APPROACHES FOR FINANCING BROADBAND EXPANSION IN THE LATIN AMERICA REGION

BACKGROUND PAPER
OCTOBRE 2020

PRELIMINARY VERSION

This report was prepared for the International Telecommunication Union (ITU), by ITU Experts Mr Philippe Defraigne and Ms Carolina Limbatto, under the supervision of the ITU Regional Office for Americas and the Regulatory and Market Environment Division (RME) of the ITU Telecommunication Development Bureau (BDT). It was prepared as a background discussion paper and presented during the ITU Regional Economic Dialogue for Americas (RED-AMS) in the framework of the ITU Policy and Economic Colloquium for the Americas Region (IPEC-2020)[1] organized online from 5 to 7 October 2020.

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[1] *ITU Policy and Economic Colloquium for the Americas Region IPEC-2020* (https://www.itu.int/en/ITU-D/Regional-Presence/Americas/Pages/EVENTS/2020/24621.aspx)

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Introduction

This paper seeks to analyse the different approaches to allow broadband expansion in Latin America. Before going in depth to the different approaches we will go through main evidence on why this expansion is key for countries in Latin America and where are the connectivity gaps.

The paper analyses main expansion solutions, on the private side efforts by traditional and new players in different connectivity models. On the public side, we will analyse main initiative regarding fibre broadband networks and the use of Universal Service Funds.

Connectivity gaps

There are different types of gaps to address to achieve a universal broadband connectivity, on one side we have the supply side gap. National broadband plans and strategy usually target this type of gaps: no broadband service (coverage gap) or/and the broadband service does not have a good quality (investment gap).

On the other hand, we have the demand side gap:
- Affordability gap: when there is service, but users cannot afford the cost.
- Digital skills gap: people can pay for the service but do not have the skills to make a good use of connectivity.
- Local content gap: people can pay for the service, know how to use it but there are no relevant or local content available online.

Why is broadband expansion important?

According to an ITU report[2] there is evidence of the impact of broadband and digital transformation on the economy and the impact of institutional and regulatory variables on the growth of the digital ecosystem.

According to the study there is an economic impact of fixed and mobile broadband. An increase of 1 per cent in fixed broadband penetration yields an increase in 0.08 per cent in gross domestic product (GDP) while an increase of 1 per cent in mobile broadband penetration yields an increase in 0.15 per cent in GDP.

There is also an economic impact of digitalization, an increase of 1 per cent in the digital ecosystem development index results in a 0.13 per cent growth in GDP per capita. Furthermore, the impact in OECD countries is higher, i.e. the impact of digitalization is bigger in more developed economies. In addition, an increase in the digitalization index produces an increase in labour productivity.

Finally, the study showed evidence of the impact of policy and regulatory framework on the growth of markets for digital services and applications. An increase in the ICT regulatory

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[2] ITU, Katz, Callorda, "The economic contribution of broadband, digitization and ICT regulation" 2018. Available at: https://www.itu.int/en/ITU-D/Regulatory-Market/Pages/Economic-Contribution.aspx

tracker is significantly correlated with an increase in the pillars measuring the development of infrastructure of digital services, connectivity of digital services, household digitization and digital factors of production. Moreover, the analysis shows that the regulatory regime component always has a positive and significant impact on every pillar of the digital ecosystem development index.

We will analyse some key policy and regulatory developments that could have a higher impact on digital development.

In the last ITU Global Symposium of Regulators (GSR-20), ICT regulators from around the world agreed on the need to promote digital transformation and affordable connectivity. The GSR-20 also highlighted that the COVID-19 pandemic has shown that connectivity for all is essential for economic activity and citizen welfare. The regulators also recognized that there is no unique, single and comprehensive connectivity plan. The policies and regulations depend on local circumstances and must be addressed considering the regional and global challenges.

The document of the meeting "The gold standard for digital regulation" recognizes connectivity as one of the best practices for digital regulation[3].

"*Connectivity: targeted and innovative strategies to increase universal broadband access and lower the costs of communication will narrow national market gaps*."

In the next sections we will explore different connectivity initiatives in the Latin America Region.

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[3] Available at https://www.itu.int/en/ITU-D/Conferences/GSR/2020/Documents/GSR-20_Best-Practice-Guidelines_E.pdf

Public funds to increase connectivity in the Americas

Public funds are usually used to fund broadband expansion in rural areas or low-income areas. There are different types of tools or policies with this target:

- National Broadband or connectivity plans;
- Universal service funds (USF);
- National fibre networks.

Public funds in the Americas Region

Country	NBBP	USF & programmes	Backbone
Argentina	Yes "Plan Conectar"	Yes Demand and offer	State-owned operator, Arsat Refefo
Brazil	Yes "Internet para todos"	Yes, but not actively used	State-owned operator, Telebras
Chile	Yes "Agenda digital 2020"	Yes Demand and offer	Fibra Óptica Nacional (FON), Wom
Colombia	Yes Colombian National Development Plan	Yes Demand and offer	Proy. Nac. Fibra Optica (PNFO)
Costa Rica	Yes "Estrategia Nacional de banda ancha"	Yes Demand and offer	State-owned operator, ICE
Ecuador	Yes "Plan Nacional de Telecomunicaciones 2016-2021"	Yes Mostly demand side	State-owned operator, CNT
Mexico	Yes "Internet para todos 2019-2024"	No fund	State-owned operator, CFE
Paraguay	Yes "Plan Nacional de Telecomunicaciones"	Yes Mostly offer side	BB plan
Peru	Proposed	Yes Mostly offer side	RDNFO + regional
Uruguay	Yes Several plans	No fund	State-owned operator, Antel

Source: Cullen International, 2020

National broadband plans

National broadband plans in Latin America include several initiatives, some plans have strong coverage targets, others include specific connectivity projects and some include both. The main goal of broadband plans is to have a roadmap to achieve certain level of connectivity in the short/mid-term.

All surveyed countries in Latin America have ongoing broadband initiatives and some set targets to extend broadband coverage and penetration.

The targets for speed, coverage and timing vary considerably. Most countries have also defined targets aiming to increase broadband connectivity in schools and public bodies. All countries in the region have publicly funded broadband deployments, some mainly focused on the backbone network, while others also targeting the access network.

In some countries there is a strong participation from the public sector in the deployment of fibre networks, to either complement or boost private investment.

Countries adopt broadband plans or other initiatives to increase connectivity

Country	National broadband plan	Year of launch
Argentina	Connectivity plan, several initiatives with a central role of the state-owned operator, Arsat. It includes and axis on fibre deployment. Digital agenda for 2030 includes actions on infrastructure deployment and connectivity.	2016/2020
Brazil	Internet for All (Internet para Todos) The strategy focuses on connecting schools, healthcare and other government units using the Brazilian Geostationary Satellite in partnership with ViaSat, which would provide services for households using the satellite capacity.	2018
Chile	Digital Agenda 2020 targets to achieve total connectivity. In addition, several fibre deployment and submarine cable projects.	2015
Colombia	Colombian national development plan 2019-2022. Among the plans included, last mile programmes and universal access expansion. Other plans: • San Andres connected • National rural connectivity plan (high-speed internet access in 170 municipalities)	2018 (National Development Plan)
Costa Rica	Estrategia Nacional de Banda Ancha (PNDT)	2015
Ecuador	National Telecommunications Plan 2016-2021 to increase broadband penetration. (In Feb. 2019, Mintel assessed the progress on the plan.) Ecuador Digital strategy (2019) aims to increase national internet connectivity.	2016/2019
Mexico	"Internet for all" (2019-2024)	2019
Paraguay	National Telecommunications Plan (NTP) includes broadband coverage targets. The digital agenda includes one pillar on connectivity	2016/2019

Country	National broadband plan	Year of launch
Peru	The National Plan for Broadband Development of 2011 defined specific policies for broadband deployment. In Oct. 2019 the Ministry of Transport and Communications (MTC) proposed guidelines to incorporate new services and digital technologies in telecommunications policies. New targets for minimum internet speed (90 per cent) were proposed on 01 June 2020 but not yet approved.	2011
Uruguay	The connectivity plan included a target of 90 per cent of households with broadband connectivity (65 per cent with fibre) by 2020.	2017

Source: Cullen International, 2020

Broadband targets can be split in three main categories:
- General broadband coverage targets (in terms of population or households)
- Fast broadband coverage targets (higher speeds or specific technology)
- Specific sector penetration target (in general for schools or public bodies).

In the table below there is a summary of targets established in Latin America.

Most countries established a connectivity target

Country	Broadband coverage target	Fast broadband coverage target	Specific sector penetration target
Argentina	-	-	100 per cent of schools and libraries connected to 1-20 Mbps (depending on the type of institution)
Brazil	-	-	Connect 3,000 schools and hundreds of public bodies to high broadband speed connections (satellite connections).
Chile	90 per cent of households with 10 Mbps download speed connection by 2020	20 per cent of households covered with fibre connections by 2020	100 per cent schools connected by 2020 (no speed target)
Colombia	70 per cent of households connected to broadband (no speed target but broadband definition is 25 Mbps download and 5 Mbps upload)	50 per cent of households connected to fast broadband (no speed target)	-
Costa Rica	80 per cent of population with 20 Mbps downlead speed connection by 2021	-	100 per cent of technical schools, min. speed 20 Mbps by 2021
Ecuador	98 per cent of population connected by 2021 (no speed target)	-	75 per cent connected schools by 2021 (no speed target)
Mexico	100 per cent of population by 2024 (no speed target)	-	100 per cent public sites by 2024
Paraguay	80 per cent of population covered with mobile broadband by 2020. General target to increase fixed broadband connectivity.	40 per cent of population with fibre connection of 10 Mbps by 2020	By 220: • 100 per cent of government bodies • 100 per cent of health care institutions • 2,500 secondary schools
Peru	-	-	100 per cent of schools, health centres, police stations and other public buildings (2 Mbps) 82 per cent of Peruvian 1838 districts (2 Mbps)

Country	Broadband coverage target	Fast broadband coverage target	Specific sector penetration target
			500,000 public sector offices (>4 Mbps)
Uruguay	90 per cent of households with broadband connectivity by 2020 (no speed target). 65 per cent of population covered with LTE mobile broadband by 2020	65 per cent of households with fibre connection by 2020	100 per cent of retired people with connectivity and digital skills.

Source: Cullen International, 2020

Universal Service Funds (USF)

The objective of universal services (US) is to make basic communication services (including voice services, fixed and mobile, and for some countries also high-speed broadband access) available to all end-users at affordable prices by imposing an obligation on one or several entities to provide such services.

A country may also choose to set a policy goal to achieve universal availability of certain basic telecommunications services at affordable prices, and to support this with public money. In this case, there would be no formal obligation to an operator to provide any such basic services at a subsidised price, but if an operator freely decides to provide the services, it could benefit from public funds earmarked for this goal.

In most of the countries observed, governments do not impose a formal US obligation on a defined undertaking but make available public funds for universal access programmes. The USF receive contributions from private and public sector:

USF usually include public and private funds

Country	Public fund	Private funds
Argentina	Yes Public and private sector can make donations to the trust fund.	Yes Telecommunication service providers must deposit 1 per cent of their monthly income. Enacom can decide which providers are exempt from contribution. In July Enacom approved new management rules for the universal service fund (USF), including the possibility to invest up to 30 per cent of their

Country	Public fund	Private funds
		universal service fee directly into USF projects.
Brazil	Yes Also receives funds from the Telecommunication Supervision Fund (FISTEL), up to BRL 0.70bn (USD0.13bn) per year, and the fees charged by Anatel for spectrum licence fees.	Yes The fund consists of the monthly charge of 1 per cent of gross operating revenue of the operators after tax. 50 per cent of the amount paid to Government (up to BRL 0.70bn (USD0.13bn) annual limit) for the grant of concessions or service licences, authorisations for use of spectrum and fines under Law 9998/2000. 100 per cent of the amount paid for the transfer of concessions, service licenses and authorisations for use of spectrum.
Chile	Yes Amount settled by public sector's Budget Law every year	No Some projects could be running through a public-private partnership.
Colombia	Yes ICT fund receives money from: • fines and sanctions imposed by the Mintic and the ANE • public budget (art 37.6 of ICT law) • rights, rates and fees received for concessions, use of spectrum and payments made by the broadcasters.	Yes The new modernisation law mandated the MinTIC to define this fee, and the contribution to the ICT fund cannot be higher of 2.2 per cent of quarterly gross income. MinTIC set the contributions to the ICT fund at 1.9 per cent of operators' quarterly gross income. This contribution will be adjusted every four years.
Costa Rica	Yes FONATEL can receive donations from the public budget (art. 38 of Telecommunications Law).	Yes Companies must pay from 1.5 per cent to 3 per cent of gross income, as defined by the regulator every year (art. 39 of Telecommunications Law)
Ecuador	No The new universal fund created by the new telecommunications law is financed by private contributions only. However, previous fund, FODETEL, allowed both private and public donations and received funds from previous NRA.	Yes Telecom service providers must contribute 1 per cent of their annual turnover, to be collected quarterly. (Telecommunications Law, art.92)
Paraguay	Yes	Yes

Country	Public fund	Private funds
	50 per cent of all fines imposed to service providers collected by CONATEL (donations, bequests, transfers or other contributions).	30 per cent of telecommunication operators tax fee (1 per cent of monthly income)
Peru	Yes Direct funding and part of spectrum fees (FITEL regulation, art. 3; PRONATEL regulation, art. 10)	Yes Telecommunication operators contribute with 1 per cent of their annual gross income. (FITEL regulation, Article 3, PRONATEL regulation, art. 10)

Source: Cullen International, 2020

Most of surveyed countries aim to facilitate connectivity in areas with high cost to reach, i.e. to increase or improve connectivity in a region or town. In general, these funds are used for this type of offer side programmes.

However, there are several countries also implementing demand side programmes, including subsidies access to low-income users, schools, libraries and health centres. All programmes seek to provide connectivity in non-rentable areas, and there are also other types of universal service programmes.

Programmes to provide connectivity in non-rentable areas

Country	Offer side Non-rentable areas	Demand side Low-income users	Schools and libraries	Other
Argentina	Yes	Yes	Yes	• Subsidised credit loans for SMEs • Accessibility for the elderly
Brazil	Yes (GESAC)		Yes (incl. public schools and healthcare units)	
Chile	Yes			Free wi-fi spots
Colombia	Yes	Yes		• Public internet access for vulnerable people • DTT access to public and academic bodies.
Costa Rica	Yes	Yes		Free wi-fi spots
Ecuador	Yes		Yes	

Paraguay	Yes	Yes		Telemedicine
Peru	Yes			

Source: Cullen International, 2020

All USFs include programmes to increase connectivity in non-rentable or rural areas. In addition, most countries established different demand side programmes or other programmes targeting specific users or areas.

Summary of USF programmes
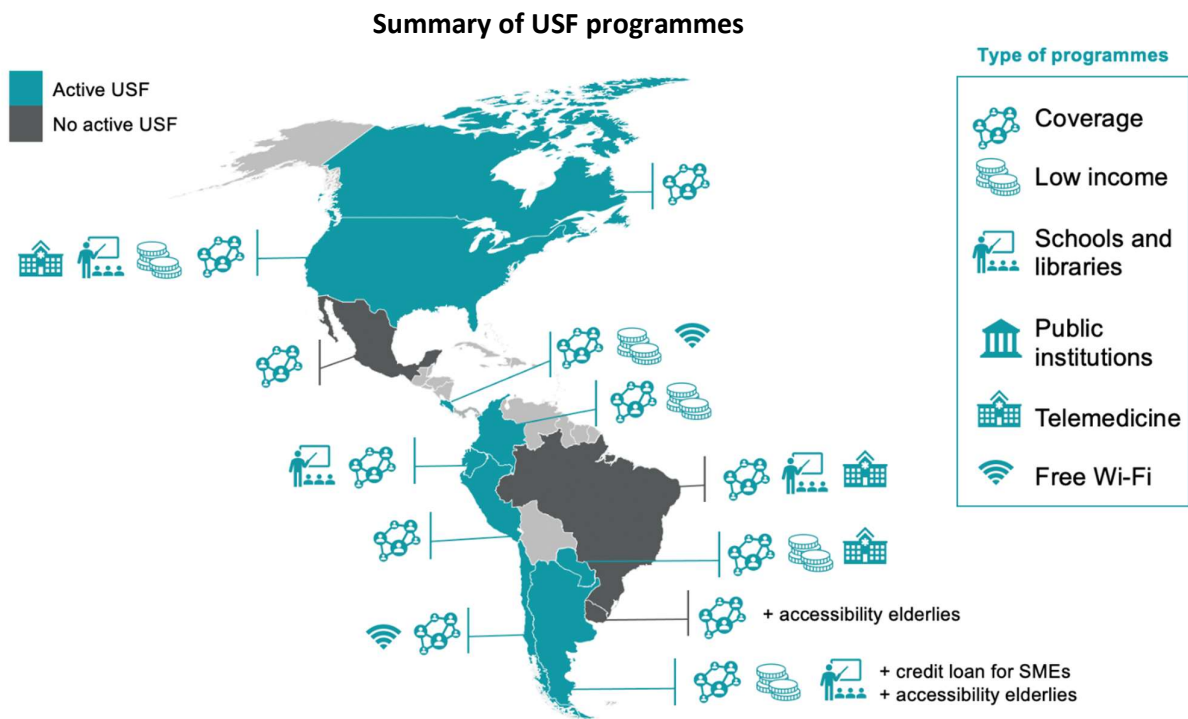
Source: Cullen International, 2020

Universal Service in Argentina: a boost to increase connectivity

In 2020 the Argentinian ICT regulator, Enacom, approved changes to management rules for the universal service fund (USF), including the possibility to invest up to 30per cent of their universal service fee directly into USF projects.

In addition, the Enacom board approved several universal service programmes, extending the scope and funding for connectivity projects, and accelerating the delivery of funds during the COVID-19 emergency situation.

New rules to foster network expansion
As before, ICT licensees must pay 1 per cent of their monthly turnover (net of taxes) into the USF. However, the new rules allow ICT licensees to invest up to 30per cent of this monthly obligation directly into USF projects.

The rules allow this 30per cent of direct investment (the "*computable investment*") to be used for equipment, software and passive infrastructure. However, direct investment cannot be used for:

- operational and maintenance costs, except if the expenditure guarantees a project's technical or economic viability;
- spectrum assignment fees; or
- compliance with coverage obligations (for both fixed and mobile telephone services).

Another provision in the new rules is that USF projects that include the provision of fibre to the home will not benefit from the 15-year deferment of fibre local loop unbundling introduced in 2017.

All USF projects must be approved in advance by Enacom and be framed in a universal service programme that includes:

- accessibility and affordability of ICT services for low-income or special needs users;
- connectivity for public bodies;
- connectivity for rural, geographically disadvantaged areas and for low-income neighbourhoods; and
- network expansion or modernisation for cooperatives and small and medium enterprises (SMEs).

For those computable investment projects where providers seek to benefit from the direct investment possibility, Enacom published guidelines stating that such projects must:

- include a detailed diagnosis, and technical and economic description;

- promote solutions to achieve universal service targets through infrastructure development;
- include a minimum investment level equivalent to 100 x the monthly minimum wage, i.e. ARS 1.69m (USD24,995); and
- be executed within 36 months.

Argentina's previous USF rules were approved in May 2016 and modified to include new programmes in November 2019.

New programmes
Enacom approved new universal service programmes, and forecast the expenditure of the universal service fund (USF) for each of them:
- connectivity in low-income neighbourhoods (expenditure of ARS 1bn (USD14.79m);
- connectivity in areas with lack of infrastructure (ARS 0.30bn (USD4.44m);
- deployment of mobile networks (ARS 0.50bn (USD7.39m); and
- connectivity to public institutions (ARS 2bn (USD29.58m).

Enacom also changed the rules of the connectivity programme, which is applicable for towns with up to 30,000 inhabitants. Any other ISP provider already connecting more than 5per cent of homes can oppose the new ISP's project. Enacom would then decide if the new ISP can use universal service funds for the project.

Use of USF during the COVID-19 pandemic
Enacom extended the scope of universal service programmes on connectivity, accelerated the delivery of funds to connect low-income and isolated areas, and granted more funds for connectivity:

- increased the money advanced from 20 per cent to 30 per cent;
- doubled the total amount granted per town from ARS 10m (USD0.15m) to ARS 20m (USD0.30m); and
- increased the total amount per project from ARS 60m (USD0.89m) to ARS 80m (USD1.18m).

The universal service fund is also used to provide subsidised broadband access in low-income neighbourhoods that are in strict lockdown due to COVID-19 outbreaks.

Enacom extended the scope of the programme "Más Simple" to deliver tablets in low-income neighbourhoods. Local government, churches and civil associations are responsible for delivery of the tablets.

Source: Cullen International, 2020

National fibre networks

Several countries in Latin America decided to deploy a national backbone fibre network. Considering that the roll out of optical fibre to deliver fast broadband is commercially viable only in very densely populated or high-income areas, these nationwide fibre deployments usually require some form of government funding.

There are different types of government funding:

- deployment through a private operator (direct subsidies, e.g. the European Union and Chile);
- state-owned operator deployment (e.g. Argentina, Brazil, Uruguay)

Some initiatives on national fibre backbones in Latin America

ARSAT	🇦🇷	Refefo: +33,000 km +1,300 towns connected. Public funds + USF
TELEBRAS	🇧🇷	Telebras: +30,000km, to be privatised
WOM	🇨🇱	FON: ~10,000 186 towns. Subsidies to private operator
azteca Comunicaciones Colombia	🇨🇴	PNFO: ~20,000km 786 towns. Public funds
azteca Comunicaciones Perú	🇵🇪	RDNFO: >13,000km, 180 provinces. Public funds
antel	🇺🇾	Antel: >12,000km, most homes connected

Source: Cullen International based on regulators and operators public information, 2020

Fibre networks in Chile, 2020 developments

National Fibre project

In April 2020, the Chilean regulator, Subtel, awarded the National Optical Fibre project for the construction of 10,000 km of optical fibre networks to WOM.
WOM, the smallest mobile network operator (MNO) in the country, won the tender in five out of the six tendered macrozones (one macro-zone remain deserted).
WOM will receive a subsidy up to a maximum CLP 86bn (USD0.10bn).

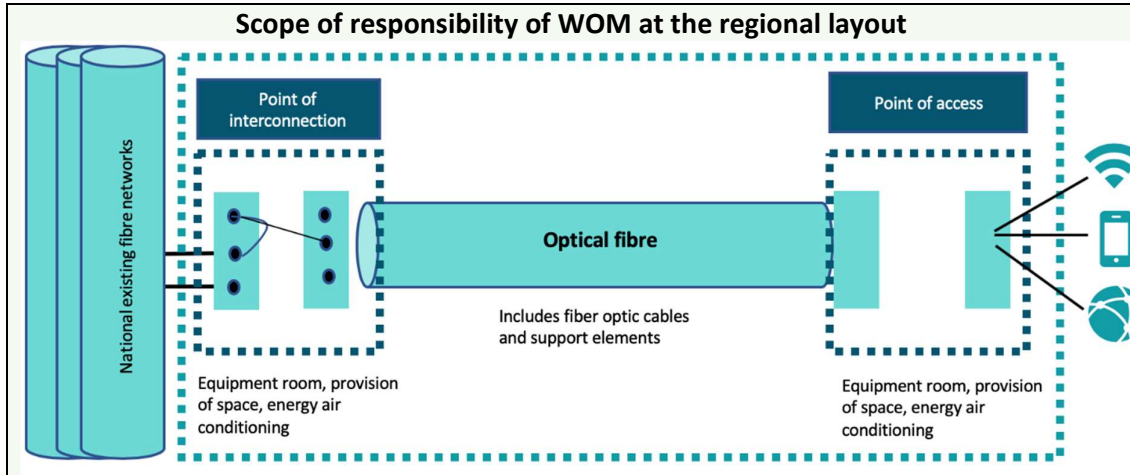**WOM obtained five of the six macro-zones in the country**

Macro-zone	Maximum subsidy available	Potential people benefited
Macrozona Norte	CLP 16.50bn (USD20.05m)	377, 892
Macrozona Centro Norte	CLP 10bn (USD12.15m)	875,208
Macrozona Centro Sur	CLP 13.88bn (USD16.86m)	525,429
Macrozona Arica y Parinacota	CLP 6.40bn (USD7.78m)	4,705
Macrozona Centro	CLP 13.35bn (USD16.22m)	767,208

Source: Cullen International based on Subtel, 2020

The South Macrozone (covering La Araucanía, Los Ríos, Los Lagos), was not awarded because Pacifico Cable SpA (the only proponent) did not meet the financial requirements. A new tender would be organised for this macro-zone in 2020.

WOM must start service provision within two years from the award (i.e. 2022) and offer wholesale services for 20 years.

WOM is responsible for connecting existing national networks with consumers at the regional level.

Scope of responsibility of WOM at the regional layout

Point of interconnection

Point of access

National existing fibre networks

Optical fibre

Includes fiber optic cables and support elements

Equipment room, provision of space, energy air conditioning

Equipment room, provision of space, energy air conditioning
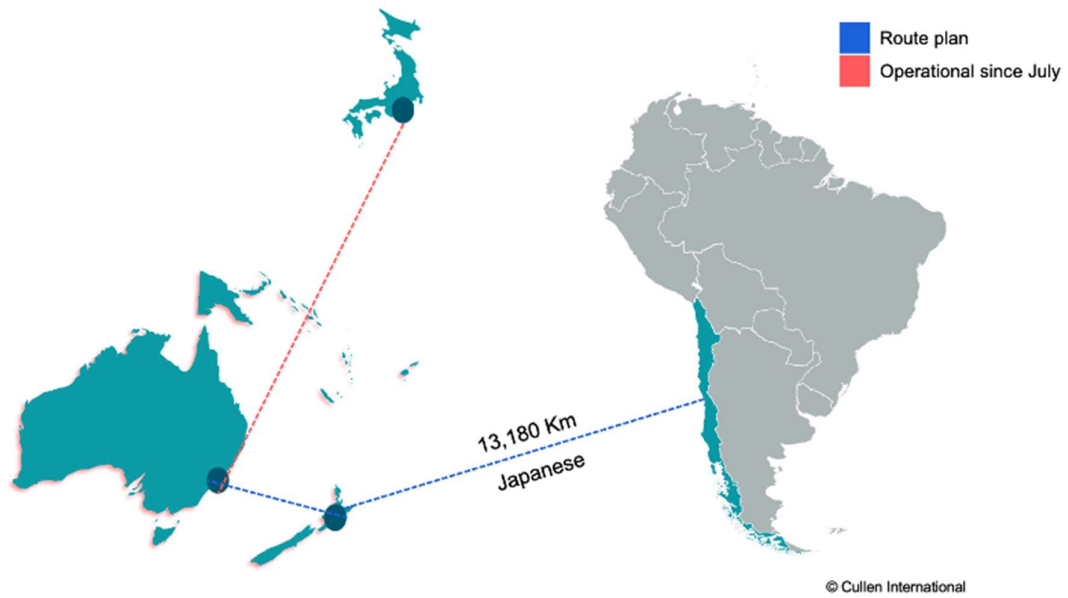
Source: Cullen International based on Subtel, 2020

Submarine cable

In July 2020, the Chilean government designated Australia and New Zealand as endpoints of the first fibre-optic cable directly connecting South America and the Asia-Pacific region.

This choice of route (Continental Chile - Auckland - Sydney) is based on a feasibility study, projecting traffic between both continents for the next 20 years.

The government is to establish a dedicated fund for this project by end 2020. Bids to award construction are scheduled in 2021, with initial investments estimated to be USD500m.

The route: Continental Chile – Auckland – Sydney

Source: Cullen International based on Subtel, 2020

Private funds and innovative connectivity projects

On top of all the public-funded initiatives, private funding and deployment of private networks are a key to increase connectivity. In this category there are the traditional private investment in connectivity by incumbent operators, new innovative solution provided by new entrants and local players. It is also important the role of investment banks to support new, innovative solutions.

Incumbent operators have large fixed, mobile and satellite networks to offer connectivity on a commercial basis. These networks are complemented by deployment by local actors. Community networks can be based on wired or wireless networks, in Argentina there is a special registry for this community-managed networks. In addition, there are some local deployments done using spectrum white spaces in Colombia.

There are several new entrants that are expanding connectivity at backbone or local loop level. New actors deploying submarine cables (Google, Facebook), new tower companies and other wholesale networks (like Altan in Mexico).

In addition, there are several innovative projects that are providing (or will provide) affordable connectivity in Latin America:

- Internet para Todos (IpT) a partnership between Telefónica, Facebook, BID Invest and CAF and currently operating in Peru
- High Altitude Platform Systems (HAPS): providing connectivity in Peruvian Amazonia
- LEO constellations: several constellations will cover Latin American region

Private funding matrix

Connectivity solutions/players	Local actors	Incumbents	New entrants	Investment banks
Fixed networks	Community networks	ISPs, Telcos		
Wholesale networks		Submarine cables, IpT (MNOs)	Submarine cables (Google, FB), Altan, TowerCos, IpT (FB)	IpT Peru (CAF, IADB invest)
Mobile networks	Community networks	MNOs	MVNOs	
Unlicensed/ shared	Community networks, Local ISPs (white spaces)		Express WiFi	

High Altitude Platforms Systems			Loon, Haps Mobile	
Satellite LEO		Telesat	SpaceX	
Satellite GEO		Echostar/Hugues, Intelsat		

Source: Cullen International, 2020

New solutions and more connectivity in Peru and Colombia

Mobile rural infrastructure operators (OIMR) were created, as a specific type of mobile operator, under Law 30083 of 2013 on competition in the mobile services market the enabler for these innovative solutions. The introduction of OIMRs intended to promote competition and service availability in rural or less attractive areas of Peru. Their launch required implementing regulation issued by the regulator, Osiptel.

Under the 2013 law, mobile network operators (MNOs), when lacking own infrastructure, may offer retail services in rural areas using "interconnection and access" facilities made available by OIMRs on a wholesale basis and on non-discriminatory conditions.

The well-known OIMR is Internet para Todos (IpT) a partnership between Telefónica, Facebook, BID Invest and CAF. IpT's concession contract was signed in August 2018 and registered as an OIMR in October 11, 2018. Currently IpT; has two clients: Telefónica and Entel (contracts signed and registered in April and October 2019, respectively. There are others five registered OIMRs, two of them have contracts with Telefónica.

General goal	Deploy mobile broadband to cover 6 million people (or 18per cent of the population) without mobile coverage or covered with 2G service.
Achievements	>10,000 connected communities covering 1.7 million population
2020 goal	13,000 communities covering 2.3 million people to mobile internet.
New partnerships	• with Satellite operator Gilat Networks Perú to cover 1,000 sites. Goal: provide 4G to 3,000 communities. This partnership will use also public investment from Pronatel. • with Loon to use Loon's stratospheric globes to expand mobile internet access to Telefónica customers in certain locations that represent about 15 per cent of Loreto's surface, in the Peruvian Amazonia. Loon tested the technology in Peru in 2017 and 2019 providing connectivity in areas affected by natural disasters (floods and earthquakes).

The Peruvian examples show how regulatory development can foster innovation and allow to increase connectivity using new partnership and technologies.

In this line, the Colombian ICT regulator, Communications Regulation Commission (CRC), adopted a regulatory sandbox framework to promote innovation in the provision of telecommunications networks and services. According to the new rules a sandbox is "*an alternative regulatory mechanism seeking to improve the design of regulatory measures, in an environment monitored by CRC*". The sandbox allows providers authorized by CRC to test business models in a flexible regulatory framework during a up to 12 months within a controlled environment. CRC proposed four criteria to select projects for the sandbox, including four main questions:

- Does the project include a significant innovation?
- Does the innovative project have identifiable benefits for citizens?
- Can the project be implemented under the current regulatory framework or needs to be tested in the sandbox?
- Does the company responsible for the project have the resources and experience for its successful implementation?
- CRC will decide which projects can be included considering the criteria and including connectivity, postal and platforms operators.

Lessons learned and challenges to increase connectivity in Latin America

There is no unique approach to reduce the connectivity gap. Governments benefit from having multiple connectivity solution in general, by allowing innovative and locally managed expansion solutions, such as:

- Funding models: public, private and mixed funded models, depending on the project and area;
- Technology: policies and rules technology neutral, allowing meaningful and affordable connectivity;
- Stakeholders: benefits of having different types of networks and operators, also benefits of having partnerships between different operators and allow combination of backbone and local networks.

There are several specific challenges for the Americas region, that must be addressed by governments:

- **Affordability of the solution**: population must be able to buy services and equipment required by each solution.
- **Sustainability of the solution**: projects must be sustainable in time and consider funds needed in the long term.
- **Efficient use of available funding**: both public and private funds are limited, it is worth to take the time and make an assessment to make sure that resources (especially public funds) are used for the most efficient solution.
- **Coordinated efforts**: there are several plans and initiatives, in different government levels or programmes. An increase in connectivity requires a coordinated effort to avoid duplication of solutions and to encourage complementary solutions.
- **Digital literacy**: connectivity is not only about networks, but also about the digital skills to make a productive use of connectivity. Connectivity plans should include demand side targets and promote digital literacy.

One the main lessons learned from cases studies and solutions in Latin America is that regulatory frameworks that allow and promote innovative ICT solutions benefiting great population with a connectivity gap. It is also important to engage with local communities, to assess local needs and to offer connectivity solution based on the needs of regions and communities with a connectivity gap.