



EXECUTIVE SUMMARY

New approaches to telecom infrastructure management in Latin America

Report commissioned by
American Tower Corporation

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NEW APPROACHES TO TELECOM INFRASTRUCTURE MANAGEMENT IN LATIN AMERICA



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SmC+ is a public affairs and technology strategy firm focused on the digital landscape in Latin America. Their goal is to enable global companies and organizations to understand and take action in the complex policy scenario in the region in relation to issues such as 4.0 technologies, innovation, platforms, digital infrastructure, online learning, cybersecurity, environmental impact, and digital transformation policies.

#SURFTHELATAMDIGITALPOLICYSCENE

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This report, prepared between July and September 2021, has been commissioned by American Tower Corporation.



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Executive summary

The COVID-19 pandemic has had a strong economic and social impact in Latin America, highlighting the technological development gaps and the lack of digital infrastructure in the region.

Less than half of the population in Latin America and the Caribbean has fixed broadband connectivity, which is essential for accessing digital media, both to study and to work. The urban-rural gap and the lack of infrastructure development, mainly in remote areas, aggravated the impact of the pandemic. In this scenario, digital infrastructure has played a key role in the region's economic and social recovery and has helped to maintain daily activities using digital tools and services to meet new demands, such as online learning and remote working among others. To a large extent, conventional activities have had to be adapted using tools that require connectivity.

When compared to the global average, Internet access in Latin America is lagging.

In addition, a key aggravating issue of the digital divide in the region is the significant gap between urban and rural populations.¹ The percentage of households with Internet access in Latin America is 33% in rural areas and 65% in urban

areas. This 32-percentage-points gap is higher than in other regions, such as in Europe where it is of 7pp. Besides, 6% of Latin Americans, which accounts for 40 million people, live in areas without Internet access, while 39% (240 million people) have coverage but do not use the service².

Over the last decade, network traffic has continually increased and is expected to keep growing exponentially.

The widespread adoption of mobile data services, driven mainly by smartphones, online gaming and high-definition streaming services, has dramatically increased network traffic. The COVID-19 pandemic fueled this trend by introducing changes to residential internet usage. However, the rise of new technologies will multiply the need of connections to support, such as Internet of Things (IoT) services (for example, connected cars), which will require low latency and high reliability services. Likewise, according to estimates by Ericsson³, with the early irruption of 5G, data traffic will continue to grow steadily in Latin America and, for example, a mobile device will go from consuming 6.9 Gb per month in 2020 to 30 Gb in 2026 (a 31% compound annual growth rate).

1. ITU (2021)

2. GSMA (2020)

3. Ericsson Mobility Report June 2021.

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There is a need for infrastructure investments to bridge the regional gap and meet the UN's Sustainable Development Goals (SDGs).

In this regional scenario, which combines the connectivity gap with the expected increase in service demand, there is a significant need for investment in the region. Several regional studies estimate investments in infrastructure will range from 47 billion to 160 billion dollars until 2030. Besides, higher investments in telecommunications has direct and quantifiable impacts on poverty reduction, life expectancy, hunger ending, inequalities reduction and even on cutting down carbon emissions⁴.

Network and infrastructure management models at a regional level have been changing in recent years, in line with the international trend.

Since 2019, infrastructure companies have owned more than 50% of sites in the region and traditional network operators have been trading these assets to enable a separate, specialized and more vertically disintegrated management. This strategic change stems from the need to lower deployment and asset management costs, which are not core for providing connectivity services for end users. By the end of 2020, there were over 195,000 communications sites in Latin America, 57% of which belonged to independent infrastructure companies. 5G deployment sets the region on a path towards network virtualization and cloudification, where new players will jump into the infrastructure value chain and where sharing, both passive and active infrastructure, will become fundamental.

However, infrastructure development poses other types of barriers, most notably, administrative barriers.

Today, local authorities or municipalities have constitutional autonomy to grant permits for installing antennas and rights-of-way for fiber laying. This could interfere with the provision of telecommunication and Internet services, which fall under national supervision. In most countries in the region local regulations have prevailed over national or federal regulations, making them very restrictive, non-transparent, bureaucratic and even irrational when it comes to obtaining municipal permits.

Maximizing infrastructure sharing offers several economic and environmental benefits. Infrastructure sharing presents financial and sustainability advantages, enabling the significant deployments that will be required for making 5G possible. Some of these advantages include:

- **More efficient markets.** Infrastructure can be delivered at lower costs, reducing unnecessary duplication of infrastructure.
- **Release of capital for mobile operators.** Tower sales to independent passive infrastructure companies, and no self-deployments, free up capital to invest in existing networks and new services and/or to pay off financial debt
- **Investing to enhance capacity and coverage.** A cost-effective and time-saving implementation in rural areas helps to reduce the digital divide.
- **Market entry simplification.** Operators of other technologies, such as IoT or fixed wireless service, have more options for their infrastructure, which reduces entrance barriers, and can benefit from a neutral host.
- **Positive environmental impact** by reducing the carbon footprint through savings in materials, energy and network emissions using existing infrastructure for new deployments and increasing the infrastructure sharing rate.
- **Public benefits.** Infrastructure sharing can reduce visual pollution and unneeded public spending on infrastructure by avoiding unnecessary duplication of networks and multiple civil works.

4. BID, GSMA, FRONTIER (2018)



New network management strategies using infrastructure companies significantly improve the quality of the connectivity and industry development.

According to data by IFC (2021), markets with a more developed infrastructure sector show a positive correlation with other connectivity-related factors, such as coverage, speed, price, access and even market concentration. Reducing the capital tied up in fixed asset investments by converting them into operating costs (transforming CapEx to OpEx) allows companies to release funds to focus on the main differentiating goal of their business, i.e., to improve the range and quality of their services.

Installing a large number of small cells is one of the main challenges ahead.

In the future, deployment costs will be strongly impacted by these cells, as they demand a radical change in the acquisition model for new sites and create the need for agreements with utility companies that have existing lines. As these cells operate at a radio frequency spectrum higher than 6 GHz, with much lower coverage per cell, coordination between telecommunications and Internet companies, dedicated infrastructure companies, owners of street furniture, ducts and public spaces (both national and local) will be key for achieving higher levels of sharing.

The increasing market share of infrastructure companies, and the subsequent increase in infrastructure sharing, improves the use of public space, reduces administrative costs and improves their environmental impact. From today standards, infrastructure sharing is likely to increase by up to 16 percentage points by 2030.

Sharing rates of new sites are expected to rise in the next few years, driven, on the one hand by the growing market share of infrastructure companies (naturally more prone to sharing than mobile network operators), which is expected to reach over 67% for total sites, and, on the other hand, by a higher level of network sharing as public spaces become more easily

available and agreements are made with other sectors, such as utilities. If the market share of infrastructure companies were to grow by 10 percentage points by 2030, the overall level of site sharing growth would likely surpass that, at 16 percentage points.

By 2030, more than 550,000 sites are expected to be deployed throughout Latin America.

5G deployment, based on small cells and macro cells in sites with coexisting base station technologies (such as 2G and 3G legacy systems and 4G and 5G stations), demands 4x more sites than the current installed base. The pace of deployment will vary from country to country; 5G spectrum licensing will be the basis for new cell and site deployment on a massive scale⁵. As such, the expected number of sites for each market and likely site growth compared to the 2021 basis is as follows: Argentina: 55,000 (x3.1); Brazil: 240,000 (x3.7); Chile: 24,000 (x2.6); Colombia: 56,000 (x3.2); Mexico: 141,000 (x4.0); Peru: 59,000 (x3.9); Others: 198,000 (x5.5).

The investment, only considering passive infrastructure development by 2030, is expected to reach 17 billion dollars.

This accounts for 3% of Latin American operators' annual revenues, so it would not be a significant figure if they are allocated to more efficient infrastructure models that can meet the demand for passive infrastructure in the face of 5G adoption and IoT growth. It is worth noting that these estimates only consider investments related to passive infrastructure deployments, i.e. excluding active infrastructure, spectrum and operating costs, among others. It is also worth highlighting that 62% of this investment will likely be made by passive infrastructure companies, while mobile operators are expected to invest only 38%. The investment share of passive infrastructure companies will evolve along with their market share, starting under 60% in the first few years and reaching 67% in 2030. With higher investments, the level of infrastructure sharing and market benefits would consequently increase.

5. Different spectrum licensing dates were considered for each country based on public news and market expectations available within the working process for this report. These will also vary depending on the conditions and capacity of existing sites; the momentum of deployment efforts considering environmental, administrative and economic factors; demand evolution for each use case; population density in bigger cities and percentage of urban population, among other factors.

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Collaboration and coordination among authorities will be essential to stimulate this growing industry that needs predictability in local government's approval processes for sites installation.

Public policy will have a key role in addressing the challenges to support these new deployments. These challenges require unique coordination efforts among the different levels of government to produce public policies, such as regulations and incentives. Local governments have the opportunity to play a key role in digital transformation, serving the needs of citizens by improving connectivity services, security or street lighting. Becoming a smart city requires intelligent use of city resources (buildings, parks, roads, etc.) and those of utility concessionaires (ducts, poles and masts). These assets ultimately belong to the citizens, who increasingly demand more advanced and better quality connectivity to carry out their activities. Failure to use those assets efficiently represents a lost opportunity cost that developing countries cannot afford.

Intersectoral roundtables and more empowered government regulators for effort coordination.

Some of the recommendations made have already been attempted in the past with mixed results; unsuccessful efforts were generally related to failures in implementation or failures to empower a regulatory entity to carry them through, such as in the case of one-stop shops. Until now, all efforts to engage other sectors have faced challenges and barriers: engaging health authorities⁶, for example, could help debunk myths regarding the effects of non-ionizing radiation to the body. At the same time, there is a need for real empowerment of those who drive the agenda at the national level in order to "discipline" the other national vertical and subnational stakeholders. Consequently, in order to achieve agreed-upon and more favorable results, it is essential for national authorities to set up an intersectoral roundtable, where various stakeholders are invited to participate and contribute with measures to support infrastructure deployments, as both local and national development depends on it.

6. According to Russell E. (2020), awareness campaigns organized by mobile operators and industry organizations have had a positive impact, but fail to build trust in the general population, as they are perceived as major stakeholders—they are ultimately seen as for-profit entities acting on behalf of their business interests, irrespective of the truth and accuracy behind the technical content of their campaigns. Thus, government-led campaigns (organized by regulatory agencies or healthcare authorities) are more effective, as they seem to be focused on the greater good.

The COVID-19 pandemic has had a strong economic and social impact in Latin America, highlighting the technological development gaps and the lack of digital infrastructure in the region.

PERCENTAGE OF HOUSEHOLDS WITH INTERNET ACCESS IN LATIN AMERICA


33%
IN RURAL AREAS

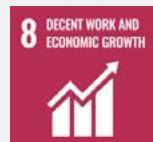

65%
IN URBAN AREAS

According to ILO estimates


23M
PEOPLE IN THE REGION WORKED FROM HOME


32M
CHILDREN DID NOT HAVE ACCESS TO ONLINE LEARNING

Several studies show the need for infrastructure investments to bridge the gap and meet the UN's Sustainable Development Goals (SDGs).



Network and infrastructure management models at a regional level have been changing in recent years.

INFRASTRUCTURE COMPANIES OWN

+50%
SITES IN THE REGION



SINCE 2019

New network management strategies using infrastructure companies significantly improve the quality of the connectivity and industry development. (IFC, 2021)


4G
65%
75%
4G COVERAGE/POP

Without infrastructure companies (market share <50%)
With infrastructure companies (market share >50%)


3,1
5,3
MOBILE INTERNET SPEED (MBPS)


4302
3722
MOBILE MARKET CONCENTRATION (HHI)


9%
8%
MOBILE INTERNET PRICE (GNI % PER CAPITA)


36%
39%
MOBILE INTERNET PENETRATION (% POP.)

Higher network densification, with a larger number of small cells, is one of the main challenges ahead.

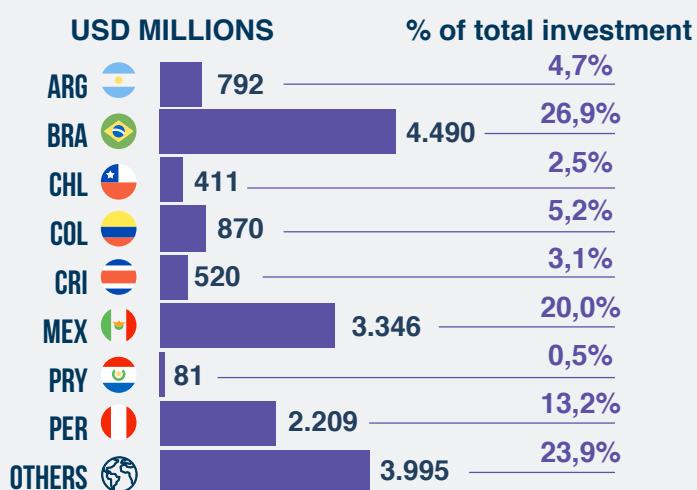
LOCAL BARRIERS FOR INFRASTRUCTURE DEPLOYMENT



Measures to encourage telco infrastructure deployments

- + Infrastructure regulations
- + One-stop shop
- + Positive administrative silence
- + Use of government-owned lands and buildings
- + Best practice codes/guidelines
- + Ranking (cities)

The investment, only considering passive infrastructure deployments by 2030, is expected to reach 17 billion dollars.



BY ALLOCATING THE EQUIVALENT TO 3% OF THEIR ANNUAL INCOME TO MORE EFFICIENT INFRASTRUCTURE MODELS, OPERATORS COULD MEET PASSIVE INFRASTRUCTURE DEMAND UNTIL 2030.

By 2030, infrastructure companies will hold over 67% of regional sites, accounting for an increase of 16 percentage points in infrastructure sharing.

Market share of passive infrastructure companies

+10PP

57% 67%
2021 2030

Sites with infrastructure sharing

+16PP

34% 50%
2021 2030

By 2030, more than 550,000 sites are expected to be deployed throughout Latin America

ARG		55,000 (X3,1)	COL		56,000 (X3,2)
BRA		240,000 (X3,7)	MEX		141,000 (X4,0)
CHL		24,000 (X2,6)	PER		59,000 (X3,9)
OTHERS		198,000 (X5,5)			

Cooperation and coordination between authority tiers will be key to boost industry development. Main focus points:

- | REGULATIONS | National-municipal coordination |
|----------------------|--|
| | One-stop shop |
| | Positive administrative silence |
| | Active, passive and carrier neutral infrastructure sharing |
| | Expedited process for smaller infrastructure |
| INCENTIVES/ ADVOCACY | Use of existing infrastructure |
| | Ranking of Internet-friendly cities |
| | Citizen perception |
| | Tax incentives |



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