



HOW TO CONNECT EVERYONE

Steve Song
Network Startup Resource Center
IAB, 21 March 2018



UNIVERSITY OF OREGON



A close-up of Morpheus from the movie The Matrix, wearing his signature black sunglasses and a dark suit. He has a serious, intense expression. The background is slightly blurred, showing what appears to be a red leather chair.

WHAT IF I TOLD YOU

**WE CARE MORE ABOUT CONNECTING
REFRIGERATORS THAN POOR PEOPLE**



UNIVERSITY OF OREGON



Internet as a Mutant Super Power



UNIVERSITY OF OREGON



The Economist

MARCH 12TH-18TH 2005

www.economist.com

America and its immigrants

PAGES 27-29

Dealing with Iran

PAGE 12

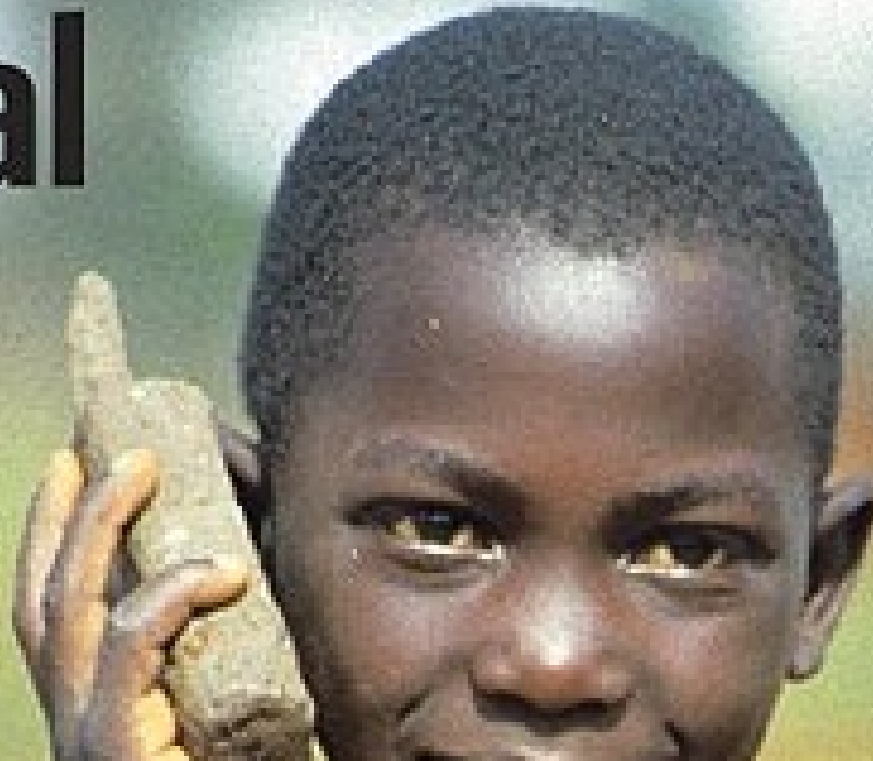
In praise of the (old) SAT

LEXINGTON, PAGE 38

Can the new boss revive Sony?

PAGES 12 AND 65-67

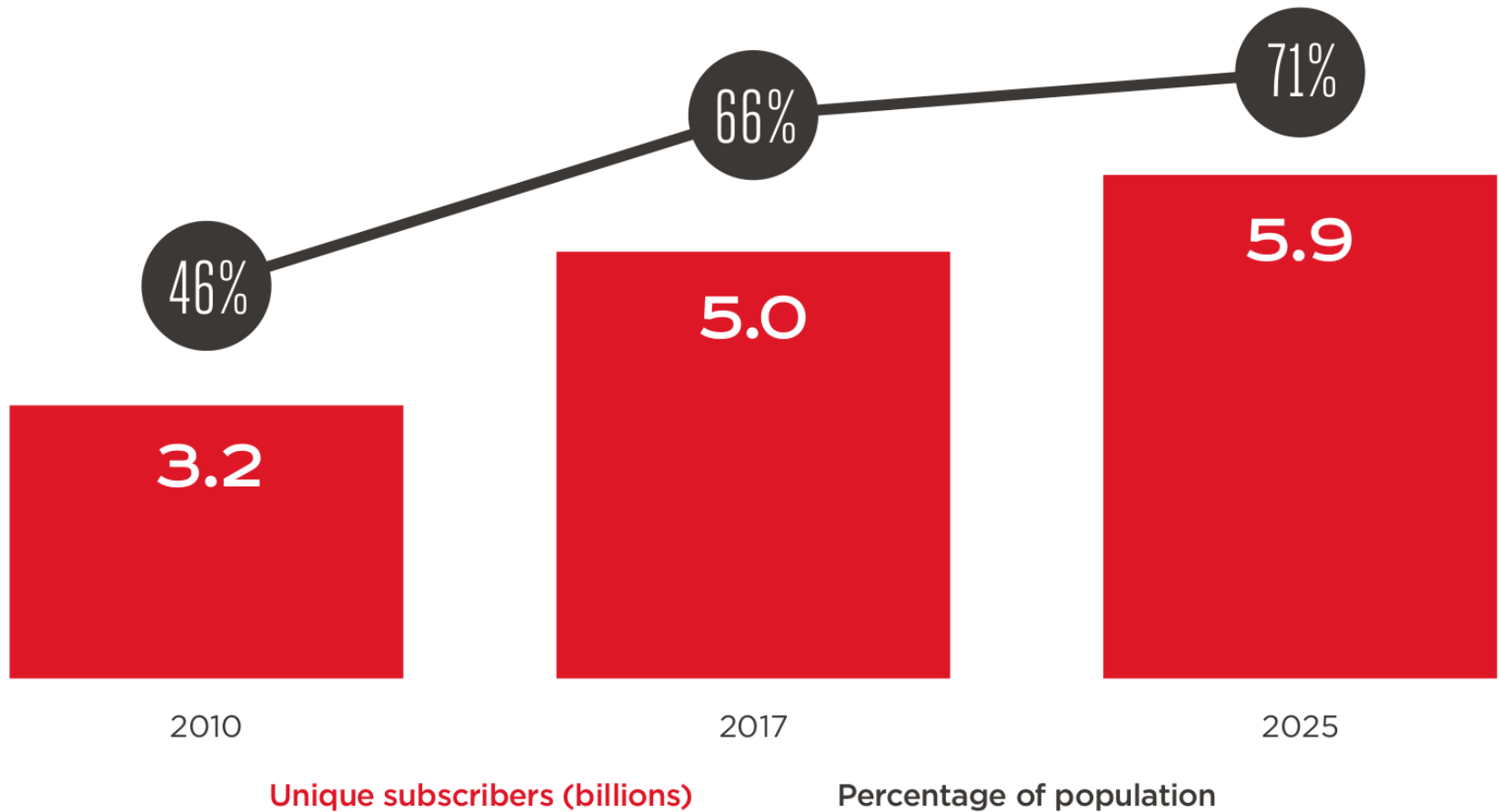
The real digital divide



UNIVERSITY OF OREGON



But Now Subscriber Growth is Slowing



Source: GSMA Intelligence

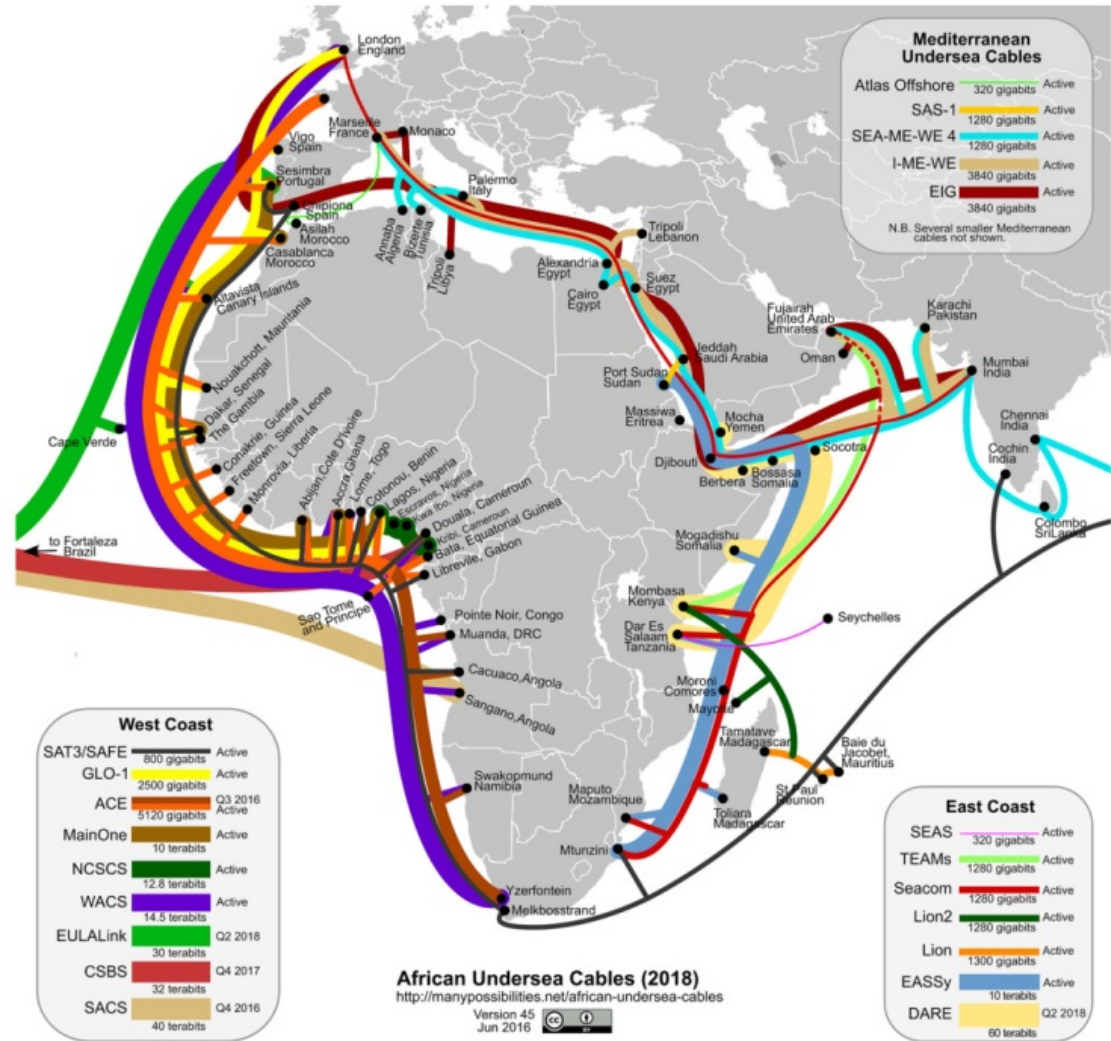


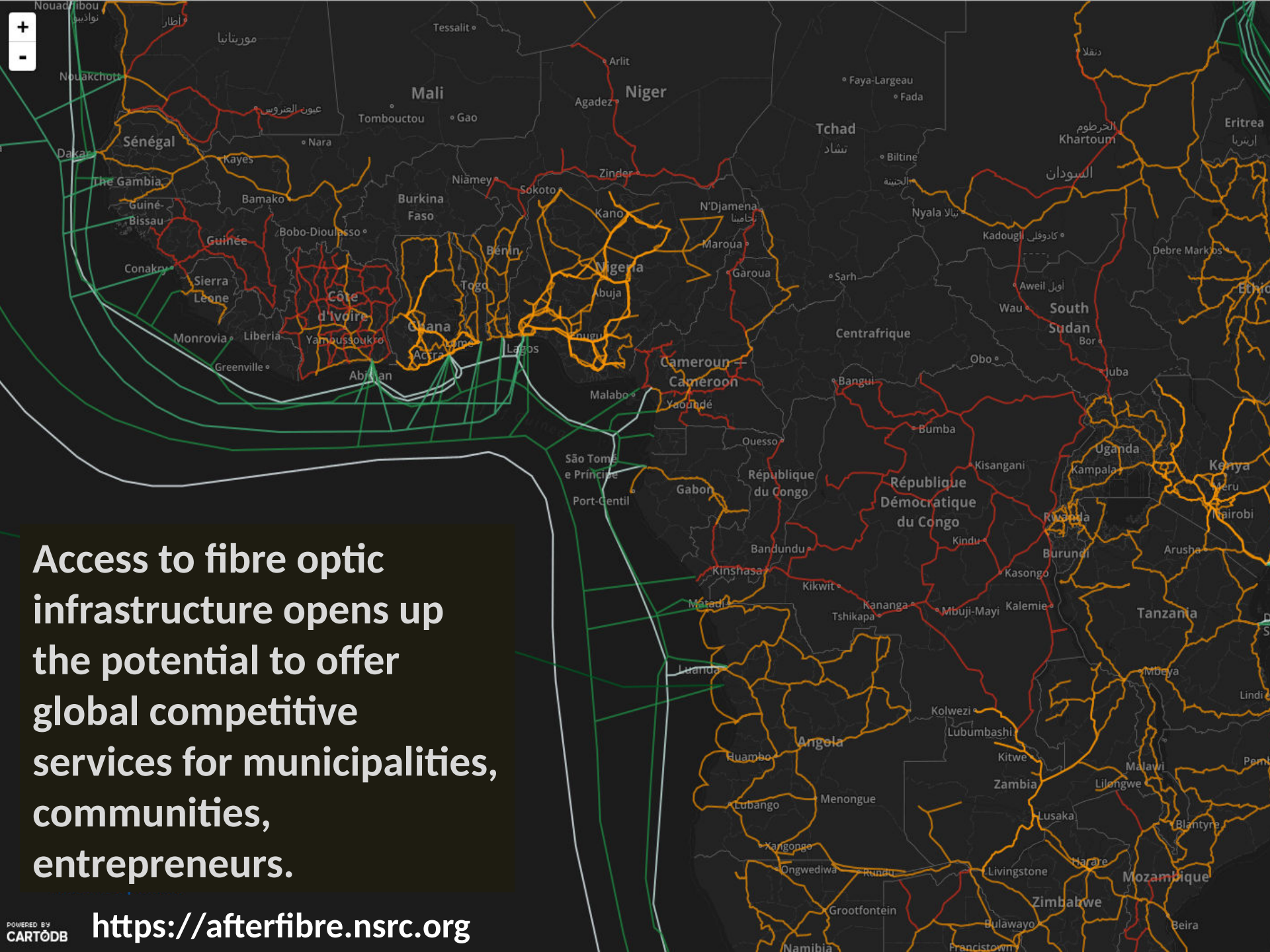
UNIVERSITY OF OREGON



The Impact of Fibre Optic Infrastructure

The growth of
undersea fibre optic
capacity has been a
catalyst for change.

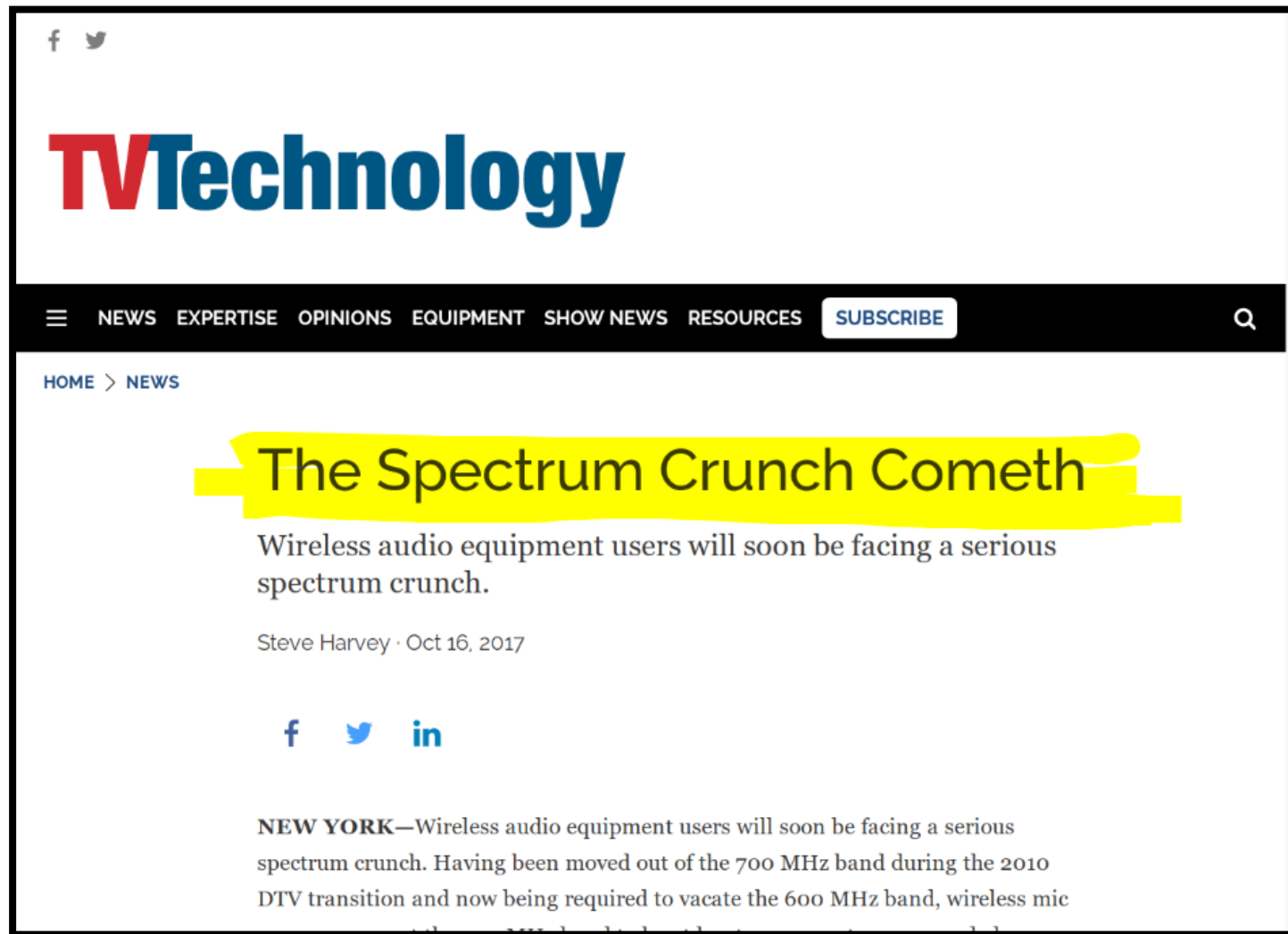




Access to fibre optic infrastructure opens up the potential to offer global competitive services for municipalities, communities, entrepreneurs.

<https://afterfibre.nsrc.org>

Spectrum Has Become a Barrier



Pace of Regulatory Change Too Slow

International Telecommunication Union

Home : Newsroom : Press Releases : Newsroom

Press Release

International Telecommunication Union

For immediate release

Telephone: +41 22 730 6039
Telefax: +41 22 730 5933
E-mail: [pressinfo](mailto:pressinfo@itu.int)

Digital broadcasting set to transform communication landscape by 2015
Accord is major step in implementing World Summit on the Information Society objectives

Geneva, 16 June 2006 — A treaty agreement was signed today at the conclusion of ITU's Regional Radiocommunication Conference (RRC-06) in Geneva, heralding the development of 'all-digital' terrestrial broadcast services for sound and television. The digitalization of broadcasting in Europe, Africa, Middle East and the Islamic Republic of Iran by 2015 represents a major landmark towards establishing a more equitable, just and people-centred Information Society. The digital switchover will leapfrog existing technologies to connect the unconnected in underserved and remote communities and close the digital divide.

"The most important achievement of the Conference," remarked Mr Yoshio Utsumi, Secretary-General of ITU, "is that the new digital Plan provides not only new possibilities for structured development of digital terrestrial broadcasting but also sufficient flexibilities for adaptation to the changing telecommunication environment."

The agreement reached at RRC-06 paves the way for utilizing the full potential of information and communication technologies to achieve the internationally recognized development goals. The date of transition to digital terrestrial broadcasting in the year 2015 is intended to coincide with the targets set by the Millennium Development Goals.

The regional agreement for digital services has been reached in the frequency bands 174 - 230 MHz and 470 - 862 MHz. It marks the beginning of the end of analogue broadcasting.

The Conference agreed that the transition period from analogue to digital broadcasting, which begins at 0001 UTC 17 June 2006, should end on 17 June 2015, but some countries preferred an additional five-year extension for the VHF band (174-230 MHz).

The Regional Radiocommunication Conference was chaired and brought to a successful conclusion by Mr Kavouss Arasteh of the Islamic Republic of Iran.

The digital dividend

The switchover from analogue to digital broadcasting will create new distribution networks and expand the potential for wireless innovation and services. The digital dividend accruing from efficiencies in spectrum usage will allow more channels to be carried across fewer airwaves and lead to greater convergence of services.

The inherent flexibility offered by digital terrestrial broadcasting will support mobile reception of video,



Spectrum Auctions: a Burden on Winners and a Barrier to Market Entry

Country	Year	Spectrum	Price	# successful bidders
Nigeria	2014	2.3GHz (30MHz)	\$23,000,000	1
Ghana	2015	800MHz (20MHz)	\$67,500,000	1
Nigeria	2016	2.6GHz (60MHz)	\$96,000,000	1
Mozambique	2013	800MHz (10MHz)	\$30,000.000	0

Evidence that high spectrum spends result in:

- Lower quality networks and reduced take-up of mobile data services owing to reduced incentives for investment;
- Higher consumer prices for mobile broadband data; and
- Lost consumer welfare with a purchasing power of US\$250bn across a group of countries where spectrum was priced above the global median.

<https://www.gsma.com/spectrum/wp-content/uploads/2017/02/Effective-Spectrum-Pricing-Full-Web.pdf>

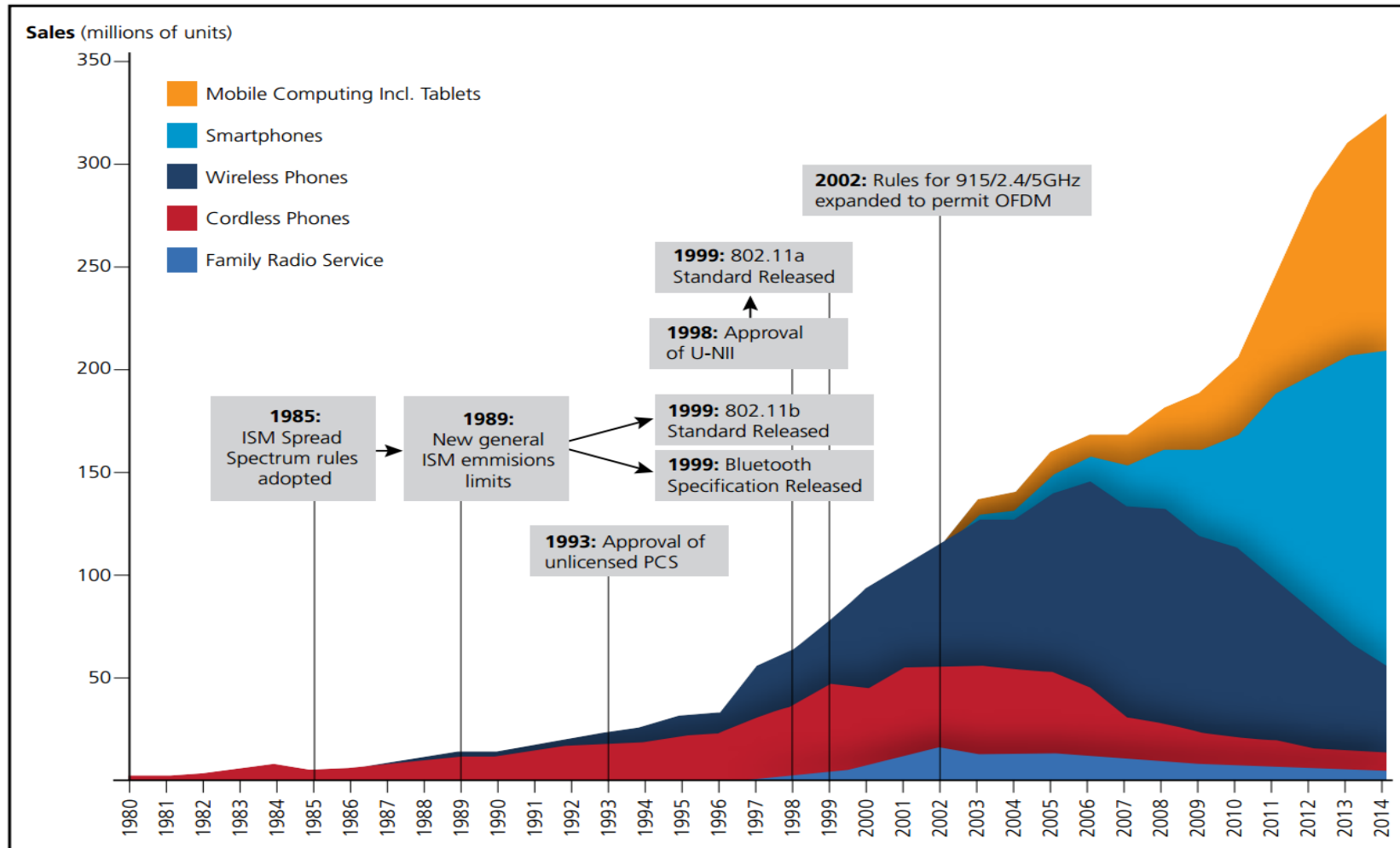


All Your Spectrum Are Belong To Us



Unlicensed Spectrum Growth

Figure 1: Unlicensed Spectrum Milestones and Selected Device Categories – Growth Over Time



HOME → ALL NEWS → AFRICA →
INTERNET PROVIDER PROPOSES TO MAKE SEYCHELLES...

Internet provider proposes to make Seychelles a Free Wi-Fi Nation

December 3, 2015 Africa 0 295



ROKESpot

Rokespots are a new innovative Wi-Fi service that greatly amplifies the quality, accessibility and affordability of the internet for users all around Kampala. The Wi-Fi service is made possible by a stretch of wireless signal points called Rokespots. With these Rokespots, one is able to enjoy a superior Wi-Fi connection that offers a remarkable internet experience within Kampala at the most affordable prices.

With over 200 Rokespots in Kampala, you are now able to access our Rokespots Wi-Fi service in malls, hotels, restaurants and public places. The service has different price categories which open it up to everyone, no matter their budget.

US\$ 1,000 gives you access for 1 day
US\$ 5,000 gives you access for 7 days
US\$ 18,000 gives you access for 30 days

Here is our list of our current Rokespots in Kampala.



news24WIRE

South Africa: Joburg Promises Free Wi-Fi for 'All Residents'

Tagged: Business • Governance • ICT • South Africa • Southern Africa

Plans are afoot to have all 4 million citizens in Johannesburg connected to free Wi-Fi within five years.

Zolani Matabese, Head of Broadband for the City of Johannesburg, told Fin24 that 1 000 hot-spots for access to the internet would be installed around the municipality by year-end.

FREE PUBLIC INTERNET ACCESS (WIFI) | NITA - Google Chrome

https://www.nita.go.ug/media/free-public-internet-access-wi

A globally competitive Uganda enabled by Information Technology

IT CERTIFICATION

FREE PUBLIC INTERNET ACCESS (WIFI)

Friday, September 30, 2016

As pledged by H.E the President in the NRM manifesto, the Ministry of Information Technology and National Guidance through its mandated agency National Information Authority (NITA-U) has commenced the trial provision of free wireless access in Kampala Central Business District and parts of Entebbe effective 1st October 2016.

Announcements

Guidance Note on IT Certification

Immigration System

Public Notice

More Announcements

Law & Regulations

e-Sa

Internet access is no longer a luxury but a necessity for all Ugandan citizens. The IT remain at the center of this country-wide transformation steering Uganda to world class and productivity!

With H.E the President's support, Phases I and II of the National Backbone Infrastructure were completed and Phase III of the NBI is nearing completion.

As a result, 169 Ministries, Departments and Agencies (MDAs) and Local Government are now connected, 102 MDAs are being connected this FY 16/17, and more will be connected.

MmegiOnline

Home Mmegi The Monitor Blogs Full Picture Premiumship

Updated | Friday 14 October 2016, 10:03 am

Home News Business Features Editorial Opinion & Analysis World Lifestyle Sport Selefu Naledi

Business

EXCHANGE RATES

FOREIGN EXCHANGE: PROBABLY

FOREIGN / PULA

USD - Pula 16.7758

GBP - Pula 13.1408

EUR - Pula 17.0200

YEN - Pula 0.1035

ZAR - Pula 0.7161

Fi to customers in SA

TECHCENTRAL

ME IN-DEPTH NEWS OFF-BEAT OPINION PEOPLE PODCASTS REVIEWS STAFF

Advertise Newsletter Contact

pe Town MyCiti buses to get free Wi-Fi

City of Cape Town has announced the launch of a free Wi-Fi pilot on its.

led by Agency Staff on 13 June 2016.

ed under Name

in MyCiti, Patricia de Lille



City of Cape Town has announced the launch of a free Wi-Fi pilot on buses.

TECHMORAN

Government of Kenya to rollout free internet across the counties

By Staff Writer

Posted on Sunday, July 3rd, 2016 at 4:43pm

f t e

IT NEWS AFRICA

AFRICA'S TECHNOLOGY NEWS LEADER

HOME TOP STORIES NEWS VIDEO INDUSTRIES REGIONS

EVENTS ADVERTISE

Kenya: Libraries to offer free Internet to pupils

May 30, 2016 • East Africa, Education, Top Stories

Like 90 Tweet Share 44 G+ 0 Print

Surf - Internet that WOWS! - Google Chrome

surf

SURFSPOT SURF@HOME ADVERTISE ABOUT BLOG

expresswifi by facebook

SERVICE PROVIDED BY surf

SURFSPOT

Fast. Public. WiFi Hotspots. Across Nairobi.

Find your nearest Surfspot here: click here

unconnected communities

REAL ECONOMY NEWS IN

Home / Latest News

Movement, at last, to extend WiFi into unconnected communities

HOT SPOTS

Fast affordable WiFi internet for Kenya.

Our coverage in Kibera is provided by 56 *free!* zones giving over 1,760,000 m2 coverage.

WiFi

connect to the portal.

NSRC

Network Startup Resource Center

Unlicensed Spectrum Potential

Phenomenal Cosmic Powers



Itty Bitty Living Space



New Generation Technologies



UNIVERSITY OF OREGON



Current Regulatory Frameworks For Spectrum Are A Bit Like a 19th Century Hotel



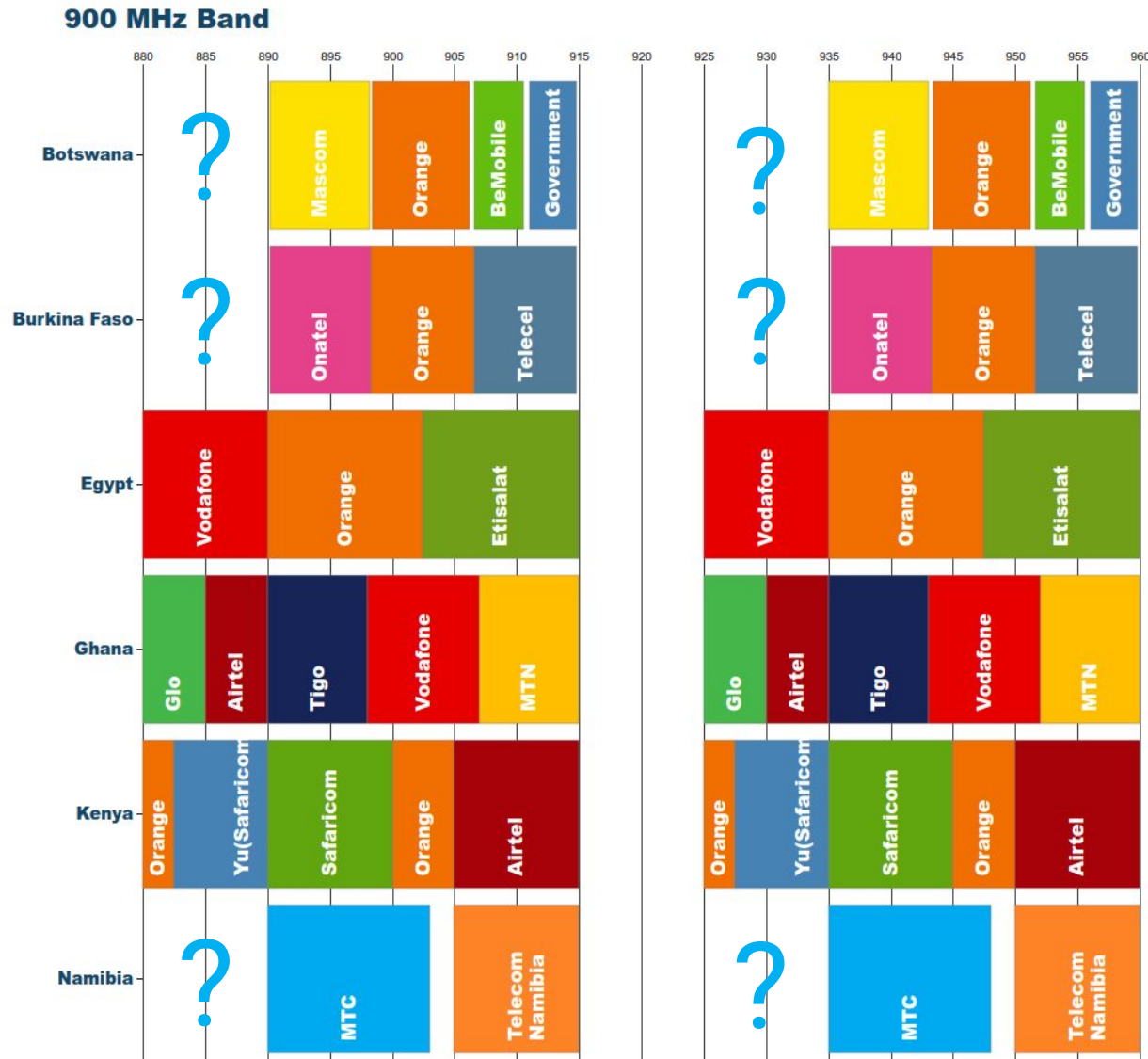
Perhaps we need more of an Airbnb approach



UNIVERSITY OF OREGON



Spectrum Availability





Filling the jar.

**Regulation must
enable small-scale
operators to
address niche
markets,
geographies, and
to stimulate
access innovation.**



UNIVERSITY OF OREGON





Technological Diversity Matters

**Identical
technologies lead to
identical business
models which lead
to a “race to the
bottom”**

**Access diversity
breaks oligopolies.**



UNIVERSITY OF OREGON





Thank you!

@stevesong
manypossibilities.net



UNIVERSITY OF OREGON

