This chapter focuses on good practices aimed at ensuring that broadband infrastructure and services are as widespread as possible. It describes leading mechanisms and tools to extend broadband access that policy makers have at their disposal, for example through national broadband plans, universal service funds and public-private partnerships.
A clear precondition for increasing broadband use by people and businesses is the availability of broadband infrastructures and final services in the geographical area where potential users are located. Any demand-side policy assumes that potential users have at their disposal broadband access and services designed to overcome barriers that are lacking because the infrastructure is not available (e.g. skills).

Ensuring that broadband networks and services attain the greatest national coverage and use is a priority for most governments. Policies to promote competition, private investment and independent regulation have been tremendously effective in extending coverage. In doing so, they reduce the size of that segment of the market that requires alternative approaches to meet policy goals. In areas where markets cannot fulfil all policy objectives, a range of further approaches is possible. Policies to increase access, in such instances, can be addressed in national broadband plans using tools such as “universal service funds” (USF) or by imposing legal obligations on operators, such as using spectrum licences that have coverage objectives, or through public funding intended to facilitate network deployments and broadband service provision in specific areas. Even here, the market may play a role through the use of tools such as public tenders for competitive bidding, to find a provider best able to deliver the infrastructure and services required, an approach that Colombia has used successfully.

Together with increasing competition, extending broadband access is one of the key challenges in the Latin American and Caribbean (LAC) area. Its diverse and sometimes inaccessible geography (e.g. the Amazon basin rainforest or small Caribbean islands), combined with low incomes, a lack of basic infrastructure (e.g. electricity grids) have meant that broadband access infrastructure is lacking in large geographical areas. In many remote rural areas, population density is low and fewer incentives for private-sector investment exist. This limits access to the abundant content and applications available on the Internet. In turn, it restricts the opportunities for people to participate in the economy, increase their civic engagement and for the country as a whole to benefit from the potential productivity gains broadband access makes possible.

Policy objectives for extending broadband access have often been articulated around concepts similar to those for telephony. These can be “universal service” (availability of the service in a residence or carried with the individual through wireless devices) and “universal access” (availability of services in public spaces, for instance at telecentres). Although the economic and social objectives that served as the basis for universal service for fixed telephony remain valid, goals for universal access acquire a new dimension with the expansion of high-capacity networks and the evolution of social needs. To extend broadband access and services, data is needed to identify coverage gaps and bottlenecks in the LAC region. In addition, government policies and funding are needed where objectives are not met by the market, to monitor their effective use. Ongoing collaboration between the public and private sectors is crucial, as it allows for synergies and mobilising resources and expertise (Broadband Commission, 2014a).
The challenges of extending coverage for broadband access are not new, or exclusive to LAC countries. Successful instances have been demonstrated in the area, as elsewhere in the world, that can serve as examples of good practice. The evolution of wireless technology has made possible new ways to extend broadband access, including mobile broadband, which extends access at lower prices and at a more rapid pace than traditional fixed technologies. Nonetheless, fixed networks play a key role, including for backhaul, and must be an integral part of any plan.

This chapter examines current policies to expand access in LAC countries, focusing on demonstrated good practices and experiences.

Key policy objectives for the LAC region

Facilitating wide availability of broadband access at affordable prices for all segments of society, including for people with low incomes and living in rural areas, is the main policy objective. Achieving this goal involves two related policy objectives:

- **Encouraging private investment extending broadband access.** Most of the good practices intended to increase competition by lowering barriers for investment can and should be used to encourage private investment. These include simplifying licensing requirements, lifting foreign investment restrictions, simplifying and harmonising rights-of-way acquisition and encouraging network sharing and co-investment. These issues are addressed in detail in Chapters 2 and 4.

- **Solving critical bottlenecks for infrastructure deployment and use.** In certain situations, these critical bottlenecks, such as addressing the availability of high-speed backbones or backhaul infrastructure, cannot be addressed adequately by private initiatives. Active public policies are needed to encourage sustainable infrastructure deployment from the private sector in the access portion. Bottlenecks for national and regional infrastructure deployment are also discussed in Chapters 4 and 8.

These policy objectives are usually set down comprehensively in national broadband plans (NBPs). These enable policy makers to set clear objectives, taking into account the level of development in the country, existing coverage gaps by fixed and mobile broadband networks and the level of competition (Chapter 4). Such policy objectives should also take into account the broadband demand side, since encouraging demand promotes the rollout of broadband networks by the private sector (Chapters 6, 9, 10, 11, 12, 13, 14 and 15).

Tools for measurement and analysis in the LAC region

Setting broadband objectives and preparing plans may not be sufficient to expand broadband access if attention is not paid to metrics that allow policy makers to assess progress. **Establishing an effective and powerful oversight mechanism** can promote better performance from managers and stakeholders, evaluate how a broadband plan affects targeted beneficiaries, determine resource allocations, improve planning, and provide input for decisions about the strategic direction of the broadband plan. It is also important that national authorities be granted legal powers to collect the necessary data from market players. Using broadband metrics to compare performance relative to other countries in a region can also provide an indication of how national policies are working.

Key metrics and data required to determine objectives and monitor advances in broadband access include **data on geographical/household coverage and speed of broadband access.** This information can be collected from operators (both fixed and mobile) and processed and analysed by the authorities or regulator monitoring broadband access extension. The nature
of the Internet means that they can also engage in their own independent assessment of network availability and performance, including through new tools such as applications that enable users to provide information. In the United States, the Federal Communications Commission (FCC) uses this tool,1 and ANATEL in Brazil has also an initiative along these lines (Box 5.1). Regular updates of data are needed to check progress and identify bottlenecks.

Measurements of broadband availability and access should address geographical coverage, as well as the share of population (households) where broadband coverage is available. In addition to the geographical coverage in a given area, data on the availability of household broadband access is vital. As discussed in the section on good practices, broadband maps are a key tool for this purpose.

Speed and quality of service is also important for broadband access, since low speeds or poor quality may make it difficult or impossible to use certain Internet applications and services. Data should regularly be collected on real speeds and quality of service (QoS) parameters. This data can be requested from operators, but real speeds and QoS parameters, such as on delay, can also be collected directly from the network (Box 5.1).

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**Box 5.1. Measuring speeds and QoS**

**OECD: Report on Access Network Speed Tests**

The report examines developments in OECD countries in measuring broadband performance on fixed-access networks, particularly in actual Internet speeds for end users. It conducts a brief survey of access network speed measurement projects, existing practices for international comparisons, and future possibilities for measuring mobile broadband performance. The Annexes of this report list tables outlining official measurement projects collected from OECD countries.


**Brazil: Fixed and mobile broadband speed measurement**

In Brazil, the communications regulator (ANATEL), the National Institute of Measurement, Quality and Technology (InMetero) and the Brazilian Network Information Center (NIC.br) have reached an agreement on defining a set of transparent criteria and the methodology to be used in measuring QoS for broadband access.

The Measurement Entity of Quality (Entidade Aferidora da Qualidade, or EAQ) was created by the Brazilian ANATEL as a part of the programme for measuring quality indicators for telecommunications networks supporting fixed and mobile broadband access in Brazil. The EAQ website offers consumers measurement software tools that can randomly test the quality and speed of their broadband access connection, giving a direct instantaneous measurement, as well as a log of previous measurements the consumer has taken.

In assessing QoS for broadband services, the following good practices were identified by the Brazilian Network Information Center (NIC.br):

- **Objectives for QoS measurement.** The publication of QoS measures encourages providers both to improve quality and lower prices. If consumers can access independent and transparent QoS measures, there is a clear incentive for broadband providers to improve QoS. Objectives for measurement should be focused on informing consumers of the quality of services, involving them as a part of the QoS improvement process, and encouraging competition in the broadband access market.
When evaluating national broadband plans, it is useful for any LAC country to compare its performance with that of others in the region, as well as other reference regions. OECD countries provide comparative data that allow members to view their performance relative to others, and the Inter-American Development Bank’s (IDB) DigiLAC initiative aims, among other uses, to compare the situation for broadband access in the LAC region (Box 5.2). Comparisons with broadly analogous countries are also often made (e.g. Chile compares its performance with other Latin American countries, while South Africa compares itself with the other BRICS countries). In the United States, the FCC is required by law to include comparisons with at least 25 countries in its annual report on advanced services.

Peer reviews are also useful in assessing broadband access extension plans. They involve systematic examination and assessment of a country’s performance by other countries, to help the reviewed country improve its policy making, adopt good practices and comply with established standards and principles. Peer review is a useful tool for assessing policies aimed at extending broadband access. The methodology developed by the OECD (2003) has been extensively applied, including by other international organisations, and could be also applied in the LAC area to assess National Broadband Plans. The examination is conducted on a nonadversarial basis, and relies heavily on mutual trust among the countries involved in the review, as well as their shared confidence in the process. When a peer review is conducted under the aegis of an international organisation, the secretariat of the organisation also plays an important role in supporting the process. With these elements in place, peer reviews tend to create, through a reciprocal evaluation process, a system of mutual accountability.

Box 5.1. Measuring speeds and QoS (Cont.)

- **Where to measure QoS parameters.** Establishing where the QoS measurement will be performed is crucial for ensuring the reliability of the process. When QoS data is obtained within the access provider network, results may be biased, showing better QoS depending on where the measurement probes are located. For this reason, the measurements should be taken between the consumer location and a point external to the service provider, usually the first traffic-exchange point. On the consumer side, the measurement is done using a Customer Premises Equipment (CPE) located between the router and the computer, or using specific measurement software.

- **When to take measurements.** Measurements can be taken on a random or regular basis. Ideally, the consumer uses a CPE with embedded measurement software that automatically takes regular measurements at least every six hours.

- **QoS parameters to be measured.** The most useful parameters are: availability, download/upload bandwidth (speed), latency (delay), jitter (variation of latency), packet loss, time and number of trials to establish Internet Protocol (IP) connections, and Domain Name Search (DNS) availability.

- **What to do with QoS data obtained.** Publication of QoS data and allowing consumers access to this data encourages improvement by service providers. The information allows consumers to compare the contracted and real values, encouraging competition among service providers.

Box 5.2. Comparison of broadband metrics across countries
digiLAC initiative (Inter-American Development Bank)

The IDB has created a comprehensive Broadband Development Index (IDBA) that measures the different elements of the ecosystem around four pillars: i) infrastructure; ii) public policies; iii) strategic regulation; and iv) applications and capacity (IDBA, 2014a). Although the index may appear to be a ranking system, its objective is not to compile a classification but rather to spot the countries’ strengths and weaknesses. The goal is to help LAC countries improve their strategies to boost broadband and information and communication technologies (ICTs). Indicators on broadband infrastructure considered in the IDB Index include households with Internet access, broadband fixed lines and mobile broadband subscriptions. The digiLAC portal (digiLAC, 2012) makes it possible to compare countries and regions, with an specific focus on the LAC region, for a broad range of indicators (Figure 5.1).

Figure 5.1. IDB-OECD comparison on key parameters related to broadband penetration (2014)

<table>
<thead>
<tr>
<th>Parameter</th>
<th>IDB</th>
<th>OECD</th>
</tr>
</thead>
<tbody>
<tr>
<td>IN-PPCM</td>
<td>5.6</td>
<td>7.8</td>
</tr>
<tr>
<td>IN-SSIN</td>
<td>6.0</td>
<td>6.5</td>
</tr>
<tr>
<td>IN-HGPC</td>
<td>7.0</td>
<td>7.5</td>
</tr>
<tr>
<td>IN-HGAI</td>
<td>8.0</td>
<td>8.5</td>
</tr>
<tr>
<td>IN-LBA</td>
<td>4.0</td>
<td>5.0</td>
</tr>
<tr>
<td>IN-LBAM</td>
<td>5.0</td>
<td>6.0</td>
</tr>
<tr>
<td>IN-LITF</td>
<td>6.0</td>
<td>7.0</td>
</tr>
<tr>
<td>IN-VBAF</td>
<td>7.0</td>
<td>8.0</td>
</tr>
<tr>
<td>IN-VBFI</td>
<td>8.0</td>
<td>9.0</td>
</tr>
</tbody>
</table>

Note: IN-PPCM is the percentage of the population covered by a mobile cellular; IN-SSIN measures secure Internet servers; IN-HGPC is the percentage of households with a computer; IN-HGAI is the percentage of households with Internet access; IN-LBA measures the fixed broadband subscriptions per 100 inhabitants; IN-LBAM measures active mobile broadband subscriptions per 100 inhabitants; IN-LITF measures fixed telephony lines per 100 inhabitants; IN-VBAF measures fixed broadband speed, in megabits per second; and IN-VBFI is International Internet bandwidth (bits per second) per internet user.


The OECD Broadband Portal

The OECD Broadband Portal (http://www.oecd.org/sti/broadband/oecdbroadbandportal.htm) provides access to a range of broadband-related statistics gathered by the OECD. It compares a range of indicators that reflect the status of individual broadband markets. The OECD has identified five main categories that are important for assessing broadband: penetration, usage, coverage, prices, as well as services and speeds. An example of data provided in the OECD Broadband Portal is provided in Figure 5.2.
Overview of the situation in the LAC region

According to the information provided by countries in the LAC region for this report, as well as publicly available information, policy makers are keenly aware of the challenges for extending broadband. Many have taken steps on a number of fronts, with a special focus on rural areas, underserved periurban areas or for citizens with particular challenges.

Although LAC countries have yet to catch up with the most advanced countries in broadband access and use (Figure 5.1), significant advances have been achieved in recent years in several LAC countries in terms of broadband access availability, use and skills. The ICT Development Index (IDI) published regularly by the International Telecommunications Union (ITU) adds to the information provided by the IDB’s Broadband Development Index (digiLAC) (IDB, 2014c). Countries such as Costa Rica, Suriname, Brazil and Colombia significantly advanced their placement in the ICT Development Index between 2010 and 2015, reflecting a wider availability, use of broadband access as well as an increase in skills on ICTs. However, the average increase in IDI level was substantially higher for countries in mainland Latin America (1.09 points) than for the Caribbean and Caribbean-facing countries (0.73 points) (ITU, 2015).

Despite this progress, many challenges remain in providing adequate broadband in the LAC region:

- The geography of many areas is especially complex for broadband networks. This is the case in the Amazon basin, which encompasses the Plurinational State of Bolivia (hereafter “Bolivia”), Brazil, Colombia, Ecuador, Guyana, Peru, Suriname and Venezuela, but also for other densely forested areas in Central America. In other mountainous areas or small Caribbean islands with sparse populations and little backbone infrastructure, network deployments are costly, and revenues are likely to be limited for one, let alone multiple, operators. If these areas do have service, it may not be offered at competitive prices, due to monopoly power.
- **Affordability** issues are still a major challenge in the LAC. A relatively large proportion of the population has relatively low income, and the reduced demand for broadband services and lowers the incentives for private investment. However, competition in mobile markets demonstrates that operators will develop tools such as prepaid services to adapt to particular circumstances if the initial challenge of deploying infrastructures can be overcome. These issues are further analysed in Chapter 6. Some countries and regions lack the basic infrastructure necessary for network operation (e.g. electricity). The availability of roads for access to install infrastructure and maintain network infrastructure is also an issue in remote areas. Even when electricity is available, most rural areas lack backbone and backhaul infrastructure, which makes deployment of both fixed and mobile networks challenging and expensive, discouraging private investment.

Many of these obstacles, including the lack of basic infrastructure, cannot be solved by policy measures specific to broadband. This means that concurrent public policies in other areas must be taken to promote broadband access. This requires close co-ordination among the government sectors in charge of infrastructure planning.

With a few exceptions, most LAC countries have developed national broadband plans or digital agendas that include specific actions to extend broadband access or objectives or projects intended to increase coverage. Most countries define broadband access in a technologically neutral way. Nonetheless, a number of broadband plans, and the associated funding for network deployment, are aimed at specific technologies, even when a range of technologies could be used.

National broadband plans and projects in the LAC region that focus on extending broadband access differ in scope, level of detail, specific objectives, and the funding and collaboration models used by the public and private actors. Many of the plans are ambitious, well-designed and address the key issues involved. Some of the weaknesses of these plans, to be addressed in the section on good practices, are:

- Key indicators aimed at measuring progress in attaining policy objectives are not defined or are defined in a very general way and, in many cases, not directly related to the actions defined in the broadband plan. This makes it difficult or even impossible to **assess fulfilment of policy objectives**.

- In a number of cases, regular updates on the achievement of the broadband plan objective are not made public. **Transparency and accountability** in this area are needed so that stakeholders can provide input to improve plans, as well as to ensure that citizens can monitor advances. Increased transparency also provides an incentive for public authorities to implement broadband plans efficiently.

- **Inventories** of available fixed broadband infrastructure and maps are not in general publicly available at the national level in LAC countries. In a number of cases, this also applies to the available coverage of mobile broadband. As shown in the next section, collecting and aggregating this information is complex and resource-consuming. However, clear, detailed information on where coverage is lacking is crucial to focus policy measures on priority issues, and experience shows that operators themselves become the largest users of this information.

- Although the most ambitious and well-designed broadband plans in the LAC region benefit from **stakeholder involvement** in the design and implementation phases, there is little evidence to show that some plans have benefited from public consultations. As noted in Chapter 2 in discussing digital agendas, lack of stakeholder involvement raises the risk
of defining policy objectives that are not aligned with real needs, and of setting measures that are unrealistic or difficult, if not impossible, to meet.

● Broadband national plans aimed at deploying broadband access infrastructure must be co-ordinated with other projects to encourage demand and build the skills needed for individuals, businesses and governments to benefit from the digital economy. Policy makers should note that demand-side policies can represent an equal or even greater challenge and should be taken into account even in earlier phases of digital economy development. Coordination issues are addressed in Chapter 2 and demand-side policies in Chapters 6, 9, 11, 12, 13, 14 and 15.

● When the regulatory framework does not clearly separate responsibilities, it also results in an overlapping of powers among different institutions that can undermine effective management of broadband plans, as described in Chapter 2, on regulatory frameworks and digital agendas. This is true of plans where the responsibilities of the ministry in charge of telecommunication policy, the regulatory authority and/or federal or municipal institutions are not clearly delineated.

The most frequent source used for funding broadband extension is a Universal Service Fund (USF). Contributions to any USF may be obtained from several sources, such as contributions from operators, revenues from spectrum licences, specific taxes for broadband extension and government budgets. Annex 5.A2 shows detailed information on the universal service funds in the LAC region. The IDB (IDB, 2014b) has also developed a comparative study of different USF in the LAC region and in other parts of the world. It has been noted that in some countries, USF contributions are not always disbursed on extending the network, and that the funds remain unspent, often resulting in large surpluses. This suggests the capacity to develop projects to extend broadband access is insufficient.

In a number of cases, fees from spectrum auctions are used to fund universal service. Although such fees can be an important source of funding, they only become available when new licences are issued and serve as a one-time source of funds. Spectrum licence fees provide a continuous source of funds and allow for better planning of broadband extension projects. Caution should be taken to ensure that the level of annual spectrum licence fees is not determined by the financial needs of universal service projects, since this may raise costs for mobile operators that are reflected in end-user prices. Spectrum management and policy making in the LAC are discussed further in Chapter 3.

In the LAC region, as elsewhere, contributions from operators for the USF are usually based on total revenues for each operator (i.e. a percentage of revenues is set as a contribution for the USF, typically around 1%-2%). In general, no exceptions are made for small operators, nor a minimum threshold set for revenue contributions. Authorities can sometimes meet part of their broadband coverage policy objectives by exemptions from specific fees. This might be by lowering or not applying spectrum licence fees in rural areas, or by lowering fees paid for the USF when specific objectives for broadband access are implemented by an operator. This can be the case for publicly or privately owned operators.

An important means to extend mobile broadband coverage is to include coverage obligations in spectrum licences, to make sure mobile broadband access is also available in rural areas and that a certain percentage of the population will have broadband and mobile telephony access. Coverage obligations will also affect the valuation of spectrum licences by operators. In some cases, spectrum licences include conditions to provide connectivity
to specific premises, such as schools, and to apply special rates, provide free services for low-income citizens or to provide terminals for schools. Peru included such conditions when renewing the license for Telefónica de Perú.4

USFs were first used in the LAC region to invest in rural telephony and install payphones in remote areas. As USF objectives evolve, they can be used to extend broadband access and coverage to households, and when needed, to provide broadband connections to telecentres in underserved areas, schools and other public institutions, or satellite broadband in remote areas. These funds can also be used to invest specifically in backbone and backhaul networks in areas lacking trunk connectivity, to encourage access network investment by network operators. Furthermore, some objectives can relate to demand-side issues and funds used to encourage demand by low-income consumers and promote digital literacy plans.

The method for selecting an operator to obtain a subsidy to develop projects for broadband extension varies across the region and according to the type of project. A tendering process is used for many projects, encouraging operators to bid and compete to obtain the subsidy. In other cases, the project is directly awarded to the incumbent operator or to publicly owned operators in charge of providing rural broadband or wholesale access networks used by other operators.

Good practices for the LAC region

Mechanisms to extend broadband access

The best mechanism for developing nationwide broadband is to encourage investment by the private sector through measures such as lowering administrative barriers to deployment, providing regulatory certainty for investors and encouraging network sharing. However, the market will not provide broadband access in certain situations. If this is the case, several mechanisms are available to public authorities.

These mechanisms can be classified as obligations (e.g. obligations to provide coverage in a certain area), incentives for operators to cover broadband access gaps (e.g. subsidies or reduction of fees for rural deployment) or direct funding of broadband infrastructure (e.g. public-private partnerships and deployment of publicly funded backbones).5

It should be noted that policies on extending broadband access availability, as noted in Chapter 2, should always be co-ordinated and complemented with policies aimed to encourage demand, for example adequate taxation regimes and programmes addressing affordability (Chapter 6), digital skills programmes (Chapter 9), encouraging ICT use for business (Chapter 10), e-health and e-government programmes (Chapters 11 and 12) and building consumer trust (Chapters 13 and 14).

Obligations aimed at extending broadband access. Any obligation imposed on operators regarding coverage should be carefully assessed against the costs and benefits. This includes comparing the expected positive effects (e.g. the number of households to be covered) against other potential implications (e.g. the cost of extending the network in less profitable areas, or the effects on competition resulting from higher costs to an operator or cross-subsidies). Obligations can be applied through:

- Universal service obligations (USO) for telephony services are usually in force in most OECD countries. However, the compulsory provision of fixed broadband access, with a minimum speed at affordable prices for all citizens in all geographical areas, is seldom imposed as part of universal service obligations. Countries such as Finland, Korea, Spain and Switzerland are an exception, in including broadband access as part of USOs. Even in these countries, much effort and investment was devoted to national and regional broadband
plans to increase coverage in rural areas, before considering universal broadband access as the right of all citizens (Box 5.3). In addition, a key difference in countries that introduce such policies is the definition they apply to broadband in terms of guaranteed baseline performance levels (i.e. the threshold speeds to be delivered).

Box 5.3. Spain’s Rural Broadband Plan (PEBA)

One of the projects included in the National Broadband Strategy in Spain (Plan Avanza) programme was specifically tailored to rural areas: the PEBA project (the National Programme for Broadband Deployment in Rural and Isolated Areas), put into effect between 2005 and 2008. Two calls for proposals were launched (in 2005 and 2007), resulting in 29 smaller projects implemented by 2 operators (27 from Telefónica and 2 from Telecable). The aim was to ensure broadband affordability and the availability of certain key service requirements, without distorting competition (MITC, 2005):

- minimum bandwidth: 256/128 kilobits per second (kbps)
- price caps: EUR 39 (one-off sign-up fee) plus EUR 39 (monthly fee) for the first 36 months
- technical characteristics comparable to commercial broadband services
- technological neutrality (any technology could in principle be deployed, subject to assessment of the Evaluation Committee)
- infrastructure deployed was open to third parties for at least three years (e.g. direct subscriber line, or DSL, wholesale obligations, on conditions fixed by the telecom regulator)
- deployment objectives were outlined and a list of eligible population centres included in the calls for tender.

The total budget for the programme was EUR 90 million, of which the Ministerio de Industria, Turismo y Comercio (MITC) provided EUR 18 million in zero-interest loans and EUR 8.4 million in grants to the European Regional Development Fund (ERDF) Objective 1 regions. Asymmetric digital subscriber lines (ADSL) (86.3%), WIMAX (5.1%), satellite (8.4%) and hybrid-fibre coaxial (HFC) (0.2%) technologies were used, depending on the most appropriate technology solution for the region in question. Only three autonomous communities did not participate in the plan.

The main outcome of the plan was that 99% of the population has broadband coverage, using all available technologies. More than 8 million people obtained broadband coverage under the programme. Operators are now offering download speeds in line with commercial services, well above the initial 256 kbps requirement. In Spain, the majority of fixed broadband subscriptions (47.2% of the 9.8 million subscribers) have a speed of between 4 and 10 megabits per second (Mbps). The PEBA was continued under Plan Avanza 2 (Infrastructure Sub-programme), focused on providing the remaining population with broadband.


- Licenses for fixed telephony have also traditionally entailed obligations to cover rural areas where the cost of providing the service is high relative to the expected revenues. Historically, this has usually included the deployment of fixed pay telephones in small villages. With network convergence, a shift is taking place from service-specific licences to a general authorisation framework. This type of universal service obligations, like the models applied in many OECD countries, have evolved, and a competitive bid process is put in place to provide universal service, and the cost assessed by regulatory authorities and shared by operators or funded by the state. Obligations for installing pay telephones can also be reassessed in areas where penetration and coverage for mobile voice are high.
In the context of mobile broadband, obligations imposed on operators are defined in terms of specific network rollout obligations, typically set out in the licence conditions or spectrum auctions. Setting coverage obligations demands careful analysis. Lax coverage obligations may waste the opportunities to ensure mobile broadband access in areas where there are not enough economic incentives to deploy network infrastructure. On the other hand, obligations that provide for extensive geographical coverage in too short a time may impose an excessive burden on an operator. It is important that all MNOs in a country, with a similar license, have the same obligations. For new entrants, however, the time allotted to fulfil obligations may differ from MNOs already operating in the market, given that they actors have a first-mover advantage.

One additional issue to consider when setting obligations associated with spectrum licences is the inclusion of obligations to finance objectives not directly related to coverage and the provision of mobile services, such as providing computers to certain communities (e.g. schools), or funding ICT skills programmes. While these are laudable goals in theory, including such obligations in the conditions for licences may result in market distortions. Any initiative to increase demand or any policy objective not directly associated with coverage, quality and services should be separated from auction proceedings and be funded through other sources, such as universal service funds.

Incentives for operators to extend broadband access are aimed at bridging the investment gap in areas where the expected returns do not justify network deployments. These incentives can be take different forms: partial or total tax exemptions, lower or no fees for spectrum licences in certain areas associated with the obligation to provide coverage, direct partial/total subsidisation of rural or backbone/ backhaul deployments, or loans at reduced interest rates. In many cases, such incentives are sufficient to stimulate the private sector to extend broadband access.

Direct funding, policy measures and incentives to extend broadband access are usually laid out in National Broadband Plans (NBPs) and Digital Agendas, which are closely interrelated. Both aim to provide a comprehensive set of co-ordinated actions involving the public and the private sector, and to address issues both on the supply side (e.g. funding of network rollout or specific measures to encourage private investment) and on the demand side (e.g. policies on education, e-health, or e-government, aimed at increasing use of broadband access by citizens, the public sector and business). Digital Agendas, as noted in Chapter 2, however, have a wider scope (covering issues related to access and application of ICTs in general across the economy and society) than NBPs, which are usually focused on extending broadband access and coverage. In many cases, NBPs are a part of national Digital Agendas.

National Broadband Plans

Defining goals for broadband expansion consists of framing national social, political and economic goals and is usually done by a government ministry. However, communication authorities have a crucial role in providing input, especially on issues involving the implications for investment and competition. In many cases, they are in a good position to manage their implementation and collect and manage universal service funds. Other stakeholders, including operators, civil society, academia and the technical community, should also be consulted and play a role in developing such plans (OECD, 2004, 2012).

Any NBP should include a reference to the gaps identified, clear objectives to cover these gaps, setting measurable targets, milestones and checkpoints to identify and correct deviations, as well as the financing mechanisms and funding to be applied. The literature on
the design of NBPs and examples of existing plans is rich and can be found in the research of the OECD (2011), IDB (2014b), the ITU (2012; 2015) and other authors, such as Calvo (2012). This section will address good practices in the design, funding, execution and assessment of NBPs, with an emphasis on issues related to the extension of broadband access.

The first step before defining and implementing public interventions is to ensure that existing bottlenecks for infrastructure deployment by the private sector are addressed. It is especially important to ensure that rights of way are simple, inexpensive and rapidly obtained and that existing passive infrastructures owned by the government or utilities can also be used for broadband access deployment. Chapter 4, on competition and infrastructure bottlenecks, discusses these issues in detail.

The next key step in designing a National Broadband Plan is to identify areas needing public intervention, to fill the gaps in the availability of broadband. This requires collecting and aggregating data on the availability of broadband infrastructure. Promoting broadband access differs from promoting broadband penetration; the former relates to coverage (geographical footprint where service can be accessed) and the latter to the take-up by users.

When considering programmes to expand coverage, policy makers need to have reliable geographical data on current service availability. A useful way to understand the landscape of current coverage is to visualise it on a map. Additionally, maps can be used to aid in the communication of a new policy, including information on outcomes (e.g. “This new programme will have this effect on these geographical areas”, “Rollout is scheduled for this area, following a given timetable” and so on). Broadband availability maps can also be a useful tool, as policy makers survey the status of competition among communication service providers or across different access technologies. Mapping broadband penetration rates, in addition to availability and demographic indicators, may also provide an overview of the achievement of policy goals in different locations, and this may be useful for work that informs broader questions (e.g. economic or social developments in areas with and without broadband).

Broadband maps are also useful to users. Maps can assist them to better understand the services available to them and to compare their performance with those of other geographical locations. To meet such requirements, a map may have to provide information at a detailed geographical level and for each location, viewers should be able to access at least some references to service providers, such as their names or contact points, to obtain further information on prices and other service conditions. The social and economic benefits of such maps are great, if they are well-designed.

Broadband maps are also commercially useful for a range of stakeholders. They can be used to inform entities that provide services (e.g. e-commerce), and help existing and new players plan to meet the level of demand and the rollout of network facilities in a location. They can also contribute to more effective infrastructure investment. In the United States, national broadband maps help companies identify the proper funding and targeted areas for universal service fund allocations (Box 5.4).

Preparing and publishing a broadband map is a good practice that, although resource-consuming, will render excellent results, not only in terms of policy decisions on the focus of broadband national plans, but also in terms of competition analysis, as well as in providing information to stakeholders. Good examples of broadband maps in LAC countries, showing key information for countries, regions and municipalities, are the infrastructure maps developed by the IDB under the DigiLAC Initiative (Box 5.4).
In setting goals for broadband national plans, preference can be given to projects with high social returns that benefit residents of rural and low-income urban areas. Experience has shown that the market is likely to serve other areas. These projects can be prioritised under a comprehensive assessment of the social and economic situation of these areas, including household income and poverty levels, demographics, existing infrastructure and the cost-effectiveness of any project.
**Affordability** is an important factor in analysing broadband gaps and the need for intervention. This is a particular challenge for the LAC region. In most rural areas lacking broadband access, affordability of broadband services (as shown in Chapter 6) can determine the take-up of broadband. Policy actions should not be restricted to availability of broadband access, but be reinforced with targeted subsidies to low-income people combined with ICT training (affordability issues are further addressed in Chapter 6, while Chapter 9 explores skills for the digital economy). It is also important to understand commercial and technological trends, and how the market can evolve without public support. Subsidies may appear to be necessary in the short term, but this may not be true of the medium term in some areas.

Another important factor in designing and implementing NBPs is making sure that NBPs are co-ordinated with other initiatives in digital agendas and ICT plans. The availability of broadband is linked with many other issues that NBPs must account for. These include a broad range of government responsibilities, such as law enforcement, finance, education and training, environment, health, industry, transport, regional and rural development, science, technology and innovation.

Digital government plans (or e-government plans) and e-health plans should also be co-ordinated with NBPs. From a geographical perspective, it is important to ensure that communications infrastructure is in place in some regions before promoting programmes to promote ICT skills. Closer co-ordination serves to ensure that all parties have realistic goals and assessments of the factors that promote success.

Furthermore, it is crucial to involve stakeholders in designing NBPs. In defining goals for broadband expansion, stakeholder input is needed to identify residents’ needs and potential bottlenecks, as well as to ensure that the goals set and the initiatives taken are targeted and feasible. A good practice is to create a council, “platform” or forum to involve institutions, vendors, operators, business users and consumers. Another tool used in some OECD countries is “town hall” meetings, where stakeholders debate issues and address areas of public interest.

Even when key stakeholders have been involved in setting goals, national broadband plans should be subjected to public consultation to obtain feedback from all stakeholders and ensure that the parties concerned can provide input. Publishing the responses received and the rationale for rejecting or accepting suggestions received is a good practice that helps increase transparency. Local authorities can also provide key input in defining needs and objectives, as well as formulating and implementing broadband plans in municipalities.

Setting measurable targets and periodic assessment of fulfilment of objectives plays a central role in the success of NBPs. Goals defined in NBPs must be measurable, and procedures and tools should be defined to assess how they are met in a regular way. Government should typically set targets for geographic and household coverage, as well as minimum and/or average transmission speeds. Other QoS measures can also be defined, to support services that are sensitive to specific requirements (e.g. for VoIP or some e-health applications). The period over which targets should be met needs to be well-defined, and the progress in meeting targets should be monitored on a regular basis, so corrective measures can be taken if necessary.

When setting measurable targets, governments and regulators may use references based on best practices in the LAC region, or when it makes sense, in other regions, such as the OECD area. Broadband plans should cover a period of between five to seven years, given
that markets and technology change too rapidly to plan for longer periods. Establishing long-term and short-term targets is also advisable, to allow for quick gains and assessment.

Increasingly, targets for national broadband plans and digital agendas are being set for the adoption rather than the availability of broadband. This means that governments need to specify a different set of indicators and policies, addressing socioeconomic groups that have been slower to adopt ICTs. Promoting broadband adoption can also help provide an incentive to invest in broadband infrastructure, for example by creating demand by policies to promote the take-up of broadband by government entities (such as municipalities, schools, hospitals and police). Another good practice is to publish periodic reports, subjected to audits, and related to assessing progress in coverage, access (e.g. population penetration) and usage.

Traditionally, broadband availability has been understood as fixed broadband access. However, wireless technologies have evolved rapidly in recent years, and mobile broadband can in many cases be a good alternative for fixed technologies, especially in rural areas with scattered population where deploying fixed access infrastructure to households is especially challenging and costly.

When possible, technological neutrality should be a guiding principle in setting targets for broadband. Broadband access can be provided with many different technologies, such as copper, fibre, Wi-Fi, cellular networks or satellite. Each has different implications for costs, speed supported, quality of service, and so on, and can be sufficient for some applications. Allowing for a range of different technological proposals to cover broadband access goals expands potential options, increases competition and at the end of the day, improves the cost/benefit relationship. It also allows for a more transparent process, providing a level playing field for all actors and avoiding selecting “winners”.

One reason for the lack of broadband access is the absence of transport infrastructure at the core network (backbone) or the infrastructure connecting these backbone networks with the access switches or base stations (backhaul networks). This is the case for rural areas, including in the LAC region, where there are fewer incentives for investment to extend nationwide backbone. In such cases, funding backbone/backhaul infrastructure with contributions from operators, direct funding by the administration or a combination of both through public-private partnerships, may help to bridge this gap and give operators access to infrastructure deployment.

Insufficient backbone and backhaul networks, especially in rural areas, is a problem in many countries in the LAC region. A number of governments have launched ambitious projects to roll out backbone/backhaul networks (Box 5.5). These facilities are intended to provide transit connectivity for operators, which in turn are expected to invest in rolling out the "last mile" to households in the area covered by funded backbone/backhaul networks.

Some good practices when designing projects to deploy backbone/backhaul networks are:

- **All market participants** with technical and managerial ability to roll out the network should be given the chance to bid for projects.

- **Before launching a project**, broadband access providers should commit to using the financed backbone/backhaul network and extend coverage for broadband access networks.

- **Open access clauses** for the future use of backbone/backhaul networks should be included, ensuring that all market participants, and not just the one deploying the network, are able to use it to connect their own access networks. Provisions on conditions for access, including guides for pricing and nondiscrimination, should be set and be made public from the outset.
● Backbone and backhaul networks should be designed to take into account the estimated future growth of Internet traffic. To avoid congestion, fibre is probably the best technology, although in cases where fibre cannot be deployed or is too costly for geographical reasons, microwave links can also be considered. In this case, special attention should be paid to future capacity upgrading.

● Backhaul capacity should be designed to facilitate fixed and mobile broadband. Base stations supporting mobile broadband access need high-speed fibre-based connections to cope with the growing need for bandwidth, and backhaul/backbone network availability is essential to permit mobile broadband access at reasonable speeds.

● Structural or functional separation may be considered as a means to ensure nondiscriminatory access to backbone networks. Under this model, the operator deploying and operating the backbone network is limited to providing wholesale services to other operators, ensuring that all retail operators are treated without discrimination. This model is used in Brazil with Telebrás and in Mexico’s Telecomm (Box 5.5). Structural or functional separation is often considered a measure of last resort used when other measures do not succeed in ensuring open access.

Box 5.5. Case studies on backbone deployment (Brazil and Mexico)

Brazil

Telebrás’ core activity is to act as a public “wholesale” broadband operator, providing infrastructure and network capacity for broadband providers, as well as the administrations of the federal government, the states and Federal District, municipalities and nonprofit organisations such as universities, schools, hospitals, community telecentres and other points of public interest.

The service is expected to be particularly useful to small broadband providers operating in the smaller towns and more remote areas that have not been reached by large operators.


Mexico

Mexico’s constitutional reform, among other issues concerning telecommunications services, included the rollout of a robust backbone network to be used as a core transmission infrastructure by telecommunications operators, including the provider of the shared network (Red Compartida) for broadband mobile services.

This backbone network will be deployed by Telecomunicaciones de México (Telecomm), a publicly owned operator using as a starting point the fibre network owned by the Comisión Federal de la Electricidad (Federal Commission on Electricity). Under Article 140 of the Federal Law on Telecommunications and Broadcasting, Telecomunicaciones de México can only sell wholesale services to other operators, and retail services only where no commercial player offers them. The planned backbone network is expected to allow for increasing fibre coverage, increasing competition in locations with only one provider, and to lower barriers to new entrants.


Mobile networks usually cover a large proportion of a country or a region for which a license is issued. Where service levels are not sufficient, there may be justification to use public funds to assist in extending and upgrading mobile broadband access networks. Some good practices are:
5. EXTENDING BROADBAND ACCESS AND SERVICES

- **All market participants** should have the opportunity to opt for the network upgrade subsidy, and open access conditions should be set to allow for infrastructure sharing among operators, to encourage competition at the retail level. Infrastructure sharing and open access conditions can be part of national roaming access conditions. Specific provisions on speed and capacity should be included under the conditions for obtaining the funds.

- **New spectrum auctions can include specific provisions for coverage in rural areas.** The regular fees for spectrum may be lowered (or even waived), so as not to impose a high burden on a new operator expected to compete with existing players who have no obligations to cover the corresponding rural area. Such exemptions have already been used in the LAC region.

- **Technological neutrality** should be considered. Goals for extending broadband access should not be limited to wireless broadband, and when possible, funding for extension of broadband access should be open to any type of technology and operator, including fixed operators, provided that requirements on speeds, quality of service parameters and costs are satisfied.

  **Extending fixed broadband access networks** are usually part of NBP initiatives. Fixed broadband access, however, has not been traditionally subjected to coverage obligations, and areas exist in the LAC region where no broadband access service is available and no copper access exists for digital subscriber line (DSL) service. In certain cases, this is because network operators do not consider these areas a profitable investment for telecommunications infrastructure, and public support may be warranted.

  When requiring open access in publicly funded network expansion, it is possible to specify that the operator receiving public funds provide bitstream or unbundled wholesale services for other operators. Generally, for rural areas, bitstream is much more effective in facilitating access, since unbundling is too costly in rural areas with a low population density and with insufficient economies of scale to justify unbundling by other operators. However, if new fixed-access deployments are fibre-based, there may be room for fibre unbundling, since fibre covers much larger distances and other fibre cables can be aggregated in a single point. Networks originally built for cable television and upgraded for broadband have fewer distance constraints than those built for telephony.

  Policy makers should also incorporate **minimum speeds and quality of service parameters** into their plans. Any publicly funded project aimed at extending broadband access should delineate the geographic area to be covered and the minimum download/upload speeds provided. These speeds are usually set in terms of averages for each connection. Definitions of the precise threshold of transmission rates that determines whether Internet access is considered broadband vary substantially by country and over time as demand and technology evolves. At the low end, broadband is often defined as download speeds of at least 256 kilobits per second (kbit/s) for the purpose of data collection. This is the definition used by the OECD, the International Telecommunication Union, the United Nations Conference on Trade and Development, and the Partnership for Measuring ICT for Development, a consortium of international organisations and agencies.

  The key consideration is to set minimum speeds and quality of service parameters that enable continuous and uninterrupted information flows, with sufficient capacity to provide access to data, voice and video applications that are common or socially relevant to users. When connecting education centres or hospitals, for example, sufficient speeds are needed to cover all potential uses, such as telemedicine. When connecting...
individual households, more modest speeds could be considered if this allows larger areas to be broadband-enabled, given the available resources.

Policy makers need to evaluate the costs and benefits of investment in NBPs by conducting an estimate of costs and impact assessment. The objective is to select initiatives that deliver both strong immediate aggregate demand effects, such as the employment created by rolling out networks, and strong longer-term aggregate supply-side effects, to increase the productive capacity of the economy, as an improved foundation for commerce and communication. It is important to ensure that broadband plans are targeted, cover short-term objectives, and that government contributions directly relate to public service goals.

Provision of broadband in public premises at adequate speeds and quality of service is key to ensuring that communities and individuals can enjoy the benefits of the digital economy:

- In universities and schools, it is important to ensure that students can benefit from the wealth of content and applications available on the Internet, as well as to cultivate the acquisition of digital skills. This is further analysed in Chapter 9.
- In hospitals and health centres, as discussed in Chapter 11, the availability of broadband access can make possible the use of e-health applications that increase the quality and efficiency of public health provision. In government offices, it is also essential to promote digital government initiatives and increase the efficiency and quality of public services delivery, as discussed in Chapter 12.
- Moreover, in geographical areas where broadband access is not available or penetration is low, other public buildings or spaces (such as public squares) may act as an anchor for broadband connection by, for example, providing broadband services for citizens, somewhat like services provided by public libraries.

Provision of broadband access in public premises is thus generally prioritised in broadband plans. It is good practice to first assess the need, feasibility and potential impact of broadband access deployments aimed at connecting public premises, and especially educational centres and telecentres, where citizens can take advantage of spaces already equipped with computers to obtain broadband access (Box 5.6).

Universal Service Funds

Projects to extend broadband can be funded in several ways, ranging from direct full subsidisation by the public sector, mixed public-private funding, to setting incentives for network deployment by private operators (for example, through tax reduction/exemption or loans at reduced rates). Comprehensive plans for broadband extension may combine several of these mechanisms for funding, depending on the level of the access gap, the funding needed to bridge gaps not covered by market forces, taxes imposed on operators that do not adversely affect investment and competition, and the availability of public funding.

The constitution of Universal Service Funds (USFs) makes it possible to aggregate and manage different sources of funding simply and comprehensively, to increase the transparency of funds management and facilitate use of broadband plans.

A variety of models for providing funds and rules for using the USF are applied in the LAC region, as well as in OECD countries. Some OECD countries collect USF contributions from operators, and the funds may only be used to finance universal service obligations and are not available to invest in broadband projects. Other OECD countries, as well as most of the countries in the LAC region, use USFs to pay for a wide range of different broadband projects. These are not necessarily limited to infrastructure deployment but also demand
side programmes, such as improving digital literacy, improving affordability and development of e-government and e-health applications.

Box 5.6. **Examples of initiatives deploying broadband access in public premises**

**Brazil (broadband in public urban schools)**

The *Banda Larga nas Escolas Públicas Urbanas* (Broadband in Public Urban Schools) project aims to bring Internet access, through broadband, to more than 64 000 public urban schools in Brazil. According to estimates from the Ministry of Education, 86% of Brazilian students should benefit from it. The project is a partnership between the Presidency of the Republic, the Chief of Staff Office, Ministry of Education, Ministry of Communications and Ministry of Planning and Budget. It is managed by the Ministry of Education and ANATEL, the communications regulator, in partnership with the national and municipal secretaries of education. Fixed-network operators involved include Telecomunicações de São Paulo S.A, Telemar Norte Leste S.A, Brasil Telecom S.A, Companhia de Telecomunicações do Brasil Central and Sercomtel S.A.

ANATEL’s role is to inspect and monitor the execution of the project. In 2008, when the concessionaries and the Agency signed the Additional Terms of Reference to provide Multimedia Communication Services. This agreement fixed dates and quality standards for connecting public schools to the Internet. All public urban schools were to be connected to the Internet by 2010 and the service maintained, free of charge, until 2025. The programme includes all public urban middle and high schools, as well as public urban schools for teacher training.

In fact, 40% of the schools were connected by the end of 2008, an additional 40% in 2009 and the remaining 20% in 2010. As well as installing high-speed Internet connection (1Mb/s download speed) in the schools, operators must offer periodical upgrades of speed, with the aim of maintaining the quality of service for as long as the validity of the Additional Terms of Reference. All public schools created between 2011 and 2025 are also to be granted Internet access through this project.


**Costa Rica (broadband in public centres)**

The projects to extend broadband access and services in Costa Rica are contained in the National Strategy for Solidarity Universal Access and Service, called crdigit@l. This strategy is part of the digital inclusion pillar of the 2015-21 National Telecommunications Development Plan: Costa Rica, “A Networked Society”. This national strategy aims to address problems of access to telecommunications services by groups in vulnerable situations and the need to develop abilities, knowledge and skills for productive and meaningful use of information and communications tools. crdigit@l is the result of an inter-agency effort co-ordinated by the Deputy Ministry of Telecommunications, under the leadership of the Social Presidential Council. This strategy is financed by the National Telecommunications Fund (FONATEL) and counterparts of the institutions involved, aiming to reduce the digital divide, and increase employment and social inclusion.

*crdigit@l* Strategy is divided into five programmes:

- **Connected Communities**. With a budget of USD 168 million, this will provide fixed voice and Internet services to public education and health centres (such as schools, high schools, Centers for Education and Nutrition and Child Integrated Care Centers (CENCINA)), Comprehensive Health Care Basic Teams (EBAIS) and, to telecentres designated Intelligent Community Centers (CECIS). It will reach 184 districts in Costa Rica.
Box 5.6. Examples of initiatives deploying broadband access in public premises (Cont.)

- **Connected Homes.** This will provide access to Internet and devices through a subsidy that will benefit 140,000 households living in poverty and extreme poverty. The programme has a budget of USD 100 million.

- **Equipped public access centres.** This will provide equipment to public housing centres for people with disabilities, childhood, youth, the elderly, indigenous people, women heads of households and micro-entrepreneurs. This programme has a budget allocation of USD 20 million.

- **Connected Public Areas.** This will connect 240 public access spots with free Internet, using a budget allocation of USD 10 million.

- **Solidarity Broadband Network.** This is oriented to improve the quality of service of Public Service Provision Centres with superior connectivity needs.

  To ensure transparency and accountability, an interagency commission was formed to follow up on the implementation of crdigit@l projects.


**Mexico (México Conectado and Puntos México Conectado)**

*México Conectado* is a Mexican government initiative to provide open and free broadband access in schools, hospitals, clinics, library, community centres and other public spaces. At the end of 2014, around 65,000 public spaces were providing free Internet access to Mexican citizens.

The *Puntos México Conectado* programme (Connected Mexico Points, or PMCs) aims to encourage innovation and the use of new technologies for the development of digital skills and entrepreneurship. The educational services include courses on digital literacy, English, robotics, mechanics, software programming, as well as innovation and entrepreneurship programmes.

The network was launched in March 2015 and includes 32 PMCs, one in each federal state. Locations were determined by prioritising municipalities with more than 40,000 inhabitants included in national development programmes, like the Cruzada Nacional Sin Hambre and Nos Mueve la Paz. By January 2016, 141,700 people were registered as members of PMCs (54% of them women) and 70,000 citizens are registered in the courses offered.


It is important to note that the original purpose of USFs – such as extending of the public switched telephone network (PSTN) to rural areas – is still relevant in most LAC countries. Nonetheless, given the ability of mobile networks to provide telephony and the growing relevance of broadband networks to provide a range of services, as well as acting as backhaul networks, policy makers should consider adapting such USF programmes. A case-by-case analysis is needed, considering a series of factors that will be analysed in the following sections. Annex 5.A2 provides information on USFs in the LAC region.

First, policies can be put in place to provide **direct funding by the public sector** to fulfil universal service goals. Providing broadband access to people in both urban and rural areas, as well as to those in the LAC region with lower incomes, is fundamental to achieve digital
inclusion. The level of financial support for broadband extension projects depends on many factors, such as gaps in broadband coverage, priorities for other investments in infrastructure (e.g. water or electricity) and the availability of public funds.

Secondly, **contributions from operators to the USF** are another, potentially important, mechanism for financing broadband expansion. Setting an adequate level of contributions to USFs from operators is complex:

- **Policy makers should analyse data** on the financial returns for operators, existing incentives for investments, the availability of public funding, and should compare the burden imposed and its implications on investment and competition relative to the expected benefits. Benchmarking with similar and reference countries is also a useful tool for determining the optimal level of USF contributions from operators.

- **Regular contributions** from operators based on their revenues allows for a steady stream of funds to address requirements for broadband expansion. This can be considered an option, provided that the burden imposed on operators is reasonable. Demanding high contributions to the USF from operators can also discourage other critical investment in the region. In addition, when there is a lack of competition, as is the case in many LAC countries, the additional burden for operators would be automatically transferred to consumers through increases in prices for telecommunications services. Conversely, setting contributions to the USF too low may not be optimal, since covering all broadband deployment projects with public funding may not be feasible in the region.

- **A balance** should be found between the burden imposed on operators and funding requirements needed to complement public funding for broadband plans. The potential effect on investments by operators and final prices should be considered, as well as the real needs for funding universal services based on the operators’ contributions. When possible, and if government budgets allow it, contributions should gradually shift to being funded by general government revenues, bearing in mind that imposing high burdens on operators may hold back broadband development and its positive economic and social spillovers (OECD, 2014b).

- **Accumulating contributions** to the USF without disbursement on broadband access projects, or disbursing substantially less than contributions collected, would exact rents on operators, affecting the incentives for investment without benefiting consumers. If this occurs, as is the case in certain LAC countries, management capabilities should be reinforced to invest in projects with the funds obtained or to adapt the level of operators’ contributions to fit the existing ability to implement USF projects.

- It is important to note that the level of USF contributions should be **reviewed regularly**. When broadband access is successfully extended and broadband penetration increases, improvements in quality and speeds may rely more and more on market competition. This means that contributions from operators can be reduced, providing more room for competition and private investment.

- Finally, in a **pro-competitive regime** favouring market entry, it can make sense to set a minimum revenue threshold for contributions to the Universal Service Fund. This lowers barriers for new entry and simplifies the management of the Universal Service Fund.

- A third mechanism used to finance broadband access is through **revenues from spectrum licenses and cross-subsidies between services**. Some countries in the LAC region use, for example, spectrum license revenues as a source for universal service funding. Although spectrum revenues can be an important source of potential funds, the availability of...
such funds is unpredictable. This is because spectrum auctions only take place periodically and the outcome of auctions is not known in advance. As a result, auction earnings can be used to supplement USF but should not be relied on for planning purposes. Similarly, income from fines imposed on operators for infringing regulations do not provide for a predictable source of revenue for USF funds.

- **Cross-subsidies** between services to extend broadband access, using revenues from one service to subsidise another, is not advisable, and any contribution from revenue obtained from a specific telecommunications service should be avoided. Tariff rebalancing can be an essential requirement for the creation of effective conditions for competition, and distorting prices through cross-subsidisation is likely to have a negative effect on affordability and demand for other services.

**Selection of providers for broadband access extension in the LAC region**

When possible, publicly funded infrastructure deployment projects should be awarded using a **transparent, open and competitive process**, in which a variety of operators tender and offer the use of different technologies, speeds, quality of service, operational support, future upgrading of a network, and so on. This may also result in higher levels of co-funding and reveal the players’ knowledge of the actual costs of meeting policy objectives, or alternatively, result in more beneficial offers (e.g. wider coverage). This allows for better outcomes and for competition among operators.

Attention should be paid to the **scope of the project**, since, for example, breaking up projects to cover smaller geographic areas can provide an opportunity for small operators to take part in the bid, increasing competition and allowing for diversification and experimentation with different models for deployment of broadband networks. In other projects, such as nationwide backbone networks, management and implementation may be more complex, making it necessary to use larger players with the experience and adequate financial and management capacity.

**The interrelation between public and private sectors when extending broadband access**

Several issues in the relationships between the public and the private sector should be considered when extending broadband access. They include the implications of public funding for competition among private providers; the opportunities offered by public-private partnerships, and the role publicly owned operators can play in closing the access gap.

As discussed in Chapter 4, ensuring fair competition among telecommunication providers is vital in improving the quality of service and lower prices for broadband access. Any broadband expansion plan or project involving public funding must consider the **potential implications for competition**, to avoid distortions in the market or inhibiting future competition. To address this potential concern, the following good practices can be applied:

- In geographical areas that already have competition for broadband and an adequate quality of service, or where there is room for more competition (for example by lowering administrative barriers), policy makers should, in principle, abstain from funding access infrastructure projects. Experience shows that **well-functioning competitive markets** lead to higher speeds, and better prices and quality of service; public intervention may distort a competitive market. Meanwhile, the use of public funds in such areas diverts these resources from areas under-served by the market. In the European Union, the legal framework does not allow for public funding of NGA deployments in areas considered as competitive (Box 5.7).
In general, any partially or totally public funded network deployment should promote open access by allowing all operators use of the access infrastructure. Open access clauses should be included in tender documents stating price conditions, and the technical and other requirements for ensuring access from other operators.

Box 5.7. Government-aid rules for NGA network funding in the European Union, a case study

The objective of the Commission’s government-aid control provisions is to ensure that government intervention does not distort competition and intra-European Community trade. The provisions specify formal guidelines for differentiating, by market structure/market contestability conditions, between white (unserved) areas, grey (private monopoly served) areas and black (multiple private infrastructures) areas for NGA networks.

- **Basic broadband networks (white areas).** In white areas, no provider of broadband access services is currently operating, and no provider is expected to emerge in the next three years. Public intervention is thus likely to be in line with the common interest, and government aid is likely to be compatible. In grey areas, one (infrastructure-based) provider is already active, but another network is not likely to be developed in the next three years. Such cases require more detailed analysis and a thorough compatibility assessment. Black areas already have, or will have in the next three years, at least two basic broadband networks of different operators. Broadband services are thus provided under competitive conditions (infrastructure-based competition) and it can be assumed there is no market failure. In such cases, little scope remains for government intervention to generate more social benefits by subsidising another basic broadband network. However, it may well be possible to support an NGA network in black basic broadband areas.

- **NGA networks (grey areas).** In a “white NGA” area, no NGA network currently exists and none is likely to be built within the next three years by private investors. In this case, the area is in principle eligible for government aid to NGA. The area is considered a “grey NGA” area if only one NGA network is in place or is being deployed in the coming three years, and no operator plans to deploy another NGA network in the coming three years. Under such circumstances, the European Commission will carry out a more detailed analysis to verify whether government intervention is needed. It is understood that deploying a second broadband infrastructure to compete with the existing one is not a sufficient argument for accepting government aid. Instead, the second network needs to provide substantially improved prices and higher speeds.

- **Black areas.** In a “black NGA” area, at least two NGA networks of different operators already exist or will be deployed in the coming three years. In such cases, there is a risk that the Commission will conclude that support for an additional publicly funded, equivalent NGA network is incompatible with the internal market targets. In practice, this means that the project is either modified or withdrawn. Prohibition decisions for broadband government aid are extremely rare. However, some exceptions may be granted if the NGA network amounts to a step change and is able to provide ultrafast speeds well above 100 Mbps.


Secondly, the public and private sectors can complement each other through public-private partnerships (PPPs). These can be an efficient model for structuring public funded broadband access extension plans or projects that take advantage of synergies that benefit both private and public interests, and that ultimately increase the benefits for consumers.
Public authorities’ role in PPPs should in general be focused on defining objectives and specific targets; setting conditions and clauses for the deployment and operation of a network; contributing funding; selecting private partners to execute the project; and monitoring and assessing projects. The role of the private sector, and specifically operators and technology suppliers, is to contribute their expertise of efficient network technologies and deployment, and to help with project management and execution. PPPs should be structured to optimise the comparative advantages and natural roles of each partner. Many different experiences and models of PPP can be used, examples of which can be found in the OECD and IDB documents included in the references. The OECD has established principles for public governance of public-private partnerships to assist with good practices in this area (Box 5.8).

Box 5.8. OECD Recommendation on Principles for Public Governance of Public-Private Partnerships

A. Establish a clear, predictable and legitimate institutional framework supported by competent and well-resourced authorities

1. The political leadership should ensure public awareness of the relative costs, benefits and risks of Public-Private Partnerships and conventional procurement. Popular understanding of Public-Private Partnerships requires active consultation and engagement with stakeholders as well as involving end-users in defining the project and subsequently in monitoring service quality.

2. Key institutional roles and responsibilities should be maintained. This requires that procuring authorities, Public-Private Partnerships Units, the Central Budget Authority, the Supreme Audit Institution and sector regulators are entrusted with clear mandates and sufficient resources to ensure a prudent procurement process and clear lines of accountability.

3. Ensure that all significant regulation affecting the operation of Public-Private Partnerships is clear, transparent and enforced. Red tape should be minimised and new and existing regulations should be carefully evaluated.

B. Ground the selection of Public-Private Partnerships in value for money

4. All investment projects should be prioritised at the senior political level. As there are many competing investment priorities, it is the responsibility of government to define and pursue strategic goals. The decision to invest should be based on a whole-of-government perspective and be separate from how to procure and finance the project. There should be no institutional, procedural or accounting bias either in favour of or against Public-Private Partnerships.

5. Carefully investigate which investment method is likely to yield most value for money. Key risk factors and characteristics of specific projects should be evaluated by conducting a procurement option pre-test. A procurement option pre-test should enable the government to decide on whether it is prudent to investigate a Public-Private Partnerships option further.

6. Transfer the risks to those that manage them best. Risk should be defined, identified and measured and carried by the party for whom it costs the least to prevent the risk from realising or for whom realised risk costs the least.

7. The procuring authorities should be prepared for the operational phase of the Public-Private Partnerships. Securing value for money requires vigilance and effort, of the same intensity as that necessary during the pre-operational phase. Particular care should be taken when switching to the operational phase of the Public-Private Partnerships, as the actors on the public side are liable to change.
Finally, fully or partially public-owned operators may play a role in extending broadband access. In a number of LAC countries, such public-owned operators are chiefly working on broadband expansion projects, deploying rural and backbone/backhaul networks. Some good practices to be considered are:

- In the LAC region, publicly owned operators are often in a position to take a leading role in the execution of national and rural broadband plans. In many countries in the region, they control a national-wide copper access network deployed for fixed telephony services, as well as much of the backbone and backhaul networks. These can be upgraded and extended rather than rolling out new networks.

- It is important to make sure that public-owned operators are not treated more favourably than other operators, based on the fact that they are publicly owned. Taxation of publicly owned operators, licenses, obligations and conditions for providing broadband services should in principle be the same as for any other operator, and any differential treatment (e.g. obligations to provide access to essential facilities) must be based on regulatory decisions (e.g. because they have a dominant market position, rather than by virtue of their ownership structure).

- Any broadband subsidy for public operators should be granted under the same transparent and open access conditions, and any obligations imposed be similar to those imposed on any other operator. If possible, subsidies for broadband access expansion must be awarded based on competitive bidding, open not only to publicly owned operators, but to any other operator fulfilling the prerequisites for participating in the bidding process.

**Box 5.8. OECD Recommendation on Principles for Public Governance of Public-Private Partnerships (Cont.)**

8. Value for money should be maintained when renegotiating. Only if conditions change due to discretionary public policy actions should the government consider compensating the private sector. Any renegotiation should be made transparently and subject to the ordinary procedures of Public-Private Partnership approval. Clear, predictable and transparent rules for dispute resolution should be in place.

9. Government should ensure there is sufficient competition in the market by a competitive tender process and by possibly structuring the Public-Private Partnerships programme so that there is an ongoing functional market. Where market operators are few, governments should ensure a level playing field in the tendering process, so that non-incumbent operators can enter the market.

C. **Use the budgetary process transparently to minimise fiscal risks and ensure the integrity of the procurement process**

10. In line with the government’s fiscal policy, the Central Budget Authority should ensure that the project is affordable and the overall investment envelope is sustainable.

11. The project should be treated transparently in the budget process. The budget documentation should disclose all costs and contingent liabilities. Special care should be taken to ensure that budget transparency of Public-Private Partnerships covers the whole public sector.

12. Government should guard against waste and corruption by ensuring the integrity of the procurement process. The necessary procurement skills and powers should be made available to the relevant authorities.

It is important to ensure that publicly owned operators have no more obligations than other operators, such as providing universal service for specific communities at lower prices or in rural areas, without compensation for the operator’s additional costs.

- **Exempting** public operators from contributing to universal service funds, paying for spectrum licenses or any other financial burdens applied to private operators, or more favourable conditions for using public infrastructure in exchange for universal access projects should in general be avoided. Such exemptions are not always transparent and may distort competition between public and private operators, and make it more difficult to apply competitive processes for universal access projects.

- **Publicly owned operators** can also be used in certain situations as a wholesale provider, deploying backbone or access infrastructures used by other operators at the retail level. For example, Telebrás, a publicly owned operator in Brazil, has a mission to implement a broadband plan aiming to provide coverage in rural areas, schools and other locations where the market has not provided coverage provided. Telebrás operates mainly as a wholesale infrastructure provider for other operators. Other LAC and OECD countries have also applied this model. Although separating the wholesale level and the retail level is attractive in terms of nondiscrimination, and is applied in specific OECD countries, there is no consensus on its merits. If all retail operators rely on a single wholesale access network, there is some risk of infrastructure remonopolisation and a loss of potential efficiencies in retail-wholesale integration. However, for broadband expansion plans to provide coverage in areas where there would otherwise be insufficient infrastructure, such a model may be necessary and considered good practice. The merits and risks of this practice must be analysed on a case-by-case basis.

**Conclusion**

This chapter focused on good practices for extending broadband access. While the private sector is expected to play a central role in expanding infrastructure and services, sound regulatory frameworks that lower administrative barriers to deployment, provide legal certainty for investors and promote competition and investment are also essential. Once existing bottlenecks for private-sector infrastructure deployment are addressed, policymakers should identify areas or locations needing public intervention.

National Broadband Plans (NBP) usually set out the guiding policy objectives for broadband expansion. They should be done in a comprehensive manner, in co-ordination with stakeholders, Digital strategies (when present) and demand-side policies provide clear objectives and both short and long-term measurable targets; take into account regions’ levels of development; map coverage gaps by fixed and mobile broadband networks; assess the existing level of competition; and implement a routine evaluation of progress towards goals. NBP should be guided by the principle of technological neutrality, allowing market actors with different technologies to bid for coverage projects, giving preference to those with high social returns (e.g. connecting public premises and benefiting disadvantaged groups).

After assessing the policy objectives, the next step is selecting mechanisms to meet these goals. Policy makers can choose to impose obligations, set incentives or provide funding for closing access and usage gaps. Obligations, when revised for the new requirements and use of high-capacity networks and directly related to coverage and quality, could be aimed at extending broadband access in certain areas and tied to licensing frameworks and spectrum assignment. Demand-related objectives should be met through other procedures. Incentives could include partial or total tax exemptions, lower or waived fees for spectrum licenses in
certain areas, or loans at reduced interest rates. Direct funding of broadband infrastructure, usually articulated in NBPs and Universal Service Funds (USFs), should be within the reach of all market participants equally and awarded in a transparent and competitive manner, with the inclusion of infrastructure sharing and open access conditions. USFs are used to aggregate and manage different sources of funding, such as contributions from operators based on revenues and general government revenues, complemented in some cases by spectrum auction earnings. Well-run USFs rely on transparent and effective management processes and a steadier stream of funds. Operators’ financial returns should be considered so as to not overburden them and impact investment, and cross-subsidies should be avoided so as not to distort prices. Meanwhile, USF contributions should be reviewed regularly through benchmarking exercises and economic analysis.

The public and private sectors can also complement each other through PPPs. These offer an efficient model for structuring public funded broadband access extension plans or projects that take advantage of synergies that benefit both private and public interests, and ultimately contribute to increasing the benefits for consumers.

Finally, public-owned operators may also have a role to play, but licenses, obligations and conditions for providing broadband services should in principle be the same as for any other operator. Any differential treatment should be based on regulatory decisions (due to a dominant market position, for example, and not to ownership structure). Broadband subsidies for public operators should be granted under a competitive process open to any operator that can satisfy the prerequisites.

Notes
3. There is one specific case where incomes for a specific service (termination for international calls) is used to set the contribution for the Universal Service Fund.
5. These mechanisms are further described and addressed in a report by the Broadband Commission (2014b).

References


MITC (2005), Plan Avanza: 2006-2010 para el desarrollo de la sociedad de la información y de convergencia con Europa y entre comunidades autónomas y ciudades autónomas, Ministerio de Industria, Turismo y Comercio (accessed on 26 February 2016).


Further Reading


### ANNEX 5.A1

**National Broadband Plans in the LAC region**

<table>
<thead>
<tr>
<th>Country</th>
<th>National broadband plans for infrastructure deployment</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Argentina</strong></td>
<td>Plan Nacional de Telecomunicaciones Argentina Conectada (2010-15)</td>
</tr>
<tr>
<td></td>
<td>Managed by: Ministry of Federal Planning, Public Investment and Services and the Ministry of Communications</td>
</tr>
<tr>
<td></td>
<td>Objective: Build infrastructure and provide equipment for network connectivity.</td>
</tr>
<tr>
<td><strong>Bahamas</strong></td>
<td>Included within the Electronic Communications Sector Policy (2014)</td>
</tr>
<tr>
<td></td>
<td>Managed by: The Utilities Regulation and Competition Authority (URCA), Minister with responsibility for the Electronics Communication Sector</td>
</tr>
<tr>
<td></td>
<td>Objective: Ubiquitous access to affordable, reliable and high-quality electronic communications services (including broadband access) to promote the government’s broader development goals.</td>
</tr>
<tr>
<td><strong>Barbados</strong></td>
<td>Included within the National Information and Communication Technologies Strategic Plan (2010-15)</td>
</tr>
<tr>
<td></td>
<td>Managed by: Ministry of Economic Affairs and Empowerment, Innovation, Trade, Industry and Commerce and its Technical Unit</td>
</tr>
<tr>
<td></td>
<td>Objective: Development and deployment of an ICT backbone infrastructure and security enterprise infrastructure, adopting a common IT infrastructure for the government.</td>
</tr>
<tr>
<td><strong>Belize</strong></td>
<td>Included in the ICT national strategy (2011-16)</td>
</tr>
<tr>
<td></td>
<td>Managed by: Ministry of Public Service, governance improvement, elections, and boundaries and sports, and the Ministry of Energy, Science and Technology and Public Utilities (MESTPU)</td>
</tr>
<tr>
<td></td>
<td>Objective: Provide citizens the opportunity to access telecommunications infrastructure, promote and facilitate investment in additional Internet backbone.</td>
</tr>
<tr>
<td><strong>Bolivia</strong></td>
<td>Programa Nacional de Telecomunicaciones de Inclusión Social (2015)</td>
</tr>
<tr>
<td></td>
<td>Managed by: Ministerio de Obras Públicas Servicios y Vivienda (MOPSV)</td>
</tr>
<tr>
<td></td>
<td>Objective: Telecommunications network expansion and reduction of the digital divide through the diffusion of ICT.</td>
</tr>
<tr>
<td><strong>Brazil</strong></td>
<td>Programa Nacional de Banda Larga (PNBL) (2010-15)</td>
</tr>
<tr>
<td></td>
<td>Managed by: Federal Government Initiative, MiniCom within the Ministerio das Comunicações (MC)</td>
</tr>
<tr>
<td></td>
<td>Objective: Expand broadband Internet access. Other programmes regarding the deployment of electronic communication infrastructure include: Regime Especial de Tributação de Banda Larga (REPNBL), Banda Larga Popular, Cidades digitais, Telecentros, cabo submarino, Governo Eletrônico – Serviço de Atendimento ao Cidadão (Gesac).</td>
</tr>
<tr>
<td><strong>Chile</strong></td>
<td>Within the Agenda Digital Imagina Chile (2013-20)</td>
</tr>
<tr>
<td></td>
<td>Managed by: Subsecretaría de Telecomunicaciones de Chile (SUBTEL), MTC</td>
</tr>
<tr>
<td></td>
<td>Objective: Infrastructure deployment includes three initiatives: i) the development of high-speed Internet networks; ii) the deployment of broadband in sectors with insufficient connectivity; and iii) increase efficiency in the use of the radio electric spectrum.</td>
</tr>
<tr>
<td><strong>Colombia</strong></td>
<td>Plan Vive Digital (2014-08)</td>
</tr>
<tr>
<td></td>
<td>Managed by: Ministerio de Tecnologías de la Información y las Comunicaciones (MinTIC)</td>
</tr>
<tr>
<td></td>
<td>Objective: Triple the number of Internet connections.</td>
</tr>
<tr>
<td><strong>Costa Rica</strong></td>
<td>Plan Nacional de Desarrollo de las Telecomunicaciones 2015-21: Costa Rica “Una Sociedad Conectada”</td>
</tr>
<tr>
<td></td>
<td>Managed by: Deputy Ministry of Telecommunications, Ministerio de Ciencia. Tecnología y Telecomunicaciones (MIGITT)</td>
</tr>
<tr>
<td></td>
<td>Objective: Promote broadband, social inclusion, empowerment of the people and an open, accessible and transparent e-government.</td>
</tr>
<tr>
<td><strong>Dominican Republic</strong></td>
<td>Biannual Projects. Resolution No. 001-14 (2014-15)</td>
</tr>
<tr>
<td></td>
<td>Managed by: INDOTEL-CNISIC</td>
</tr>
<tr>
<td></td>
<td>Objective: Infrastructure development and broadband access based on optical fibre.</td>
</tr>
<tr>
<td><strong>Ecuador</strong></td>
<td>The national Broadband Plan is included in the Digital Strategy for Ecuador (2012-17)</td>
</tr>
<tr>
<td></td>
<td>Managed by: Ministerio de Telecomunicaciones y de la Sociedad de la Información (MINTEL)</td>
</tr>
<tr>
<td></td>
<td>Objective: Improve quality of life by the introduction, usage and appropriation of new ICT technologies, decreasing the prices of broadband access and promoting the deployment of the network and services.</td>
</tr>
<tr>
<td><strong>El Salvador</strong></td>
<td>Does not have national plan, part of the regional project Autopista Mesoamericana de la información (AMI) (2008-15)</td>
</tr>
<tr>
<td></td>
<td>Managed by: Regulatory authorities from participating countries</td>
</tr>
<tr>
<td></td>
<td>Objective: Provide connectivity in Latin America through fibre-optic expansion and submarine cables. It includes three subprojects: the rural connectivity network, the fibre-optic network and the regional network access point (NAP).</td>
</tr>
<tr>
<td>Country</td>
<td>National broadband plans for infrastructure deployment</td>
</tr>
<tr>
<td>------------</td>
<td>--------------------------------------------------------</td>
</tr>
<tr>
<td>Guatemala</td>
<td>Does not have national plan, part of the regional project Autopista Mesoamericana de la información (AMI) (2008-15)</td>
</tr>
<tr>
<td></td>
<td>Managed by: Regulatory authorities from participating countries</td>
</tr>
<tr>
<td></td>
<td>Objective: Provide connectivity in Latin America through fibre-optic expansion and through submarine cables. It includes three subprojects: the rural connectivity network, the fibre-optic network, and the regional network access point (NAP).</td>
</tr>
<tr>
<td>Guyana</td>
<td>Within e-Gov Guyana Unit (2013-15)</td>
</tr>
<tr>
<td></td>
<td>Managed by: e-Gov Guyana Unit</td>
</tr>
<tr>
<td></td>
<td>Objective: Facilitate the implementation of two ICT ventures integral to development in Guyana and loyal to the decree in the team’s mission statement. The project has two subprojects: the transmission network and the data network.</td>
</tr>
<tr>
<td>Honduras</td>
<td>National Plan for the Development of the Broadband included in the Digital Agenda, Section 1.4.2 (2014-18)</td>
</tr>
<tr>
<td></td>
<td>Managed by: Technical Secretary for Planning and External Co-operation, Secretaría de Planificación y Cooperación Externa (SEPLAN) and Comisión Nacional de Telecomunicaciones (CONATEL)</td>
</tr>
<tr>
<td></td>
<td>Objective: Increase broadband connection in the different sectors of society through the availability of infrastructure and offering appropriate services.</td>
</tr>
<tr>
<td>Jamaica</td>
<td>Within the Master Implementation Plan for E-powering Jamaica 2012, National Strategic Plan (2007-12)</td>
</tr>
<tr>
<td></td>
<td>Managed by: Central Information Technology office and the Ministry of Science, Technology, Energy and Mining (MSTEM)</td>
</tr>
<tr>
<td></td>
<td>Objective: Establishing a widely dispersed ICT infrastructure and broadband penetration in rural Jamaica.</td>
</tr>
<tr>
<td>Mexico</td>
<td>México Conectado (2013-18)</td>
</tr>
<tr>
<td></td>
<td>National project that contributes to warrant the constitutional right to access broadband internet service</td>
</tr>
<tr>
<td></td>
<td>Managed by: Federal Government and the Secretaría de Comunicaciones y Transportes (SCT)</td>
</tr>
<tr>
<td></td>
<td>Objective: Promote the deployment of telecommunication networks in public spaces such as libraries, schools and health centres.</td>
</tr>
<tr>
<td>Nicaragua</td>
<td>A consultancy is being developed in collaboration with COMTELCA and the IDB for the deployment of a Central American broadband Regional</td>
</tr>
<tr>
<td></td>
<td>Managed by: Gobierno Electronico de Nicaragua (GOBeNIC), Consejo Nicaragüense de Ciencia y Tecnología (CONICYT), Ente Nacional de los servicios de Telecomunicaciones (TELCOR)</td>
</tr>
<tr>
<td></td>
<td>Objective: Deployment of broadband at the regional level.</td>
</tr>
<tr>
<td>Panama</td>
<td>Broadband strategic plan for the Panama Republic (2013-22)</td>
</tr>
<tr>
<td></td>
<td>Managed by: Autoridad Nacional para la Innovación Gubernamental (AIN)</td>
</tr>
<tr>
<td></td>
<td>Objective: Includes the analysis of the broadband ecosystem, the diagnostics of broadband and the strategic plan for broadband.</td>
</tr>
<tr>
<td>Paraguay</td>
<td>A national plan for broadband is being developed. Broadband deployment is already included in the Telecommunications National Plan (2011-15)</td>
</tr>
<tr>
<td></td>
<td>Managed by: Comisión Nacional de Telecomunicaciones (CONATEL)</td>
</tr>
<tr>
<td></td>
<td>Objective: Increase the coverage and density of fixed and mobile broadband, increasing penetration rates, as well as the number of localities with broadband.</td>
</tr>
<tr>
<td>Peru</td>
<td>National Plan for the Development of Broadband in Peru (2011-15)</td>
</tr>
<tr>
<td></td>
<td>Managed by: Ministerio de Telecomunicaciones y Transportes</td>
</tr>
<tr>
<td></td>
<td>Objective: Broadband deployment.</td>
</tr>
<tr>
<td>Suriname</td>
<td>There is no national plan, but two regional projects exist: 1. Broadband Infrastructure inventory and Public Awareness in the Caribbean; 2. Regional Digital Development Strategy (2011)</td>
</tr>
<tr>
<td></td>
<td>Managed by: Caribbean Community (CARICOM) (regional) and TAT</td>
</tr>
<tr>
<td></td>
<td>Objective: Broadband deployment at regional level.</td>
</tr>
<tr>
<td>Trinidad and Tobago</td>
<td>smarTT (2014-18)</td>
</tr>
<tr>
<td></td>
<td>Managed by: Ministry of Sciences, Technology and Tertiary education and the Telecommunications Authority of Trinidad and Tobago (TATT)</td>
</tr>
<tr>
<td></td>
<td>Objective: Address the provision of an adequate telecommunications and broadcasting network, to guide infrastructure deployment. Broadband vision aims at delivering access speeds of 100 Mbps to the majority of the population by 2016. The high-level broadband objective promotes widespread access to high-speed broadband. In the smarTT plan under thematic area 4: Infrastructure Development.</td>
</tr>
<tr>
<td>Uruguay</td>
<td>Broadband deployment objectives are included in the digital agenda (2011-15)</td>
</tr>
<tr>
<td></td>
<td>Managed by: Agencia de Gobierno electrónico y Sociedad de la Información y del Conocimiento (AGESIC).</td>
</tr>
<tr>
<td></td>
<td>Objective: One of the objectives of Uruguay’s digital agenda is to reach Internet coverage for everyone. The goal is to reach Internet broadband connection for 60% of the population in 2012 and 80% in 2014.</td>
</tr>
</tbody>
</table>
### ANNEX 5.A2

#### Universal service funds in the LAC region

<table>
<thead>
<tr>
<th>Name of the fund and website</th>
<th>Acronym</th>
<th>Financed through (% of operators income)</th>
<th>Budget estimation</th>
<th>Country currency</th>
<th>USD million</th>
<th>Date</th>
<th>Legal framework</th>
<th>Responsible entity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chile Fondo de Desarrollo de las Telecomunicaciones <a href="http://www.subtel.gob.cl">www.subtel.gob.cl</a></td>
<td>FDT</td>
<td>National Budget</td>
<td>CLP 87 759 billion</td>
<td>CLP</td>
<td>125</td>
<td>1994</td>
<td>Law Decree 1762</td>
<td>SUBTEL</td>
</tr>
<tr>
<td>Colombia Fondo de Tecnologías de la Información y las Telecomunicaciones <a href="http://www.mintic.gov.co/portal/604/v3-propertyvalue-6171.html">www.mintic.gov.co/portal/604/v3-propertyvalue-6171.html</a></td>
<td>FONTIC</td>
<td>Fees, licences, contributions</td>
<td>COP 12 000 billion</td>
<td>COP</td>
<td>3.9</td>
<td>2009</td>
<td>Article 58, law 1450</td>
<td>MINTIC-FONTIC</td>
</tr>
<tr>
<td>Costa Rica Fondo Nacional de Telecomunicaciones <a href="http://www.sutel.go.cr/pagina/que-es-fonatel">http://www.sutel.go.cr/pagina/que-es-fonatel</a></td>
<td>FONATEL</td>
<td>1.5%</td>
<td>CRC 128 billion</td>
<td>CRC</td>
<td>239</td>
<td>2008</td>
<td>Law No. 8642</td>
<td>SUTEL</td>
</tr>
<tr>
<td>Dominican Republic Fondo de Desarrollo de las Telecomunicaciones <a href="http://indotel.gob.do/indotel/fondo-para-el-desarrollo-de-las-telecomunicaciones/">http://indotel.gob.do/indotel/fondo-para-el-desarrollo-de-las-telecomunicaciones/</a></td>
<td>FDT</td>
<td>2%</td>
<td>DOP 397 million</td>
<td>DOP</td>
<td>8.8</td>
<td>1998</td>
<td>General Telecommunications Law resolution No. 24-10</td>
<td>INDOTEL</td>
</tr>
</tbody>
</table>
### Universal Service Funds in countries from the LAC region

<table>
<thead>
<tr>
<th>Country</th>
<th>Name of the fund and website</th>
<th>Acronym</th>
<th>Financed through (% of operators income)</th>
<th>Country currency</th>
<th>Budget estimation USD million</th>
<th>Date</th>
<th>Legal framework</th>
<th>Responsible entity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ecuador</td>
<td>Fondo de Desarrollo de las Telecomunicaciones <a href="http://www.telecomunicaciones.gob.ec/plan-de-acceso-universal-y-alistamiento-digital/">www.telecomunicaciones.gob.ec/plan-de-acceso-universal-y-alistamiento-digital/</a></td>
<td>FODETEL</td>
<td>1%</td>
<td></td>
<td>7.6</td>
<td>2000</td>
<td>Special Telecommunications Law No. 2000-4</td>
<td>MINTEL</td>
</tr>
<tr>
<td>Guatemala</td>
<td>Fondo para el Desarrollo de la Telefonia</td>
<td>FONDET</td>
<td>Spectrum auctions</td>
<td>GTQ</td>
<td>114 million</td>
<td>1996</td>
<td>Telecommunications General Law. Decree No. 94-96</td>
<td>FONDET-MCIV</td>
</tr>
<tr>
<td>Nicaragua</td>
<td>Fondo especial de Inversión de Telecomunicaciones y servicios postales <a href="http://www.telcor.gob.ni">www.telcor.gob.ni</a></td>
<td>FITEL</td>
<td>2%</td>
<td></td>
<td>-</td>
<td>2003</td>
<td>Executive Decre 5-2006</td>
<td>TELCOR</td>
</tr>
<tr>
<td>Panama</td>
<td>Fondo para el Desarrollo de Proyectos de Servicio y Acceso <a href="http://www.innovacion.gob.pa/descargas/acceso_universal_Resolucion_No_6.pdf">www.innovacion.gob.pa/descargas/acceso_universal_Resolucion_No_6.pdf</a></td>
<td>FDPSA</td>
<td>1%</td>
<td>PAB</td>
<td>10 million</td>
<td>2010</td>
<td>Law 59 from 2008</td>
<td>AIG-ASEP- Junta Asesora de Servicio y Acceso Universal</td>
</tr>
<tr>
<td>Paraguay</td>
<td>Fondo de Servicios Universales <a href="http://www.conatel.gov.py/">http://www.conatel.gov.py/</a></td>
<td>FSU</td>
<td>1%</td>
<td>Amount is not fixed</td>
<td>1999</td>
<td>Telecommunications Law</td>
<td>CONATEL</td>
<td></td>
</tr>
<tr>
<td>Peru</td>
<td>Fondo de Inversión en Telecomunicaciones <a href="http://www.fitel.gob.pe">www.fitel.gob.pe</a></td>
<td>FITEL</td>
<td>1%</td>
<td></td>
<td>70</td>
<td>1993</td>
<td>Telecommunications Law</td>
<td>MTC-FITEL</td>
</tr>
<tr>
<td>Suriname</td>
<td></td>
<td></td>
<td>x</td>
<td>x</td>
<td>x</td>
<td></td>
<td>Telecommunications Act 2000</td>
<td>MinTCT-TAS</td>
</tr>
<tr>
<td>Trinidad</td>
<td>Universal Service Fund <a href="https://tatt.org.tt/">https://tatt.org.tt/</a></td>
<td>USF</td>
<td>-</td>
<td>-</td>
<td>Universal Service Framework</td>
<td></td>
<td></td>
<td>TATT</td>
</tr>
<tr>
<td>and Tobago</td>
<td></td>
<td></td>
<td>x</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Uruguay</td>
<td></td>
<td></td>
<td>x</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Venezuela</td>
<td>Fondo de Servicio Universal <a href="http://www.conatel.gob.ve/servicio-universal/">www.conatel.gob.ve/servicio-universal/</a></td>
<td>FSU</td>
<td>1%</td>
<td></td>
<td></td>
<td>2011</td>
<td>Ley Orgánica de Telecomunicaciones</td>
<td>CONATEL</td>
</tr>
</tbody>
</table>

Note: x = not applicable; - = absolute zero.