WORLD ECONOMIC FORUM

COMMITTED TO IMPROVING THE STATE OF THE WORLD

Internet for All
A Framework for Meaningful Digital Access

12 June 2018
ITSO Symposium

Agenda

- The Context
- The Approach
- Country-level Platforms

Why Internet for All?

- A 10% point increase in digitalization[1] yields an increase in **GDP per capita by 0.25 to 1.38% and a ~0.8% decrease in unemployment rate**[2,3]
- Doubling download speeds and data usage results in a **0.3 to 0.5% increase in GDP growth**[4]
- Positive relationship between digitalization and **quality of life**[3]
- Enables **new services** that directly affect people's daily life, e.g. **mobile finance,** improving **agricultural productivity** in emerging economies[5]
- Enables 4IR technologies, e.g.. **IoT applications** which can help solve pressing problems related to traffic, water hygiene, disaster prevention, precision medicine, etc.

1. Digitization is the capacity to use broadband and other digital technologies to generate, process, share and transact information; 2. ITU Report on "Impact of Broadband on the Economy" 3. Colombia Business School and ITU publication "Economic and Social Impact of Broadband and Development of Digital Agendas" by Dr. R. L. Katz 4. Kongaut, Chatchai; Bohlin, Erik (2014) : Impact of broadband speed on economic outputs: An empirical study of OECD countries. 5. See Voafone's report "Connected Farming in india"
Source: World Economic Forum; BCG analysis, ITU, Colombia Business School

ICTs will be critical to achieving the SDGs

From The Broadband Commission:
“State of Broadband: Broadband catalyzing sustainable development” (Sept 2017)

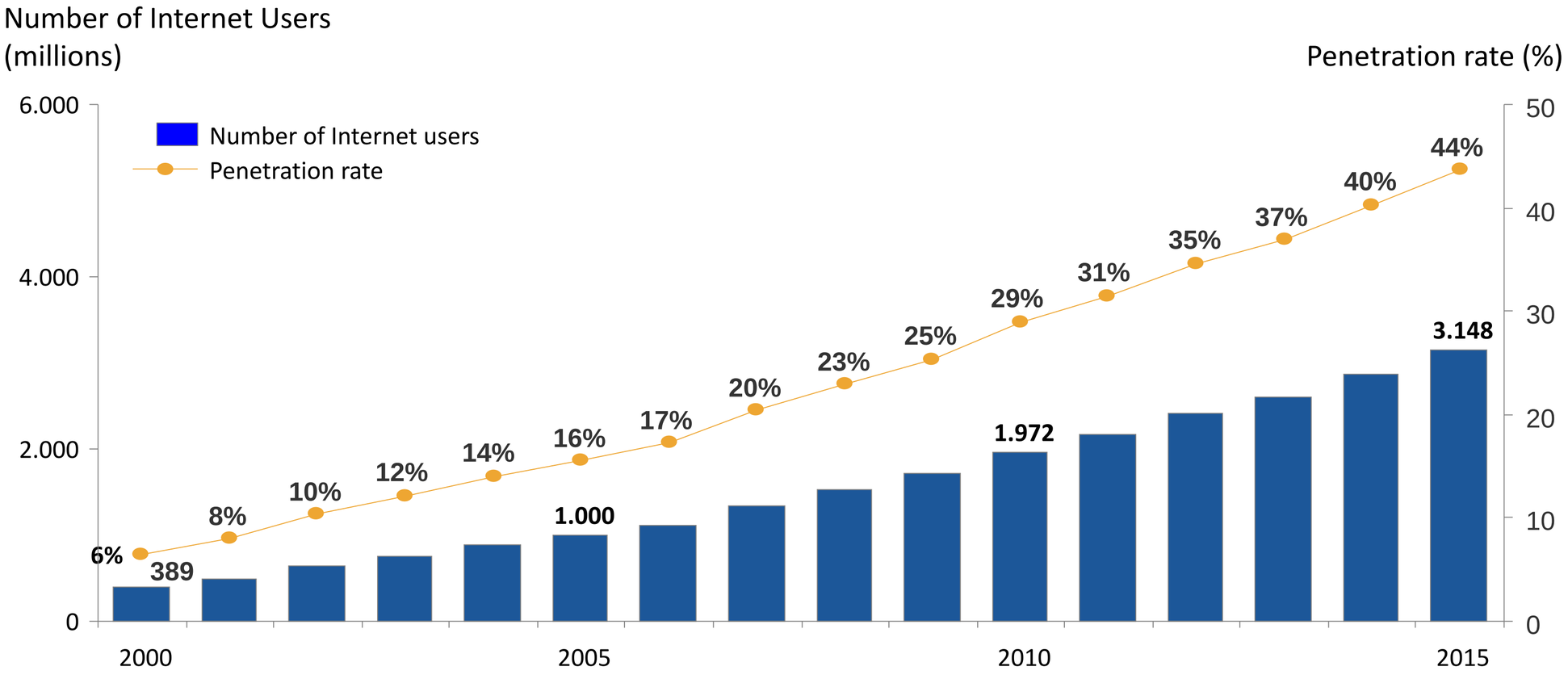
Food
Digital technologies create major opportunities to improve how we produce, distribute and manage food, as a major driver for economic growth and an accelerator for innovation.

Health
ICTs are being used to improve timeliness and accuracy of public health reporting and to facilitate disease monitoring, as well as speed responses.

Education
ICTs are helping to generate more effective ‘creative learning’ options through online flexible learning spaces. e.g. interactive websites, chat rooms, web-based courses and online libraries, and offer learning resources and forums for interactive discussion, questions and advice for teachers, parents and students, including the more than 260 million children and youth around the world who are out of school.

Trade
Broadband and ICTs are enabling rapid growth in e-commerce and helping reduce trade costs, improve market information, expand market access, reach a broader network of buyers and participate in global value chains, while offering new opportunities for employment, training and skill improvement. Between 2013 and 2015, the value of online trade increased from USD 16 trillion to USD 22 trillion.

Growth in internet penetration has remained steady at 2 to 4 percentage points per year over last 15 years



If this growth rate continues it will take more than 20 years to reach universal internet penetration

Source: ITU, EIU Population data, BCG analysis

Four principal barriers hinder universal internet access

Infrastructure

33% of people in rural areas live outside of 3G coverage[1]

92% of people in developing regions live outside of fixed-broadband coverage areas[2]

Affordability

10% of people live below the international poverty line of $1.90 per day[3]

33% percentage of coutnries surveyed that meet the global affordability standard of 1GB of data for 2% of income[4]

~4 billion non-users

Skills, awareness & acceptance

14% of people over 15 are considered illiterate[5]

50% women are up to 50% less likely to be connected[6]

Content

80% of online content is written in 1 of 10 languages (native to only ~3b people)[7]

51% of countries exhibit “low” or “medium” e-government readiness[8]

Most recently available figures used: 1. ITU, 2016 estimate; 2. International Institute for Sustainable Development (IISD), 2016. 3. World Bank, 2015 projection; 4. A4AI Affordability Report 2017; 5. UNESCO, 2016; 6. Controlling for education level and household income, World Wide Web Foundation, 2015 ; 7. World Bank, 2014; 8. United Nations E-Government Survey, 2016

The need for additional investment in ICT connectivity remains significant

- **High speed internet access remains a challenge throughout the world**
  - In 2017 fixed broadband penetration was 30.3% in developed regions, 8.2% in developing regions, and 0.8% in LDCs
  - Only 76% of the world's population lives within access of a 3G signal, and only 43% of people have access to a 4G connection.

- **Simple access is no longer sufficient**
  - Global internet traffic in 2021 will exceed 125 times the traffic volume in 2005, and average monthly per capita traffic is expected to triple from 10 GB in 2016 to 30 GB by 2021
  - GSMA has estimated that meeting fast-rising mobile traffic demand in the world's major cities by 2025 will require network operators to at least double, and in some cases triple, their capital and operating expenditures
  - Next to broadband coverage, quality is a key element of user satisfaction (e.g., latency rates, bandwidth), but also required for advanced applications

- **A paradigm shift will be required to accommodate new use cases and dynamics**
  - Network operators are facing significant investment and operating costs as well as low monetization potential challenging financial viability of projects – this holds particularly true for rural areas, but also in difficult geological conditions (mountainous terrain, remote islands)
  - Factor in broader social and economic returns in traditional internal rate of return calculations
  - Need to crowd in non-traditional sources of capital

Five maturity levels describe the ways in which individuals, businesses, and societies interact with the internet

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1

Internet use in its most elemental form.

Limited access to the internet**,** typically due to poor connectivity, resource constraints, limited skills, or lack of relevant content

2

Internet to enrich day-to-day life.

Frequent internet use, mostly unconstrained by costs of access, that is **incorporated into some aspects of day-to-day life**

3

Internet as vital part of most activities.

Near-constant connectivity that is considered **essential for both personal and professional reasons.**

4

Internet as the enabler of society.

Constant inter-connectivity via the **Internet of Things**; internet outages are hugely disruptive and sometimes dangerous

5

Internet as backbone of the future.

An **as-yet-unknown** role for the internet's future applications

Emerging

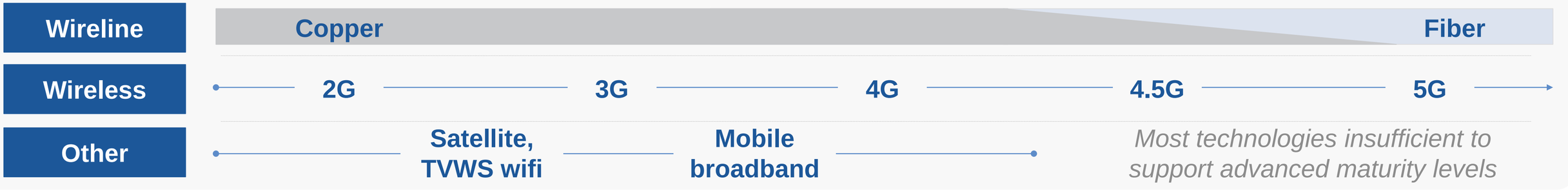
Lower **Benefits to society** *Higher*

QoS requirements increase significantly at higher maturity levels

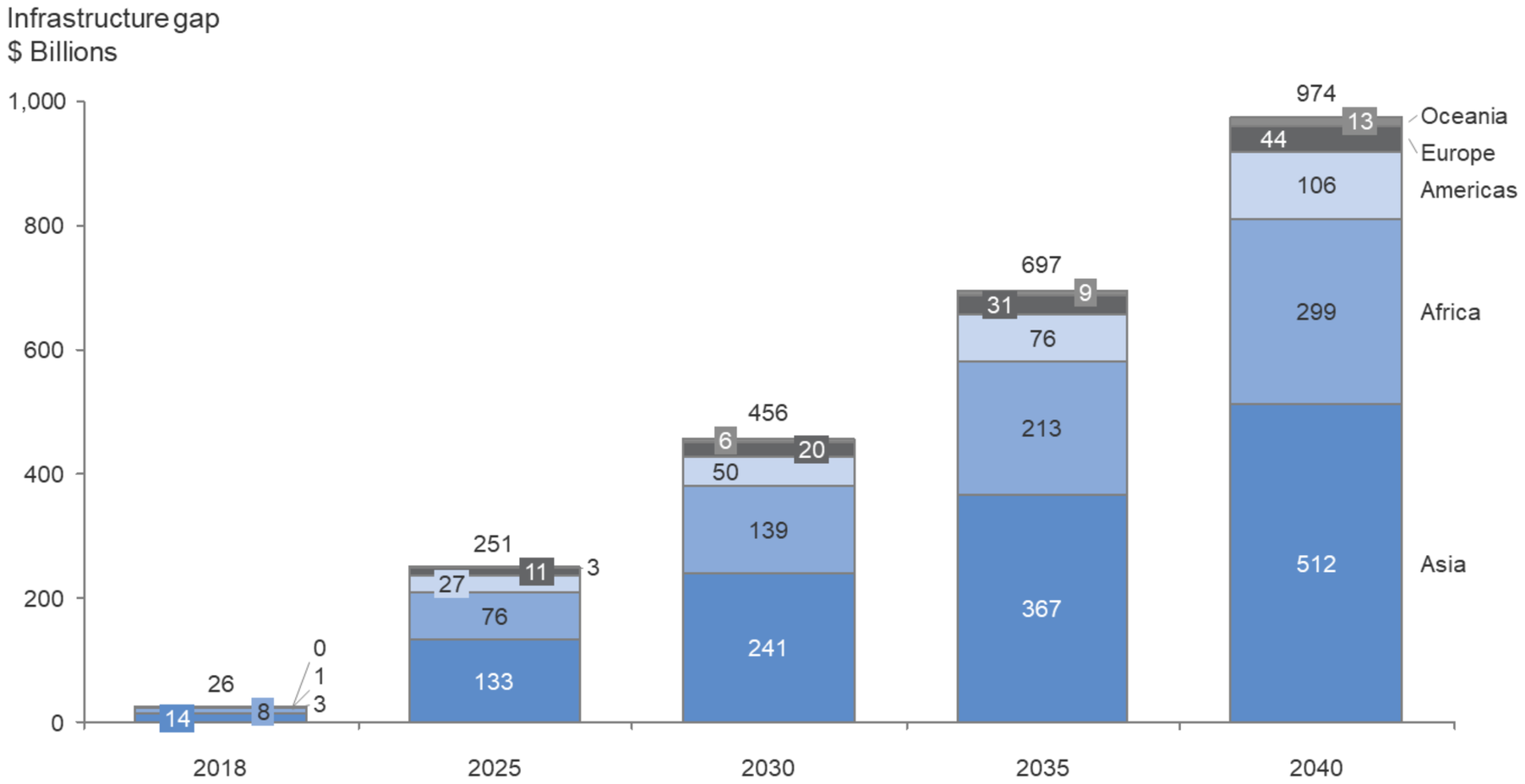
Future-oriented internet will require massively higher bandwidth

	Level 1	Level 2	Level 3	Level 4	Level 5
D/L speed	512 Kbps	2 – 3 Mbps	25 Mbps	100 Mbps	1 Gbps
U/L speed	64 Kbps	512 Kbps	10 Mbps	100 Mbps	1 Gbps
Latency	1,000 ms	400 ms	100 ms	20 ms	10 ms (1 ms for select applications)
Monthly use	10 – 100 MB	500 MB	50 GB	200 GB	1 TB

Technological requirements: last 100 meters



Bridging coverage gaps will be hindered by a financing gap that may reach $1 trillion by 2040



Note: The infrastructure gap is defined as the difference between projected ICT infrastructure stock and projected ICT infrastructure need. Projected ICT infrastructure stock is developed by first calculating current ICT infrastructure stock at the national level through a perpetual inventory approach using data on Gross Fixed Capital Formation (GFCF) in ICT, then projecting future GFCF based on a model that includes economic growth, population growth, and stated government commitments. Projected ICT infrastructure need is defined as the level of infrastructure that would bring a country's infrastructure stock equal with its best performing peer. Peer groups are defined by GDP/capita, and "best performing" is defined as 75th percentile of countries in the peer group. More detail on the methodology can be found at https://s3-ap-southeast-2.amazonaws.com/global-infrastructure-outlook/Global+Infrastructure+Outlook+-+24+July+2017.pdf
Source: The Global Infrastructure Hub's Global Infrastructure Outlook (G20 Initiative)

When evaluating ROI using total socioeconomic returns, payback of infrastructure projects is surprisingly short

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European Union example

~$320B

Amount needed for Europe to **close the infrastructure gap and bringing all existing infrastructure to a level** that supports forward-looking maturity levels[1]

0.6-1.5

Years needed[2] to **recover the costs based on associated total socio-economic benefits to society** deriving from increased high-quality internet access

Given the magnitude of economic benefits and the short timeframe for society to recoup investment, why aren't more projects currently in play expand and improve infrastructure?

1. National connectivity at 100 MBPS connection. 2. Assumes infrastructure improvements lead to 10% increases in penetration (up to maximum 100% by country), that between 10% and 50% of "level 1" users migrate to "level 2," and that between 10% and 50% of "level 2" users migrate to "level 3."

Current ICT financing landscape driven by ICT companies… but won't be sufficient to support forward looking needs

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	Actors	Examples	Notes	Objectives	Risk app.
Private sector	**Industry**	MNOs / ISPs / TowerCos	• **Vast majority of financing** & "front line" of profitable investment	• Provide connectivity for profit	Low
	Financial sector	Investment & Commercial Banks	• **Willingness to invest is often complicated** by concerns over competing infrastructure networks, uncertainty around technological developments, and the belief that investment is the responsibility of MNOs and ISPs	• Provide financing and capital for profit	Low
		Private investment firms (pensions, VC, PE, etc.)		• Grow capital for profitability • Diversify portfolio	Low
	Other private sector	Technology firms Other sectorial firms		• Expand customer base • Invest for business sustainability	Low-Medium
	Non-profit	Foundation / NGOs	• **Longer-term investment horizons**, enabling investment in lower-IRR projects that do not meet objectives of other investors	• Develop philanthropy by addressing inequalities	Medium-High
Public sector	**Multilateral**	Multilateral Development Bank / Fund	• Investment usually **motivated by national interest**, with social and development outcomes prioritized alongside (or above) economic profitability • Funds can be **combined with private sector** money to mitigate some kinds of investment risk and improve investment climate	• Provide financing to foster long-term economic development	High
	Public sector	Sovereign wealth fund		• Create long-term value for investors by driving sustained economic development	Medium
		USFs		• Expand connectivity in under-served areas through subsidies and fees	High
		National Development Bank / Fund		• Provide financing to foster national long-term economic development	High

A 2017 survey found that most development banks consider ICT infra investment to be adequately covered by the private sector

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Opportunity for new financial investors

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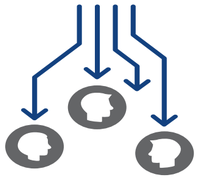
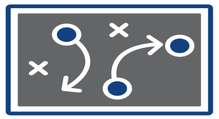
Capital flows are constrained due to a variety of factors



Market factors

Elements of **competition from operators and infrastructure providers**, as well as concerns over **consumer adoption and willingness to pay**



Sourcing factors

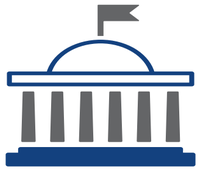
Project obscurity and the lack of a conventional pipeline for surfacing ICT infrastructure projects

Project factors

Inadequate project preparation, small project size, and lack of comfort with alternative technologies

Risk mitigation factors

Concerns that existing means of **risk mitigation are inadequate and complex**, and are often derived from a lack of available market and investment research



Regulatory factors

Areas of **spectrum policies, pricing barriers, and regulatory uncertainty**

Partnership factors

Perception that partnership models of infrastructure finance are **overly complex and of limited financial benefit**

1. Improving the regulatory environment around ICT connectivity infrastructure investment

The public sector can do much to improve the regulatory environment and create a more favorable environment for both infrastructure project owners and investors. Many such policies have been explored elsewhere in World Economic Forum output.

- **“Dig once” policies** to reduce overall costs per connection and allow funders to bundle investments across different types of infrastructure
- **Reducing or eliminating spectrum licensing fees** significantly reduce costs and barriers to entry for MNOs, thereby facilitating competition, reducing end user costs, and reducing risks from unexpected spectrum policy changes
- **Rework tax policies** to incentivize investment and reduce financial burdens for those who are willing to invest in infrastructure expansion and improvement
- **Providing anchor tenancies to infrastructure expansion** – e.g., a commitment to use a minimum amount of data capacity in schools, government offices, and more – can help incentivize infrastructure investment and improve the business case for private investors

2. Promotion of practical investment vehicles and institutions

The **private and multilateral sectors** can, similarly, do much to improve the funding landscape via the promotion of dedicated investment vehicles and institutions

- **Bundling mechanisms or infrastructure funds** combine ICT infrastructure projects across geographies, technologies, and populations, thereby reducing exposure to any individual risk and enabling smaller projects to attract capital from larger investors
- **Securitization mechanisms**, such as social bonds, have a similar effect on risk mitigation to bundling mechanisms, and are often given special tax treatment by governments
- **Co-investment vehicles** permit MNOs to solicit additional funds from other players when expanding and upgrading infrastructure, which attracts financing and diversifies risk.
- **Increasing the effectiveness of project preparation facilities** – funded by multilateral, public, donor, and/or private capital – can serve to address many risks associated with smaller projects that have limited resources to support investor due diligence

3. Increased deployment of blended financing arrangements

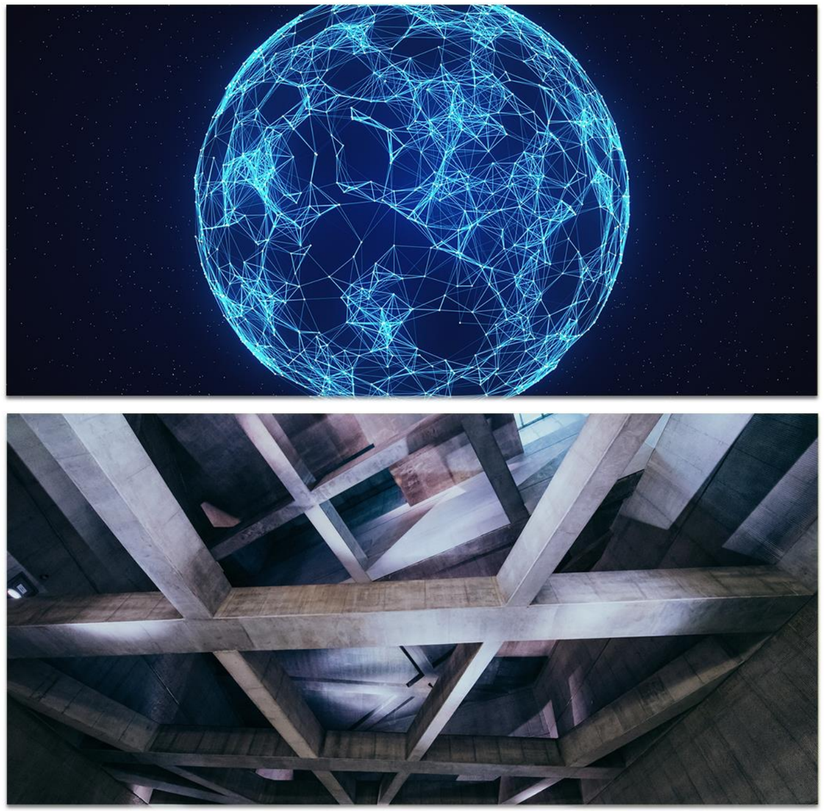
Blended financing arrangements should be more widely used to reduce private investment risks and attract more capital to infrastructure investments that serve a public need:

- Such investments often also **address issues related to regulatory and market risks** given the financial involvement of the public sector
- In many circumstances, blended finance also **addresses knowledge and capability gaps** that impede understanding of investment opportunities in unfamiliar territories
- **Risk guarantees** have been shown to address major risk elements observed by private investors, enabling capital to flow more directly to underserved geographies and populations
- **The development of infrastructure marketplaces**, such as the Sustainable Development Investment Partnership (SDIP) run by the World Economic Forum and the OECD to share information, discuss potential investments, and arrive at blended financing arrangements for projects that have a demonstrated impact

Agenda

- The Context
- The Approach
- Country-level Platforms

The Internet for All project



Internet for All establishes and facilitates **multi-stakeholder platforms** at the country level and the global level to overcome the coordinate failures that prevent internet access and adoption from growing exponentially. A country programme consists of the establishment and facilitation of an Internet for All platform.

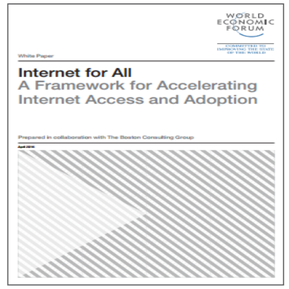
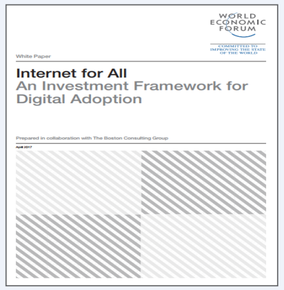
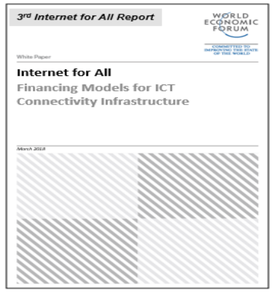
Current Country Platforms:

- South Africa
- Argentina
- Rwanda
- Jordan

Global Platform:

- The Network for Digital Development

Internet for All was launched in 2015

Project phase	1 2015/16	2 2016/17	3 2017/18
Activities	— Define **four barriers** to accelerating essential Internet access and adoption — Research and analyze **case studies** of interventions to facilitate connectivity — Develop a **checklist** for country assessments	— Set up **country programs** in Africa's Northern Corridor, Argentina, South Africa, and Jordan — Develop **Investment model** for achieving Internet for All — Launch a global **Network for Digital Development** and several global working groups	— Scale up additional **country programs** — Develop **framework** for evaluating ICT connectivity financing options — Initiate a **pilot platform** for matching infrastructure projects with potential investors
Report Outputs	 **A Framework for Accelerating Internet Access and Adoption** — Published in Apr 2016	 **An Investment Framework for Digital Adoption** — Published in Apr 2017 — Customizable **investment model**	 **Financing Models for ICT Connectivity Infrastructure** — Published in May 2018 — **Pilot platform** to link ICT infra projects with investors

Internet for All Steering Committee

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- African Development Bank (AfDB)
- AT&T
- Berkman Center (Harvard)
- BT
- Cisco
- Cloudflare
- Cornell Univ (Prof. Soumitra Dutta)
- Cyberspace Administration of China
- Deutsche Gesellschaft fur Internationale Zusammenarbeit (GIZ)
- DIAL (Digital Impact Alliance)
- DiploFoundation
- DETEC (Govt of Switzerland)
- Digital Opportunity Trust
- Facebook
- Ericsson
- Google
- Government of Rwanda
- GSMA
- Hewlett Packard Enterprise
- Huawei
- ICANN
- IEEE
- INSEAD (Prof. Bruno Lanvin)
- International Telecommunications Satellite Organization (ITSO)
- Internet Governance Forum (IGF)
- Internet Society
- ITU
- Japan International Cooperation Agency
- Mastercard
- Microsoft Corporation
- Millicom
- Mozilla Foundation
- MTN Group Ltd
- NEPAD
- NetHope
- Nokia
- ONE
- People Centered Internet
- Pearson
- Qualcomm
- Smart Africa
- TCS
- Telkom
- The Boston Consulting Group
- The Inter-American Development Bank
- UK Department for International Development
- UNESCO
- UNHCR
- Univ. of London (Prof. Tim Unwin)
- Univ. of Pennsylvania (Prof. Christopher Yoo)
- USAID
- US Government State Dept
- Veon
- World Bank Group
- World Wide Web Foundation/Alliance for Affordable Internet

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Establishing Internet for All country programmes

Design

1 Engage
Identify and engage influential champions across a broad group of stakeholder including government, private sector, civil society

2 Align
Develop a shared partnership agenda, including high-level vision and targets to be achieved Key to align with national ICT strategies and other stakeholder plans e.g. funders

3 Structure
Establish the partnership structure to drive collaboration and mutual accountability among organizations. Build in a transition strategy for long-term sustainability

Implement

4 Brainstorm
Collectively identify barriers and internet inclusion initiatives to be addressed at country level. Occurs inside of working groups.

5 Plan
Collaboratively define specific goals and action plans to deliver initiatives. Plans include partner roles and expectations; roadmap and milestones to be reached. To be done in project teams inside of working groups.

6 Implement
Implement action plans by experimenting with new collaboration approaches and innovations. Set up **quick wins** for early progress and momentum

Monitor and scale

7 Monitor
Track progress and results this is done through a specific working group on data, working with a national secretariat.

8 Review
Review the success or failure of action plans. Hold summits where members can identify new solutions across working groups, or establish new working groups

9 Scale
Scale proven initiatives, documenting and sharing lessons and innovations developed through in-country or global/ regional partnership networks

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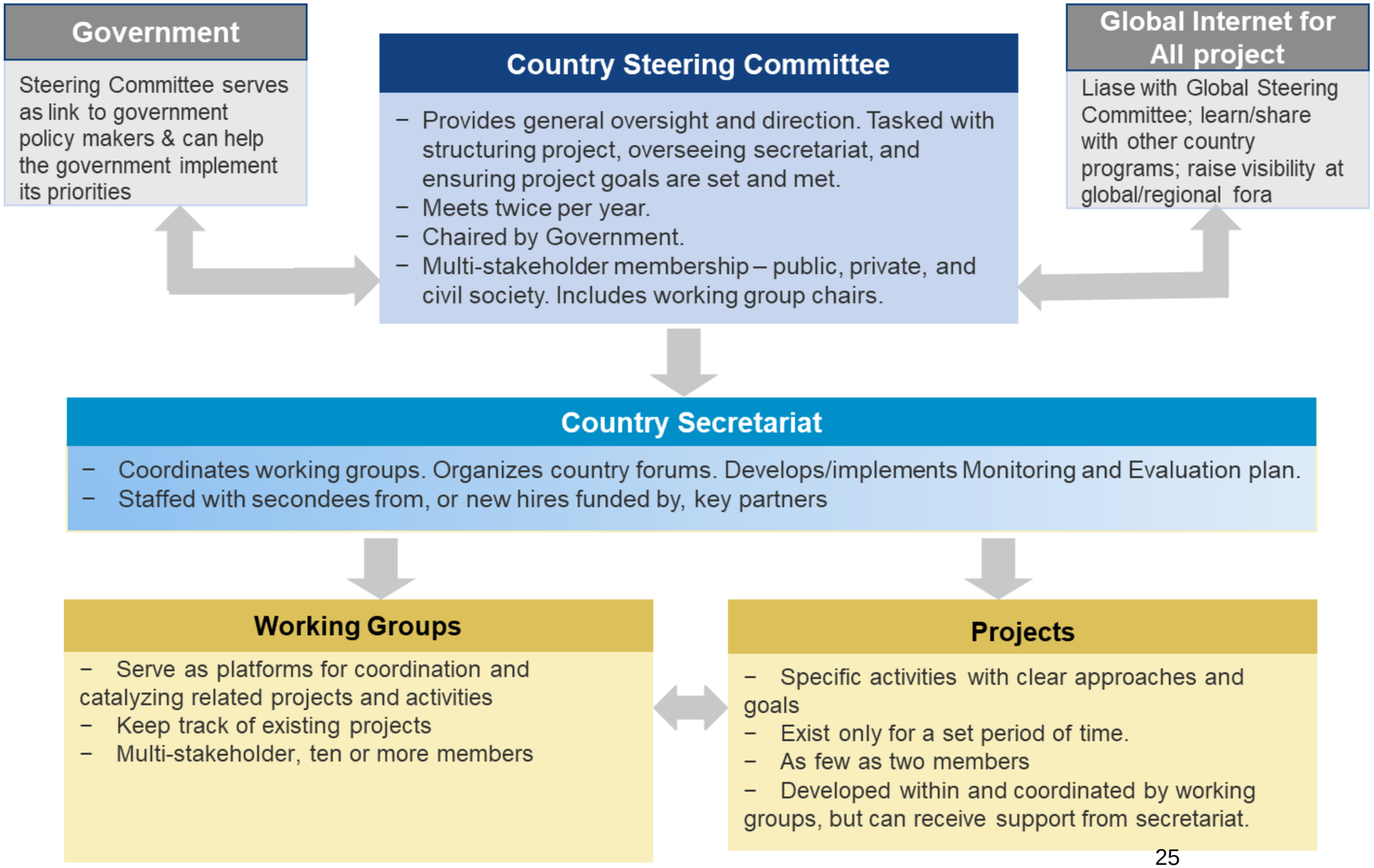
Internet for All country programme structure



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South Africa Internet for All

Snapshot:

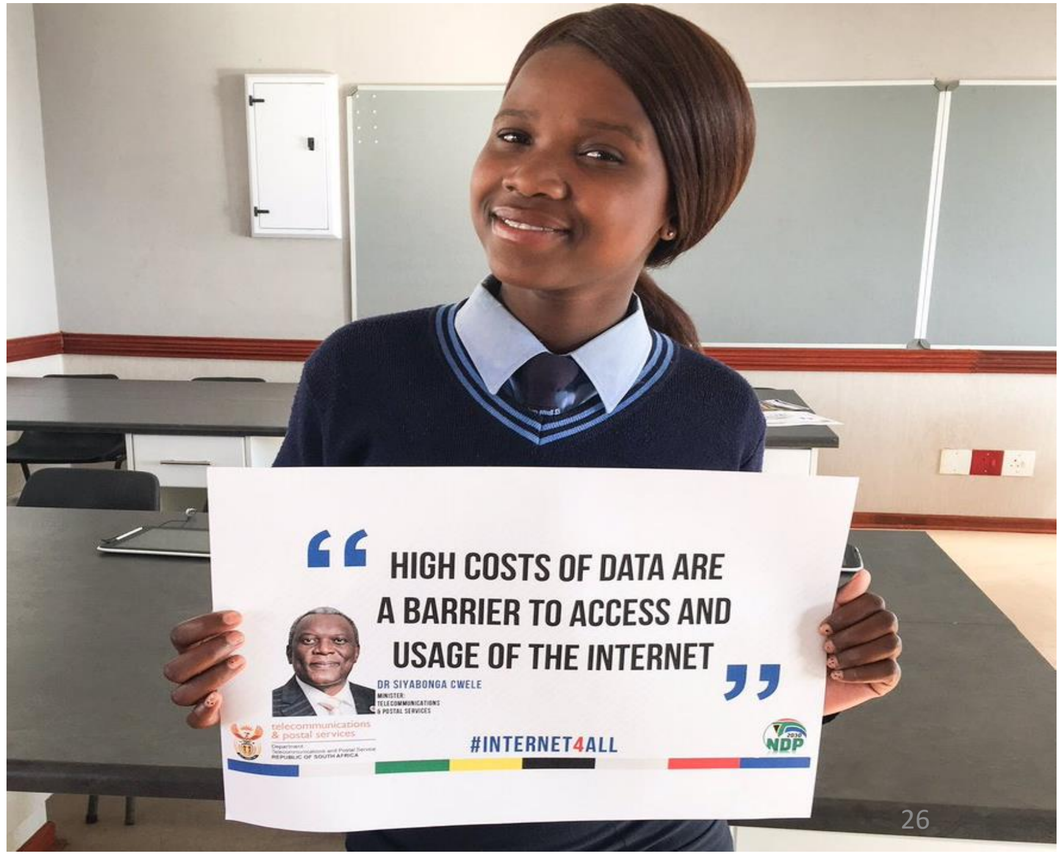
- **Launched** in May 2017 at World Economic Forum on Africa in Durban, in partnership with Minister Siyabonga Cwele of DTPS
- **Number of stakeholders involved**: 66 organizations
- **Target:** 22 million new users by 2019
- **Secretariat:** Staffed by DTPS with secondees from MTN

Workgroups and Leads:

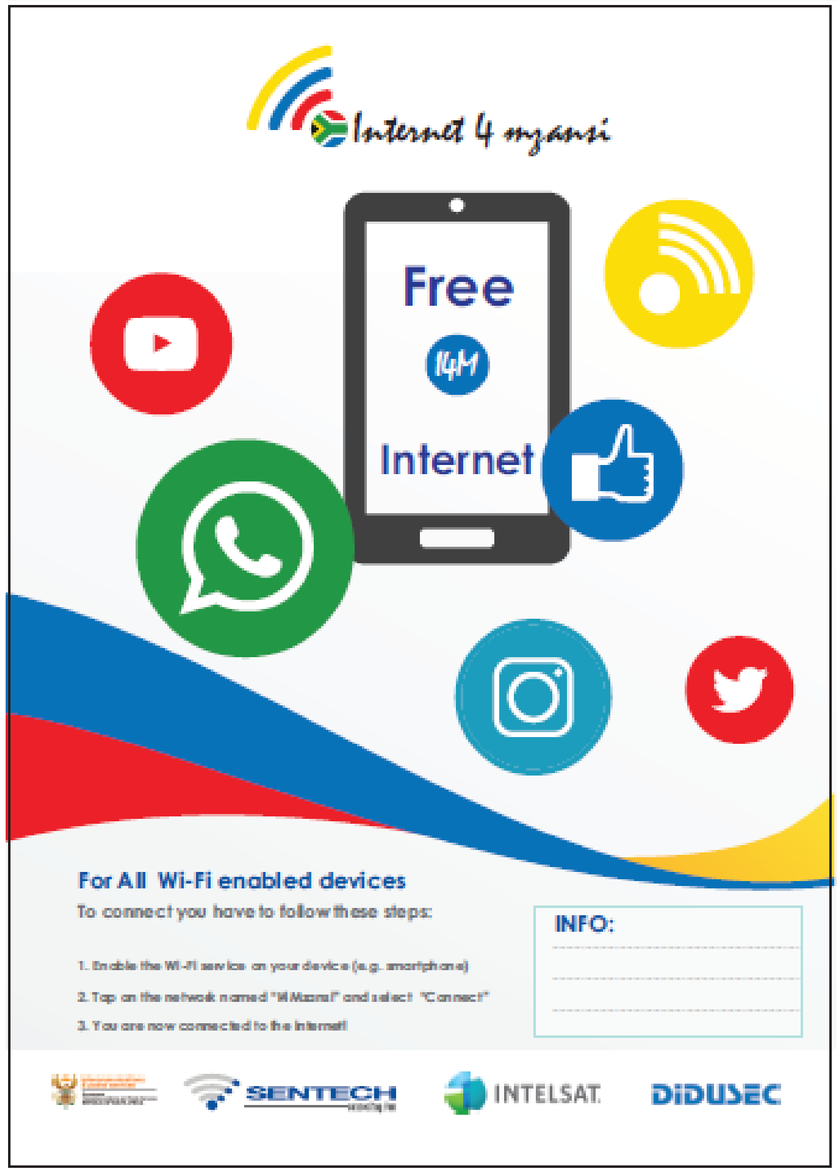
- Data: Boston Consulting Group
- Infrastructure: CSIR
- Skills and Awareness: NEMISA
- Local Content: Google (tbc)
- Affordability: MTN, Vodacom and public sector (tbd)

Key results:

- Satellite Connectivity in Eastern Cape: 5 pilot sites as part of a multi-stakeholder pilot deployment. Plan is to scale to hundreds.
- *Imbizo* Campaign: 500 high school students obtained their first email addresses through the kick-off event of the Imbizo initiative, an outreach program that is holding internet awareness events in nine provinces



South Africa Internet for All – Satellite example



- Internet4Mzansi is a pilot implementation of the Internet for All initiative in South Africa

- Provide affordable Wi-Fi connectivity to remote areas in South Africa
  - The end user will access Wi-Fi at a hot-spot located in a central area
  - Intelsat's VSAT services provides backhaul to the sites
  - A local ICT SME provider, who have been recruited will assist end-users in connecting to the service. The SME will also promote the service and support the Wi-Fi platform. A teleport service operates the ground stations and transmits the signal to the ICT SME

- The first three months are a pilot designed to test demand which will then be used to build a business case that can be scaled nationally

Rwanda Internet for All

Snapshot:

- **Launched** in May 2016 at World Economic Forum on Africa in Kigali, in partnership with Minister Jean Philbert Nsengimana of Ministry of Youth and ICT, as part of Northern Corridor initiative
- **Number of stakeholders involved**: 113
- **Target:** 5 million new users by 2019
- **Secretariat:** Staffed by MITEC with secondees from RwandaOnline

Workgroups and Leads:

- Access, Connectivity, and Devices: Rwanda Utility Regulatory Authority
- Digital Skills and Internet Awareness: Carneige Mellon University
- Gender and the Digital Divide: Digital Opportunity Trust
- Content and Applications: Rwanda ICT Authority

Key results:

- Digital Ambassadors Program: Trains recent grads to go into the field for postings as digital skills trainers. 50 deployed since launch in fall 2017. 15,000 beneficiaries reached so far. Will scale to 500 trainers and millions of beneficiaries.
- Tigo Smart Village: project linked with several partners to improve efficiency and effectiveness. Provides full services needed to connect the unconnected in several villages in northern Rwanda

Jordan Internet for All

Snapshot:

- **Launched** in May 2017 at World Economic Forum on the Middle East in Jordan, in partnership with Minister Majd Shweikeh of the Ministry of ICT
- **Number of stakeholders involved:** 57
- **Target:** Millions of new internet users in Jordan by end 2019
- **Secretariat**: Co-financed by Orange, Zain, and Umniah. Housed at the IT industry association INT@J

Workgroups and Leads

- E-government Services Adoption: MoICT
- Women's Empowerment through Digital: Digital Opportunity Trust and Cisco
- Refugee Connectivity: UNHCR
- Arabic-language Online Content: Zain
- Digital Skills and Internet Awareness:: Int@j
- Digital Transformation of Society: Telecommunications Regulatory Commission of Jordan
- E-Education: Orange
- Digital Financial Services: Umniah Telecom

Key results:

- Girls Power Tech project: network established to link successful Jordanian women in technology to high school girls. Several events held to date to raise awareness about the internet and tech career possibilities with young women.

Argentina Internet for All

Snapshot:

- **Launched** in April 2017 at the World Economic Forum on Latin America, with Minister Andres Ibarra of the Ministry of Modernization.
- **Number of stakeholders involved:** 122
- **Target:** 8 million new users by 2019
- **Secretariat**: Provided by Federal Ministry of Modernization. Buenos Aires City Ministry of Modernization is previously acted in the role.

Workgroups and Co-Leads:

- Infrastructure: Nokia and Ministry of Modernization (Secretary of ICT)
- Affordability: GSMA, Microsoft, and Ministry of Modernization (Secretary of ICT)
- Skills and Content: Cisco, Google, Ministry of Modernization (Sub-secretary of ICT Regulation)
- Data: Convergencia Research, Ministry of Modernization (Open Data Directorate)

Key Results:

- Seven currently projects already predicted to reach 3-4 million new internet users
- Platform used by Minister of Modernization to socialize pre-release National Digital Strategy in meeting at *Casa Rosada,* attended by 90 stakeholders (March 7th 2018)

Argentina Internet for All – Satellite example

Ministerio de Modernización
Presidencia de la Nación

IDB

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- As part of the Infrastructure Working Group, project to deliver broadband connectivity in remote areas

- Objective is to develop a connectivity model to bring LTE/3G services to a remote population of 2 million using satellite backhaul and a consortium-owned rural wholesale network.
  - Aim is to deploy 1000 base stations by end 2019.

- Project Team is composed of Telespazio, Telecom, Claro, Telefonica, GSMA, Intel, Nokia, Cicomera, Tower Companies Association, Ministry of Modernization

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Thank you

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