Connect2Recover

Building back better with broadband

Webinar: Identifying Country-level Connectivity Gaps and Building Resilience To Future Pandemics

15 March 2021

Identifying and combining data sources for Connect2Recover
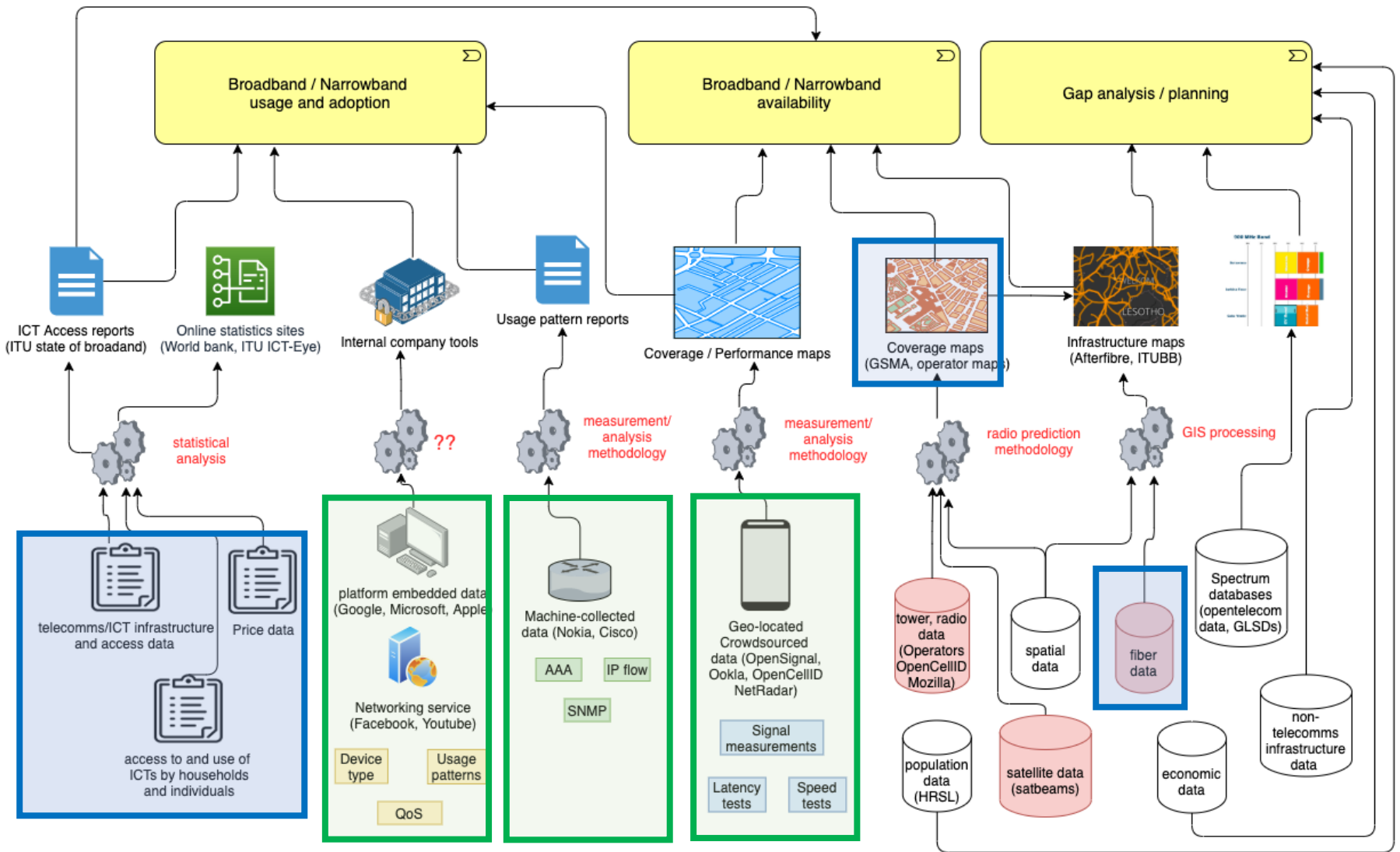
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Data taxonomy for broadband/narrowband

More data sources = more reliable data / gaps filled

Current ITU sources

Complementary sources

Broadband / Narrowband usage and adoption

Broadband / Narrowband availability

Gap analysis / planning

ICT Access reports (ITU state of broadand)

Online statistics sites (World bank, ITU ICT-Eye)

Internal company tools

Usage pattern reports

Coverage / Performance maps

Coverage maps (GSMA, operator maps)

Infrastructure maps (Afterfibre, ITUBB)

statistical analysis

??

measurement/ analysis methodology

measurement/ analysis methodology

radio prediction methodology

GIS processing

telecomms/ICT infrastructure and access data

Price data

access to and use of ICTs by households and individuals

platform embedded data (Google, Microsoft, Apple)

Networking service (Facebook, Youtube)

Device type

Usage patterns

QoS

Machine-collected data (Nokia, Cisco)

AAA

IP flow

SNMP

Geo-located Crowdsourced data (OpenSignal, Ookla, OpenCellID NetRadar)

Signal measurements

Latency tests

Speed tests

tower, radio data (Operators OpenCellID Mozilla)

spatial data

fiber data

Spectrum databases (opentelecom data, GLSDs)

population data (HRSL)

satellite data (satbeams)

economic data

non-telecomms infrastructure data

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Purpose and function of data sources

- For cases where ITU ICT indicators are reported to the ITU in a given year

  - supplementary data sources primarily serve to check quality and reliability of data

- For cases were there are missing ITU ICT indicators in a given year

  - supplementary data sources serve both to potentially provide wider insight into coverage, usage and adoption as well as check quality and reliability of the available indicators

  - e.g., 143 member states provided 4G coverage in 2019, 73 members states reported Internet use data in 2019 (196 member states)
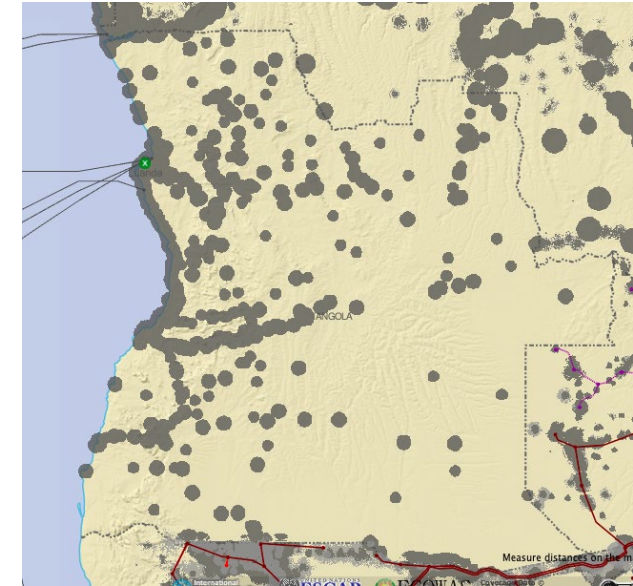
Coverage map quality problem

Lavender shades show purported coverage In Southwestern Uganda (source: Vanu)
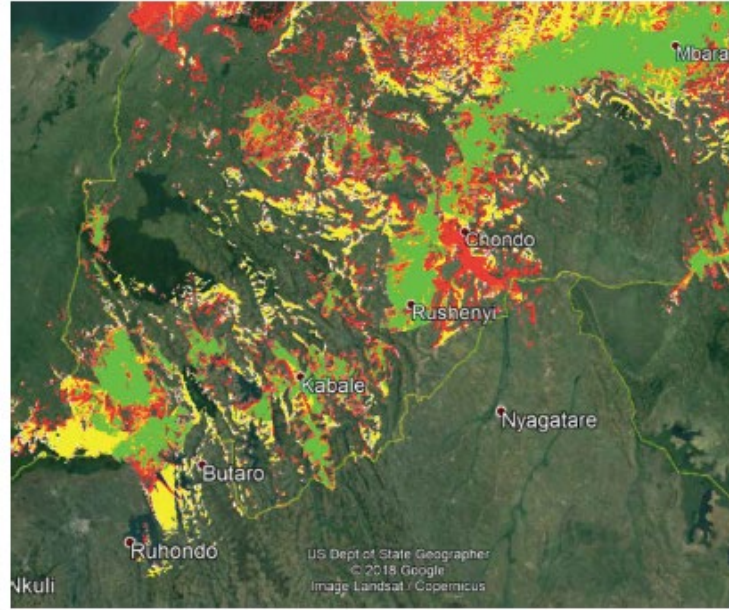
Lime green, yellow, orange and red show estimated coverage with decreasing signal strength and background (darker green) shows uncovered terrain using Vanu radio coverage tools (source: Vanu)
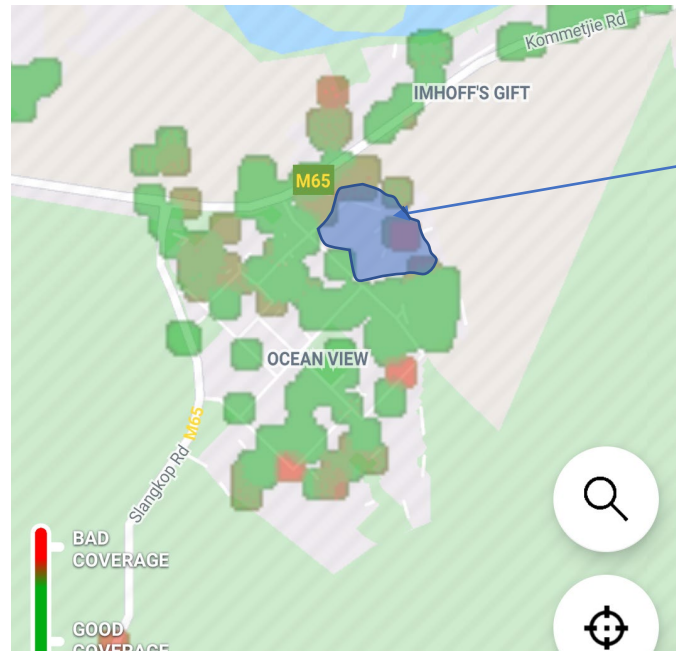

Current GSMA coverage map for Angola shows perfect circles for 2G coverage (source: ITU Interactive Transmission Map)

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Solution is (1) use a set of standards (e.g., 3GPP) and guidelines universally applied by all operators or 3rd parties (2) Make use of crowdsourced verification (e.g., OpenSignal)

Crowdsource tools to verify coverage

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Dead zone

In this low-income community there is not enough market incentive to add another tower to fill this dead zone

Community have built a community network that will be using TVWS and Wi-Fi mesh to fill this dead zone with connectivity

Coverage map from operator in Ocean View, South Africa

There is a known dead zone shown in blue – picked up by **OpenSignal** and not shown on coverage map

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Crowdsource tools expose access inequality

		⬇ Download Speed (Mbps)			⬆ Upload Speed (Mbps)		
ZIP Code	Town	M-Lab	Ookla		M-Lab	Ookla	
13844	South Plymouth	0.6	8.3	(+1,283%)	0.3	0.9	(+190%)
13862	Whitney Point	0.9	71.6	(+7,851%)	0.3	11.2	(+3,617%)
13324	Cold Brook	1.2	63.7	(+5,212%)	0.5	11.2	(+2,138%)
13054	Durhamville	1.3	4.3	(+229%)	0.6	0.7	(+18%)
13416	Newport	2.4	90.3	(+3,664%)	0.4	11.5	(+2,785%)
13843	South New Berlin	2.5	11.0	(+339%)	0.5	1.1	(+110%)
13431	Poland	2.5	70.5	(+2,720%)	0.6	11.5	(+1,823%)
13491	West Winfield	2.4	58.6	(+2,340%)	0.8	11.1	(+1,293%)
13812	Nichols	2.3	69.3	(+2,914%)	1.1	11.4	(+935%)
13409	Munnsville	3.0	50.6	(+1,586%)	0.6	6.0	(+898%)
13801	McDonough	3.4	9.2	(+171%)	0.6	1.0	(+60%)
13830	Oxford	3.9	13.7	(+251%)	0.7	1.5	(+111%)
13460	Sherburne	4.1	16.3	(+299%)	0.7	2.3	(+221%)
13425	Oriskany Falls	4.5	23.3	(+418%)	0.9	5.8	(+544%)
13438	Remsen	4.8	47.4	(+887%)	0.6	11.0	(+1,738%)
13485	West Edmeston	4.6	34.3	(+645%)	0.9	12.2	(+1,258%)
13733	Bainbridge	4.8	62.4	(+1,200%)	0.9	11.6	(+1,189%)
13077	Homer	5.1	65.8	(+1,190%)	0.7	11.6	(+1,554%)
13815	Norwich	5.3	43.5	(+721%)	0.9	10.7	(+1089%)
13803	Marathon	5.5	14.5	(+163%)	1.0	1.6	(+61%)
13477	Vernon Center	5.3	23.9	(+350%)	1.4	4.4	(+217%)

Numbers shown in red do not meet FCC minimum speeds of 25 mbps download / 3 Mbps upload.

Ookla data set showing ZIP codes in New York that don't meet FCC broadband threshold in red

- FCC 477 form asks ISPs to self-report offered speeds

  - Can be used to check census blocks that meet the 25/3 Mbps broadband threshold

- Measurements from **Ookla** can reveal aggregate performance for minimum tile area of approximately 100mx100m

- Methodology amongst speed tests systems can result in very different results (compare **M-lab** and **Ookla** results)

- Speed test results are very dependent on the nearest test server and the load on that server

For countries that don't report to ITU

- What intervention is needed to improve reporting?

  - e.g., Create a very short questionnaire with only key important questions (e.g., mobile and fixed line population coverage, mobile and fixed subscribers to the highest level of granularity that's practical)

- Complement this data with supplementary data sources

  - Availability data from crowdsourced companies like OpenSignal, Ookla, and OpenCellID

  - Usage and adoption data from operators and platform and Internet service companies like Facebook, Google, Microsoft, Akamai, Amazon, and Tencent

- Create a data portal that can store anonymized aggregate data (such as number of Internet users, device types, access speeds, QoS measures)

- Privacy and security for supplementary data sources is critical

- Good example of effort: Facebook data for good (https://dataforgood.fb.com/)

Access at home is critical

We need to know about available access in homes not in trees
(Malaysia's treetop girl: Veveonah Mosibin)

- What percentage of the world can access 3G/4G/5G inside their home?
- Are local WISPs/cooperatives who provide fixed wireless broadband at home captured in statistics?

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