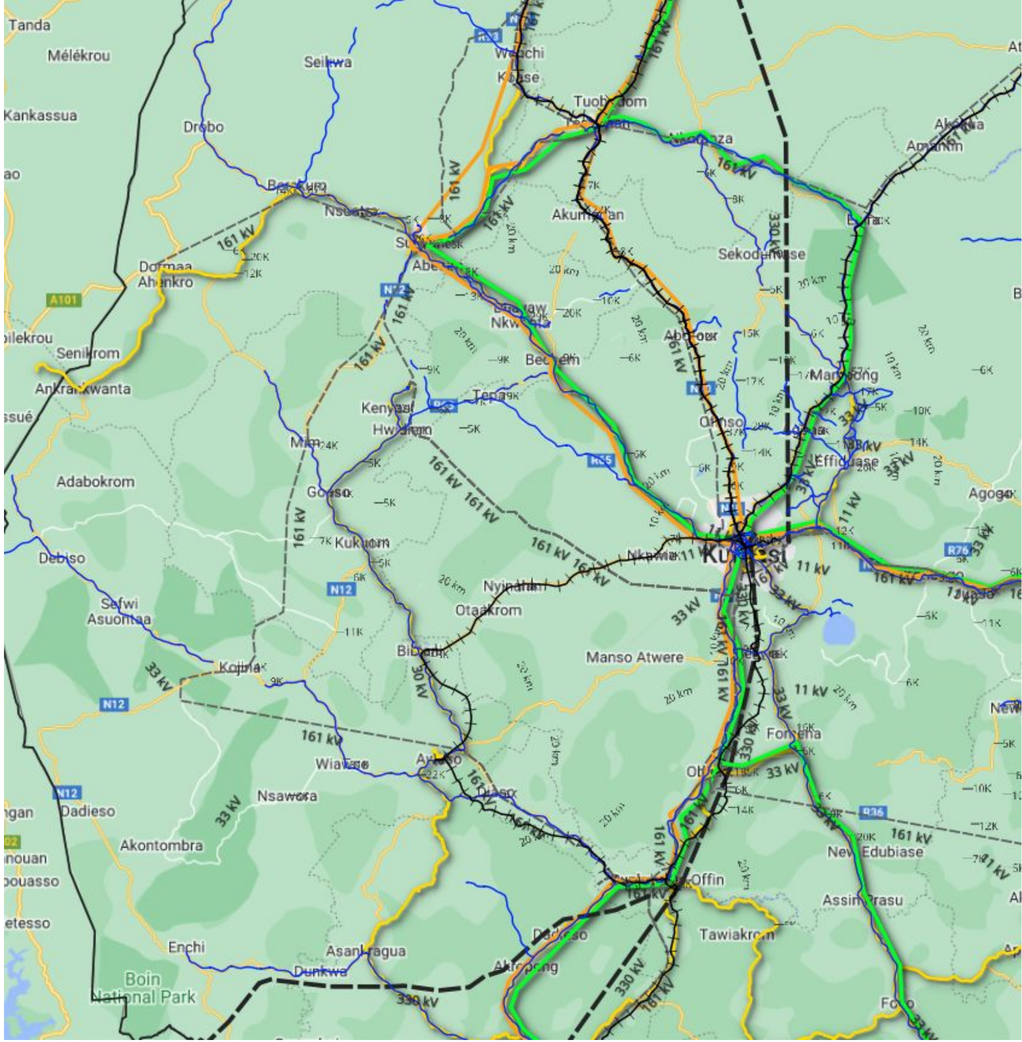
As a result the network map data is typically restricted from being downloaded, presenting an barrier to researchers who might leverage this resource.

Multistakeholder Initiative

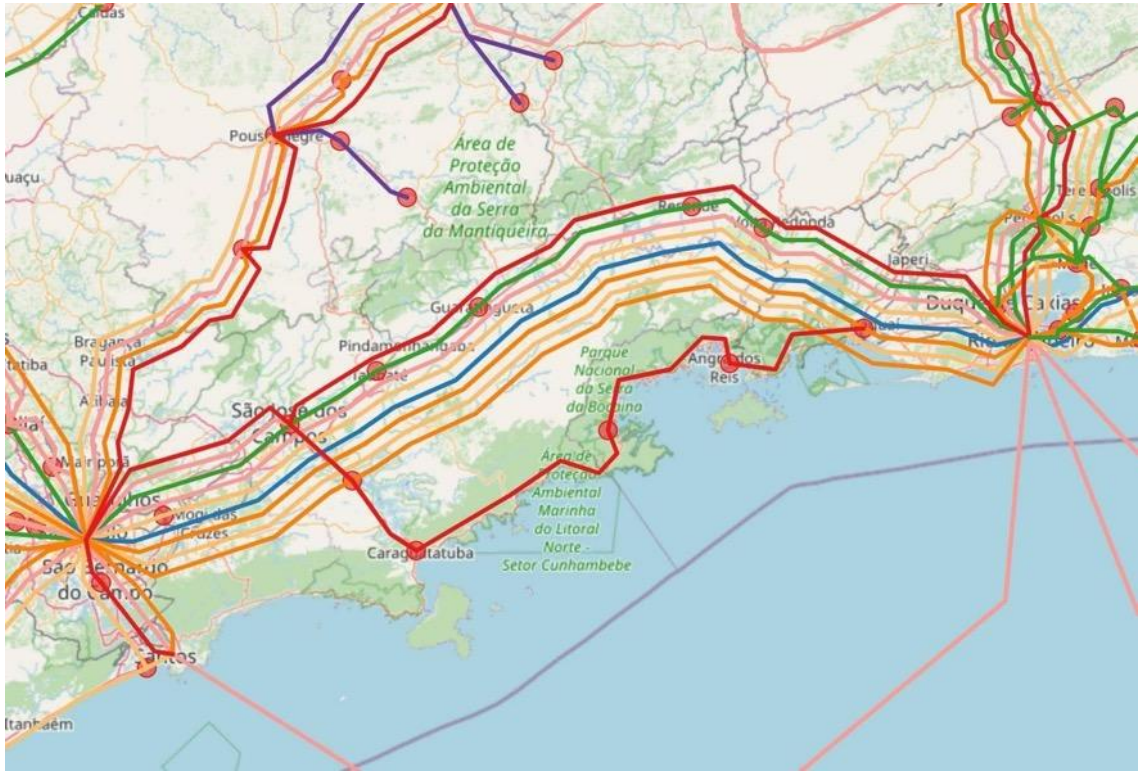
The World Bank, the International Telecommunications Union (ITU), Mozilla Corporation, the Internet Society (ISOC), Liquid Intelligent Technologies, CSquared, and Digital Council Africa are partnering to promote the collaborative development of open data standards for describing telecommunications infrastructure. The first challenge we have taken on is that of terrestrial fibre optic infrastructure.

Benefits of Open Fibre Data

- 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



- Understanding the true extent of national fibre infrastructure
- If 8 operators report fibre along a route such as that to the right, does that represent 8 unique fibre networks?

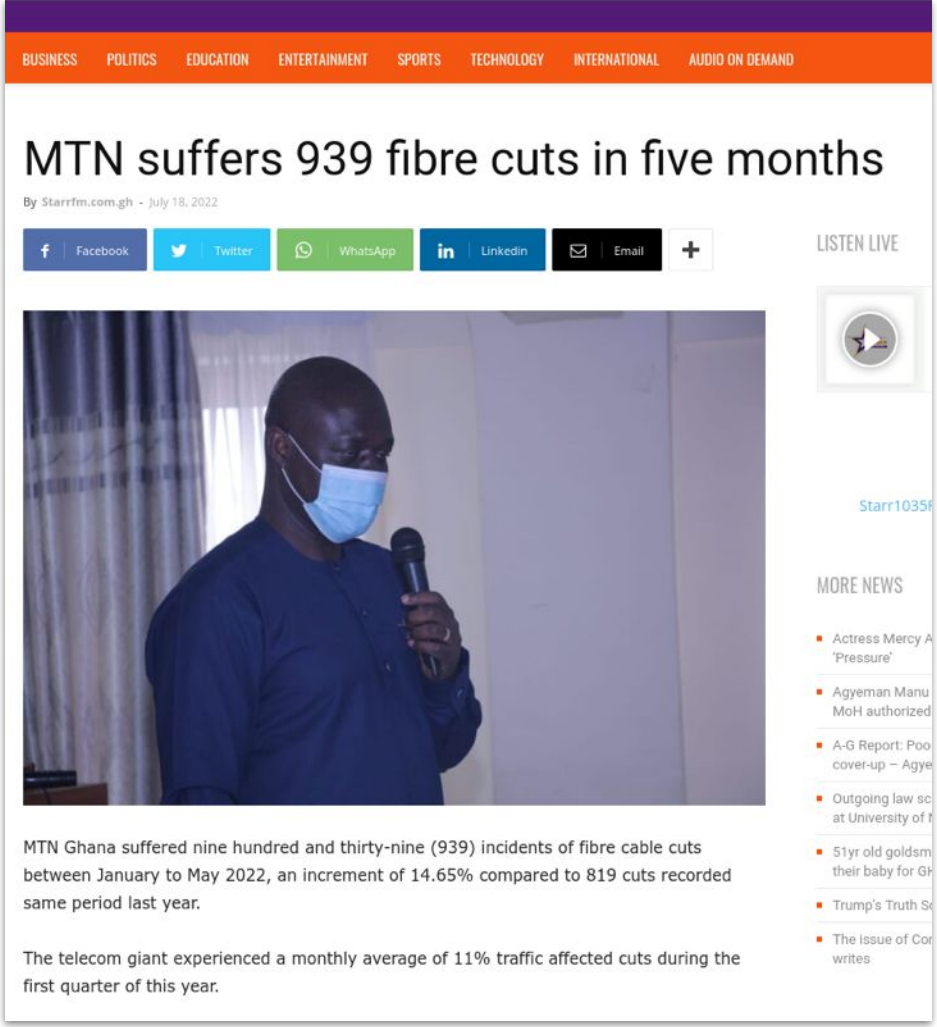


Map of fibre networks from Sao Paulo to Rio de Janeiro

BENEFITS TO OPERATORS

Benefits to operators

- Reduction of physical network interruption and destruction.
- 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



BUSINESS POLITICS EDUCATION ENTERTAINMENT SPORTS TECHNOLOGY INTERNATIONAL AUDIO ON DEMAND

MTN suffers 939 fibre cuts in five months

By Starrfm.com.gh - July 18, 2022

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MTN Ghana suffered nine hundred and thirty-nine (939) incidents of fibre cable cuts between January to May 2022, an increment of 14.65% compared to 819 cuts recorded same period last year.

The telecom giant experienced a monthly average of 11% traffic affected cuts during the first quarter of this year.

ITU Partner2Connect Pledge

ITU | Partner2Connect

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ITU

CSquared

Internet Society

Digital Council

LIQUID
INTELLIGENT TECHNOLOGIES

Open Data in Telecommunications Pledge

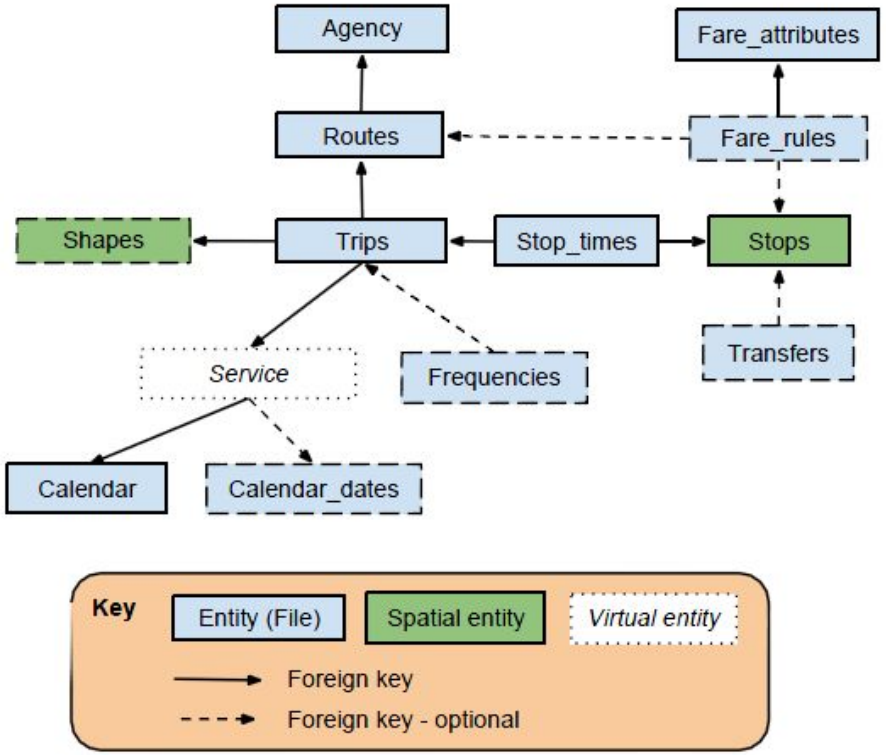
We believe that trusted open data is essential in order to extend affordable, high-quality broadband to all. Accordingly we pledge to:

- promote the **collaborative development of open data standards** in the ICT infrastructure sector in order to better understand the challenges and opportunities of providing affordable access to communication for all;
- begin by developing open data standards for describing **terrestrial fibre** optic networks;
- develop sustainable mechanisms for promoting **public input, management, and adoption** of these standards; and,
- promote a culture of **openness and trust** among regulators, infrastructure owners and operators.

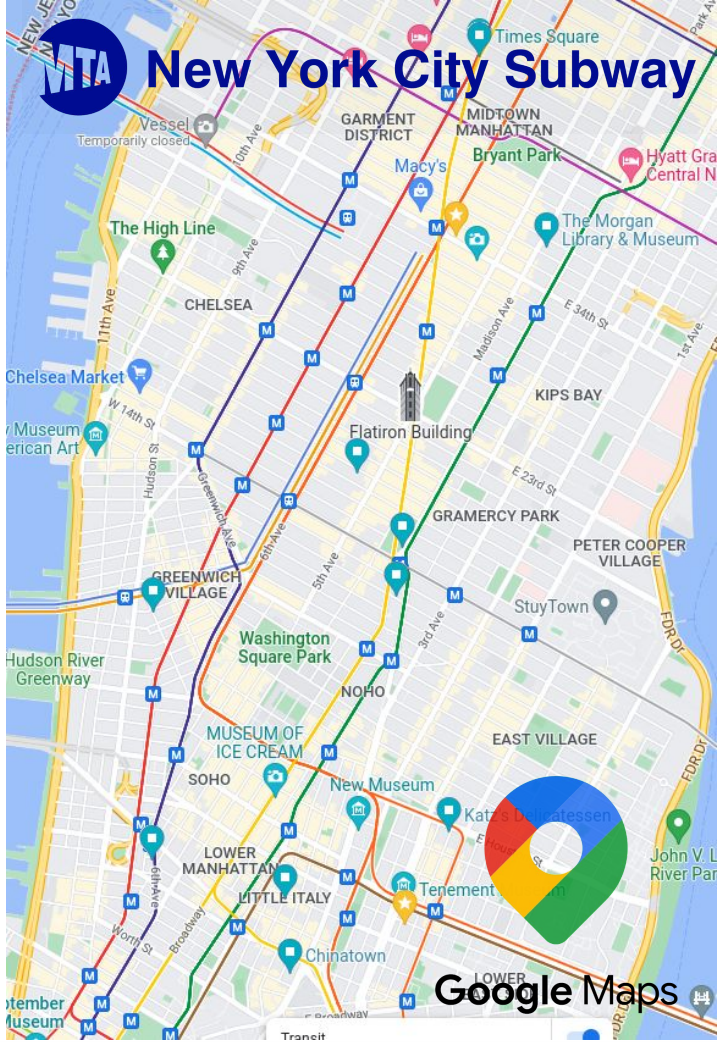
Partnership with Open Data Services

- Leading experts in open data standards who have worked on:
  - Beneficial **Ownership** data standard
  - International **Aid** Transparency Initiative (IATI) data standard
  - Open **Contracting** Data Standard
  - Among others...

Open Data Standard Example

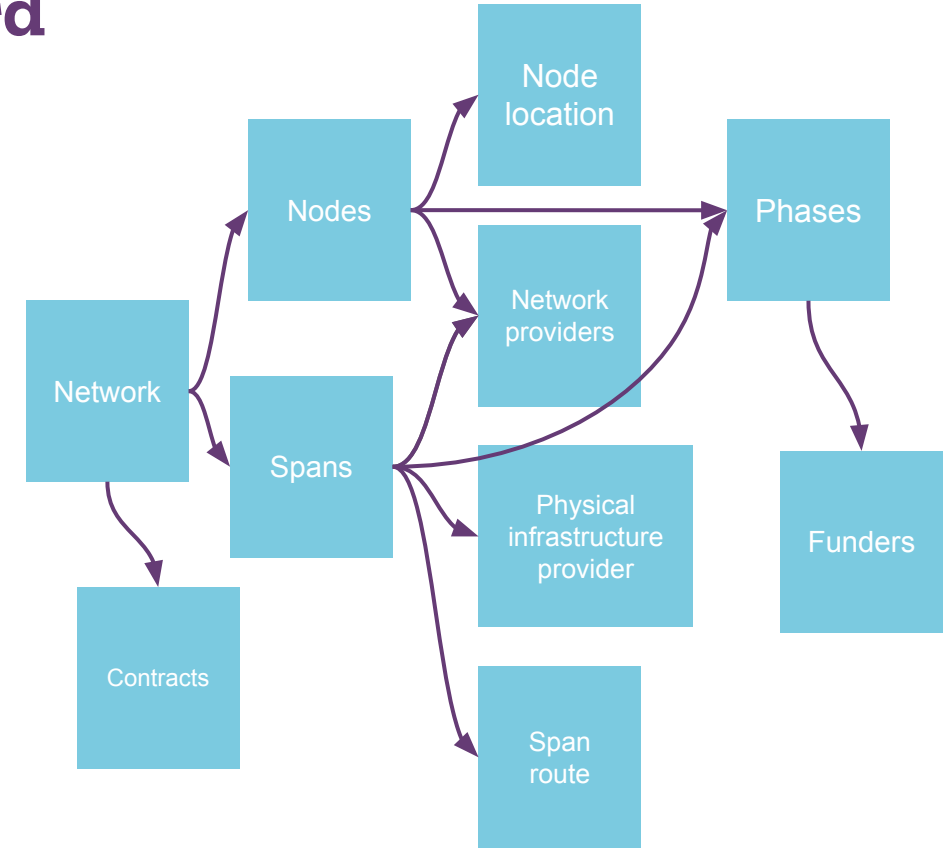


Public Transit

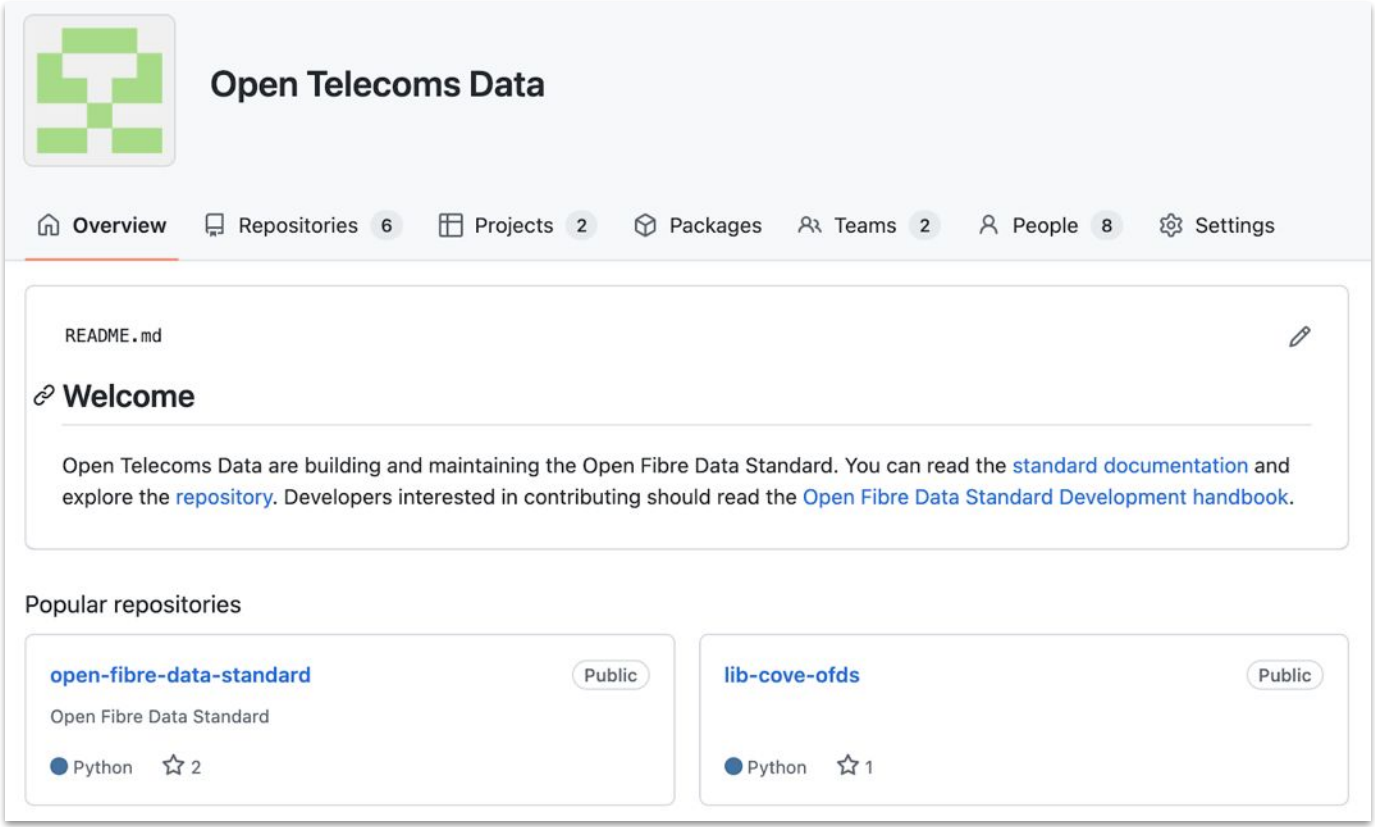


Open Fibre Data Standard

- 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

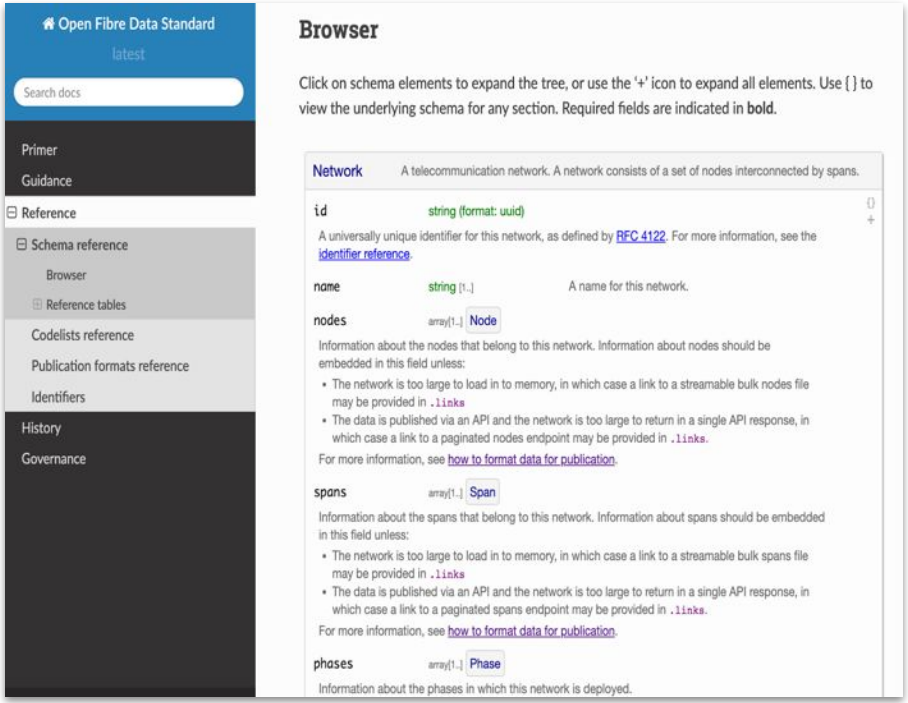


A version of the standard is publicly available

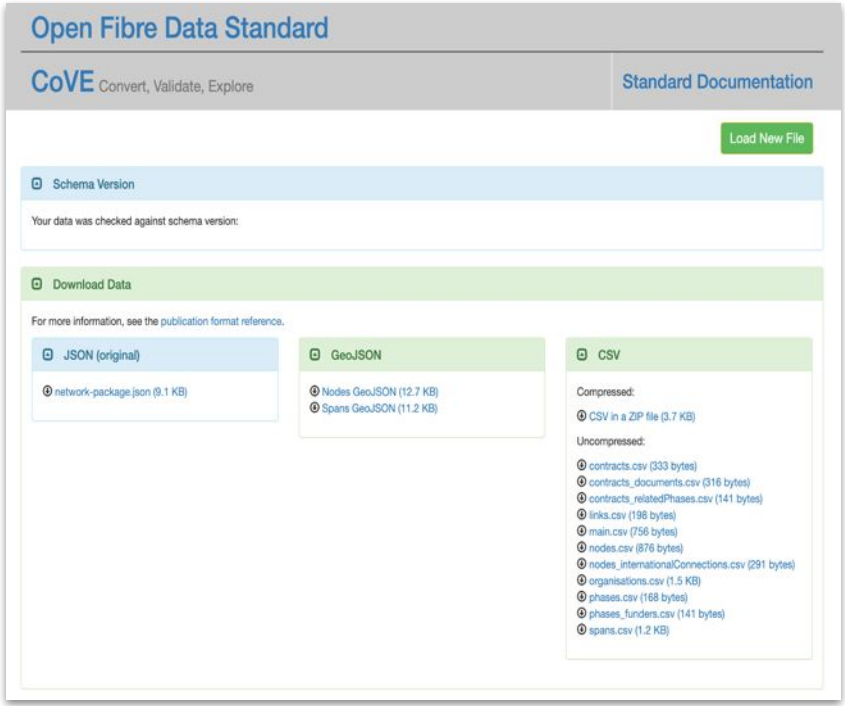


github.com/Open-Telecoms-Data

Documentation and digital tools are available



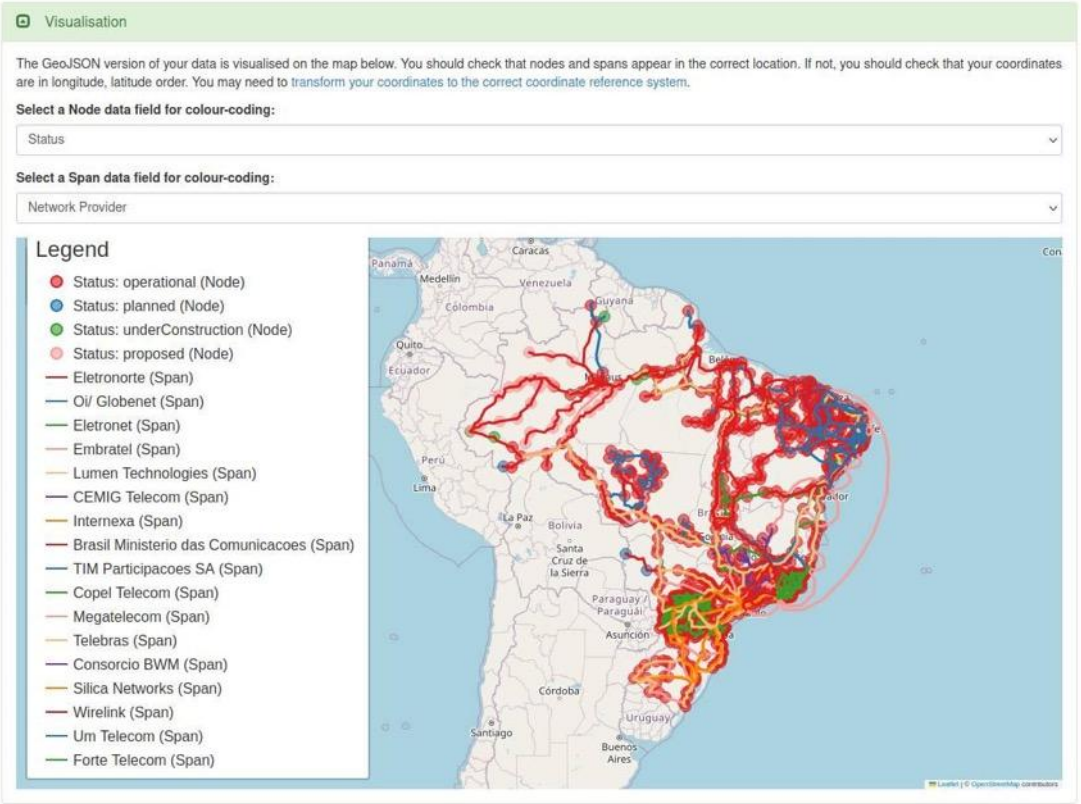
open-fibre-data-standard.readthedocs.io/



ofds.cove.opendataservices.coop/

Action has already begun

- In November 2022, the Brazilian government released network fibre optic infrastructure data using the draft Open Fibre Data Standard.
- Pilots are currently underway in Ghana and Kenya



https://www.itu.int/en/ITU-D/Technology/Pages/OpenFibre.aspx

moz://a

Thank You

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