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An Analysis of National Broadband Plans in Latin America

Importante

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Abstract

The significant public investment in deploying new network infrastructure and the ambitious government initiatives to develop broadband provision indicate a change from the consensus that prevailed during the 1990s in the telecommunications sector. To what extent does this change represent a return to an earlier period characterized by market liberalization and the privatization of the main state operators? What must the objectives of State intervention in the market of broadband provision be and which tools are most suited to achieve them? This paper analyzes these questions through a comparative analysis of the objectives, instruments and models for network deployment contained in the national broadband plans adopted by major Latin American countries. Common patterns and differences are identified between the plans adopted by Latin American countries, and among the initiatives adopted by developed countries. These plans are also analyzed within the framework of broader processes of political change in Latin America.

Resumen

La significativa inversión pública en desplegar nueva infraestructura de red y las ambiciosas iniciativas de los gobiernos por desarrollar la cobertura de banda ancha son factores indicativos de un cambio de política de telecomunicaciones, comparado con el proceso de liberalización y alejamiento del Estado de la década de los 90. ¿En qué medida este cambio representa un retorno a las políticas de intervención del Estado en la economía previas al periodo de liberalización? Ante este panorama, ¿cuáles deben ser los objetivos de la intervención del Estado en el mercado de la cobertura de banda ancha? ¿Y qué herramientas son más adecuadas para alcanzarlos?

Este documento analiza estas cuestiones a través de un análisis comparativo de los objetivos, instrumentos y modelos para el desarrollo de redes de nueva generación contenidos en los planes nacionales de banda ancha lanzados por varios países de América Latina. Se identifican aspectos comunes, pero también diferencias clave entre los programas adoptados por estos países, así como entre los países de América Latina y países desarrollados. Estos planes también son analizados tomando en consideración los procesos de cambio político que han sucedido en la región en los últimos años.

*Introduction**

Once again the pendulum has swung regarding the role of the State in the development of telecommunications networks and services. The significant public investment in the deployment of new network infrastructure and the ambitious government initiatives to develop broadband services indicate an unequivocal change from the consensus that prevailed during the 1990s in the telecommunications sector. Governments are no longer satisfied with regulating private activity and correcting market failures with universal access funds. Public financing of networks and equipment, state participation in the operation of these networks and an active industrial policy are once again being employed by policymakers in the telecommunications sector.

At first glance, this change can be observed both in developed and developing countries, and is particularly noticeable in the proliferation of national broadband plans. This term encompasses a diverse array of initiatives implemented by national governments in the past five years, whose principal objective is to accelerate the deployment and adoption of broadband services. Latin American countries have been particularly proactive in designing and implementing national broadband plans. The change in the role of the State in the telecommunications sector since the 2000s has raised several questions. To what extent does this change represent a return to the period before the market liberalization reforms and privatization of the main state operators? What safeguards must be adopted to avoid market distortions and the crowding-out of private investment? What must the objectives of State intervention in the broadband services market be and which tools are more suitable to achieve them? How should the activity of the operators who receive state subsidies or are directly controlled by the state be regulated?

This paper analyzes these questions through a comparative analysis of the objectives, instruments and models for network deployment contained in the national broadband projects adopted for major Latin American countries. One of the main objectives is to identify common patterns and differences between the plans adopted by Latin American countries as well as among the initiatives adopted by developed countries. The paper also seeks to contextualize the analysis of these plans within the framework of political change in the region, particularly within the so-called “left turn” that followed the economic crisis in the late 1990s.

The paper is organized as follows: the following section seeks to identify the factors that have encouraged governments in the region to undertake public initiatives supporting the implementation and adoption of broadband

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services. The third section describes the main characteristics of the national broadband plans of six Latin American countries (Argentina, Brazil, Chile, Colombia, Mexico and Peru), which are also summarized in the table in Appendix 1. The fourth section identifies similarities and differences in the objectives, tools and management of these plans, and compares them with the initiatives of developed countries. The last section discusses the policy recommendations and conclusions of this paper.

I. National Broadband Plans in the Regional Context

The change in the role of the State in telecommunications is not new. Several authors have shown that these variations are the result of changes in macroeconomic conditions and the prevailing consensus on the requirement for government intervention in the economy (Viator, 1994; Bauer, 2010). The wave of regulation in the 1930s coincided with greater government participation in the economy following the economic crisis of the 1920s. The following significant wave of transformation in the 1970s and 1980s resulted in deregulation, liberalization and the privatization of state companies as a result of the decline of the model of direct State participation in the economy (Mariscal, 2002; Cowhey & Aronson, 2009).

In the telecommunications sector, the policy cycles designed to promote the deregulation of industry and privatization of state operators, which began in Latin America in the late 1980s, showed signs of wear in the late 2000s. This may be surprising at first, insofar as this cycle saw a significant increase in service cover, an exponential rise in investment levels and the presence of a virtuous cycle for the introduction of new technologies and new business models and adoption of new services (Estache *et al.*, 2002; Jordan *et al.*, 2010). Moreover, in terms of the effect of reforms aggregate welfare, several studies show a positive indirect effect on employment, while the direct effect of redundancies in private companies has been largely offset by the growth of total employment in the sector (McKenzie & Mookherjee, 2003). And, despite the tariff readjustment resulting from reforms in the sector (in particular in local fixed service), a number of studies show that the privatization process and liberalization of the telecommunications market has had a positive effect (Navajas, 1999; Ennis & Pinto, 2003).

If the evidence generally indicates that the market reforms process has been successful, how can the governments' interest in altering this cycle and accentuating State intervention in the telecommunications sector be explained? This paper identifies five factors explaining this change, two of which are linked to broader transformations in the political-economic context of the region, and three of which are more closely linked to the telecommunications sector. Not all the factors are equally relevant in the countries analyzed; this explains the variations in the policies adopted by

Latin American countries. However, taken as a whole, these factors enable the State to return as a central player in the development of the industry.

Beginning with the context-related factors, the first is the so-called “left turn” in the political orientation of Latin American governments in the early 2000s (Castañeda, 2006; Levitsky & Roberts, 2011). This change is relevant insofar as it entails an economic agenda of greater State intervention in the economy, and a return to the developmental and industrial policy tradition that characterized Latin America during much of the 20th century (Corrales, 2008). The economic crisis of 1998-2002, during which the per capita GDP of the region dropped and poverty and inequality levels increased, significantly turned public opinion towards candidates offering an agenda of redistribution and greater state intervention in the economy.

This shift in public opinion is particularly noticeable in the rejection of the privatization of public utility companies. Figures show that the level of support for privatization fell from 46% in 1998 to 19% in 2004, then rose slightly during the 2000s (Latinbarómetro, 2011). Several studies identify many reasons for the limited support for the private management of public utilities in Latin America, among which are mistrust in governments’ ability to regulate the private operators adequately (Panizza & Yañez, 2006), the persistence of private monopolies in several sectors (Murillo, 2006), and the unequal distribution of the profits created by the privatization process (Shirley, 2004).

In the telecommunications sector, the renationalization of operators carried out by the Venezuelan (2007) and Bolivian (2008) governments is the most convincing evidence of this change. Moreover, the progressive reduction of the powers of the agencies regulating telecommunications in several countries (in certain cases *de jure* and in others *de facto*), and the widening of the functions of the executive bodies linked to the sector (such as State ministries and departments), suggests a wider process of institutional reconfiguration regarding the State regulation scheme adopted during the 1990s.

The second explanatory factor linked to context is the economic prosperity that resulted from noticeably improved trading terms in the region. As pointed out by several authors, the combination of fiscal and external surplus caused by the so-called “commodities boom” has not only provided governments with the funds to carry out large infrastructure investments, but also reduced the macroeconomic risk of the state operation of public utility companies (Weyland, 2009; Murillo *et al.*, 2011).

By allowing a rapid accumulation of international reserves and reducing the burden of external debt, the cycle of macroeconomic prosperity that began in the early 2000s increased Latin American governments’ ability to carry out an agenda of redistribution and state intervention in the industries regarded as strategic. In contrast, the international crisis that began in 2008

slowed private investment in some of these industries. By way of an example in the telecommunications sector, between 2008 and 2009, investment in mobile telephones (the sector's most dynamic market) fell in most of the countries analyzed in this paper, with a drop of up to 40% in Brazil and Colombia.¹

This context-linked process reverses the situation in the late 1980s, when the States controlling the incumbent operator were unable to supply the vast investments to modernize and widen the cover of national telecommunication networks, while the private sector had the funds and the know-how to do so. Two decades later, in a context of global economic uncertainty, private operators are reluctant to make large investments in network infrastructure, particularly investments implying high risk and low return, such as installing fiber backbone outside large urban centers. Although investment in voice services continues to increase, broadband infrastructure investment requires large investments with unclear returns. This encourages Latin American governments, which benefit from favorable trade terms, to fill the gap left by the deceleration of private investment in the sector.

The third explanatory factor, related to the telecommunications sector, is the mounting evidence of the contribution of telecommunications, particularly broadband, to added economic growth and job creation (Qiang & Rossotto, 2009; Koutrompis, 2009). Today public salience has increased given the importance of broadband deployment and governments around the world are not waiting for private investors to decide to upgrade networks. This has shifted policy makers' incentives for changing the status quo from market liberalization to state intervention. In the early 90s, policy objectives were centered on the notion of the market as the engine of growth whereas in the current generation reforms, we witness the return of the state under a new paradigm where broadband itself is the policy objective.

However, important differences arise when comparing the nature of the return of the State as Figure I summarize. The first generation reforms occur in a context of fiscal crisis where state led growth gives way to the market, and private investment becomes the instrument towards the sectors' development. The return of the State does not necessarily imply the failure of the market liberalization paradigm but rather, its return responds to a new perspective where a strong belief in the public benefits derived from broadband investment are higher than the private incentives to invest in underserved areas due to uncertain returns to investment.

¹ Source: Merrill Lynch Wireless Matrix IQ 2011. The exception is Argentina, in which the absolute investment level did not decrease between 2008 and 2009, although the investment growth rate fell by almost a third during that period.

**FIGURE I POLICY REFORM CHARACTERISTICS AND STATE PARTICIPATION
IN LATIN AMERICA**

Country	First Generation Reform: Market liberalization (1989-2000)		Regime Change	Second Generation Reform: Return of the state (2009-2012)	
	Fiscal Crisis			Salience of Broadband/Availability of Public Resources	
	TYPE	NATURE OF REFORM		SCALE: Public investment (US\$ per cápita)	NATURE OF RETURN
Argentina	Pragmatic	Controlled liberalization	Continuance of populist regime	44.20	State as operator
Brazil	True market believer	Market liberalizer	Towards left wing	16.60	State as operator
Chile	True market believer	Market liberalizer	Permanence of free- market ideals	2.60	Public- private partnerships
Colombia	True market believer	Controlled liberalization	Towards right wing	48.60	Public- private partnerships
Mexico	Pragmatic	Controlled liberalization	Towards right wing	Subsidies	State intervention through regulation
Peru	Pragmatic	Controlled liberalization	Populist regime	14.50	State intervention

Despite an apparent policy convergence in Latin America, country specific particularities remain. Once again we see partisan orientation of incumbents shaping the content or design of telecommunication policies. The differences lie in the role given to the State to ensure proper service provision, to make telecommunications an engine of growth for other sectors of the economy. In other words, while empirical evidence is limited to demonstrating the positive effect of the deployment of networks on competitiveness and employment, in the late 2000s a consensus emerged that it was urgent to adopt proactive public policies to galvanize this deployment, in particular in the case of the so-called new generation networks (NGN).² These policies are part of the economic stimulation packages adopted by various countries in response to the 2008 economic crisis, combining the deployment of broadband with the increase in competitiveness and employment (Qiang, 2010). Just as the State played a key role in the development of electric, transportation and notably telecommunications networks until the 1980s, the new consensus calls for governments to assume a similar role in the modernization of the telecommunications infrastructure in the 21st century.³

What is the basis for this call, given the evidence of the positive effect of the cycle of market reforms of the last two decades? In the case of developed countries, two factors have been identified: firstly, a reduction of the incentives for private investment as a consequence of the 2008 crisis, through the combined effect of a deceleration in demand for services and a decrease in credit (Katz, 2009). Secondly, several studies indicate that the fiber must be brought closer to the final user for a significant increase in the quality of broadband services, which implies investments that the private sector does not appear to be prepared to assume in the short term due to uncertainty of the returns to investment. In particular, the large operators that emerge from the reform process are still achieving a return on the copper pair access networks (an investment recovered decades ago), while the profitability of the new access networks is uncertain (Cave & Martin, 2010). Additionally, as shown by Ganuza and Viegens (2011), these new networks carry many risks for traditional operators, as market power and the benefits of the value chain tend to shift from the network operators to the content providers.

The fourth explanatory factor is the persistence of regional unbalances in the deployment of infrastructure and access to telecommunications services, particularly broadband. Research shows that the investments made by the private sector during the last two decades have been concentrated in urban areas with the highest per capita income (e.g., Regulatel, 2006), which compounds disparities in access to services between rural and urban towns, and between income levels (Grazzi & Vergara, 2011). The real problem,

² See also, among others, OECD (2009), ECLAC (2010) and ITU Broadband Commission (2011).

³ Of course, the consensus is not generalized. Kenny (2011) reviews the evidence and summarizes the criticism of public investment in new generation networks.

however, has been the flaws in the use of the instruments designed during the reform process to mitigate these disparities, principally private operators' obligations to implement network and universal service funds (USF).

The limited impact of USF in Latin America has been widely documented (Stern 2009; Barrantes, 2011). In the case of Brazil, the Universalization Fund of Telecommunications Services (FUST) was created in 2000 and currently rises to approximately \$800 million USD a year, which, however, is never spent due to legal obstacles. In the case of Argentina, the problems in raising funds and carrying out USF (also created in 2000) involve the renegotiation of the contracts with landline telephone operators before the 2001 economic crisis.⁴ Mexico does not have USF in the strict sense of the term, but rather a temporary fund (the Telecommunications Social Coverage Fund created in 2002 to provide fixed telephony for isolated villages. This fund has limited resources (approximately \$75 million USD, provided by the national government in a one-time payment, and there are many flaws involved in carrying it out, both in the design and the contracts.⁵

Other countries such as Colombia, Chile and Peru have achieved better results in the implementation of USF. In the case of Colombia, between 1998 and 2007, the Compartel program managed to implement rural telephone programs, telecenters and connectivity to public institutions at a cost of approximately \$400 million USD, thus achieving 83% landline telephone coverage in rural towns (UIT, 2008). However, as indicated by Barrantes (2011), even in the cases of relative success in the implementation of USF, this instrument has two fundamental problems: the first corresponds to financing restrictions, and consequently the impact of these funds; the second is the fact that USF focus on subsidizing shared access to landline telephone, while Internet has lost relevance following the progress of new technologies such as broadband, which require other models for implementing infrastructure and offering services.

At the end of the 2000s, Latin American governments reached a similar conclusion: on the one hand, the limited scope of high transmission capacity core networks and insufficient competence in access networks outside large urban centers has a negative impact on the cover, quality and price of the broadband services. On the other hand, the existing instruments to encourage the implementation of infrastructure and mitigate the regional unbalances in access to services are insufficient to supply the new connectivity needs of homes, companies and public institutions.⁶ In this context, State intervention

⁴ In 2011, after 10 years of inactivity, part of the funds assigned to the USF were reconstituted and spent.

⁵ For a discussion of the Mexican case, see Mariscal & Ramírez Hernández (2011).

⁶ The case of Peru exemplifies this situation. According to figures from INEI (National Statistics Institute), for the last trimester of 2011, 35% of homes in the Lima area had access to the Internet, which represents an annual variation of 10p.p. This dynamism contrasts with the situation in the rest of the country's urban areas, in which Internet penetration in homes reaches 15% (with an annual variation of 3p.p.), and rural areas, in which Internet penetration in homes barely reaches 0,5% and annual variation is almost nil (0,2p.p.). This regional imbalance is also

in the deployment of backbones in zones with limited private return is not only considered a matter of equity, but also implies the full use of the positive externalities of broadband consumption, which, as it cannot be appropriated by private operators, causes a sub-optimal investment level.⁷

The last explanatory factor is the imitation effect and the dissemination of broadband stimulation policies adopted by the most developed countries. Several authors have studied the mechanisms to introduce market reform policies in Latin America (e.g., Levi-Faur, 2005). The results suggest that the reforms are produced mainly in response to common external factors, and that dissemination is based on legal instruments (such as free trade agreements) and incentives designed by multilateral credit organisms. Interestingly, the mechanisms operating in the new cycle of state intervention policies are largely different, as they follow a pattern of interdependence of decisions between countries and shared knowledge networks among policymakers, rather than a pattern of hegemony of certain countries over others.

In this process, the leadership position is particularly relevant in the deployment of broadband services by several countries in South-East Asia, whose success is demonstrated by various indexes and rankings of the deployment and adoption of the service.⁸ The leadership of countries such as South Korea can be explained not so much by the success of the market reform process but rather of proactive public policies combining incentives for the private sector with significant public investment in infrastructure, training and R&D (Kim *et al.*, 2010). The lesson to be learned by developing countries is therefore that private activity must be complemented by a greater State intervention in the orientation of investment and the stimulation of demand.

II. Broadband Plans: Main Characteristics

A. Argentina: Argentina Conectado ("Argentina Connected") National Telecommunications Plan

The *Argentina Connected* program, introduced in October 2010, seeks to integrate several initiatives in the sphere of new ICT (such as the implementation of digital terrestrial TV and the introduction of notebooks in colleges), as well as responding to the regional imbalance in access to high transmission capacity networks.⁹ According to the plan, the objective is to

reflected in the laying of existing fiber networks in Peru, which are concentrated in the coastal areas, and only reach three cities in the non-coastal zone.

⁷ See the diagnosis documents of the national broadband plans cited in the references.

⁸ Among the most significant are the ICT Development Index (IDI), created by the UIT, the Network Readiness Index (NRI), created by the World Economic Forum, and the broadband reports produced by OECD. For criticism of these rankings see Ford *et al.* (2007) and Galperin & Ruzzier (2010).

⁹ The Argentina Connected Program was established in the presidential decree 1,552 of October 2010.

widen cover and improve the quality of broadband Internet access service, in particular in zones that are not profitable for private operators (Plan Argentina Conectada, 2010).

One of the central themes of the plan is the deployment of a Federal Fiber Optic Network. The area of the network is estimated at approximately 50,000 km, a combination of: a) the building of 22,000 km of provincial networks and 18,000 km of interprovincial network; b) the lighting of dark fiber stretches from the electric company Transener (in which the State is a shareholder); and c) fiber exchange agreements with several private operators. It is hoped that the backbone will cover 97% of the population by 2015, with local operators responsible for providing service in the last mile.

The operation of the Federal Fiber Optic Network was assigned to AR-SAT, a state-owned company created in 2006 to take over the assets of Nahuel Sat, a private satellite operator that was unable to cover its outstanding balance. While the government plan emphasizes the need to reduce costs and increase competition in the wholesale access market, a structural separation of the new state operator was not established, enabling AR-SAT to enter the retail tranche.

The Argentina Connected plan considers several initiatives that complement the deployment of the fiber network. For example, the plan promotes the creation of public access and training centers (called Access to Knowledge Units and Digital Access Points), as well as digital literacy initiatives and support for research into communication technology. On a regulatory level, the plan is considering various initiatives to encourage competition, such as the tender of new radio spectrum for mobile broadband networks, and the reactivation of the universal service fund. This is accompanied by support through credit and technical assistance for cooperatives and small private broadband service operators, for whom the program is considering a central role to achieve the coverage and adoption objectives established. Total investment in the program is estimated at AR\$ 8,000m (approximately \$1,800 million USD) in a five-year plan (2011-2015), of which AR\$ 3,700m (approximately \$840 million USD) represents investment in the fiber backbone.

To date, tenders have been issued for the building of ten stretches (approximately 18,700km) of the federal fiber network, in addition to the construction of the national data center through which AR-SAT will manage the new network. Moreover, shared access and training centers have been inaugurated in several provinces, and there has been progress in cooperation agreements for the creation of traffic exchange points with neighboring countries (particularly Brazil and Uruguay).

B. Brazil: Plano Nacional de Banda Larga (National Broadband Plan)

Developed by Lula's government in 2010 and reaffirmed by that of Dilma Rouseff, the *National Broadband Plan* (PNBL) has established five main objectives: increase the population's possibilities of accessing broadband Internet services; accelerate economic and social development; promote digital inclusion; reduce social and regional inequalities; and promote job and income creation.¹⁰ Specifically, the plan seeks to reduce the prices of Internet access and increase broadband service coverage and quality. The plan is organized into four lines of action: regulation and infrastructure norms, tax incentives for telecommunications services, productive and technological policies and finally, the deployment of a national fiber network.

The national fiber network has the priority of implementing a network linking the 27 state capitals, in response to the demand for connectivity by public organisms, which can offer capacity in towns not serviced by private operators, or in which the existing provision is of poor quality or expensive. The plan seeks to provide service for 4,278 of the country's 5,564 municipalities (76%) in the space of four years (2011-2014), by means of a total investment of R\$ 5,700 (approximately \$3,300 million USD). The network is designed to cover 30,000 km, which includes the laying of new fiber and employing the idle capacity of the fiber of state-controlled companies, such as Petrobras and Eletrobras.

The PNBL gave Telebras the responsibility of building and operating the network, by means of a plan to capitalize the company with a state input of R\$ 3,200 (approximately \$1,800 million USD). The company, a former state telecommunications incumbent until its privatization in 1998, was reactivated by the government in 2010 to lead the infrastructure initiatives promoted by the PNBL. Telebras will offer capacity in the wholesale market, reaching the final customer through agreements with last mile operators. According to the PNBL, these agreements must include offering the customer 1 Mbps access for R\$35 a month (around \$20 USD). As in the case of Argentina, the PNBL is considering the possibility of Telebras operating in the retail tranche in villages without a local operator or with inadequate service, under conditions fixed by the sector regulator (ANATEL).

The entry of a state operator into the market has been questioned by large private operators (Jensen, 2011). Nonetheless, some of them have already signed agreements with Telebras, while the small operators see an opportunity to correct a highly concentrated market, in which five operators control over 90% of the market (PNBL, 2010). At the same time, and in order to promote competition, Anatel has proposed the General Competition Goal Program, which would authorize Anatel, among other things, to force

¹⁰ The PNBL was established in the presidential decree 7,175 of May 2010.

companies with significant market power to share their infrastructure with small operators at lower wholesale prices than the retail prices offered by these operators.¹¹

Moreover, the PNBL is considering tax incentives, support for R&D and financing equipment with national production technology, as well as using the government's purchasing power to encourage the production of national technology. State investment in these initiatives is estimated at R\$2,500m (USD 1,450m); in addition to the BNDES (National Development Bank) credit line for R\$7,500m (\$4,170 million USD).

Telebras has already signed contracts that will enable it to bring fiber backbones to 40% of the country's municipalities by late 2012. Moreover, the state operator has signed data capacity contracts with several private operators that have pledged to offer a 1 Mbps connection for R\$35, 00 a month that guarantees 20% of the offered speed. The first of these contracts was signed in June 2011 with the Sadnet company for a region in Goiás, where Telebras offers 100 Mbps capacity for under R\$200 (\$115 USD) per Mb per month (Pena, 2012). Moreover, several tender processes are underway for the building of different stretches of the same network.

C. Chile: Todo Chile Conectado (Connecting All Chile) Plan

The connectivity project Connecting All Chile, designed to promote productive development, education and the inclusion of communities from the country's isolated and rural zones, brings mobile broadband to these communities. These are mostly (68%) small communities (under 1,000 inhabitants) and therefore of little interest to private operators. This initiative was implemented within the framework of the Telecommunications Development Fund (TDF), a fund created to promote the increase of telecommunications services coverage in low-income or isolated areas, which, funded by the national budget, subsidizes telecommunications companies to provide services in these areas.

The Connecting All Chile Plan is a public-private partnership in which the government subsidizes the operators to provide services to the final customer in pre-determined zones and under conditions established in the plan's new bidding document. The initiative was launched in 2010 and seeks to provide mobile broadband service for over 3 million inhabitants in 1,474 isolated rural towns once its three stages are finalized in 2012. The tender was awarded to the private operator Entel, and is considering a total investment of approximately \$110 million USD, of which \$65 million USD of which will be

¹¹ Plano Geral de Metas de Competicao, Consulta Pública N° 41 de ANATEL, available at <http://sistemas.anatel.gov.br/SACP/Contribuicoes/TextoConsulta.asp?CodProcesso=CI509&Tipo=I&Opcao=andamento>.

paid for by Entel and the rest in equal parts by the TDF and regional governments.

The plan is operating in over 1,000 towns, where Entel offers a mobile broadband Internet access service for \$14,220 (approximately \$30 USD) a month, at a maximum download speed of 1Mbps. The operator also offers a daily access plan for \$1,886 (approximately \$4 USD).

D. Colombia: Vive Digital (Live Digital) Plan

The Live Digital Plan is an initiative launched in 2010 designed to make the Internet widely available in Colombia. The plan establishes three main objectives to be achieved within five years: triple the number of municipalities connected to the national fiber optic network, connect 50% of micro, small and medium-sized companies and 50% of homes to the network and quadruple the country's number of Internet connections, which would rise from 2.2 million in 2010 to 8.8 million in 2014. As regards coverage, the plan is designed to take fiber optic to 62% of Colombia's 1,120 municipalities (which corresponds to 90% of the population), and ensure the presence of shared access centers in all towns with over 1,000 inhabitants (Vive Digital, 2010).

Among the plan's main initiatives is the National Fiber optic Project, to deploy backbone in municipalities not connected to high transmission capacity networks under a public-private partnership model. In July 2011, the Information and Communication Technology Department (responsible for carrying out the plan) published the National Fiber optic Project's tender documentation. In November 2011, the project was awarded to the Colombia Fiber Optic Temporary Union, consisting of the Total Play and TV Azteca companies owned by Mexico's Salinas group. The government pledged to provide \$415,000 million pesos (approximately \$237 million USD), an estimated third of the total investment required for the implementation of the network. According to the Ministry, the winning consortium was selected from four candidates as it offered the greatest coverage of municipalities (1,078).¹²

The tender documentation stipulates that the operator must design the configuration of the optical transport network and subsequently operate it and connect all the proposed municipalities, respecting freedom of access, transparency, non-discriminatory treatment, promotion of competence, efficiency and guarantees of users' rights. Once the municipalities' infrastructure is implemented, the company must operate and manage the network for 15 years under conditions determined by the tender documentation, which include considerations such as the free provision of

¹² See <http://www.mintic.gov.co/index.php/fibra-inicio/53-sitio-fibra-optica/sitio-fibra-noticias/542-20111104licitacionfibra>.

broadband Internet access for 2,000 public institutions located in the municipalities reached by the network. Beyond this period, the infrastructure comes under the ownership of the selected company and is regulated by the same conventional regime as all other private operators. Structural separation conditions are not established which enables the fiber network operator to offer access services to the end customer.

Among the other initiatives of Live Digital Plan are the creation of a legal and regulatory framework for the convergence, efficient use of infrastructure and stimulation of the software and digital content industries (by July 2011 withholding at source was reduced from 11% to 3.5% for Colombian software companies). As regards electronic government services, the program aims for 100% of national and 50% of territorial entities to offer online government services by 2014. Meanwhile, during the second semester of 2011 import duties were eliminated from terminals with Internet access such as computers, tablets and smart phones. The plan is also considering the design of ICT training programs for low-income population groups.

E. Mexico: Agenda Digital.mx (Digital Agenda.mx)

During President Calderón's administration (2006-2012), several actions were undertaken to encourage Internet deployment and use. However, this period was characterized by significant instability within the Secretariat of Communications and Transport (SCT). During the six-year term, there were three secretaries, four under-secretaries and three coordinators for the E-Mexico program. As a result, the initiatives to promote broadband were modified without being fully completed. Since the SCT's most recent management changes, two new programs have been announced. On the one hand, these include several of the actions undertaken before 2011 and on the other; they eliminate certain components of the State Networks initiative,¹³ designed by the former team. During the first trimester of 2012, national strategies for broadband development were introduced: "Actions to Reinforce Broadband and Information and Communication Technology" and "Digital Agenda.mx".

The former focuses on promoting the provision of telecommunications services, by encouraging private investment in infrastructure and public investment while the Digital Agenda centers on developing demand for services, by encouraging ICT adoption and use, in addition to developing the market for telecommunications-based content and applications. The general

¹³ State Networks for Education, Health and Government was a group of projects in which state governments participated with the aim of offering connectivity to schools, hospitals and government offices. The connectivity project was initially complemented by digital inclusion programs such as Digital Skills for All, which consisted of connecting and equipping school classrooms for children's learning process, and the Vasconcelos 2.0 program, which sought, by means of a mass training program, to enable adults to access and use the Internet. These two components have been eliminated and replaced by the National Campaign for Digital Inclusion.

vision contains four main objectives: promote infrastructure investment to provide broadband services throughout Mexico; reduce the cost of broadband services; increase digital literacy and encourage the acquisition of Internet services.

Among the initiatives adopted before 2011 are the launching of the fiber optic backbone of the Federal Electricity Commission's (CFE), a public organism and the country's main electricity provider. CFE's fiber network stretches over 34,000km and has 36 fiber optic cables, of which it only uses six (Mariscal & Flores-Roux, 2009). In 2010 the SCT invited tenders for a pair of dark fiber cables from the CFE's network in three routes that amount to 19,467 km for 20 years, during which the operator would undertake to carry out complementary investments to increase the network's coverage and capacity. A consortium composed of the Telefónica (Spain) and Televisa (Mexico) companies won the tender, offering approximately \$70 million USD and an investment commitment of an additional \$103 million USD to expand by 1,735 Km. The new operator will be able to provide interurban data transfer services under conditions of non-discrimination and with the obligation to allow third parties to use the fiber in the parts of the network not used by the consortium (SCT, 2012).

Though the tender of the network could have had a greater impact by providing the market with more dark fiber pairs, it is an interesting model for other countries of the region. The CTD plans to invite tenders for an additional pair of strands of dark fiber during the second semester of 2012, which will still constitute a limited effort given the availability of dark fiber.

Another initiative to develop infrastructure is the implementation of Fiber to the Node announced by the government. This initiative has resources from the National Infrastructure Fund (FONADIN), possibly non-repayable, with which private operators will be subsidized to deploy fiber optic in zones in which the total investment would not be profitable. Over 400 municipalities have been identified, where investment will begin (SCT, 2012). For this initiative, a public-private partnership scheme is being considered, in which the concessionaire will be obliged to allow infrastructure to be shared and will be subject to non-discriminatory access rules. Moreover, due to the characteristics of these projects, they will require tariff and asymmetric regulation.

On the other hand, the E-Mexico program, now called the Coordination of the Information and Knowledge Society (CIKS) has re-launched its digital literacy strategy with the National Campaign for the Digital Inclusion of Adults,¹⁴ designed for persons between the ages of 25 and 54 lacking the knowledge and skills to use ICT. The campaign has benefited from its

¹⁴ This campaign succeeded the Vasconcelos 2.0 program, and also focused on training mechanisms, withdrawing state governments' participation in the operating of the program and associating strategically with NAEI to use its facilities and provide services to its beneficiaries.

association with the National Adult Education Institute (NAEI), by means of which between 300 and 500 thousand persons a year have been trained over the past five years.

Among the initiatives soon to be implemented are those destined to use the State's passive infrastructure to deploy telecommunications networks. This implies the use of over 6,000 government buildings, employing rights of way over 49,000 km of federal roads, and 1,000 km of ducts installed on the most important stretches of road.

In order to promote access for low-income population groups, the government aims to increase the number of Community Digital Centers from the current 6,788 to 24,000 in late 2012. To this end, its main objective is to increase satellite capacity for the provision of connectivity services. Moreover, CSIC will launch a social network called Digital Club to develop technological skills and promote technological entrepreneurship projects for young people. Thirty-seven Digital Club centers will be installed in Mexican Youth Institute buildings and certain high schools.

F. Peru: Plan Nacional para el Desarrollo de la Banda Ancha en el Peru (National Plan for Broadband Development in Peru)

In March 2011, the Peruvian government created the Temporary Multisector Commission, composed of representatives of the public organizations linked to the telecommunications industry to create the "National Plan for Broadband Development in Peru" document.¹⁵ In this document, the Commission presents a group of goals, objectives and policy proposals for broadband development in the country. Four goals were initially established to be achieved within six years (by 2016). The first two state that 100% of municipalities, education centers and health establishments in urban zones, and the most important ones in rural zones, as well as police stations and other State institutions, must have broadband connections with a minimum speed of 2 Mbps. The third goal consists of achieving 4m broadband connections at the national level while the fourth involves achieving 500,000 broadband connections with speeds of over 4 Mbps.

In order to reach these goals, three general objectives have been defined, the first linked to the supply of infrastructure and services, the second to stimulating demand and digital inclusion, and the third to reinforcing and modernizing the institutional framework. The first objective addresses the deployment of infrastructure and the promotion of competence. It has therefore been suggested, among other things, that a fiber optic backbone and regulatory measures be created to encourage competition. In this regard,

¹⁵ The document is available at http://www.mtc.gob.pe/portal/proyecto_banda_ancha/Plan%20Banda%20Ancha%20vf.pdf.

there are proposals to use a public-private association that combines the State's investment effort with the private sector. Another proposal, in order to prevent the backbone from being contracted out to one operator, is to divide it between three networks. At the same time, it is hoped that the concessionaires of public telecommunications services will make the investments required for access networks, except in remote areas for which public-private partnerships are also recommended. In order to promote a competitive environment that prevents anticompetitive behavior from the backbone operator, the Commission recommends revising existing international schemes, such as that of the neutral wholesale market operator that does not participate in the retail market, the separation of accounts and the regulation of wholesale tariffs.

As regards the second objective of stimulating demand, recommendations include the elimination of the general tax on computer sales, the provision of connectivity in all public seats and organisms, the promotion of electronic government, the creation of digital content and the promotion of a plan to train the population in technological skills. Although the Commission's recommendations have not yet been formally adopted or promised funds, the document indicates the direction of the State's intervention in the sector.

III. Discussion

The various broadband plans in Latin America are not being implemented in an isolated fashion and instead, follow a broader pattern demonstrated at the international level. It is possible, however, to identify certain characteristics that distinguish the plans adopted in the region from those in more developed countries. First of all, the plans are based on different diagnoses: whereas in OECD countries, the main problem is the limited use of high speed access networks (particularly fiber-to-the-home). In countries in the region, the diagnosis emphasizes the scant use of an interurban fiber optic backbone. Therefore, whereas broadband plans in developed countries attempt to promote the use of high-speed access services (typically over 30Mbps), in Latin America, initiatives favor the correction of regional imbalances in the provision of first-generation broadband services, with far more modest access speed goals (usually around 1Mbps). In other words, whereas developed countries prioritize the improvement of service quality, plans in the region are guided by the geographical expansion of coverage and the increase in the number of accesses.

Secondly, unlike plans in developed countries, initiatives in Latin America focus almost entirely on increasing coverage and encouraging competition in the wholesale section (backbone) of the network, particularly in areas with limited or no presence of private operators. This reduces the problem of market distortions and the displacement of private investment that may be

caused by public investment in network infrastructure, since this investment focuses on areas not covered by fiber networks (as in the case of Colombia) or in areas where there is a single incumbent operator (characteristic of the plans in Argentina, Brazil and Mexico). In this respect, investment strategy in Latin America follows similar patterns to those established by the European Commission's "Broadband Guidelines."¹⁶ In general terms, these guidelines prohibit public investment in zones with two or more operators (black zones) and permit it in areas where there are no operators (white zones).¹⁷ This strategy contrasts with that of other countries such as Australia, New Zealand and Singapore, whose plans cover practically the entire population and propose a more extensive overhaul of the industry model.

Another characteristic element of broadband plans in the region is the link between public investment in backbone infrastructure with the provision of last mile services by the private sector. In particular, Argentina and Brazil's plans agree on the promotion of small and medium-sized local access operators through soft credits, technical training and interconnection facilities and local traffic exchange points. In these countries, the State operator's entry into the retail tranche is established as a "last resort" strategy, even though the criteria to permit this behavior are not established in the plans. It is worth noting that unlike certain initiatives in developed countries that foresee the creation of a backbone network operator controlled by the State (as in the case of Australia and New Zealand), conditions for the structural and functional separation of the operators created are not established in Argentina, Brazil or Colombia (AR-SAT, Telebras, and Unión Temporal Fibra Óptica Colombia). However, in the case of Mexico and Colombia, safeguards are established in the public procurement contracts that require non-discriminatory treatment in access by the new network operator.

In the cases of Argentina and Brazil, the regulatory scheme and the authority responsible for overseeing the behavior of the State operator are still at the discussion stage. In this respect, both the theoretical foundations and international experience suggest the need to guarantee regulatory treatment for State operators comparable to that given to the rest of the operators. Moreover, insofar as State operators provide services and develop infrastructures in unprofitable zones, State subsidies must be granted transparently, through mechanisms that optimize public investment. These safeguards are particularly important insofar as the plans do not establish long-term financing plans for the State operator (unlike the FSU schemes, which establish similar financing rules in both countries for the extension of services to non-profitable zones).

¹⁶ European Commission (2009).

¹⁷ Areas where there is a single operator (gray zones) are analyzed in relation to future expectations of the entry of new private operators.

At the same time, a comparison of estimated investments and sources of financing for national broadband plans yields interesting results. As Appendix 1 shows, State investment in the use of network infrastructure in the region varies between US\$ 2.6 per capita in the case of Chile and US\$ 21 in the case of Argentina. These differences can partly be explained by differences in the extension and capillarity of planned deployments. Taking as a parameter the most ambitious initiatives, such as those of Australia and New Zealand (Given, 2010), in which the level of public investment per capita totals US\$ 845 and US\$ 245 respectively, the level of investment of plans in the region is relatively low. The comparison, however, is irrelevant insofar as the plans in Australia and New Zealand envisage fiber to the home services with access speeds of up to 100Mbps, whereas, as discussed above, plans in the region set more modest goals.

Considering the objectives pursued, the geographical conditions and the architecture of the network, the comparison of broadband plans in Latin America is more appropriate in relation to the US and Canadian initiatives, in which public investment per capita in network totals US\$ 8 and US\$ 5 respectively (Qiang, 2010).¹⁸ This comparison reveals the significant scope of committed investment in Argentina (and to a lesser extent Brazil), particularly in view of the fact that the GDP per capita in the United States is nearly three times higher than that of Argentina and four times higher than that of Brazil. Chile is in the opposite situation, since with a similar GDP per capita to Argentina, it has a planned investment level that is ten times lower.

In general, a comparison of the national plans adopted by countries in the region reveals several similarities regarding the diagnosis of the situation, the motivations and objectives pursued. Differences arise, however, regarding the policy instruments chosen by governments, particularly in regard to the deployment of the national backbone network. The analysis reveals two main models: on the one hand, the model adopted by Argentina and Brazil, in which the deployment and operation of the backbone network is undertaken by a State-controlled firm and on the other, the public private partnership (PPP) model, adopted in the cases of Colombia, Mexico and Chile. Each of the models has various implications regarding the State's role in the sector.

One of the most important aspects refers to the level of financing commitment the State assumes in each model. In the State operator model adopted by Argentina and Brazil, the government assumes responsibility for the investment for the whole of the backbone deployed, while the private sector is responsible for the investment for the local tranche (in both cases, soft credits are envisaged for the sector to this end. There is therefore an implicit link between public and private investment, although these coordination mechanisms are not formalized in the plans adopted. Conversely,

¹⁸ In the case of the United States, only the projected expenditure of \$2.5 billion USD in the Broadband Initiatives Program (BIP), which corresponds to the deployment of network infrastructure, is considered.

the PPP model makes it possible to formalize coordination between public and private investment and therefore reduces the initial investment commitment assumed by the State as well as the future commitment to maintain and operate the network (in the case of Chile and Colombia, the State finances 45% and 38% of the network respectively). In other words, in the State operator model, the level of public investment is significantly higher, both because the government must assume the total amount of investment in the new infrastructure (CAPEX) and because of the need to cover the operating cost of the network in the long term (OPEX). However, one should consider that these cases involve investment in assets that remain in the hands of the State whereas in the PPP models in Chile and Colombia, the state subsidizes the deployment of the network which, after a set period, remains in the hands of the private operator.

The PPP model adopted in Chile is the one that best reflects the continuity regarding the paradigm of market reforms. In this model, a private operator provides services in unprofitable areas in exchange for a subsidy determined through a bidding process. Well-designed, this scheme makes it possible to optimize the use of public resources and minimize the displacement of private investment (Wallsten, 2009). In the case of Colombia, a bidding process was also used to determine the final amount of the state subsidy and a contract established for a 15-year period during which the State made predetermined contributions. In these cases, the enforcement mechanism seeks to promote “competition for the market” in zones with a low potential for private return. Conversely, in the case of Argentina, Brazil and to a certain extent Mexico, the strategy pursued is to promote “competition in the market,” through the creation of a new backbone operator to exert competitive pressure on incumbents and thereby reduce access prices.

The PPP scheme followed by Mexico has an important difference, since in this case, the State invites tenders for using an already existing yet under-used infrastructure (in this case, the fiber network is owned by the state electricity company CFE). Despite the deficiencies already mentioned in the tender design, this type of scheme usually permits the full use of State-owned assets in conjunction with the financing and management capacity of the private sector. Although the scheme depends on the availability of this type of infrastructure, there are usually many assets in the hands of the State that can leverage private investment in new network infrastructure (including dark fiber ducts and associated rights of way, pole antennas and towers for equipping the wireless network, etc.).¹⁹

In regard to the financing scheme, there is a striking lack of coordination between national broadband plans and existing schemes for subsidizing supplies such as FSUs. The only exception is Peru, where the project envisages

¹⁹ For a discussion, see UIT (2008).

the use of FITEL funds for expanding the network. Financing national broadband plans through non-specific funds, which are therefore subject to variations in the fiscal situation and macroeconomic cycles in general, poses a challenge in the medium term, particularly for Argentina and Brazil, where state operators must strike a delicate balance between financial sustainability and preserving their goal of serving the least profitable zones of the market.

How can these differences in policy instruments associated with the broadband initiatives adopted in the countries analyzed be explained? Although an exhaustive answer to this question is beyond the scope of this paper and requires a different type of analytical tools, the previous discussion of the factors that encourage governments to adopt broadband initiatives suggests various lines of analysis for future research. The starting point for these studies is the different impact of the factors discussed in Section II on the various countries in the region, which explains some of the variations in the policy tools adopted in the telecommunications sector.

In the case of Argentina and Brazil, the left turn in government's political orientation has had a clear impact on the sectoral policy tools adopted to deal with the investment deficit in the backbone, contributing to a strategy that provides the State with a permanent tool for orienting investment and prices in the telecommunications sector. At the same time, the positive effect of the commodities boom on the tax situation is crucial for both countries, particularly in the case of Argentina, whose government has managed to capture most of the revenue generated by the improvement of international cereal prices.²⁰ At the same time, the presence of a ruling coalition with a platform of greater State intervention in the economy, combined with a notable improvement in public accounts, encourages the adoption of broadband plans that involve a significant commitment of state resources (in both the short and medium term) and a return to the developmental tradition of greater State participation in sectors regarded as strategic.

Conversely, in the cases of Mexico and Colombia, where there has been no left turn in governments' political orientation, the direct fiscal impact of the increase in commodity prices on public accounts is less than in the case of Argentina and Brazil. Moreover, in both countries, growth is conditioned by greater exposure to the persistent economic crisis of developed countries (particularly in the United States, the main trading partner of both countries). Although there are government initiatives oriented towards expediting broadband deployment and adoption in both countries, these initiatives encourage the public-private partnership model, which limits the investment commitment assumed by the State and poses fewer challenges to the existing regulation scheme.

²⁰ To exemplify this point, it is worth noting that in Argentina, tax revenue from international trade and transactions as a percentage of GDP has risen from 1.92% in 2003 to 3.85% in 2010, whereas it remained relatively constant in the remaining countries in the region (Source: ECLAC).

In the cases of Peru and Chile, analysis of the broadband strategies adopted is as yet incipient, since these countries do not have ambitious infrastructure deployment initiatives at the national level. Although in both countries, the commodities boom (particularly in the mining sector) has contributed to strengthening public accounts, the broadband initiatives adopted by governments has remained within the focused subsidies scheme characteristic of the market reforms cycle of the previous decade. In the case of Peru, the recent victory of a center-left coalition in the 2011 general elections points to a possible change towards more proactive policies by the State in the sector. Conversely, in the case of Chile, the defeat of the center-left coalition in 2010, together with various institutional mechanisms that contribute to the continuity of the market reform scheme begun over two decades ago (Scartascini *et al.*, 2010) suggests the probable continuity of focused mechanisms to subsidize supplies under a PPP scheme.

Conclusions

During the past decade, Latin American countries have undergone significant changes in their view of the State's role in the telecommunications industry. At first sight, this change seems paradoxical in view of the evidence regarding the success of the market reform process in the sector, which has enabled the majority of the population to gain access to telephony services previously reserved for a small minority of urban residents. The rapid technological changes in the sector, particularly the growing importance of broadband Internet services in the economic and social sphere partly explain this paradox. Although private investment has produced exponential growth in the levels of access to basic telephony services, the diagnosis of the main countries in the region points to an insufficient development of the fiber backbone as well as the capacity for absorption of the new services associated with Internet by households, firms and the government itself. At the same time, the successful experience of proactive public policies of certain leading countries in the adoption of broadband services (particularly in South Korea) has captured the attention of countries in the region. The return of State does not necessarily mean the failure of market liberalization policies but rather the necessity to address new investment in the deployment of broadband before the evidence of its increased importance for development.

In this paper, we suggest that the national broadband plans adopted in the region in recent years are associated with various factors that encourage governments to deviate from the path of market reform policies adopted since the early 1990s. This change, however, does not constitute a generalized return to the state operating model in force during the period prior to these reforms. As we have seen, the main mandate of the new state operators created within the framework of national broadband plans is to operate in the wholesale access market in zones where private investment has been insufficient or nonexistent, and envisages coordination with private last mile operators under conditions of non-discrimination. The rest of the countries have adopted various PPP schemes that guarantee complementarity between public financing and the private operation of the new network (Falch & Henten, 2010). In short, there are no rigid dichotomies between state operator and competition between private actors but rather different policies that seek complementarities to promote the development of the sector.

Consequently, rather than a movement of the pendulum—as we described it in the introduction—the new role of the State represents a new mixed model in which the government and the private sector develop a collaborative relationship in regard to the deployment of a general-purpose technology (broadband Internet access) with high economic and social externalities. The

specific circumstances currently found in the telecommunications sector therefore encourage the State and private stakeholders to seek a cooperative relationship in order to maximize the contribution of the sector to the objectives of economic development and the social improvement of the region.

It is still too early to identify the potential impact of the new role of the State in the telecommunications sector. It is, however, possible to frame certain key questions for the immediate future. Firstly, as we have pointed out, the state operation of telecommunications firms necessarily refers to the multiple problems faced by former state telephony monopolies. The efficient, transparent operation of these firms is a central challenge of national broadband plans. In this respect, the emulation of successful state intervention instruments in other countries must be considered within the institutional context of countries in the region. Governments must carefully evaluate the capacity for state management of a complex infrastructure network within a context of rapid change in technology and patterns of demand. It is also essential to acknowledge the cyclical nature of the international economic context, which now enables governments to afford large investments in network infrastructure with relative ease yet in the medium term, will require sustainable financing models for the new network.

Secondly, the complementarity between the public and private sector will be useful insofar as the mechanisms for safeguarding competition and the promotion of private investment are not weakened. In this paper, we indicate the numerous challenges raised by establishing a level playing field for state operators or those that receive State subsidies. This is a long-standing debate in certain countries in which the State has maintained a significant share of the incumbent operator, which most of the countries in the region are only just beginning to confront.²¹ It is therefore important to transfer these experiences in order to adapt the regulatory framework to the new mixed management environment of the telecommunications industry.

Lastly, if we return to the question of the role of the State in the sector, its participation is unquestionable when it is intended to take the network infrastructure to zones not covered by the private sector. The need for this participation is less obvious when it involves zones served by a single operator, typically the historic incumbent. Is the duplication of parts of the network with public financing the most efficient tool for ensuring competitive access prices? There are obviously other tools such as access price regulation and the disaggregation of the components of non-replicable assets to which countries in the region should not resign themselves. This requires continuing the challenge of boosting the technical capacities of industry regulators and

²¹ The exception are the few countries in which the historic operator has not been privatized such as Uruguay, Paraguay and Costa Rica.

strengthening the institutions that will enable these regulators to implement appropriate rules for the new context of the sector.

Appendix

TABLE 1 MAIN FEATURES OF BROADBAND PLANS IN SELECTED COUNTRIES

	ARGENTINA	BRAZIL	CHILE	COLOMBIA	MEXICO	PERU
Population	40.738.000	195.498.000	17.133.000	46.299.000	110.675.000	29.495.000
Size in Sq. Km.	2.780.400	8.514.877	756.102	2.070.408	1.972.550	1.285.216
Name of Initiative	<i>Argentina Connected Plan</i>	<i>National Broadband Plan (PNBL)</i>	<i>Connecting All Chile Plan</i>	<i>Live Digital Plan</i>	<i>Actions for Reinforcing Broadband and Information and Communication Actions. Agenda Digital.mx</i>	<i>National Plan for Broadband Development in Peru (2011).</i>
Target population	100% of the population with broadband access.	68% of the population with broadband access by 2014; 15% of the rural population connected by 2014; triple broadband connections; add 60 million subscribers to mobile broadband.	90% of the rural or isolated population (3 million inhabitants).	100% of the population with access to some form of connectivity. 50% of households covered. Multiply number of connections by 4.	Not defined	100% of the population with broadband access. 4 million connections with at least 2 MMBps speed, half a million connections with a speed of over 4 Mbps.

	ARGENTINA	BRAZIL	CHILE	COLOMBIA	MEXICO	PERU
Geographical target	100% of localities (9,400 localities).	100% of municipalities.	1474 rural localities.	64% of municipalities covered by fiber (700 out of a total of 1,122 municipalities). 36% of municipalities covered by satellite, wireless or microwave.	Not defined	100% of municipalities.
Institutional goals	100% of public schools and public administration offices connected.	100% of schools, health centers, libraries and local governments connected; Small and medium businesses considered but not specified.	2,133 schools, 1,108 kindergartens, 534 health centers.	100% of health centers and public schools connected; 50% of small and medium businesses connected.	100% of schools, public libraries, health centers and offices at the three levels of government	100% of public organizations connected in urban zones together with the largest organizations in rural zones.
Price and/or quality objectives	10Mbps.	1Mbps at US\$ 18 per month.	1Mbps.	1Mbps.	Not defined	Connection goals with 2 and 4 Mbps speed.
Tax incentives	As yet unspecified incentives for local Internet providers to ensure last mile	Obligations for the Universal Service Fund are not imposed on small/medium Internet	Not provided for	Not provided for	Not provided for	Elimination of general tax on sales in lower-priced computers.

	ARGENTINA	BRAZIL	CHILE	COLOMBIA	MEXICO	PERU
	connectivity.	providers; elimination of local taxes for equipment and broadband services; reduction of license tariffs.				
Regulatory incentives		Every infrastructure project must reserve ducts for fiber; shared infrastructures established; universal service obligations reviewed for the purpose of including broadband; the interconnection regime reviewed for conflict resolution; guidelines established for operators with Significant Market Power.	Not provided for	Not provided for	Shared infrastructure and non-discrimination rules in access. Tariff regulation and asymmetrical regulation. Permit telecommunication service provision in radio broadcasting bands and all other technically feasible services; clearly define the compensation to be paid to the State. Simplification and harmonization of the regulations	Shared infrastructures proposed.

	ARGENTINA	BRAZIL	CHILE	COLOMBIA	MEXICO	PERU
					and administrative processes of the SCT and COFETEL.	
Loans for private sector		Loans for purchasing equipment with local components with FUNTTEL funds.	Not provided for	Not provided for	Not provided for	Not provided for
Public investment	\$ 1.8 billion USD	\$ 3.25 billion USD (\$ 1.8 billion USD in the network and \$ 1.45 billion USD in other initiatives).	\$ 45 million USD.	\$ 2.25 billion USD	Subsidies for private operators for fiber deployment in non-profitable zones with FONADIN resources.	Resources available from FITEL for approximately \$400 million USD.
Public investment per capita	\$ 44.2 USD	\$ 16.6 USD	\$ 2.6 USD	\$ 48.6 USD	Not defined	
Origin of public funds	National Government.	Federal Government	50% regional government, 50% FDT.	Central Government.	Not defined	Plans are underway to boost Fitel with new taxes on the Telecommunications sector.
Public investment in	\$ 840 million USD	\$ 1.8 billion USD	\$ 45 million USD (Entel contributes	\$230 million USD (Unión Temporal Fibra	National Government.	

	ARGENTINA	BRAZIL	CHILE	COLOMBIA	MEXICO	PERU
network			approximately \$ 55 million USD).	Óptica Colombia contributes approximately \$370 million USD).		
Public investment in network per capita	\$ 21 USD	\$ 9.2 USD	\$ 2.6 USD	\$ 5 USD	As yet undefined	As yet undefined
Network characteristics	Formation of a 50,000 km broadband backbone infrastructure. The existing Transener fiber network (9,000 km) will be established and fiber will be exchanged with incumbent firms (14,000 km). 25,000 km of new fiber will be built. The backbone will cover 97% of the population. The remaining 3% of the rural	Formation of a backbone that will take advantage of existing Petrobras and Electrobras fiber (35,000 km). Installation of regional IXPs. Local Internet providers purchase Telebras capacity and provide access under minimum quality and maximum price guidelines.	12 optical nodes and 3G mobile broadband for the last mile.	Fiber optic backbone (17,000 km). Municipalities not covered by this network will be connected by satellite or wireless.	Use of fiber optic backbone of the CFE, a public organization and the main electrical operator in the country which has 34,000 km. Use of 1,000 km of ducts installed on roads plus the possible construction of ducts on 49,193 km of roads.	The backbone will be divided into three operators for three regions (north, center and south) to ensure that the whole backbone is not left in the hands of a single operator. Use of existing fiber networks.

	ARGENTINA	BRAZIL	CHILE	COLOMBIA	MEXICO	PERU
	population will be provided with satellite technology.					
Network ownership and management	The backbone will be operated at the wholesale level by ARSAT, a publicly owned telecommunications operator. The State also has a minority hold in Transener. Internet providers will have to provide last mile connectivity under as yet undetermined conditions.	The backbone will be operated at the wholesale level by Telebras, a publicly owned telecommunications operator. Internet providers will have to provide last mile connectivity under as yet undetermined conditions.	Ownership and provision of final service by Entel consortium.	The backbone will be operated at the wholesale level by Unión Temporal Fibra Óptica Colombia. There are not separation conditions imposed on the firm and the operator is allowed to provide retail services.	Infrastructure operated and extended by private operators. Installation and maintenance of ducts and fiber optic on roads by rights of way concessionaires.	Public-private partnership for new backbone deployments.
Complementary initiatives						
Digital training	Training provided at 250 Shared Access Nuclei (SAN).	Not defined	Not provided for	800 new training centers (Technocenters). Training for users, teachers and micro	Digital literacy campaigns focusing on indigenous people, working women and	Digital training law as state policy.

	ARGENTINA	BRAZIL	CHILE	COLOMBIA	MEXICO	PERU
				entrepreneurs; 81% of teachers will receive digital skill training.	senior citizens. ICT education in the National Education System.	
Equipment for schools	Connect Equality Plan: 3 million portable computers for state school students.	Not defined	Not provided for	"Computers to educate": program to re-use computers for public schools. "Government on-line" Program.	Equip schools with Internet access devices for pupils' use. Provide equipment to connect to the National Education and Research Network.	
Contents and applications	A National Contents Network is planned to house a national data center.	Not defined	Not provided for	E-governance, human resource development; support for e-working and applications developers.	Development of digital educational contents, telemedication and electronic government applications. Promotion of cloud computing, e-commerce and e-banking.	Promotion of software industry from CONCYTEC. International cooperation for public sector applications and promotion of e-government.
Public access centers	Installation of 250 Nuclei of Access to	100,000 new telecenters.		Construction of 800 technocenters.	Increase Community Digital Centers from 6,788 to	

	ARGENTINA	BRAZIL	CHILE	COLOMBIA	MEXICO	PERU
	Knowledge.				24,000.	
Agenda	2011-2015	2010-2014	2010-2012	2010-2014	2012-2015	2012-2016
Advances to date	Tenders have been awarded for the construction of 10,000 km of backbone. Fiber exchange agreements have been signed with incumbent firms. Provincial networks under construction. Tenders awarded to the National Data Center. Undersea cable to connect Tierra del Fuego under construction.		First stage (09/10): 451 localities; Second stage (08/11): 587 localities. Entel already provides service ("BAM Chile Comunicado 1Mbps": monthly cost \$ 28 USD (\$14.220), 1Mbps downlink and 512 Kbps upstream).	Over 300 municipalities already connected.	Development of "Fiber to the Node" infrastructure investment plan, which seeks to install fiber optic networks in 412 municipalities (with a total population of 36 million) identified with gray and white zones.	The Commission created by the government has drawn up the Plan with suggestions on measures to be carried out. The tender for the network has been issued.

Source: Plan Argentina Conectada (2011), Plan Nacional para el Desarrollo de la Banda Ancha en el Perú (2011), Vive Digital (2011), PNBL (2010), Proyecto Todo Chile Conectado (2010), SCT (2012).

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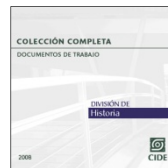
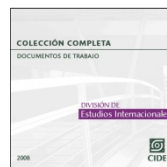
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