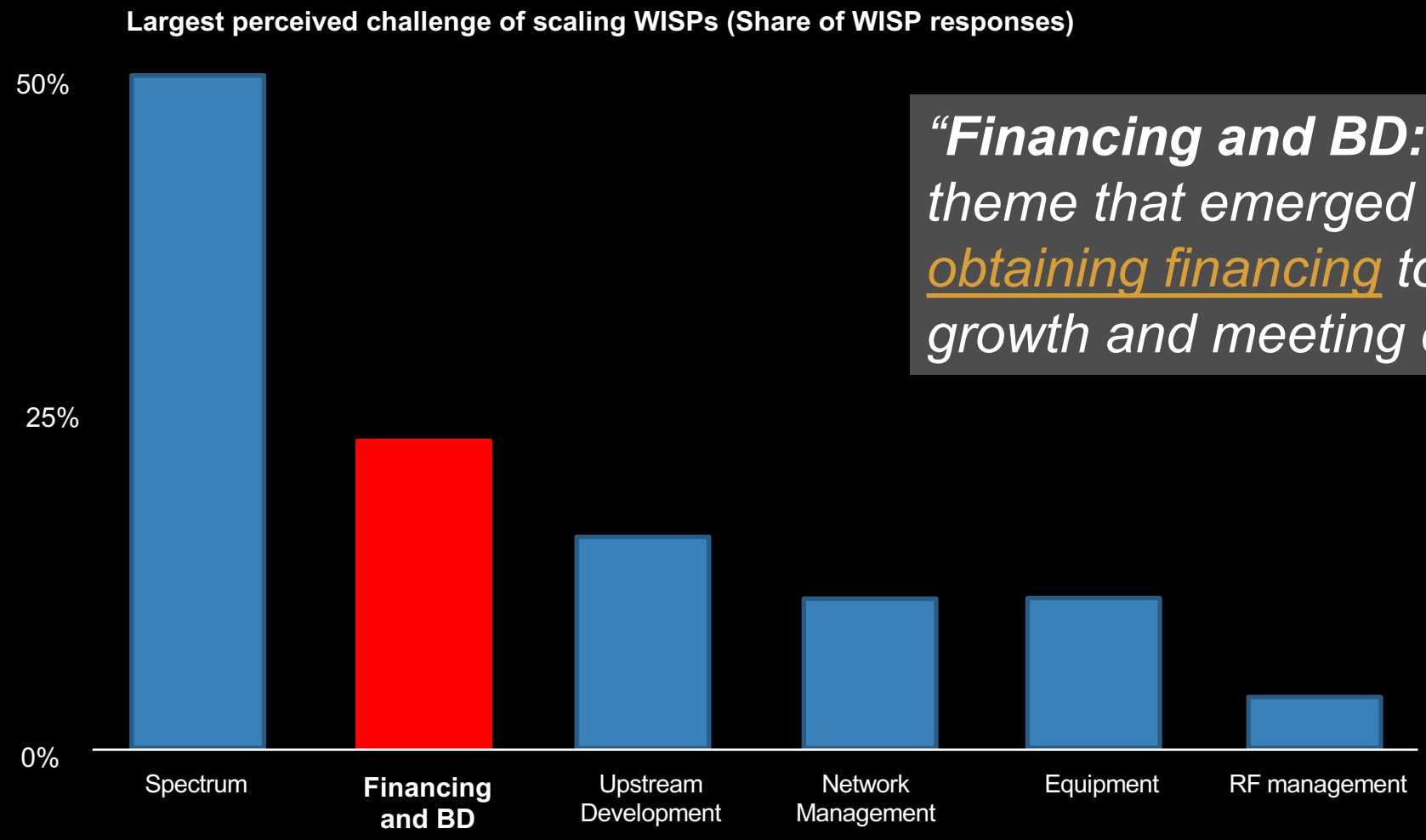
Financing your last-mile connectivity infrastructure:

Options and overcoming investment rock blocks

Why focus on financing at a technical conference?
One of the most significant operational challenges to ISP management and growth



*"**Financing and BD:** An unexpected theme that emerged was the difficulty of obtaining financing to expand network growth and meeting demand for service."*

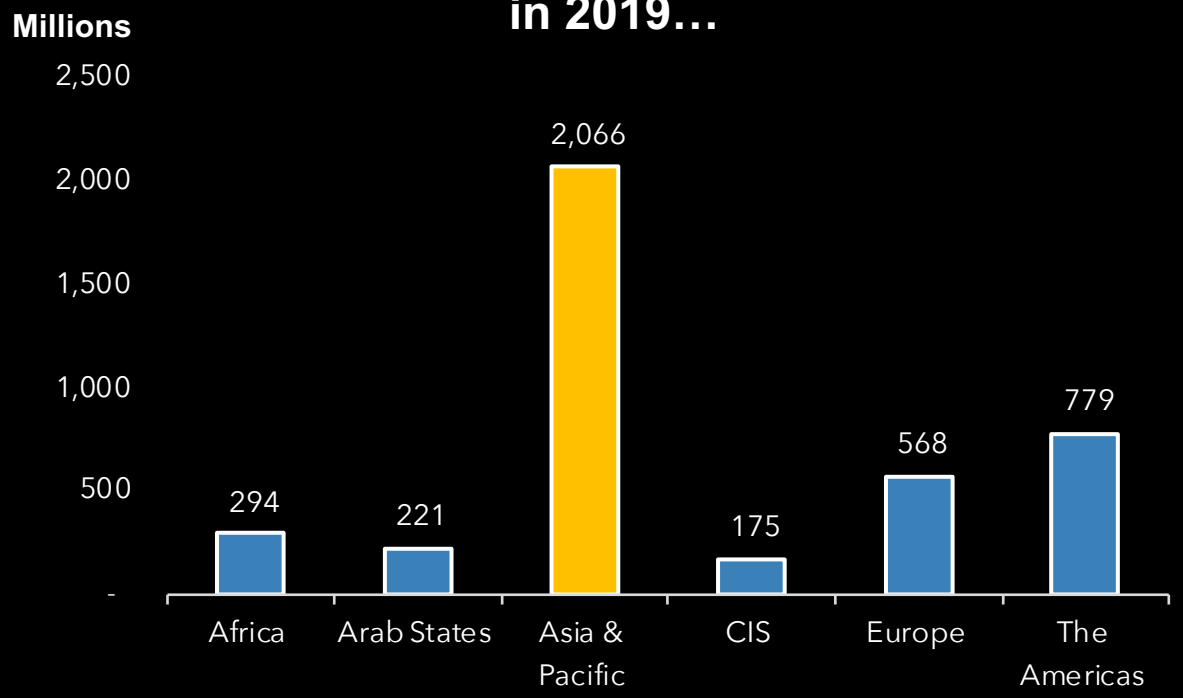
Source: Shaddi Hasan, Barath Raghavan, Yahel Ben-David, Max Bittma et al "The Challenge of Scaling WISPs" - https://raghavan.usc.edu/papers/celerate-dev15.pdf

4

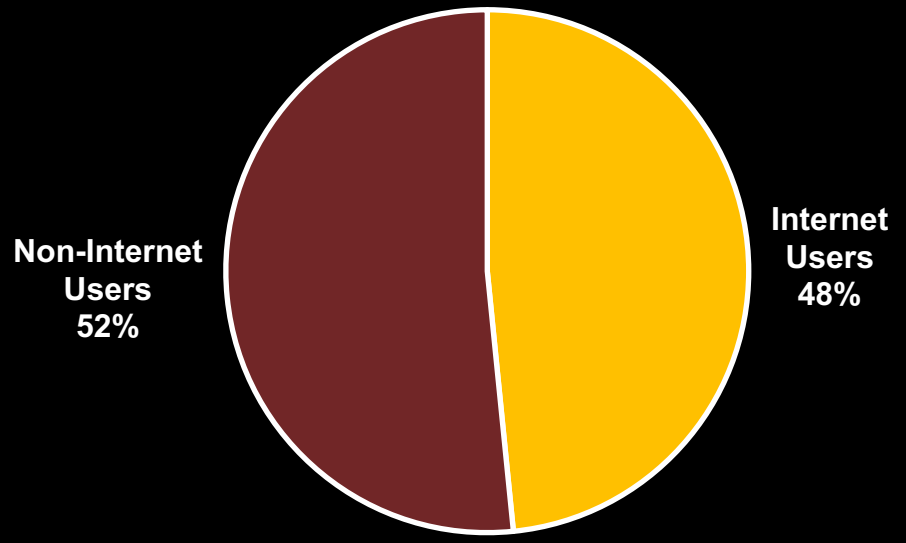
Conflicting trends that demonstrate the important role of ISP operators in the Asia Pacific connectivity ecosystem

Over two billion inhabitants of the Asia-Pacific region using the internet…
…but less than half of the population is online, and the growth rate is slowing down.

2.1 Billion Internet Users in Asia Pacific in 2019…



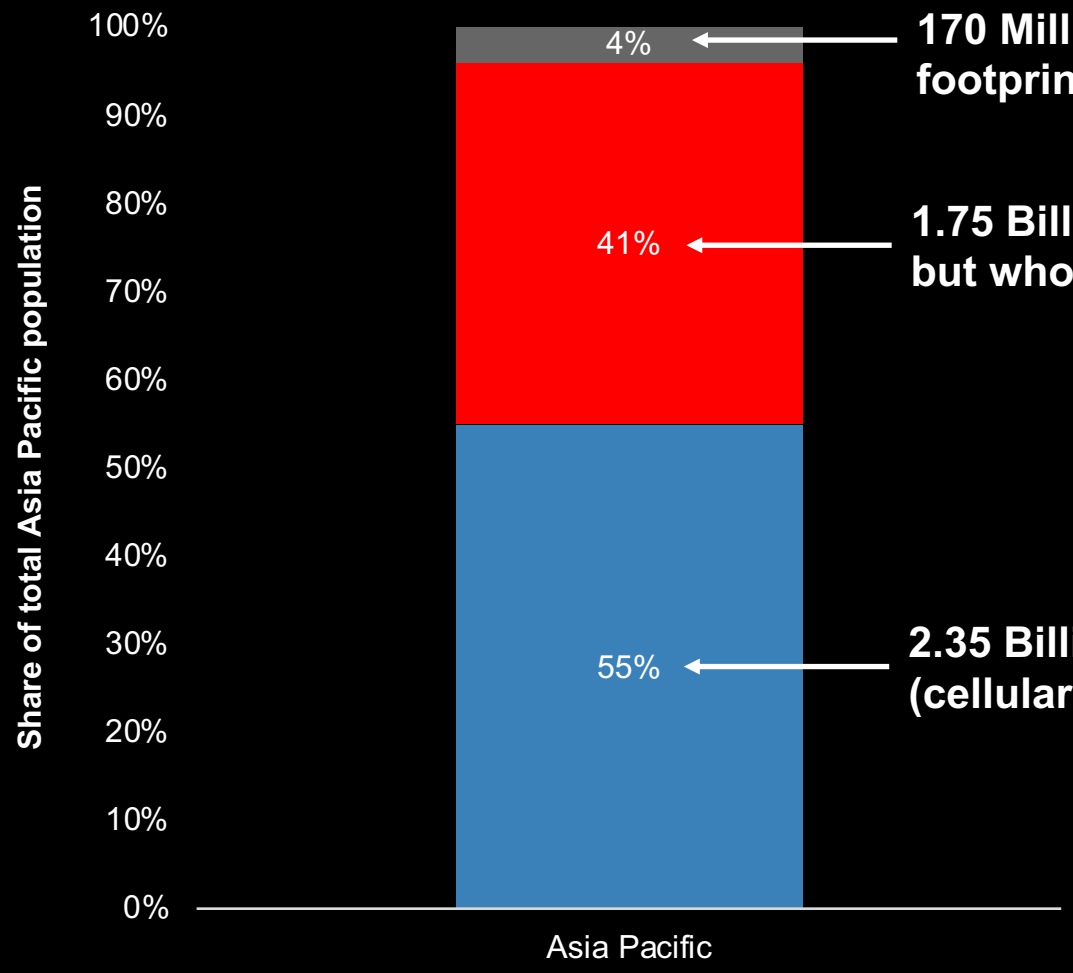
… But less than half of the population of Asia Pacific online



And the growth rate is falling: 15.0% (2017), 6.7% (2018), 5.7% (2019)

Source: ITU 2019 ICT Statistics – Facts and Figures 2019 - https://www.itu.int/en/ITU-D/Statistics/Pages/facts/default.aspx

3G (mobile cellular data) covers 96% of the Asia Pacific population…
…but 1.75 billion people who are covered still don't connect to the internet



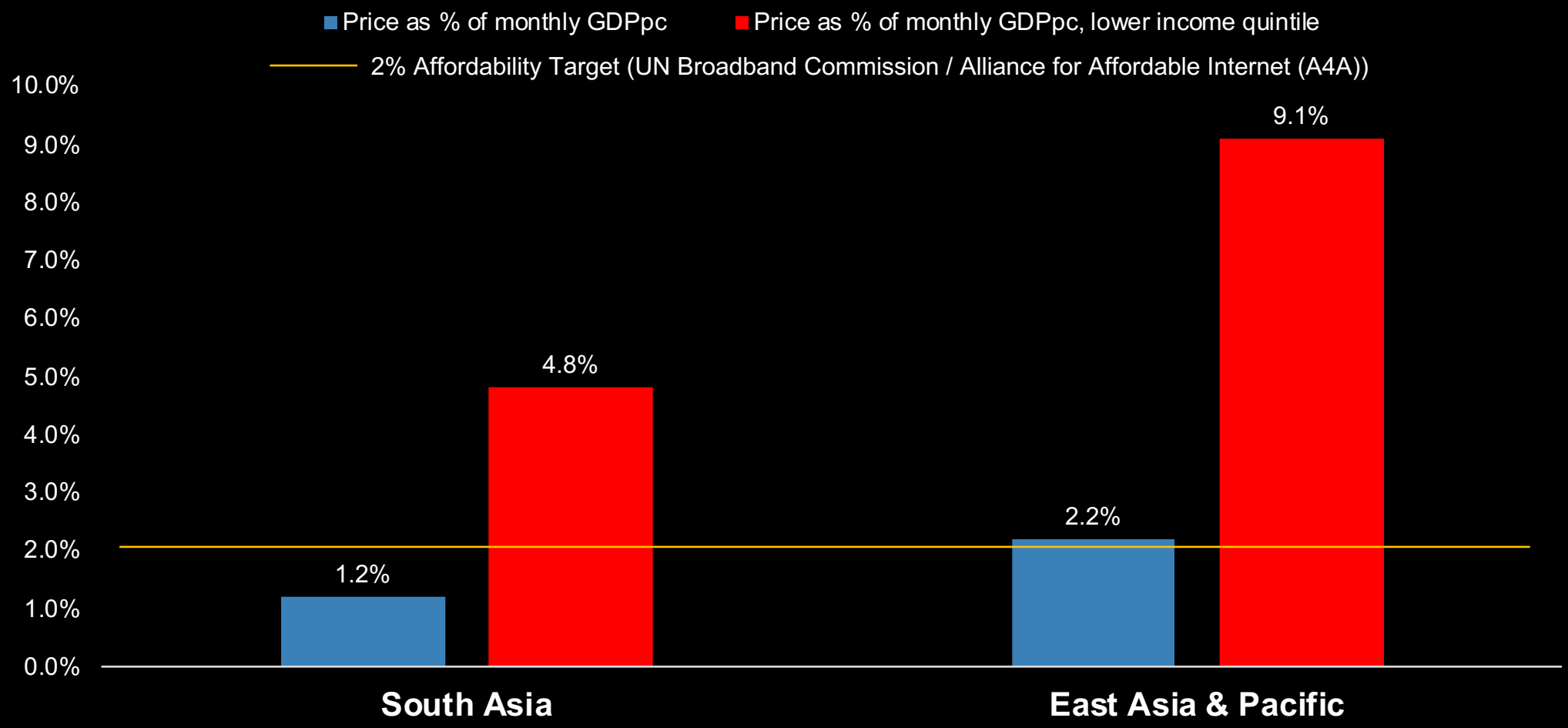
170 Million people in Asia Pacific who do not live within the footprint of at least a 3G network

1.75 Billion people who are covered by at least 3G but who have not used the mobile internet

2.35 Billion 'connected' individuals who have used mobile (cellular) internet services on a mobile device

Source: GSMA 2019 "Closing the Coverage Gap" https://www.gsma.com/mobilefordevelopment/wp-content/uploads/2019/07/GSMA-Closing-The-Coverage-Gap-How-Innovation-Can-Drive-Rural-Connectivity-Report-2019.pdf

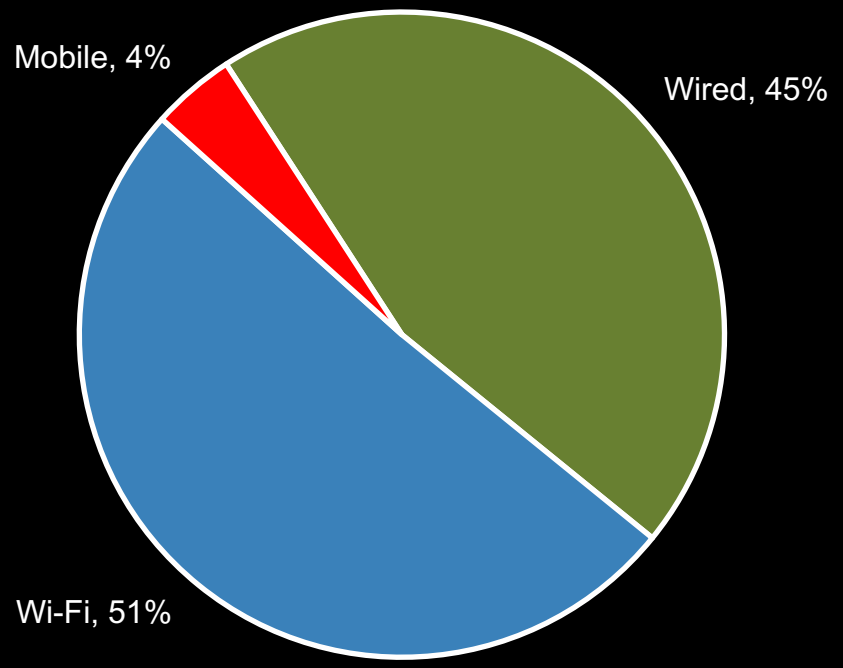
On average, the region has low entry level broadband service prices…
… But national averages belie true costs for lower income consumers



Source: GSMA State of Mobile Internet Connectivity 2019 - https://www.gsma.com/mobilefordevelopment/wp-content/uploads/2019/07/GSMA-State-of-Mobile-Internet-Connectivity-Report-2019.pdf

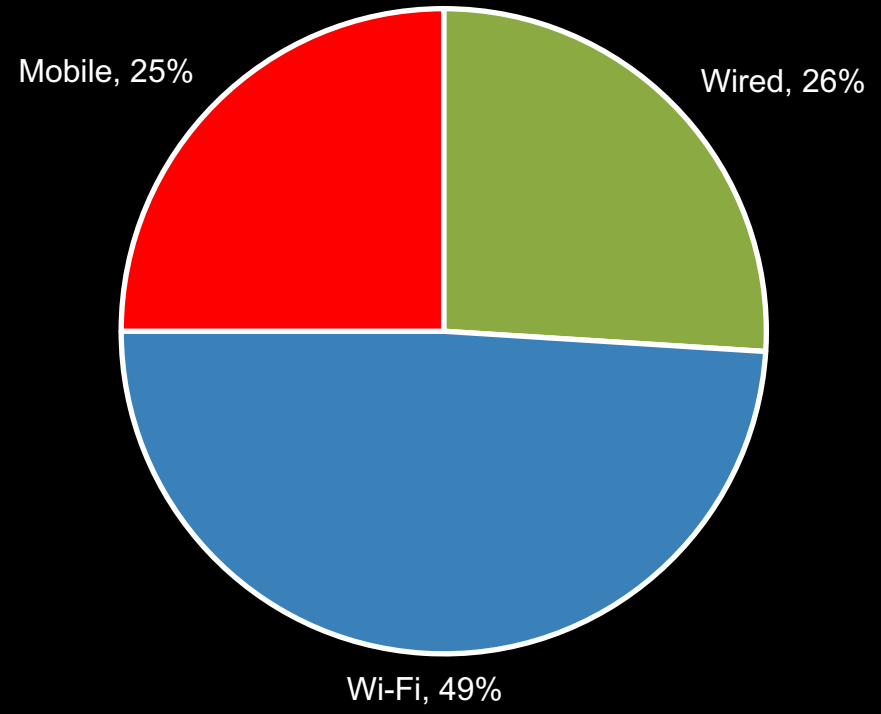
Fiber expansion is growing across the region (terrestrial & subsea)…
…However, connectivity ecosystems in many Asia Pacific countries lag other markets

North America



Other country examples (share of Mobile traffic):
USA (4.3%)
Western Europe (6.7%)

Rest of Asia Pacific

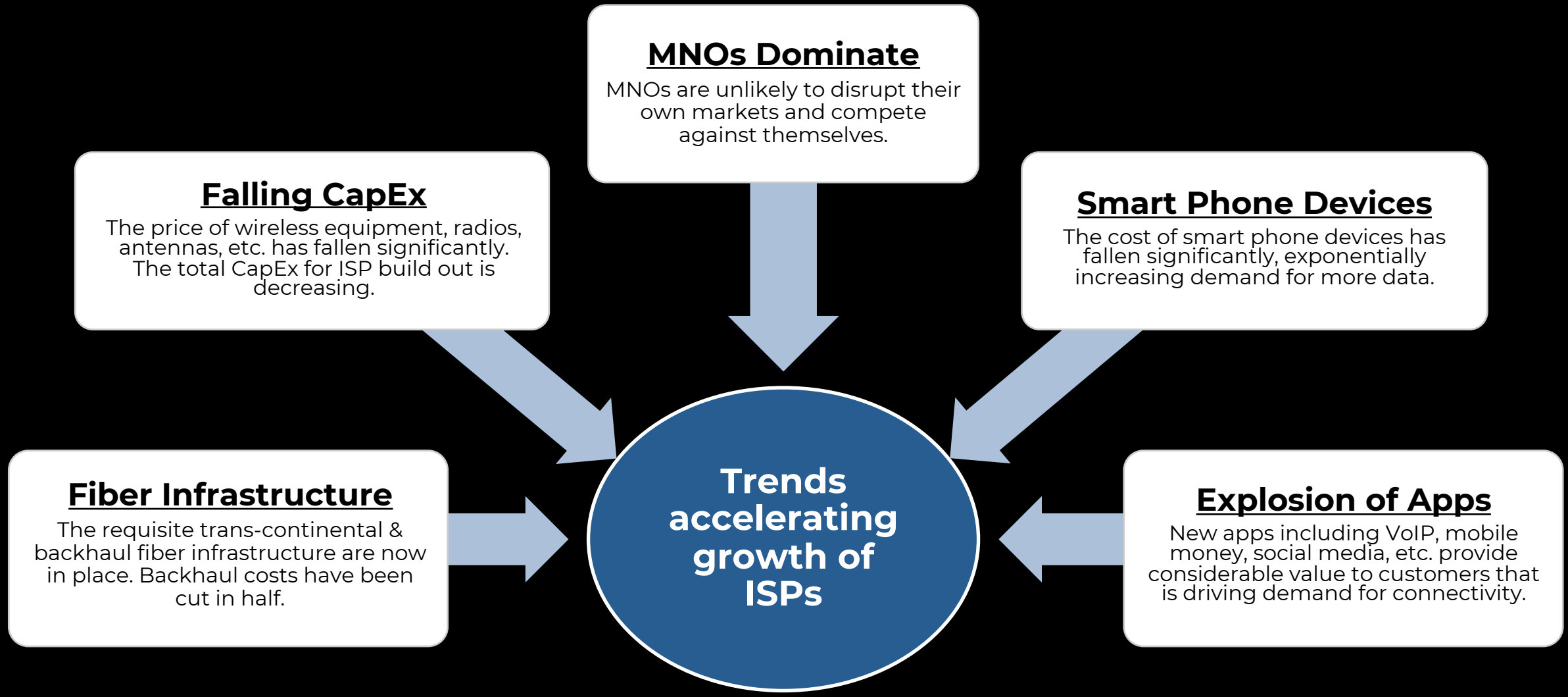


Other country examples (share of Mobile traffic):
Indonesia (41.3%)
India (46.7%)

Source: Cisco VNI Traffic Forecasts 2017-2022 https://www.cisco.com/c/m/en_us/solutions/service-provider/vni-forecast-highlights.html#

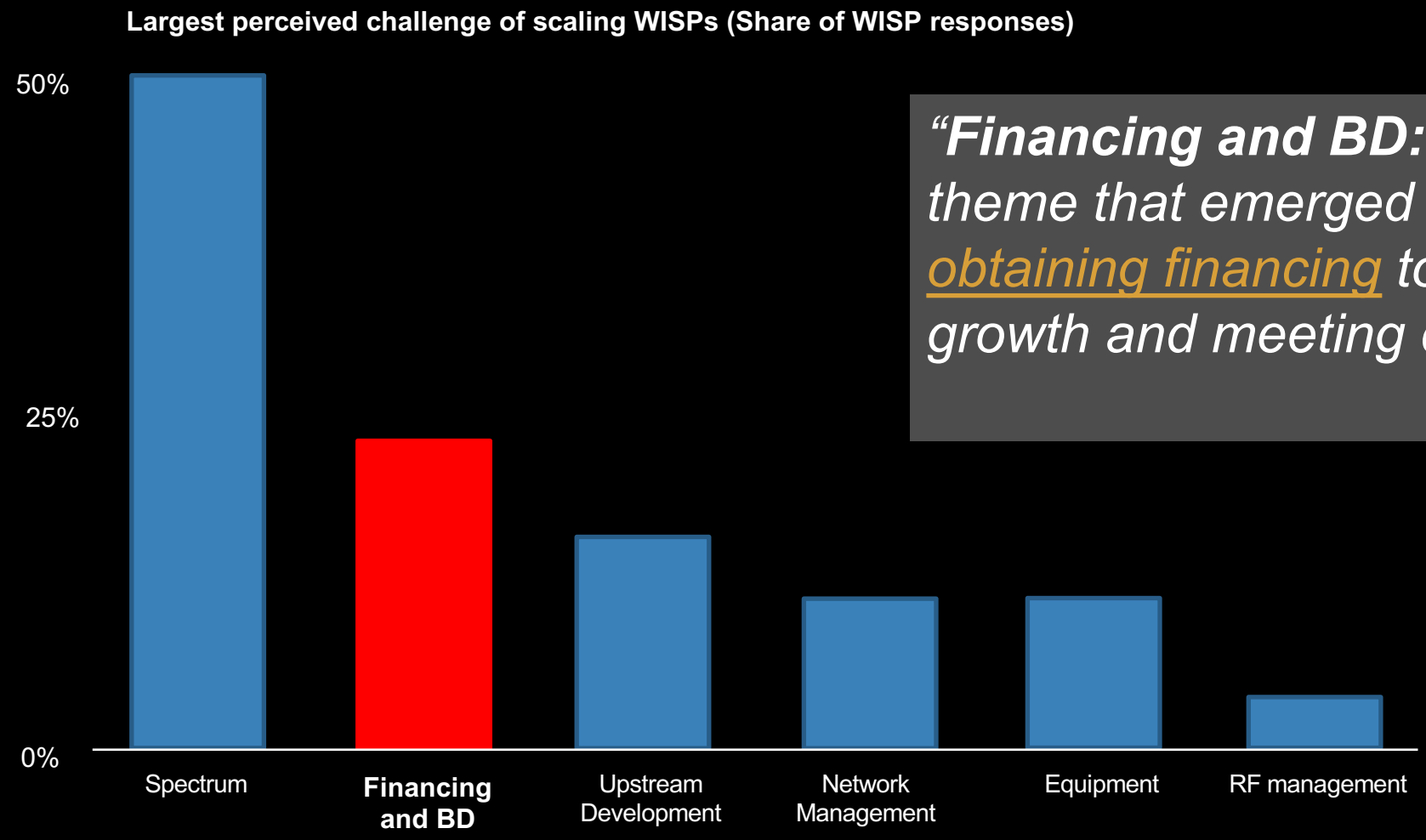
Additional trends in connectivity are accelerating the growth of ISPs

Both fixed and wireless technologies are filling the gap for last-mile access



Source: Connectivity Capital

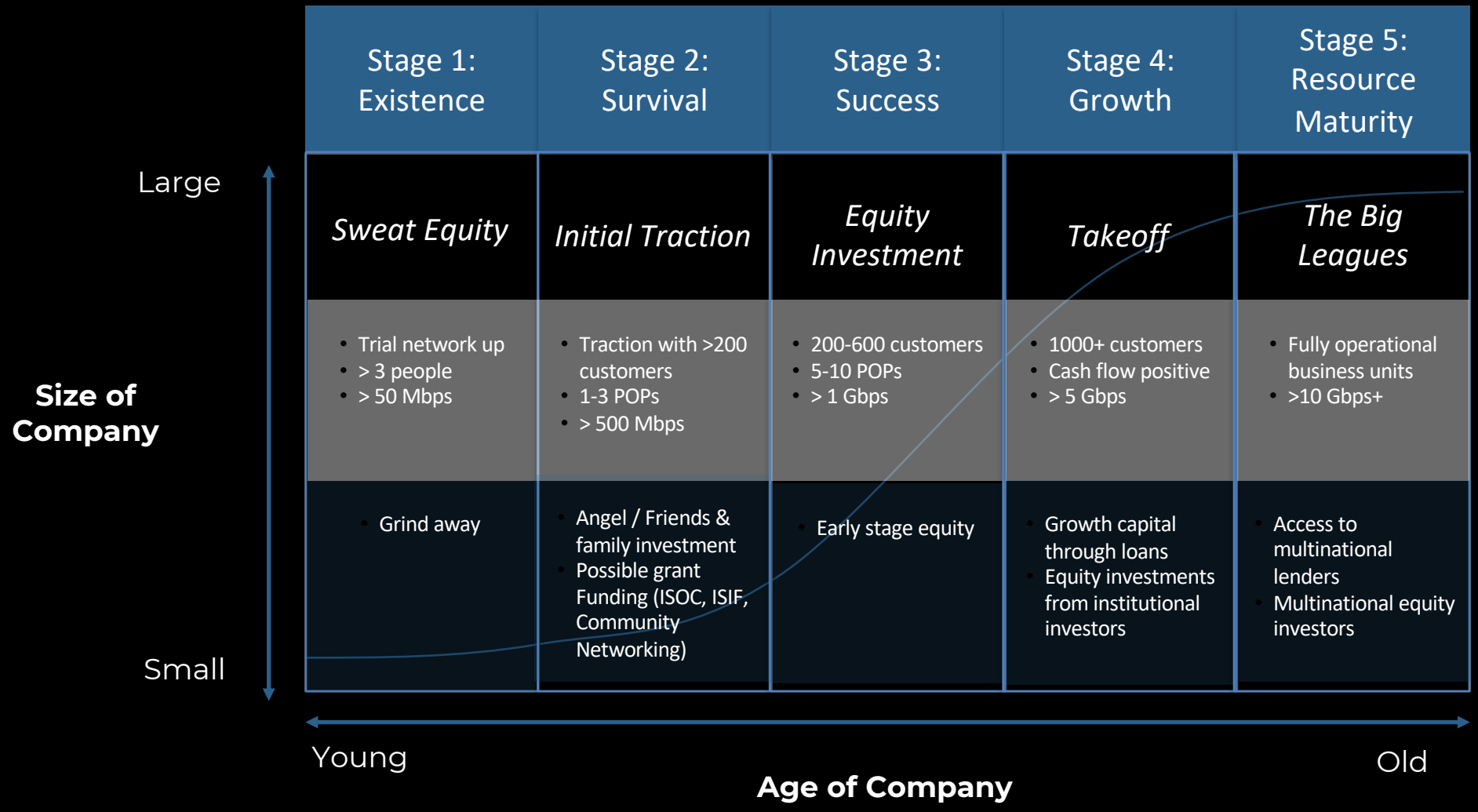
With such opportunity for growth… why is financing so difficult to obtain?



> *"**Financing and BD:** An unexpected theme that emerged was the difficulty of obtaining financing to expand network growth and meeting demand for service."*
>
> - Hassan et al

Source: Hasan et al "The Challenge of Scaling WISPs" - https://raghavan.usc.edu/papers/celerate-dev15.pdf

Five stages of ISP growth



Source: CC internal research

The Dr. Jekyll & Mr. Hyde challenge for ISPs

ISPs are:

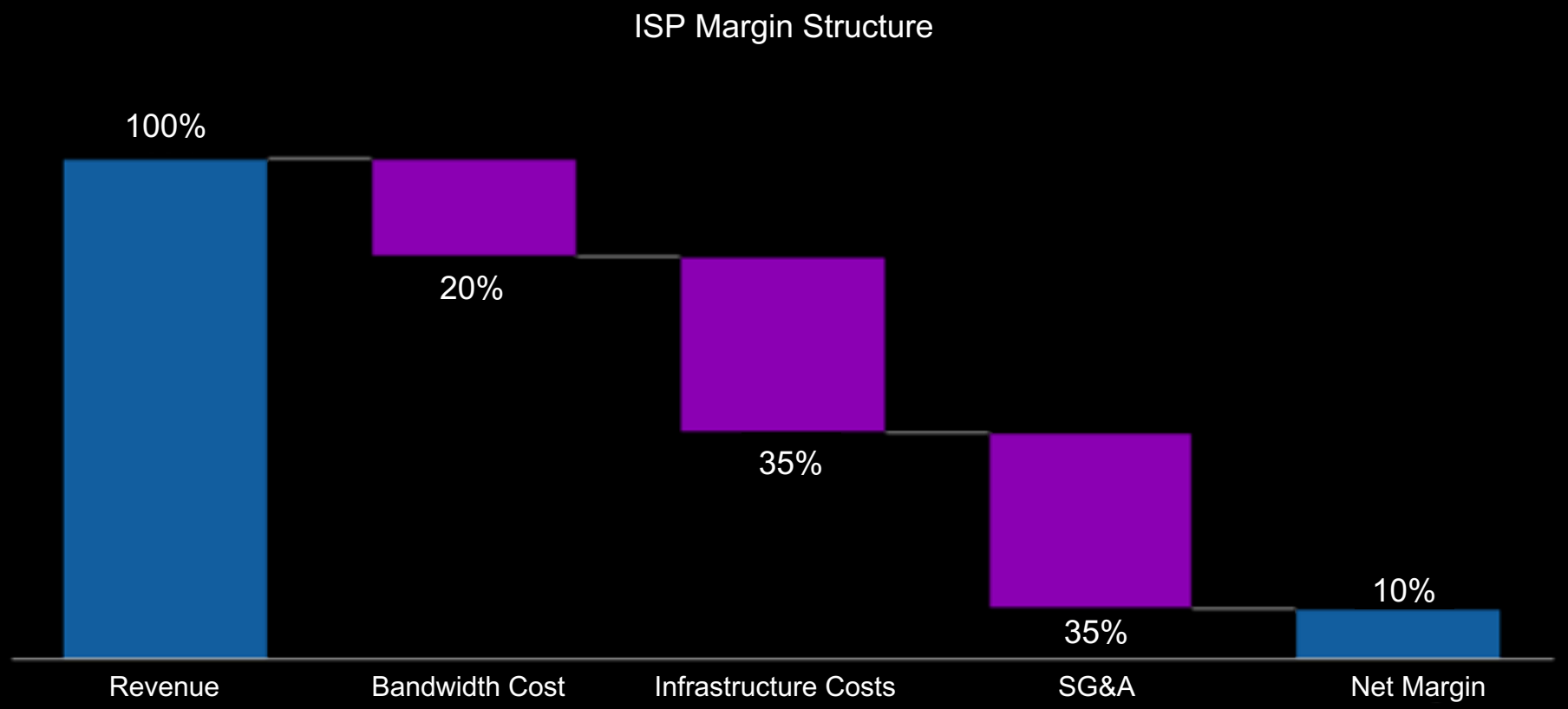
SMEs

Capex-heavy Infrastructure Projects

Image: https://medium.com/addiction-unscripted/dr-jekyll-and-mr-hyde-a-portrait-of-drug-addiction-c25cc5a683a3

ISPs are SMEs but with large capex cost base coupled with thin margins

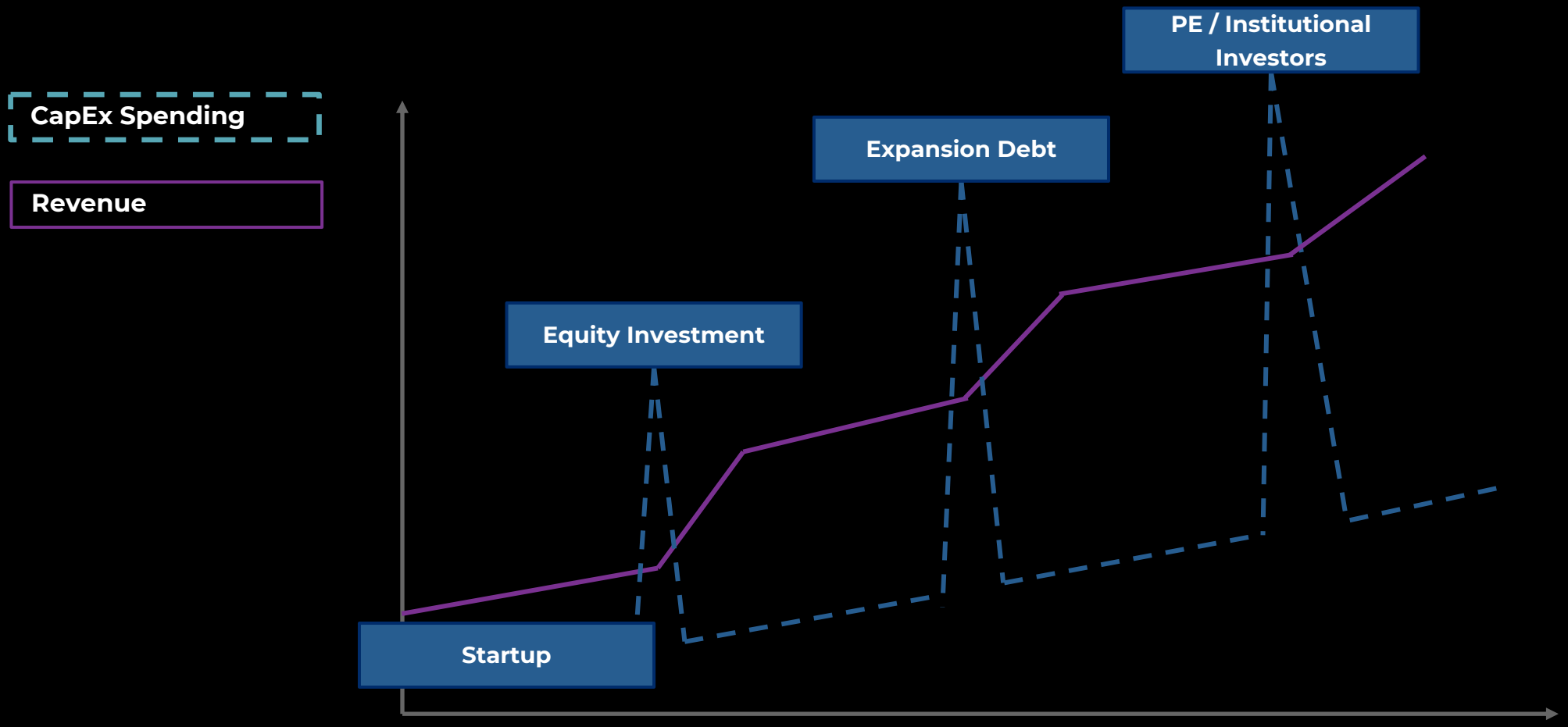
Like other infrastructure investments, ISPs grow on a linear trajectory



Source: CC internal research, assumes base case.

ISPs have investment needs at certain step-functions of their growth

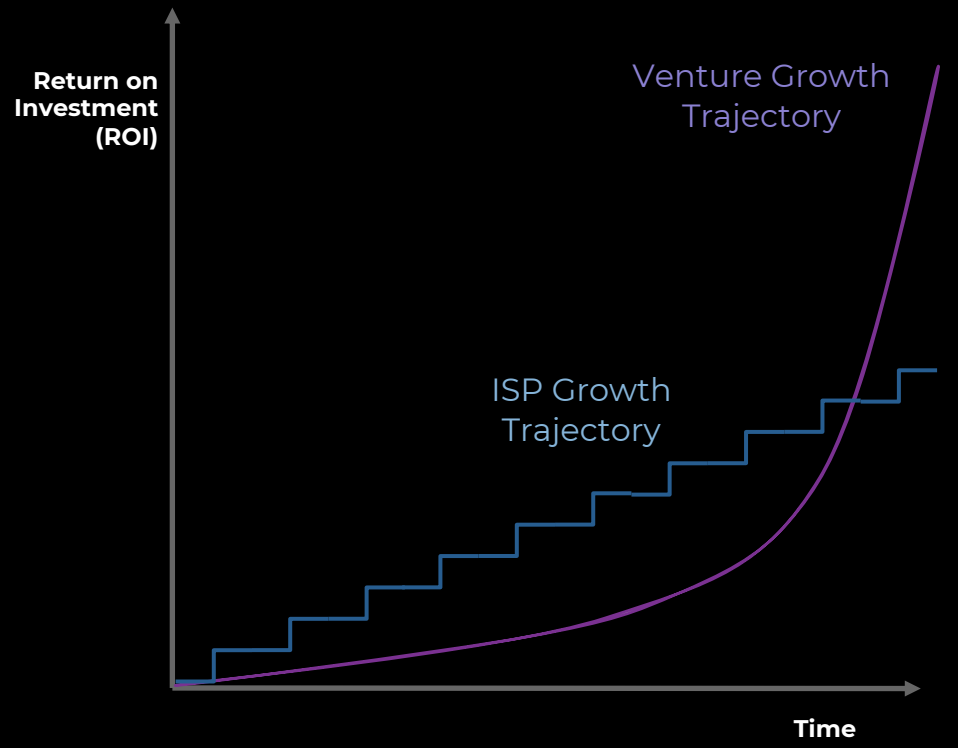
Network expansion has a capital expense (CapEx) cycle similar to infrastructure finance



There's a mismatch between the economics of ISPs & Venture-backed companies

Resulting in a lower number of deals and availability of funding in the connectivity space

	ISP	Venture-backed company
Growth trajectory	Linear	Exponential
Average Return on Investment (ROI)	5-10%	20-30%
Gross Margin	40-60%	75-90%
Cost Base	Capex heavy	Capex light

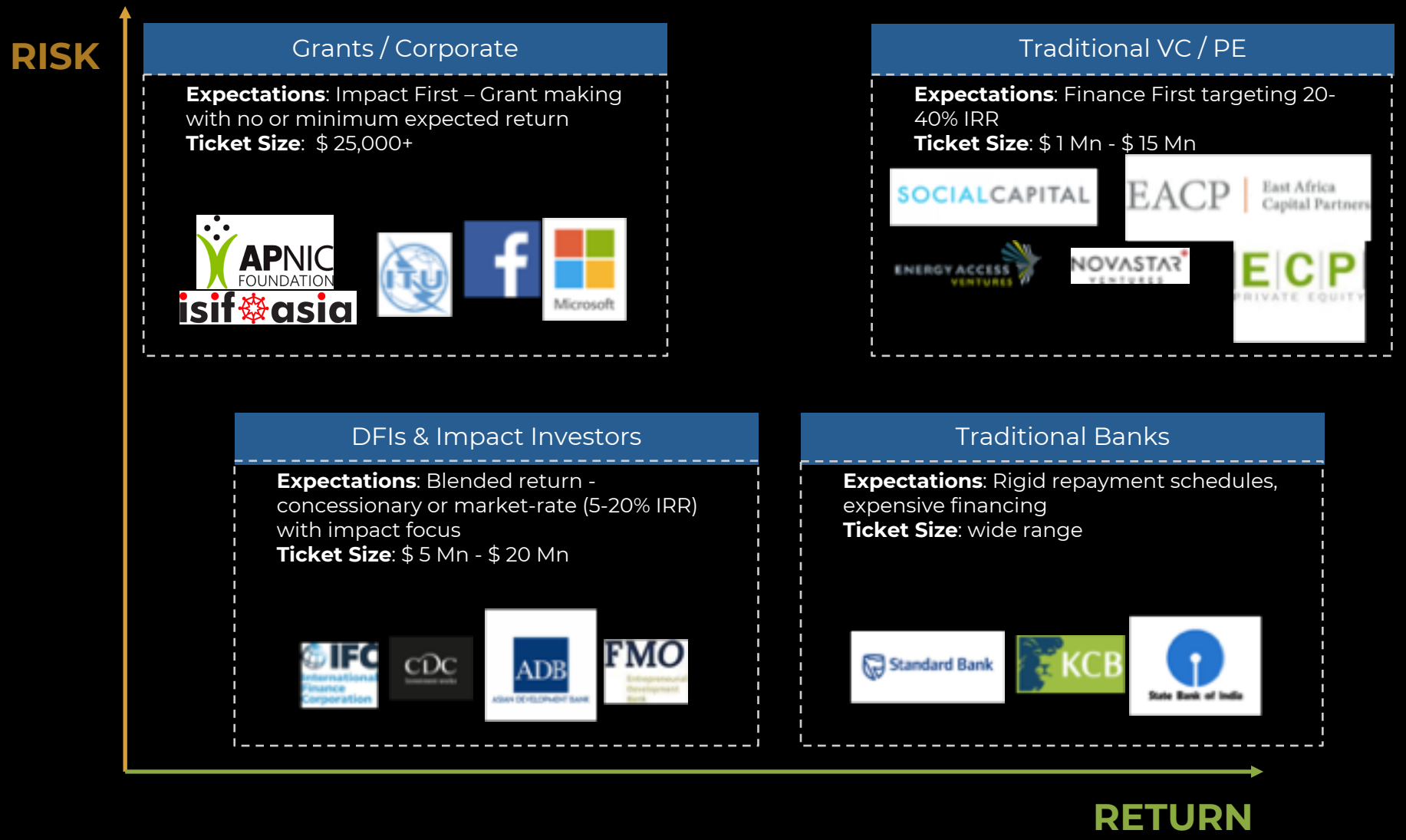


The profile of growth, expectation of returns and margin structure of ISPs and typical venture backed companies differ significantly

Source: CC internal research

Investor landscape snapshot

The funding landscape can be understood through a risk-reward matrix with type of capital

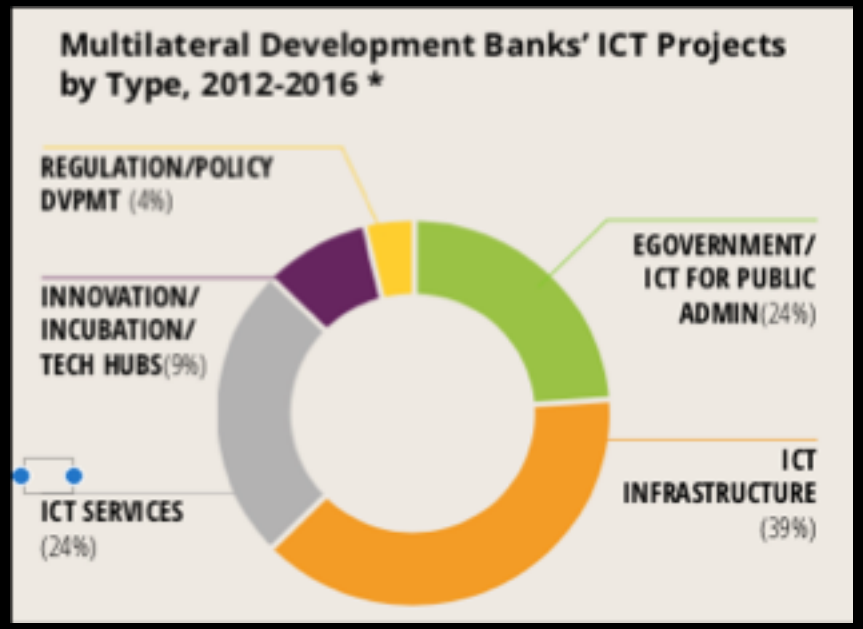


Source: CC internal research

Public investment in ICT infrastructure is low compared to other sectors

Plus the average project sizes are too big for small and medium ISPs

Of the $525 billion USD investment between 2012 to 2016, only 1% went to ICT projects.



Average project commitment size is approximately **$30 million**, with a median of **$20 million.**

Big ticket backbone ICT projects are being financed, but growth capital for last-mile connectivity is limited.

Source: A4AI MDB Investments in the ICT Sector April 2018.

Examples of other ISPs financing paths from Connectivity Capital / USAID INVEST research (30+ ISPs, Financiers, DFIs)

WorldLink (Nepal)

- FTTH
- 350,000 customers (from 30,000 in four years)
- 800 km of fiber (2.5 the govt telco)
- 50% of business in Katmandu
- In business for 7 years before first bank loans

Frontiir (Myanmar)

- Fiber + Wi-Fi
- High capacity, lower capex
- Self-funded first 3.5 years (then PE fund, OPIC)

Other challenges and (incorrect?) investor perceptions (from Connectivity Capital / USAID INVEST research)

- Use of unlicensed spectrum viewed as commercially risky (susceptible to competition)
- Inability to borrow against capital assets (lower capex base than cellular deployments)
- Investors need better data on market demand in smaller markets with limited data
- Low-income consumers only for impact / philanthropic models?
- Limited options for vendor financing
- Sponsorship models / advertising revenue models not working (not just for Google Station)
- Measuring impact / including ”impact without blowing up commercial returns”
- Need to speak the language of investors
- Public government tenders: viable income stream from subsidy / subject to changing politics
- Regulatory: Franchise / licensing uncertainty
- Regulatory: Slow progress on licensing non-MNO centric commercial deployments (i.e. TVWS)

PANELISTS – ISPs and Investors

Sylvia Cadena
APNIC Foundation
(ISIF Grants & Awards)

Jim Forster
Connectivity Capital
(Angel Investor, Debt Capital)

Michael Ginguld
AirJaldi
(ISP – India)

Weng-Yew Wong
Extreme Broadband
(ISP – Malaysia)

Additional Resources

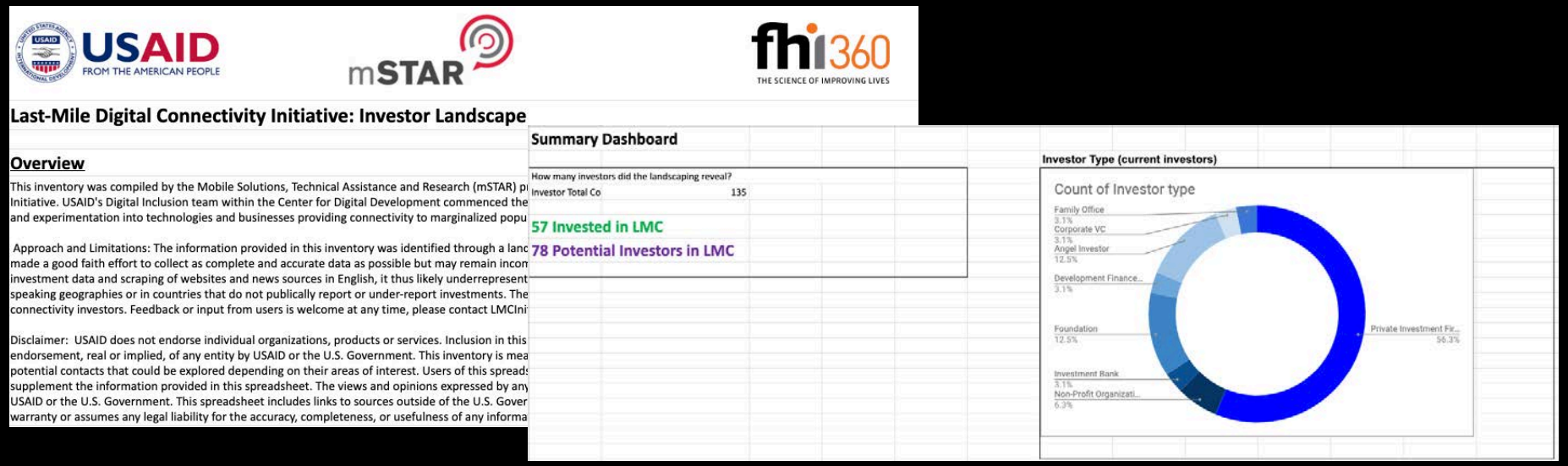
APNIC FOUNDATION

isif asia

apnic.foundation

Connectivity Capital

connectivitycap.com



Email: jdgarrity@gmail.com