

Open Telecom Data



Steve Song

NSRC / Mozilla / APC

@stevesong

<https://manypossibilities.net>



The Internet is a kind of super power

**...it is not
quite
turning out
how we
imagined it**



... but the
genie is not
going back in
the bottle.



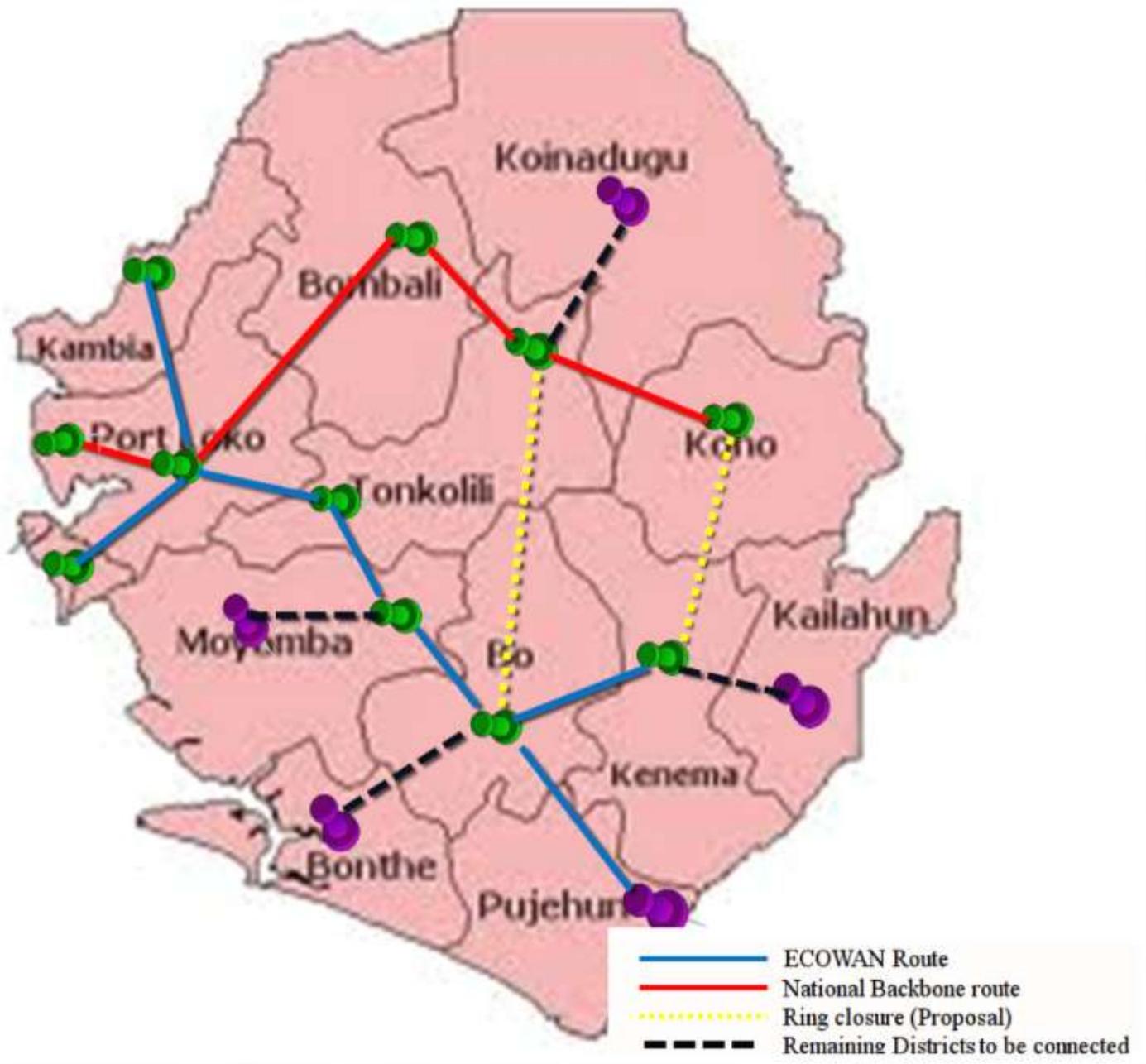
We Need to Better Understand the Challenge

Fibre

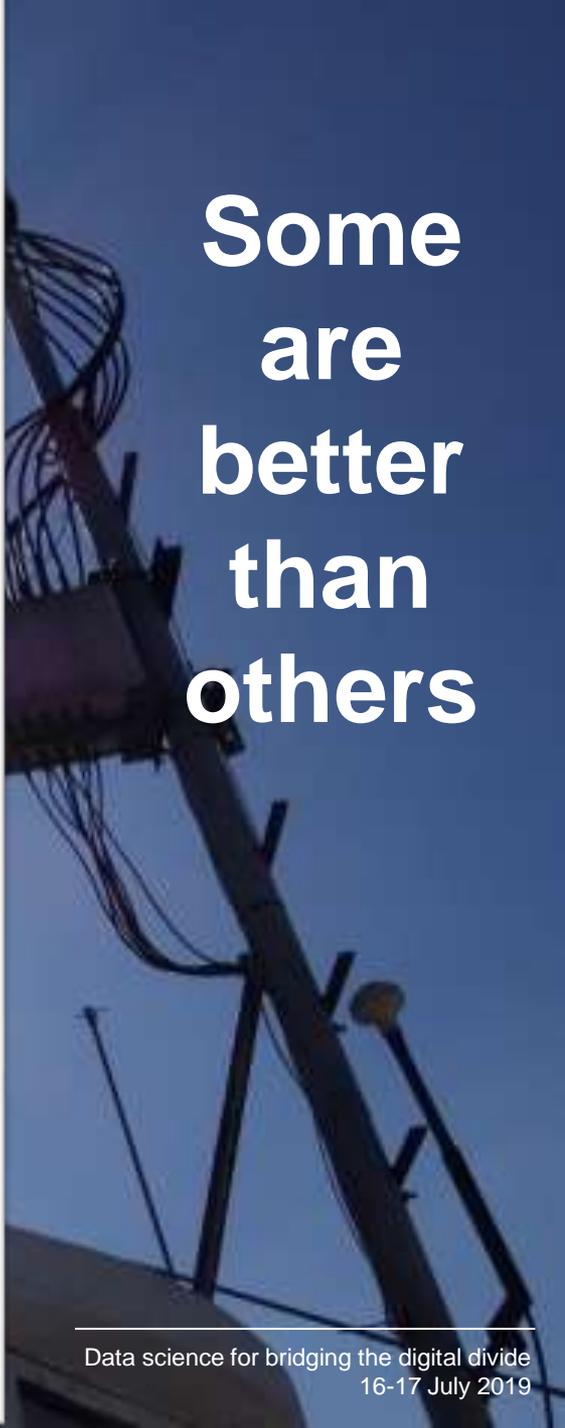
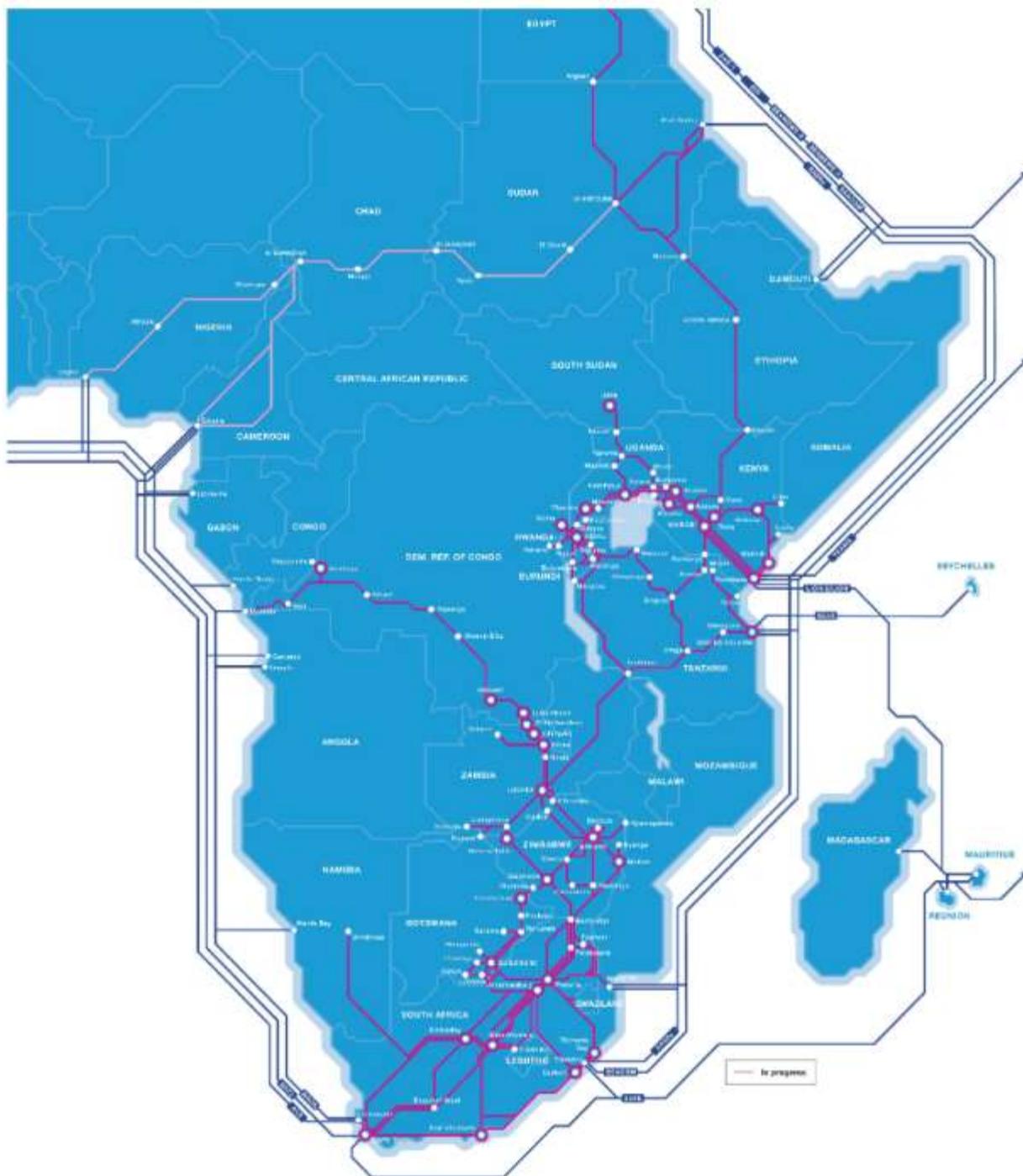
Towers

Spectrum

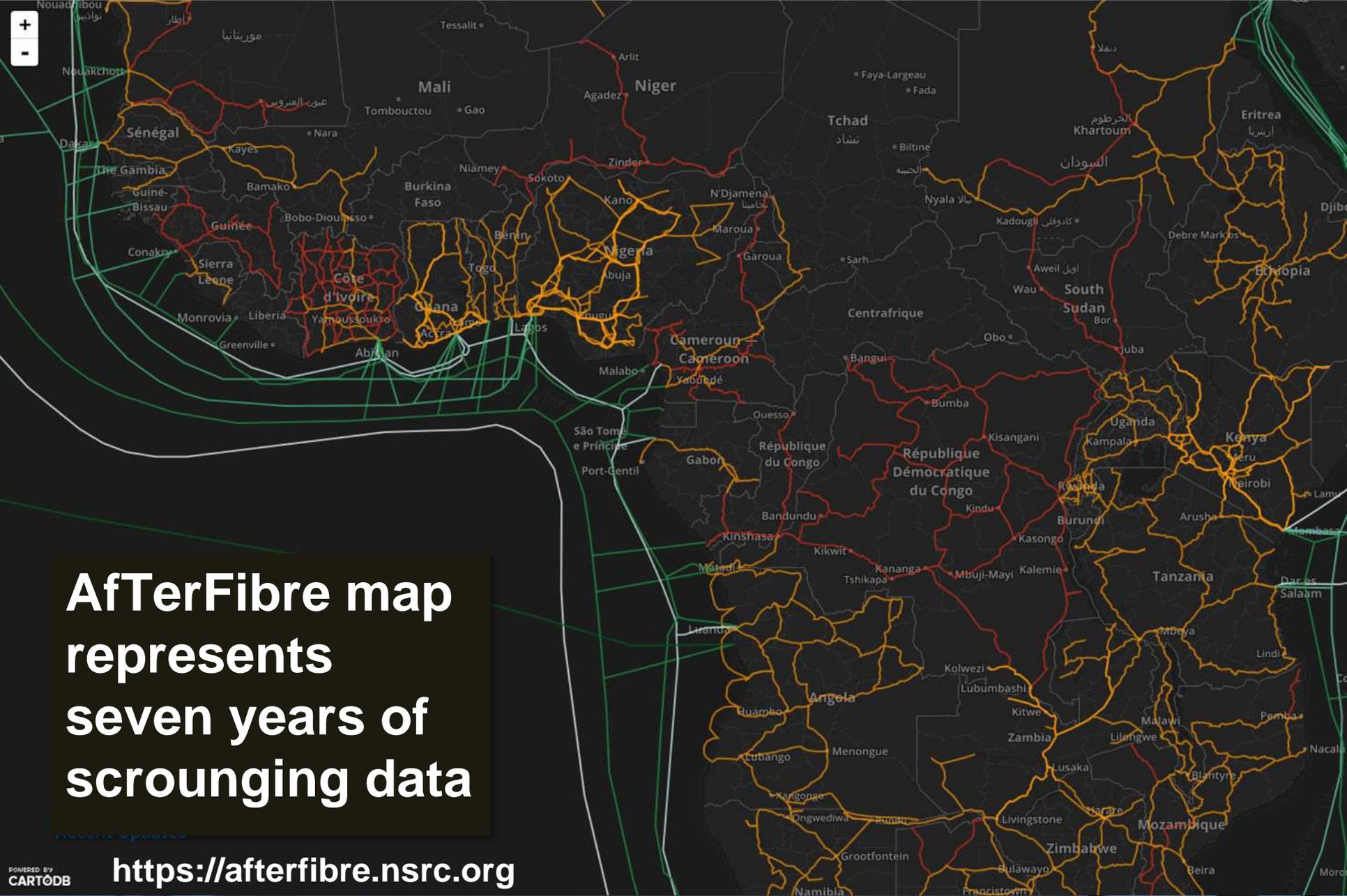
Pricing



Available
fibre
maps
lack
detail



Some
are
better
than
others

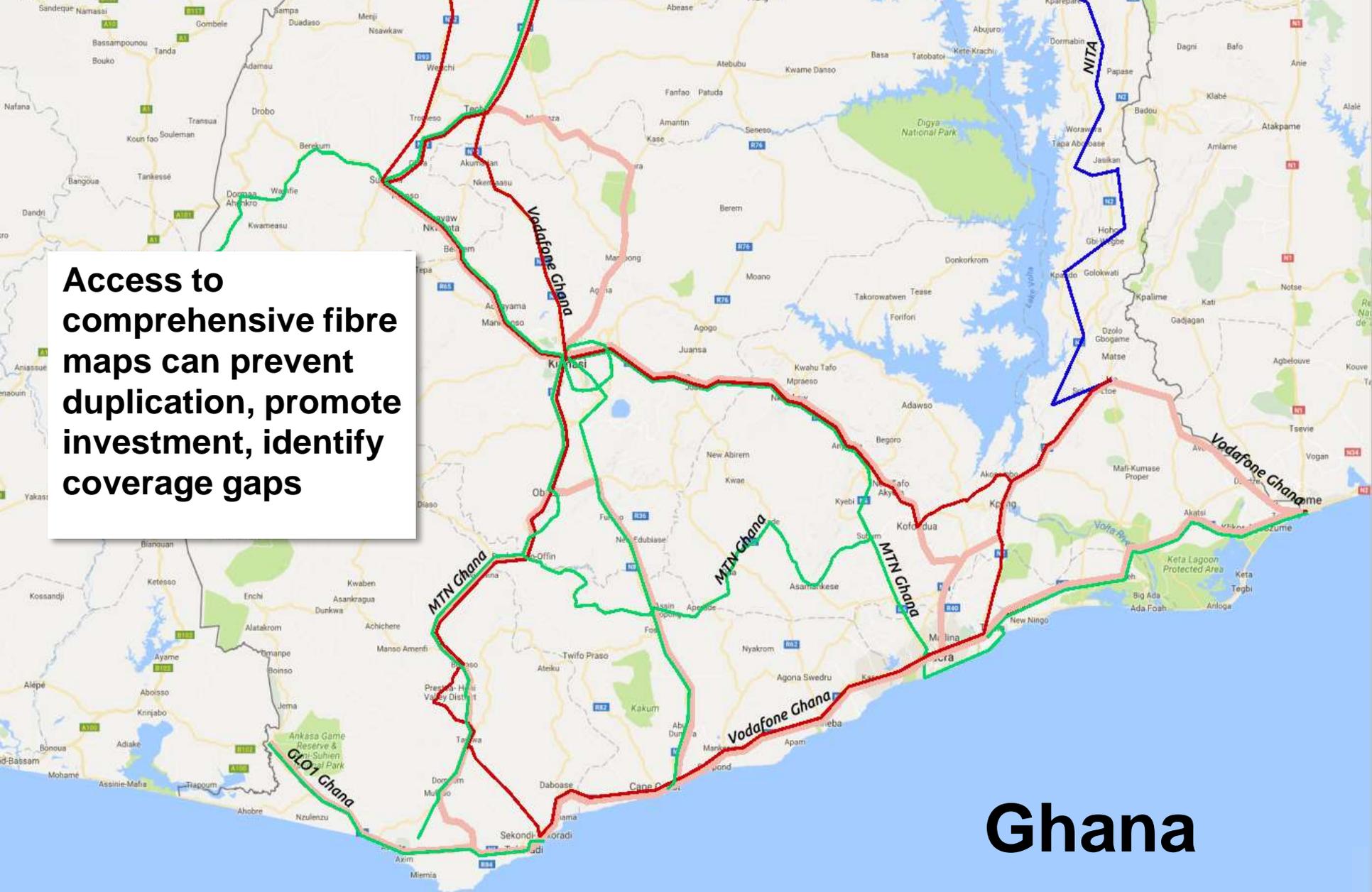


**AfTerFibre map
represents
seven years of
scrounging data**

<https://afterfibre.nsrc.org>

POWERED BY
CARTODB

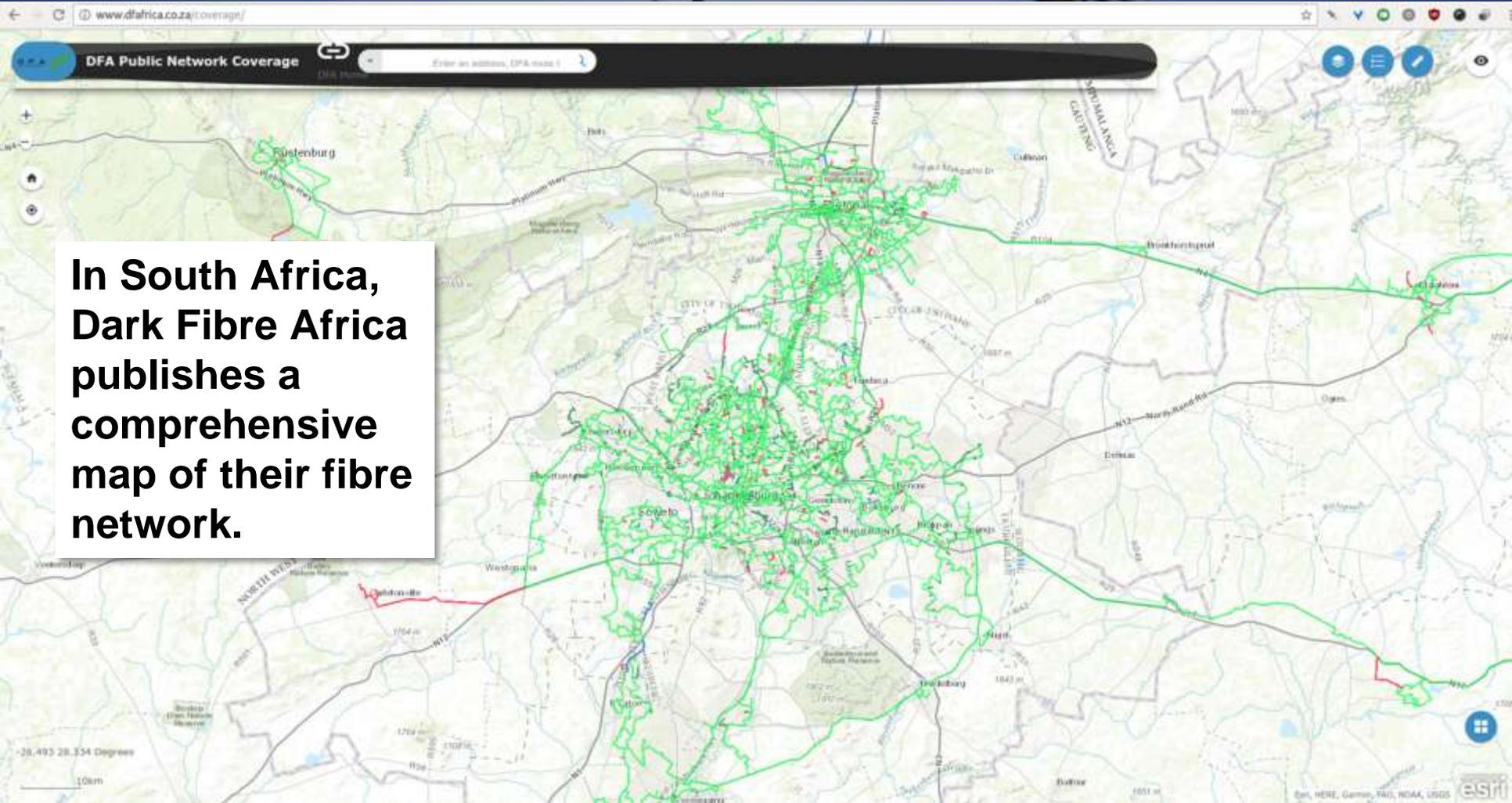
Access to comprehensive fibre maps can prevent duplication, promote investment, identify coverage gaps



Ghana

Good Practice Exists!

In South Africa, Dark Fibre Africa publishes a comprehensive map of their fibre network.



Open Telecom Data

Fibre

Towers

Spectrum

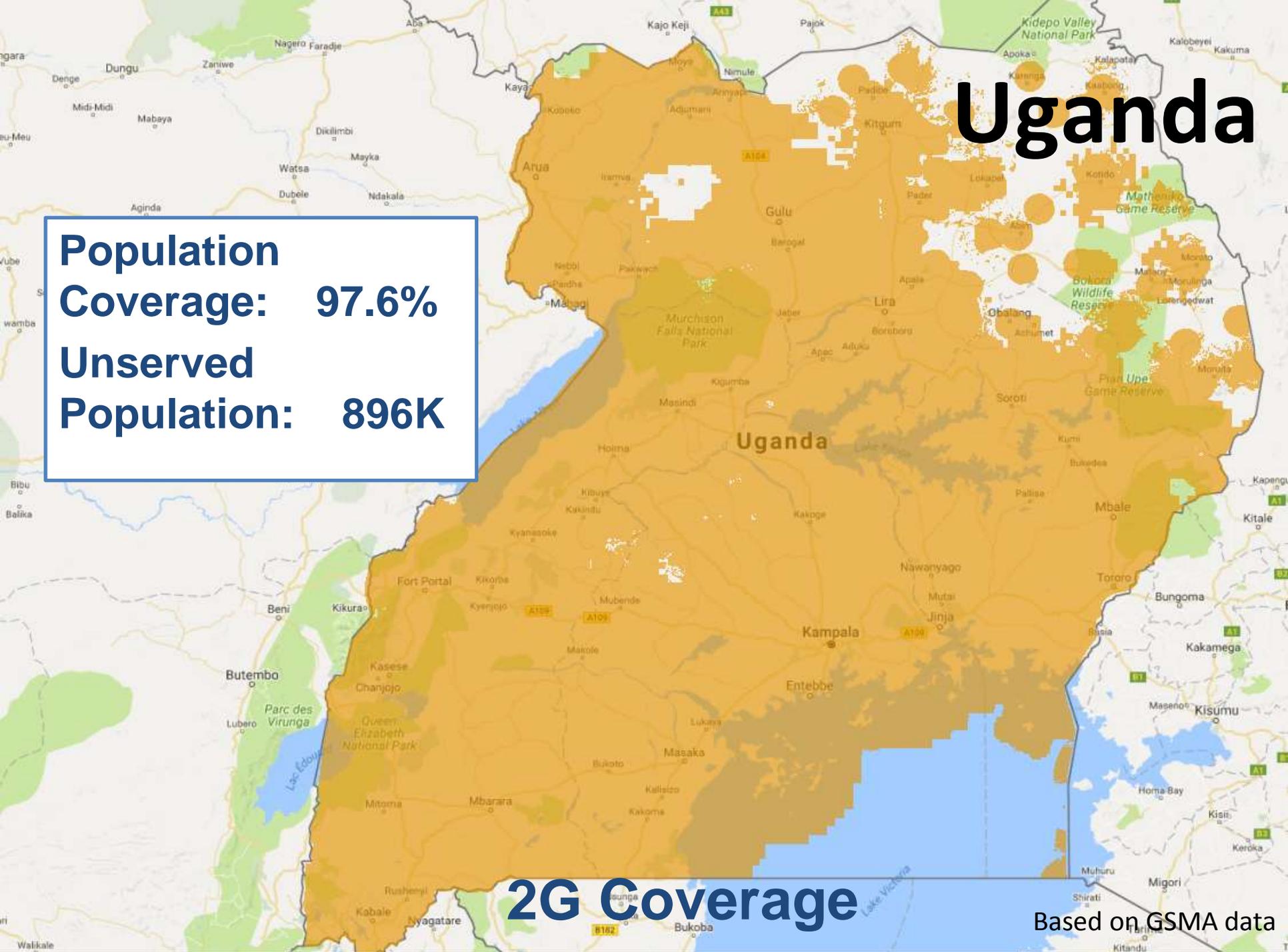
Pricing

Uganda

Population Coverage: 97.6%
Unserviced Population: 896K

2G Coverage

Based on GSMA data



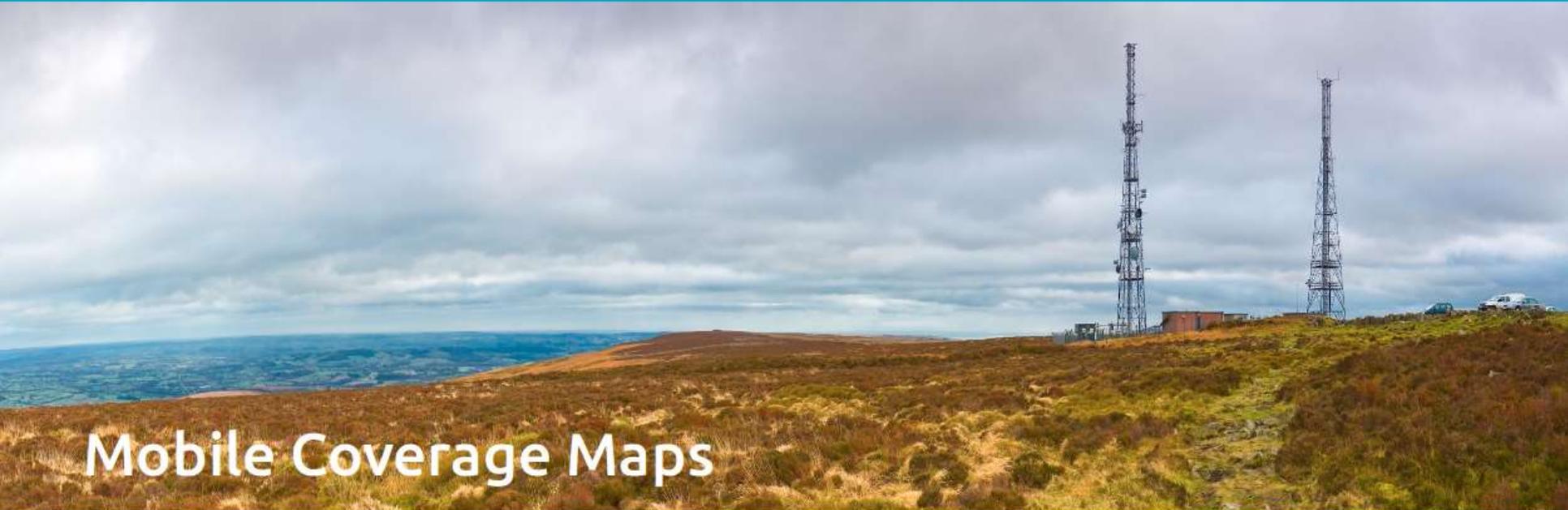
Uganda

Population Coverage: 81%
Unserved Population: 6.5M

2G coverage

Research by RIS based on tower data

Mobile Coverage Maps



Mobile Coverage Maps

Welcome to the GSMA 'Mobile Coverage Maps' platform, developed by the Connected Society programme.

Reliable population mobile coverage data is the starting point for enabling the digital economy. Access to this data is vital in order to:



POPULATION DATA

Sub-county

DISTRICT :
Kotido

WARD
COUNTY :
Jie

WARD :
Panyangara



2G Covered
57183



3G Covered
56085



4G Covered
0

Additional Data

Field	Value
Total Population	87940
Population under 15 rate	-- %
Adult Population	--
Poverty rate	86%
Cap. Stock (m\$)	--
Population Uncovered by 2G	30757
Population Uncovered by 3G	31855
Population Uncovered by 4G	87940

Coverage status is based on medium and strong signal strength.



Stats

Filter

Distance

Measure

VCell

POIs



2G

3G

4G

Signal strength

- Strong
- Medium
- Weak

Population

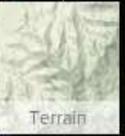
- Less
- More



Mobile Coverage Maps



- Stats
- Filter
- Distance
- Measure
- VCell
- POIs



Terrain

2G
 3G
 4G

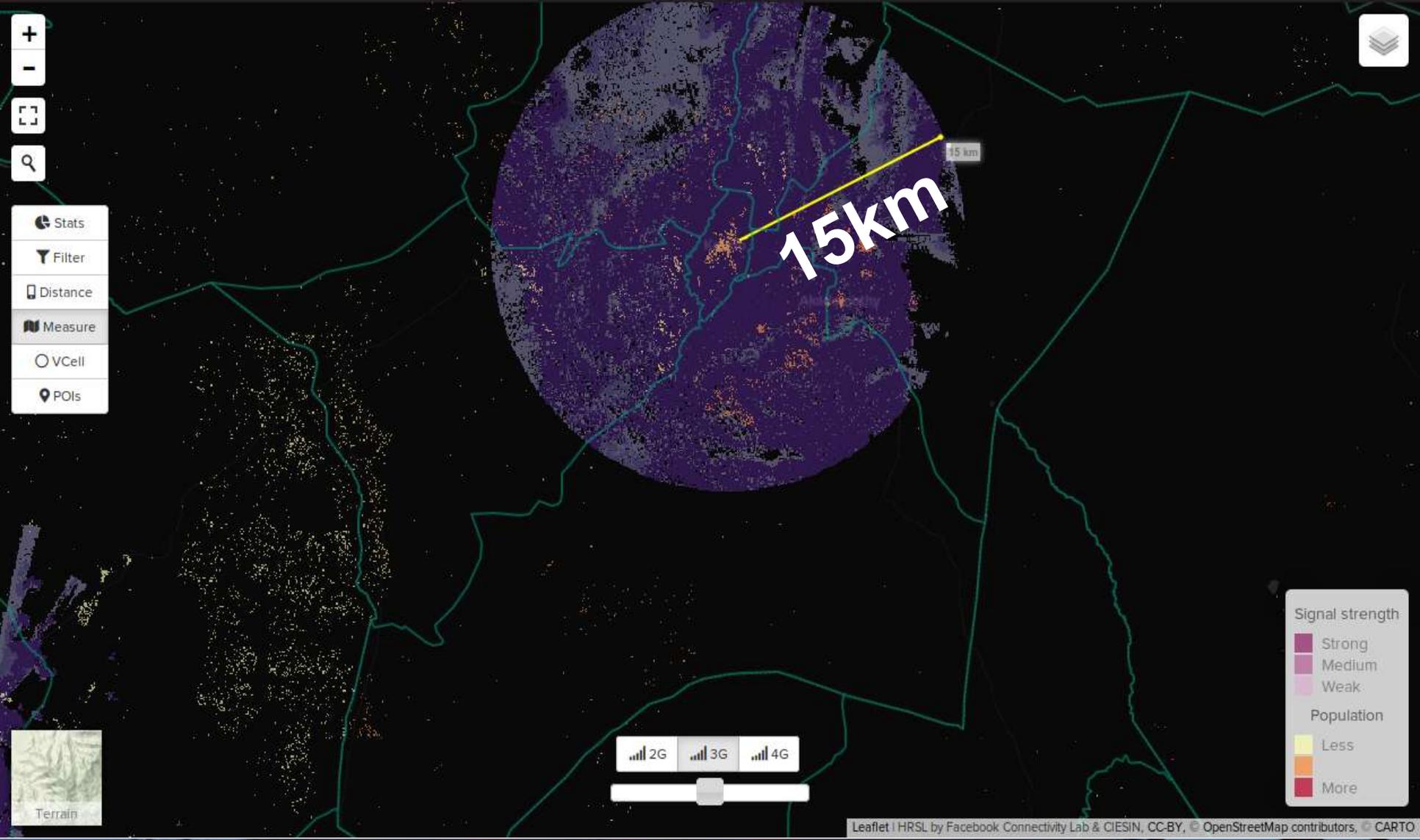
Signal strength

- Strong
- Medium
- Weak

Population

- Less
- More

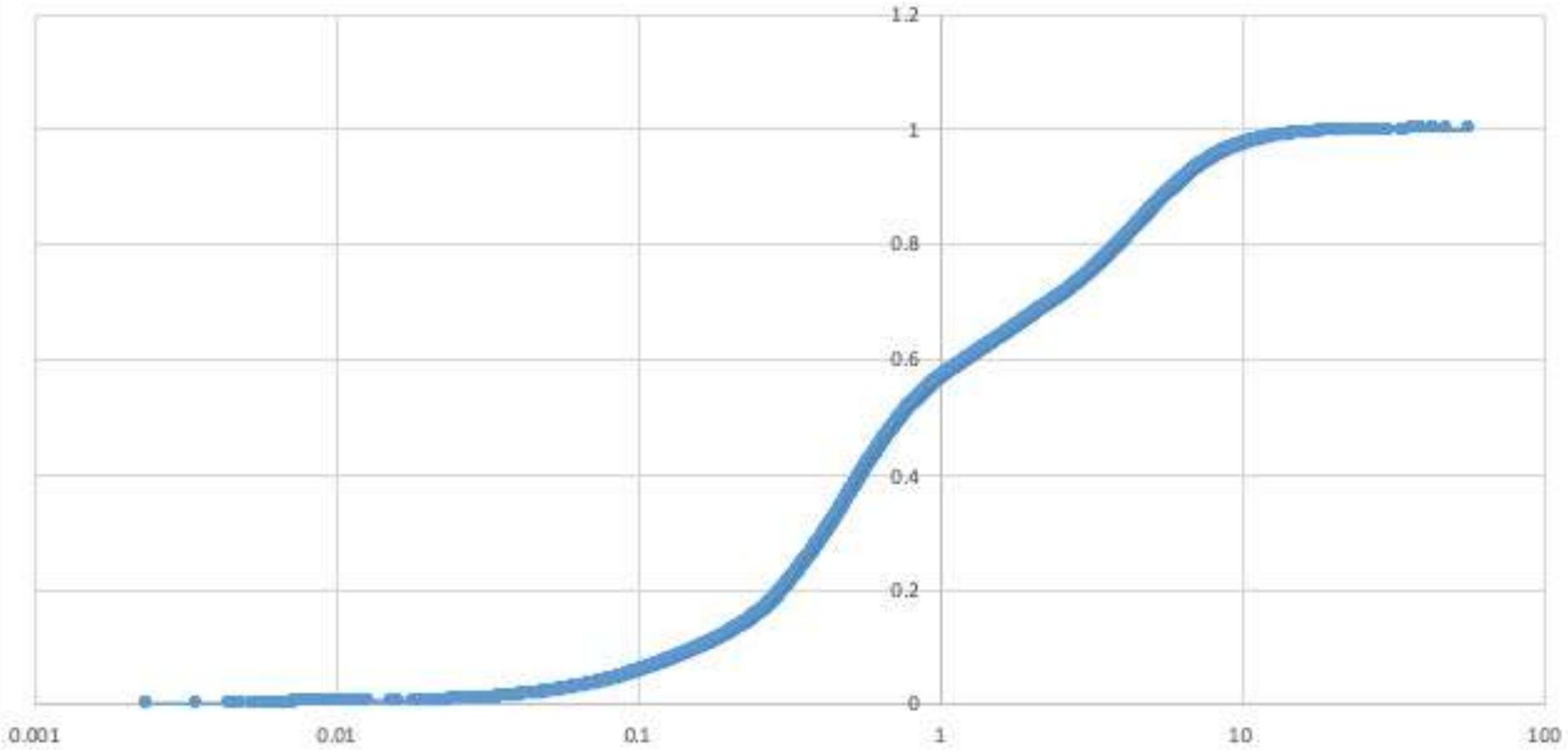
Leaflet | HRSL by Facebook Connectivity Lab & CIESIN, CC-BY, © OpenStreetMap contributors, © CARTO



Cell Size

Mobile Cell Size in South Africa

Cumulative distribution of cell radius in South Africa

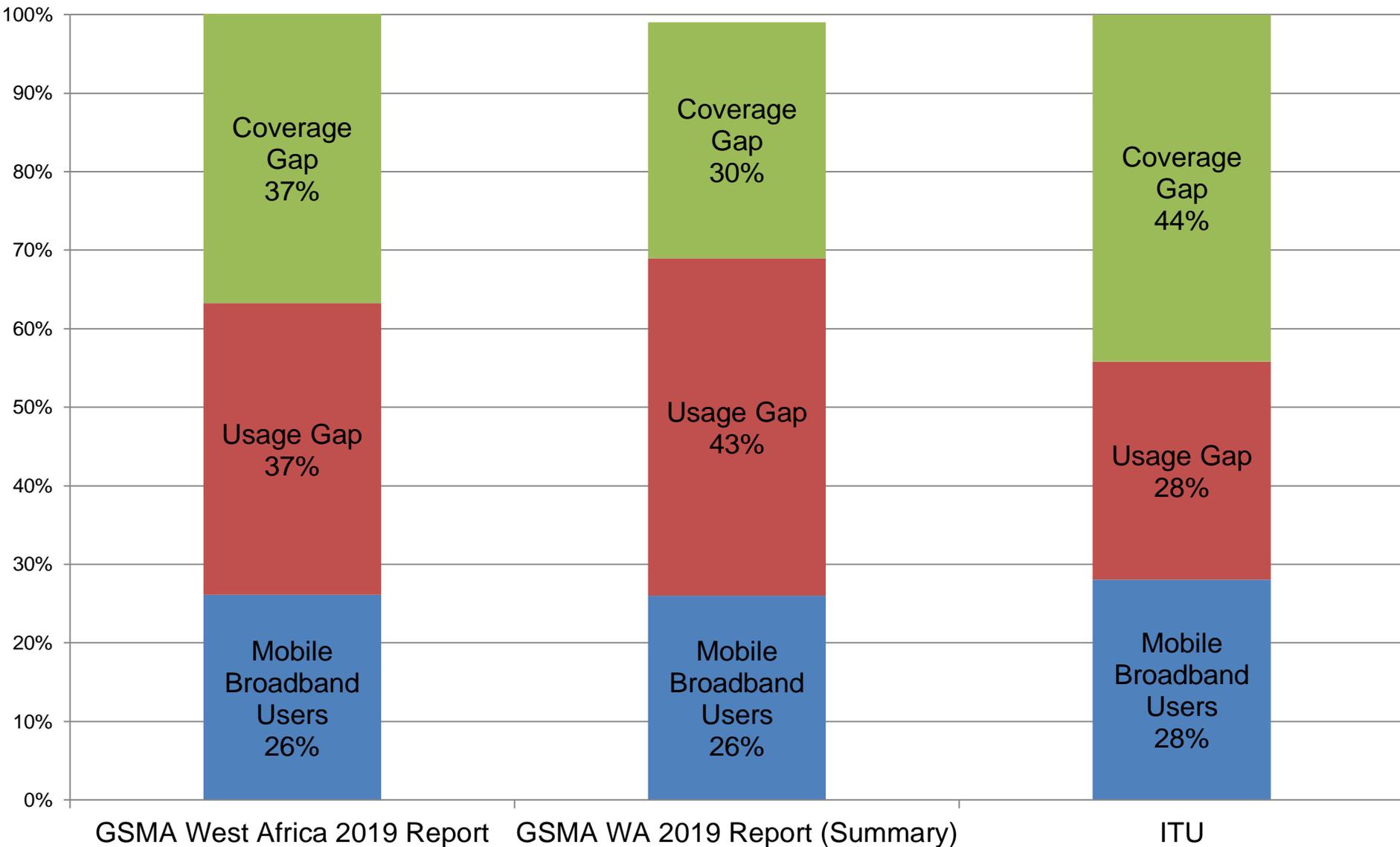


Some anomalies

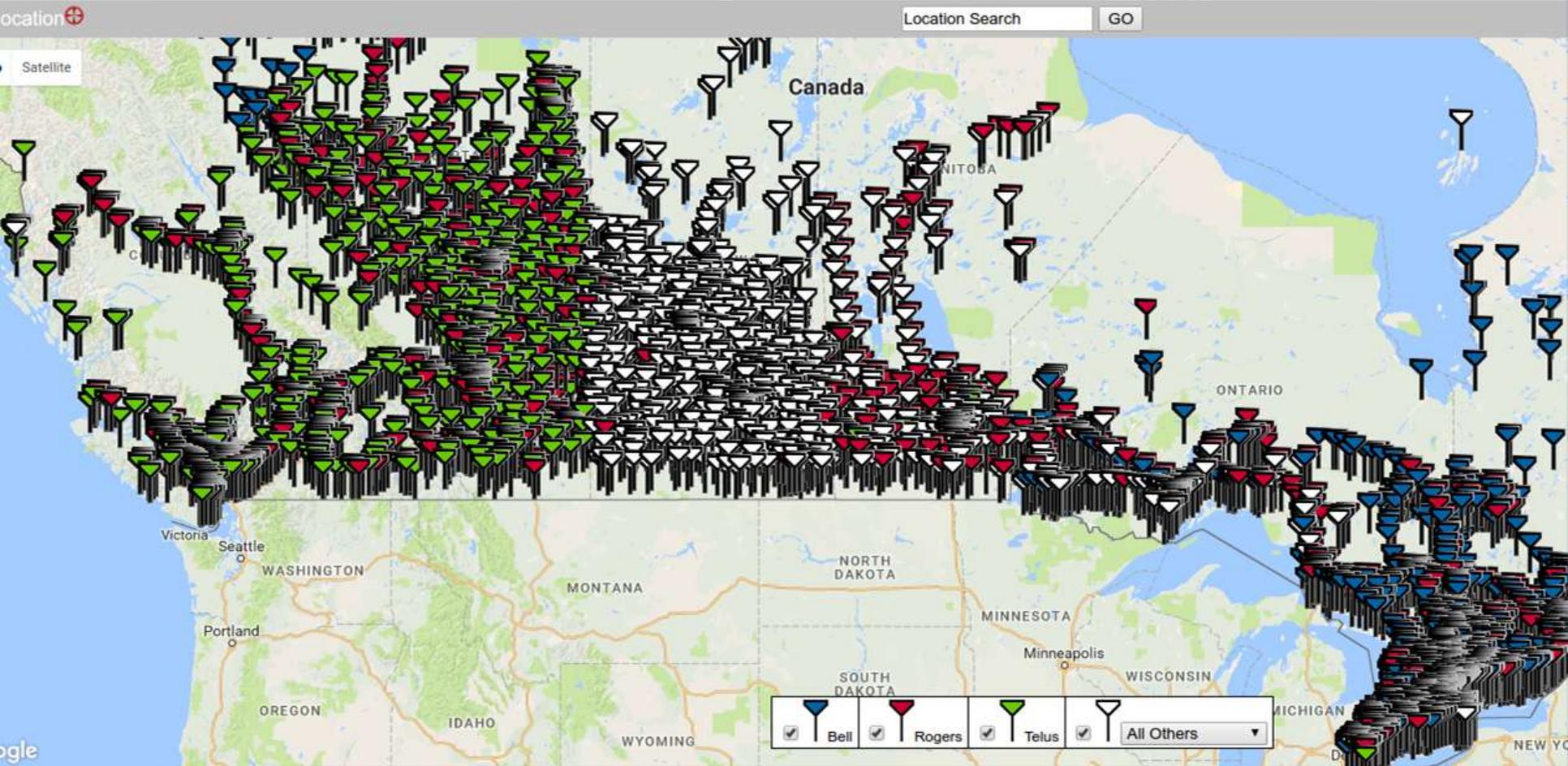
	# wards where more population is covered by 3G than by 2G	Total population covered by 3G but not 2G	# wards where more population is covered by 4G than by 2G	Total population covered by 4G but not 2G	# wards where more population is covered by 4G than by 3G	Total population covered by 4G but not 3G
Ghana	15	44,330	4	2,265	16	44,909
Côte d'Ivoire	10	55,507	28	192,893	58	593,419
Liberia	18	3,302	40	13,359	121	106,654
Nigeria	63	330,940	13	74,532	34	93,250
Rwanda	0	0	37	13,750	240	1,086,040
Tanzania	34	49,787	0	0	2	832
Uganda	272	335,631	21	10,877	15	15,537
Zambia	0	0	0	0	0	0
Totals	412	819,498	143	307,676	486	1,940,641

Difference in Mobile Broadband Users / Coverage

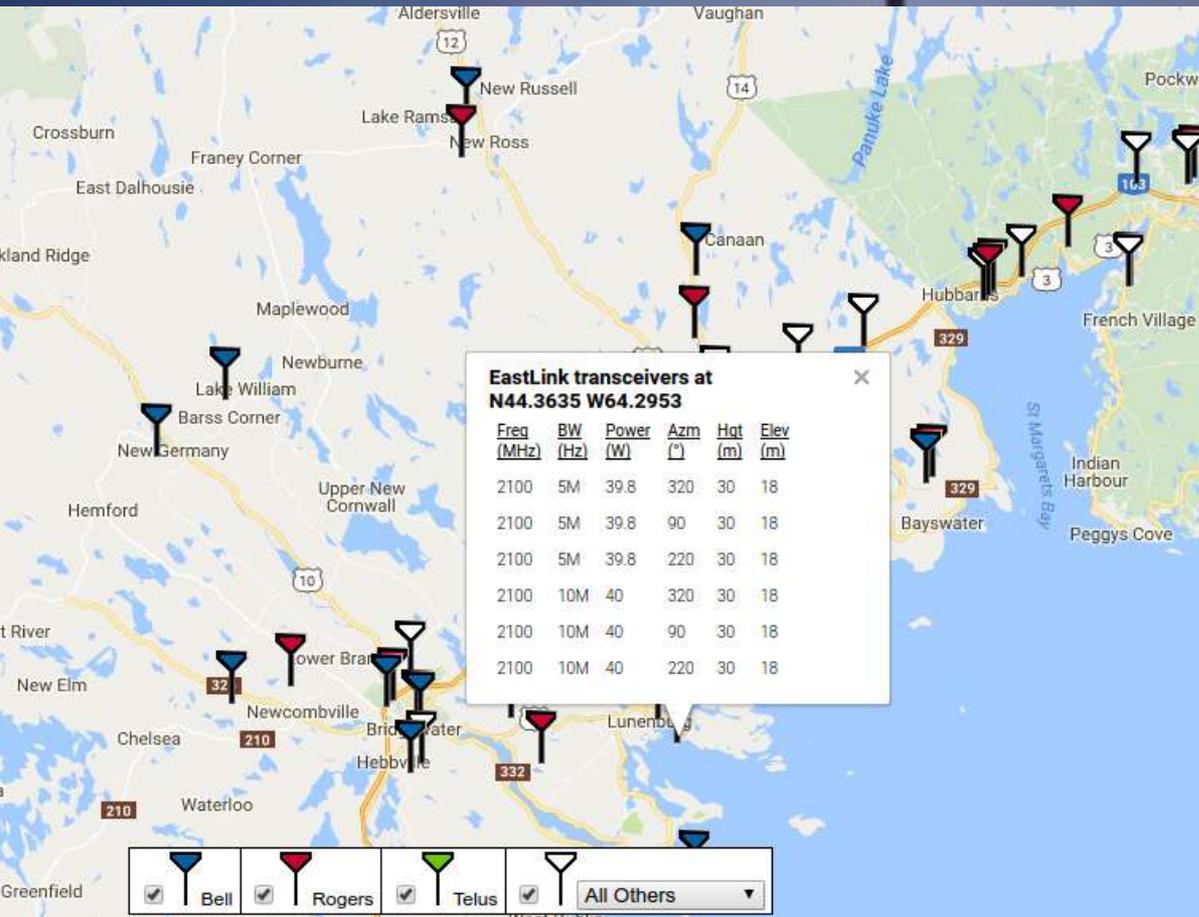
■ Mobile Broadband Users ■ Usage Gap ■ Coverage Gap



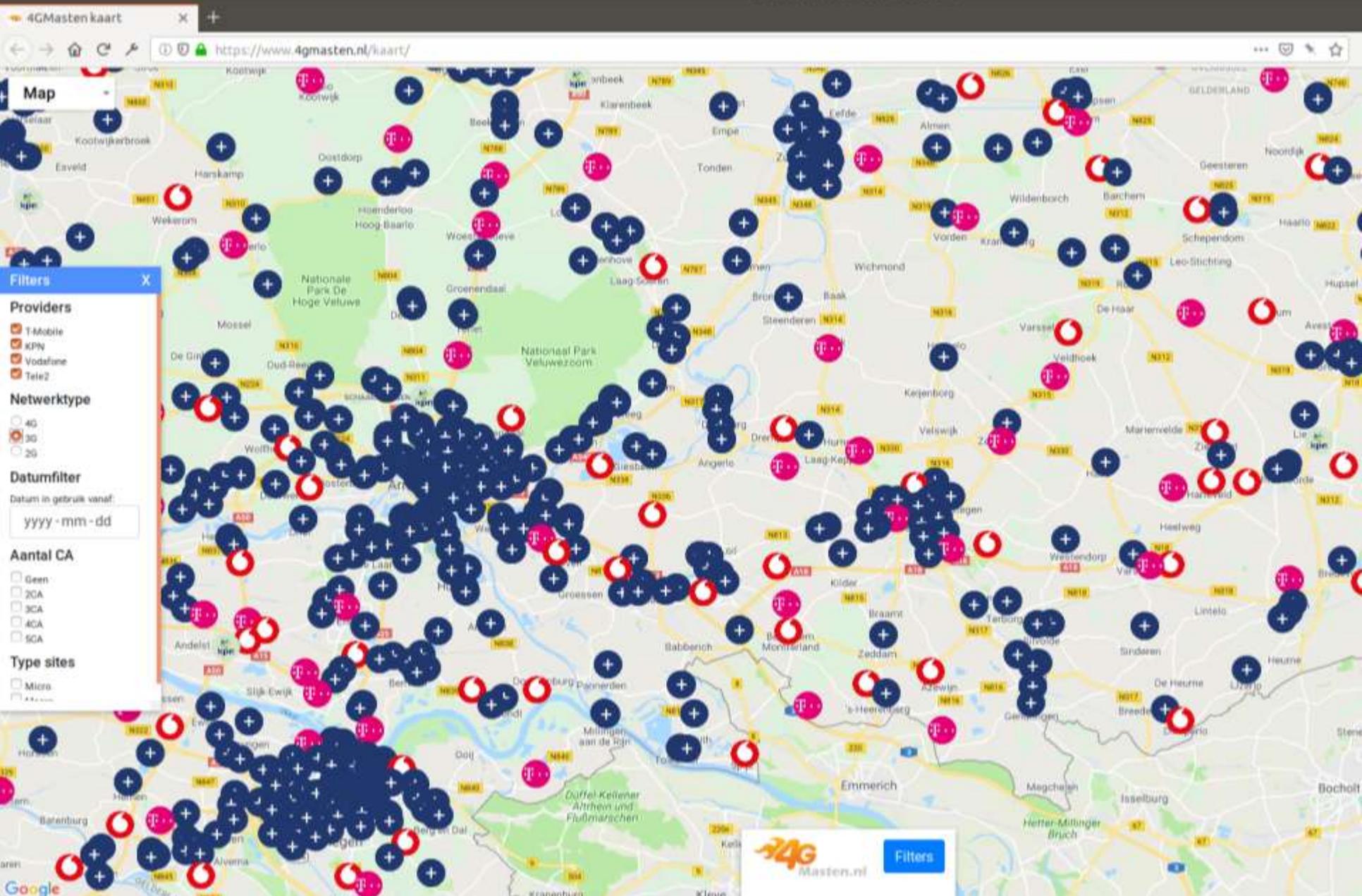
Canadian Tower Map



Canadian Tower Map Detail



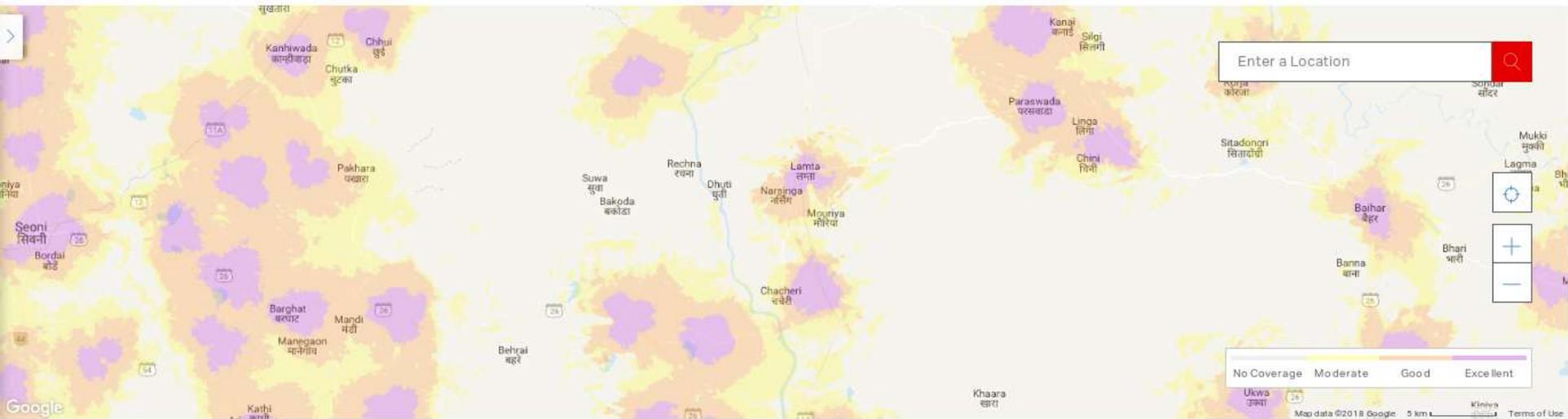
Operator
Location
Frequency
Height
Power



Netherlands

openNETWORK

Because you have a lot to say. And we have nothing to hide.



2G coverage 4G/3G coverage

- Existing Towers
- Towers Upgrading
- Towers Needed
- Towers Forcibly Shutdown

WHAT IS INDIA'S FIRST OPEN NETWORK?

In 2015, Project Leap took the first brave step in building a truly transparent network. It is now



PAY & RECHARGE

PRODUCT

STORE FINDER

AIRTEL MONEY

OUR NETWORK

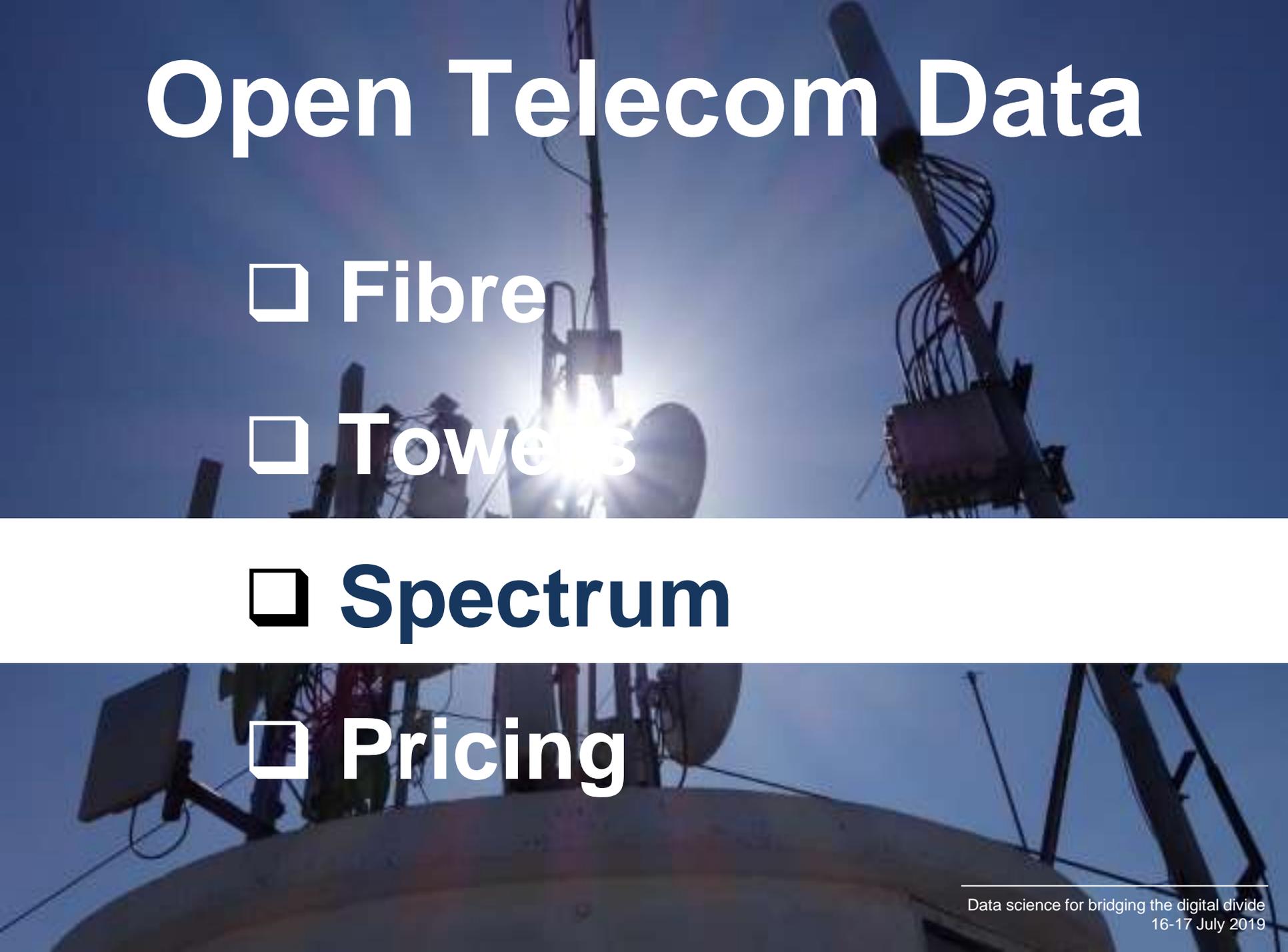
GET HELP

The Network That Covers Uganda.



Airtel Uganda

Open Telecom Data



Fibre

Towers

Spectrum

Pricing

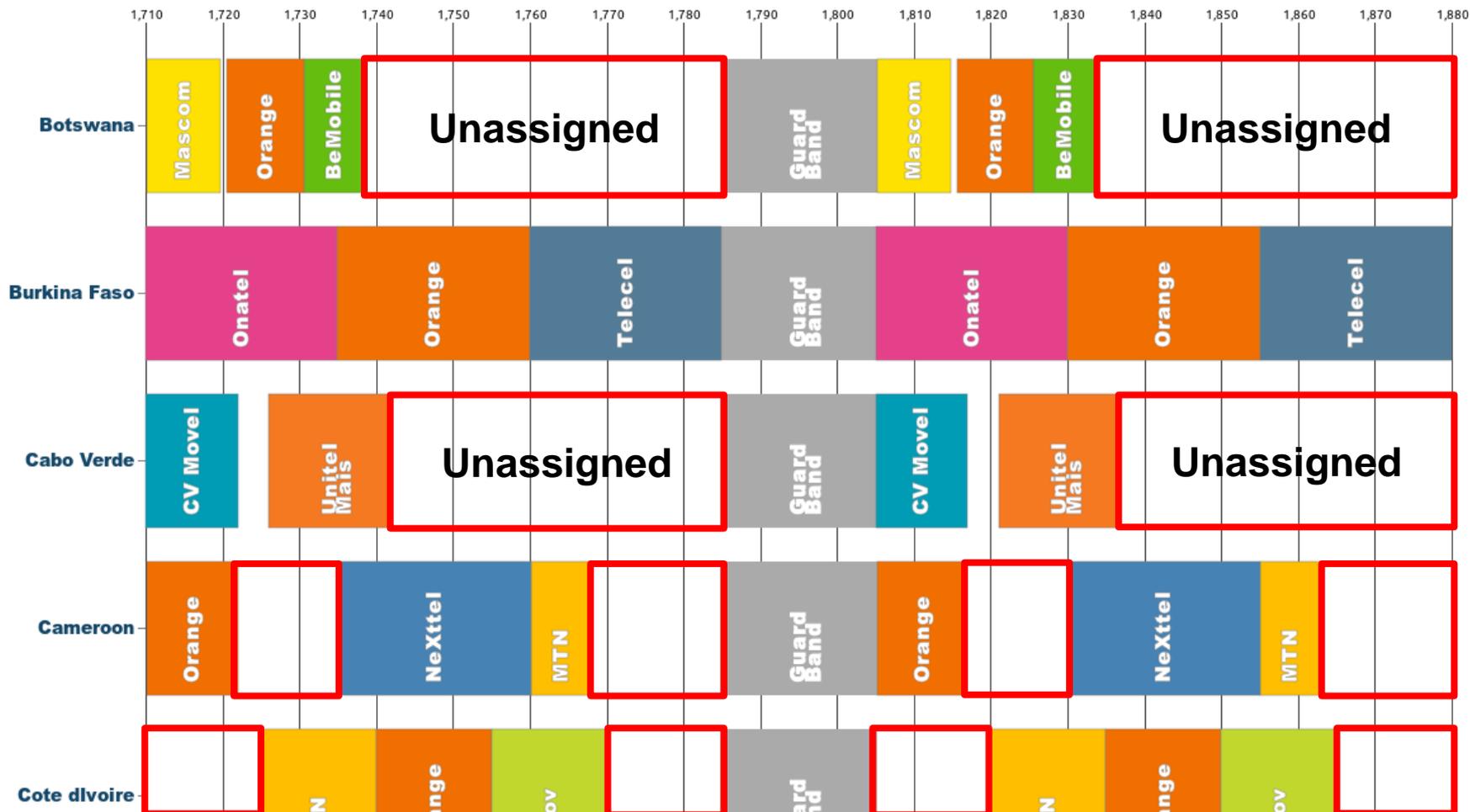
SPECTRUM ASSIGNMENTS

Prototyping a new comparative visualisation of spectrum assignments around the world

Source code: <https://github.com/open-telecom-data/spectrum-assignments/>

800 MHz 900 MHz 1800 MHz 2100 MHz 2600 MHz

1800 MHz Band



Spectrum Assignments

Community Cellular in Mexico

theguardian

home › world › americas › asia › australia › africa › middle east › cities › developm ≡ all

World news Half full: solutions, innovations, answers

'It feels like a gift': mobile phone co-op transforms rural Mexican community

In indigenous communities like Nuyoó, where almost every family has members who have migrated for work, low-cost phone calls are seen as an essential service



People gather in Santiago Nuyoó's main square to hear about the new mobile phone network. The TIC social cooperative has a licence to install networks in 356 marginalised municipalities. Photograph: Nina Lakhani

Regulator
has set aside
small
amounts of
GSM
spectrum for
rural
underserved
areas.

[Home](#) • [Spectrum](#) • [Spectrum information](#) • [Spectrum Information System \(SIS\)](#) • [Spectrum information portal](#)

Spectrum information portal

Please view our [guide to using Ofcom's System Information System \(SIS\)](#) to understand how to use the portal.

Please direct any feedback on your experience of the spectrum information portal to: spectrumportalfeedback@ofcom.org.uk

For the best experience, expand to full screen (click on the button in the bottom right corner).

Data files

View the spectrum information portal data files:

- [Transfer Notification Register \(CSV\)](#)
- [Wireless Telegraphy Register \(CSV\)](#)

1 SPECTRUM OVERVIEW

- View the spread of Allocations and Applications across the spectrum.
- Specify a frequency range or pre-defined frequency bands.
- See which frequencies are allowed to be used under each Application.
- Drill-through into details of a particular Allocation/Application or into the licences which are part of a specific application.

2 ALLOCATION / APPLICATION DETAIL

- View details relating to a specific allocation (either brought in from the Spectrum Map or by specifying one or more allocations on this page).
- For each allocation view the frequency ranges on which it operates, the footnotes relating to each range (outlining the rules governing use of the frequency) and the applications which share the same frequencies.

Open Telecom Data

- Fibre
- Towers
- Spectrum
- Pricing

ECONOMIC COMMUNITY OF
WEST AFRICAN STATES



COMMUNAUTE ECONOMIQUE
DES ETATS DE L'AFRIQUE
DE L'OUEST

**THIRTY-FIRST SESSION OF THE AUTHORITY OF HEADS
OF STATE AND GOVERNMENT**

Article 22: Publication of a reference interconnect offer

The reference interconnect offers approved by the national regulatory authority shall be made available on the dominant operators' websites and shall be accessible by a web link available on the national regulatory authority's website.

THE HIGH CONTRACTING PARTIES,

MINDFUL of Articles 7, 8 and 9 of the ECOWAS Treaty as amended establishing the Authority of Heads of State and Government and defining its composition and functions;

1.4.2 Offre de transit IP au niveau des POP

Capacité (Mbps)	Tarif en FCFA/mois/Mbps
100 à 1000	20 000
Plus de 1000	18 000

Frais d'accès : 500 000 FCFA

Les équipements colocalisés concernés doivent avoir au maximum les caractéristiques ci-après :

Volume (V)	$V \leq 1000 \text{ cm}^3$
Poids sur Pylône (P)	$P \leq 5\text{kg}$
Consommation en énergie (E)	$E \leq 20\text{kwh/mois}$

PUBLIC NOTICE - TELECOMMS AND ICT PRICES

Corrections to previously flighted advert on Table 1(c) and Figure 2 (a) & (b)

TRENDS OF PRICES IN THE BOTSWANA TELECOMMUNICATIONS AND ICT MARKET 2011 – 2014

In line with the Communication Regulatory Authority Act (No 19 of 2012) and pursuant to the BTA Directive No.1 of 2011, BOCRA wishes to share with the public, trends in the prices of telecommunication and Internet services at both wholesale and retail levels. The services referred to in this publication are offered by the 4 major public operators, that is, Botswana Fibre Networks (BoFINet), Botswana Telecommunications Corporation Limited (BTCL), Mascom Wireless Botswana and Orange Botswana. Trends indicate that prices have been reducing over the 3-year period of 2011 to 2014 especially for data Internet services.

Prices for Value Added Network Services (VANS or ISPs) providers will be issued in the July 2014 publication.

The information is shared with consumers to advise on the state of prices of telecommunication and ICT services as at May 2014. BOCRA shall monitor movements in the ICT prices and will ensure that the end consumer benefits from the falling prices.

WHOLESALE PRICES

Over the 3 years BOCRA approved the following wholesale tariffs:

- National Leased lines which affect prices of both voice and data services;
- Internet Bandwidth, which affect prices for data services;
- International Private Leased Circuits, which affect prices of carrying telecommunication services across borders; and
- Mobile termination rates, which affect prices of mobile voice calls across mobile network operators (Off-Net Calls)

WHOLESALE INTERNET BANDWIDTH PRICES PER MONTH (BWP)

The following are sample prices of Wholesale Internet Bandwidth by BTCL and BOFINET:

Table 1(a): BTCL WHOLESALE INTERNET BANDWIDTH PRICES IN BWP

Capacity (Mbps)	2011	2012	2013	2014	%age Reduction Over 3 years
1	14,925.32	8,220.89	5,640.28	3,020.76	80
2	29,716.22	16,279.01	11,168.87	6,030.02	80
5	73,180.78	39,500.61	27,100.99	14,988.86	80
8	113,608.51	61,342.31	42,086.33	23,844.26	79
10	138,479.43	75,166.96	51,571.33	29,690.39	79
20	248,707.23	136,605.05	93,723.39	58,231.47	77
30	351,556.82	201,763.88	138,428.22	86,485.23	75
40	445,771.18	264,791.90	181,671.13	114,164.34	74
50	540,604.22	328,881.23	225,642.18	142,130.77	74
60	629,395.20	386,881.17	265,435.36	169,867.34	73
70	712,413.87	442,467.73	303,572.78	197,374.05	72
80	789,922.16	495,713.65	340,104.22	224,650.90	72
90	862,182.90	546,689.38	375,078.18	251,697.88	71
100	929,429.34	595,463.76	408,541.84	278,515.01	70
155	1,150,773.30	869,478.44	596,540.58	426,353.99	63

Table 1(c): PRICE COMPARISON IN BWP - BTCL AND BOFINET WHOLESALE INTERNET (Correction to previously flighted tables)

Mbps	Current Prices per month(P)		Prices Effective July 1, 2014	
	BOFINET	BTCL	BOFINET	BTCL
10	36,693.00	29,690.39	12,162.00	13,394.85
20	73,387.00	58,231.47	24,323.00	26,364.46
30	110,080.00	86,485.23	36,485.00	39,227.76
40	146,774.00	114,164.34	48,646.00	51,878.45
50	183,467.00	142,130.77	60,808.00	64,635.45
60	211,960.00	169,867.34	70,435.00	77,307.40
70	247,286.00	197,374.05	82,175.00	89,894.30
80	282,613.00	224,650.90	93,914.00	102,396.15
90	317,940.00	251,697.88	105,653.00	114,812.96
100	343,376.00	278,515.01	117,392.00	127,144.73
150	515,064.00	413,462.62	174,822.00	189,122.47
200	670,751.00	536,725.62	231,829.00	248,548.81
300	1,006,126.00	764,862.74	343,943.00	363,255.46
500	1,656,874.00	1,133,981.33	560,570.00	571,938.65
600	1,952,911.00	1,280,326.22	668,884.00	667,190.89

Figure 2 (a): BTCL AND BOFINET CURRENT WHOLESALE INTERNET BANDWIDTH PRICE

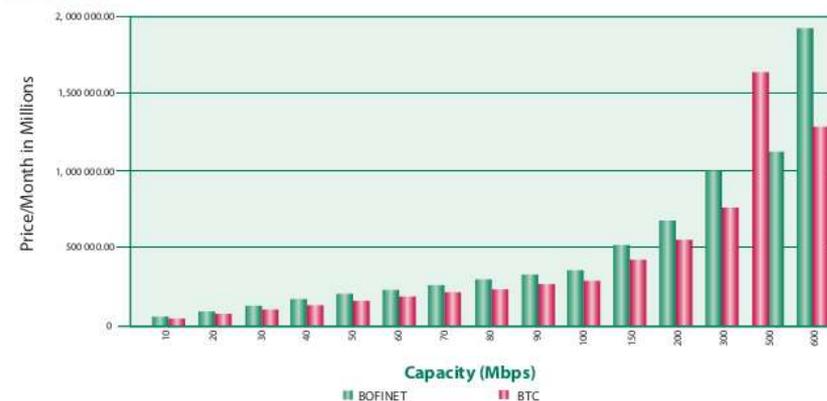


Figure 2 (b): PRICE COMPARISON IN BWP - BTCL AND BOFINET WHOLESALE INTERNET BANDWIDTH PRICE NEW PRICES EFFECTIVE JULY 2014



Open Telecom Data

- ❑ Fibre
- ❑ Towers
- ❑ Spectrum
- ❑ Pricing

Opportunity for
common policies
and data
standards for
public telecom
data



CONNECTED SOCIETY

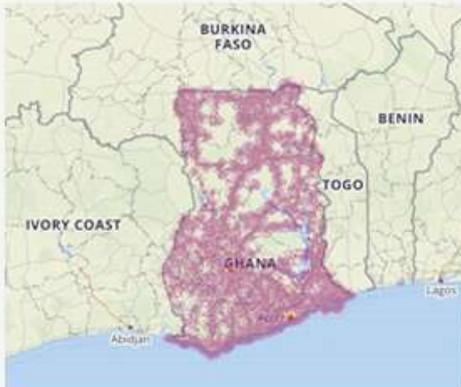


Register your place at the Connected Society webinar

Exploring the GSMA Coverage Maps Platform

Wednesday 24 July | 3pm GMT

Register Now



Explore the GSMA Coverage Maps Platform

You don't have to wait for the webinar to get started. Visit the [GSMA Coverage Maps Platform](#) now to explore the coverage and population data of 8 African countries.

Use Tool

This initiative is currently funded by the UK Department for International Development (DFID), and supported by the GSMA and its members.



The Swedish International Development Cooperation Agency, Sida, is a government agency working on behalf of the Swedish parliament and government, with the mission to reduce poverty in the world. Through our work and in cooperation with others, we contribute to implementing Sweden's Policy for Global Development.



How to Bring About Change

Spread good practice

Engage regulators

Engage funders