

Smarter Regulation in Practice: Evidence, Tools and Lessons

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The cost of obscurity

939

fibre cuts on MTN Ghana's network in five months

USD 750,000*

estimated loss from cuts like these over a five-month period (2021 study with MTN Ghana)

**This does not include the economic losses to the enterprises and users that depend on that infrastructure.*



Why we measure

- To answer questions/validate beliefs
- To set a baseline from which we can track change/show results
- To demonstrate value
- To justify decisions
- To identify opportunities for improvement
- Advance our knowledge



Two blind spots for regulators

Smarter regulation depends on evidence. Two layers of evidence are often missing.

OUTCOMES

How does the Internet perform for users?

Resilience, performance, security and market health, measured and benchmarked across countries.

→ Internet Society Pulse

INFRASTRUCTURE

Where is the network?

Terrestrial fibre routes, owners, status and redundancy. Largely unmapped, and hard to combine where it is.

→ Open Fibre Data Standard

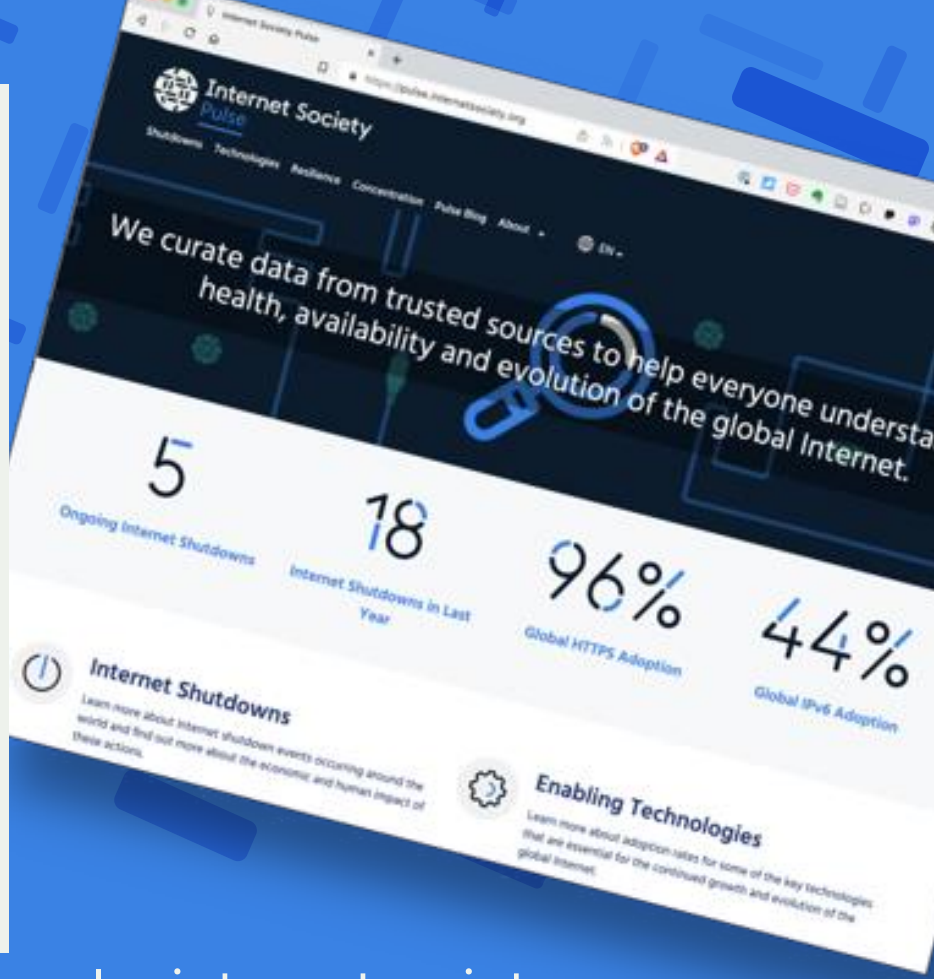
Ghana's fibre cuts sit in both: users lose service (an outcome) because no one could see the fibre (the infrastructure).

Internet Society Pulse

- Launched in December 2020.
- We curate Internet measurement data from trusted sources to help everyone gain deeper, data-driven insight into the Internet.

Trusted data from multiple sources:

- **Benefit**: Helps to assess whether efforts to ensure that the Internet remains open, globally connected, secure, and trustworthy are working.
- **Benefit:** Allows policymakers, researchers, journalists, network operators, civil society groups, and others to better understand the health, availability, and evolution of the Internet.



pulse.internetsociety.org

Pulse Data Partners



pulse.internetsociety.org/partners

Internet Resilience



A resilient Internet connection maintains an acceptable level of service despite faults and challenges to normal operation.

The **Pulse Internet Resilience Index** is a framework collates around 30 sets of public metric data that relate to four pillars of a resilient Internet

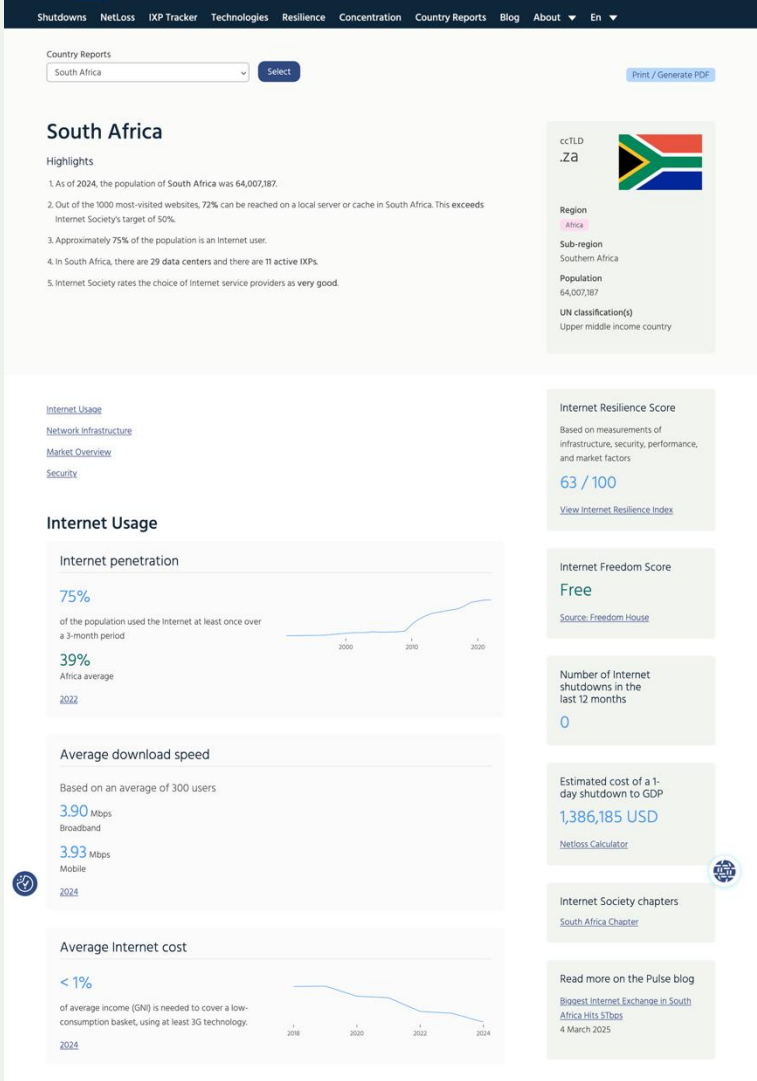
Infrastructure	Performance	Security	Market Readiness
The existence and availability of physical infrastructure that provides Internet connectivity.	The ability of the network to provide end-users with seamless and reliable access to Internet services.	The ability of the network to resist intentional or unintentional disruptions through the adoption of security technologies and best practices.	The ability of the market to self-regulate and provide affordable prices to end-users by maintaining a diverse and competitive market.

Pulse Country Reports

Consolidate and provide context for the data that we collect and curate via the four Pulse research tracks.

Reports can assist:

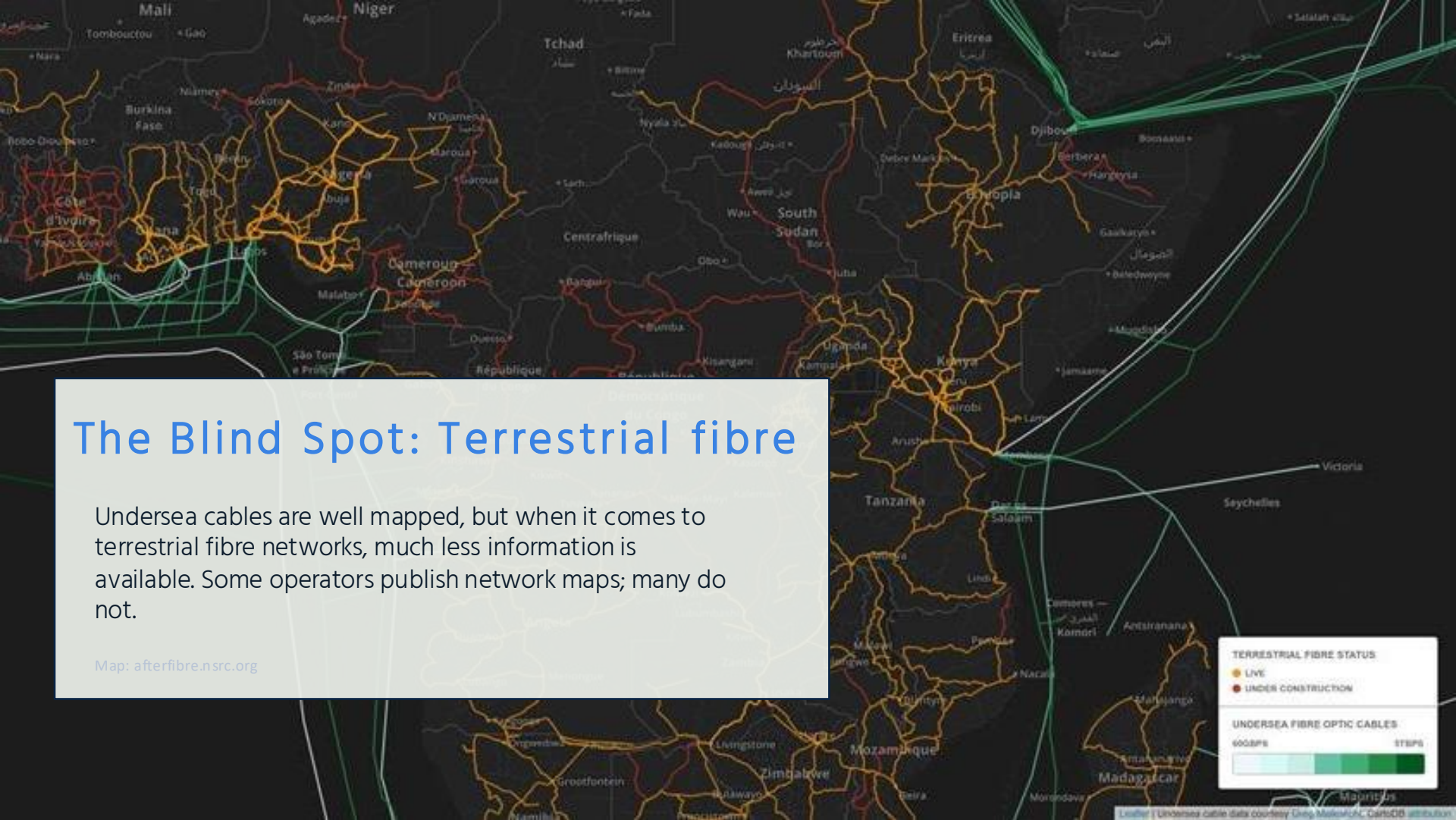
- Policy and decision makers to understand local and regional differences regarding various aspects of the Internet. This can help target improvement plans and work towards enabling policies to support development.
- Civil society groups and journalists to advocate and lobby for more investment and targeted improvements to infrastructure.



The Blind Spot: Terrestrial fibre

Undersea cables are well mapped, but when it comes to terrestrial fibre networks, much less information is available. Some operators publish network maps; many do not.

Map: afterfibre.nsrc.org



Terrestrial fibre mapping challenges

Accuracy	Sources vary: official operator maps, shareholder reports, World Bank studies and other ‘informal’ sources.
Completeness	Most maps are incomplete and many need updating. Most map data lacks enough information to inform policy and development.
Publication format	Operators that publish are limited to interactive web pages, PDF or KML.
Standardisation	Publishers use inconsistent terminology, which makes combining and comparing maps from different operators difficult.

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The Solution

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

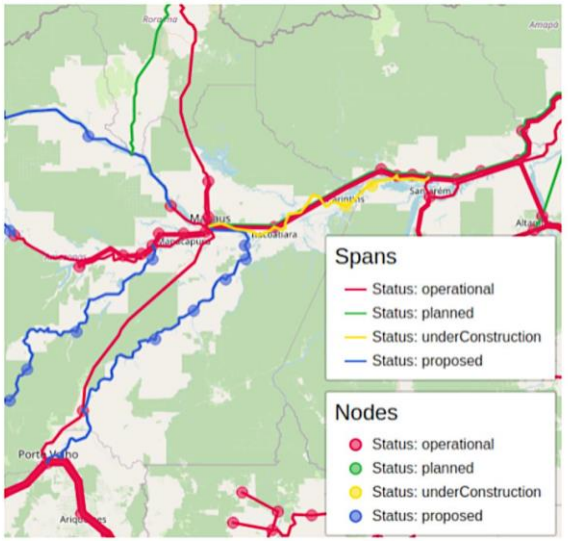
A common data language for fibre.

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What does OFDS data look like?

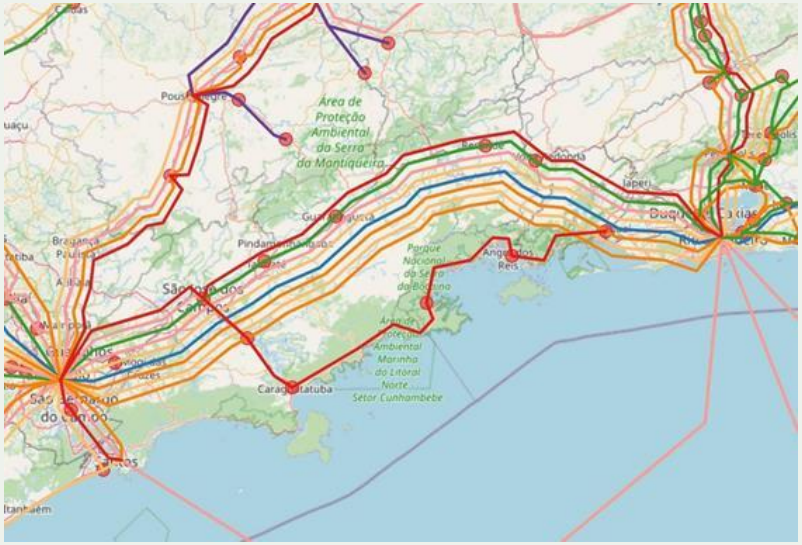
- A network is a set of nodes interconnected by spans.
- Each node has an identifier, so spans reference it explicitly, without guessing from geographic proximity.
- Nodes and spans carry a status: operational, planned, under construction or proposed.
- Formats: GeoPackage, CSV (WKT), JSON, and GeoJSON by conversion.


```
{
  "networks": [
    {
      "id": "febb76d1-ddd6-466f-ada6-9419572b830b",
      "name": "Brazil",
      "nodes": [
        {
          "id": "0",
          "name": "Calcoene",
          "location": {
            "type": "Point",
            "coordinates": [
              -50.945839,
              2.496629
            ]
          },
          "address": {
            "country": "BR"
          },
          "status": "operational"
        },
        {
          "id": "1",
          "name": "Amapa",
          "location": {
            "type": "Point",
```

Benefits to governments and regulators

- Understanding the true extent of national fibre infrastructure
- More effective network investments by accurately targeting the unserved
- Improved coordination across infrastructure sectors: road, electricity, rail, oil and gas
- Reduction of physical network interruption and destruction
- Opportunity for national and regional benchmarking
- Cybersecurity benefits: redundancy is key to network resilience



Fibre networks between São Paulo and Rio de Janeiro

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

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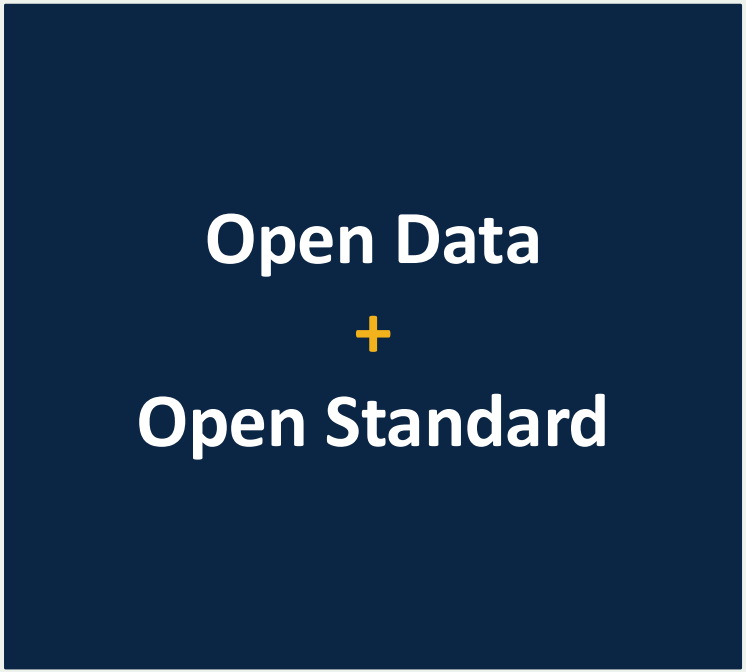
A common language

OFDS is both an Open Data and an Open Standards initiative.

A common language for describing terrestrial fibre is essential to understanding network resilience and to regulatory compliance, whether the data is made public or kept to a limited group.

Regulators and operators can choose together the level of transparency that is appropriate.

Public data obfuscation is an option: maps can be useful to researchers while allaying operators' security concerns.



From evidence to action

1. Use Pulse country reports and the Resilience Index as evidence for benchmarking and policy.
2. Consider OFDS for infrastructure reporting and licensing data requirements.
3. Take part in OFDS governance and working groups.
4. Build common data standards into regional mapping work such as Africa-BB-Maps.

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Internet Society Pulse
pulse.internetsociety.org
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Open Fibre Data Standard
ofds.info
standard.ofds.info

Thank you.

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