



The Mobile Economy
Latin America
and the
Caribbean
2018



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Executive Summary



Mobile adoption to reach three quarters of population by 2025

By mid-2018, there were 442 million unique mobile subscribers across Latin America and the Caribbean, accounting for 68% of the population. The region is characterised by varying levels of mobile subscriber penetration. A number of countries (such as Chile, Uruguay and Argentina) are approaching saturation of the total addressable market, while others (including Honduras, Guatemala and Nicaragua) still exhibit relatively low levels of penetration.

Despite slowing mobile subscriber growth in recent years, Latin America and the Caribbean still has substantial room for growth. The region will account for 10% of all new subscribers globally out to 2025. Material increases in subscriber numbers will be delivered by major markets including Brazil, Mexico and Colombia, which have penetration levels close to the regional average. By 2025, around three quarters of the region's population will subscribe to mobile services, closing the gap on the average for developed markets (87%).



Smartphone and 4G adoption scaling; 5G to arrive in mid-2020s

Smartphone adoption is consistently strong across the region and continues to see rapid growth despite affordability challenges. The total number of smartphone connections reached 417 million at the end of 2017, representing 62% of total connections. This will reach 78% by 2025. A combination of improved network coverage and growing smartphone adoption and data usage means consumers are now rapidly migrating to 4G services, ushering in a new era of digital connectivity in many of the region's markets.

Adoption of 4G reached 35% of total connections in mid-2018 and is set to overtake 3G as the dominant technology by the end of the year. It will reach 64% of the total base

by the end of 2025. With 4G investments still underway and with consumer adoption of the technology in its infancy, 5G is viewed as a technology for the medium to long term in the region.

The majority of 5G launches in Latin America and the Caribbean are not expected until the middle of the next decade, after Release 16 and significant improvement in the economies of scale of devices and infrastructure. GSMA Intelligence expects 5G adoption to scale once coverage reaches critical mass in key markets, with 5G connections forecast to exceed 62 million by 2025, equivalent to 8% of total connections in the region.



Revenues stabilise as operators continue to invest in 4G coverage and capacity expansion

Though the macro-economic performance in the region is slowly improving, sizeable challenges remain and the economic prospects of the region's major markets are increasingly diverging. For mobile operators, the recovery in mobile revenue growth will continue to benefit from an improving subscriber mix, as customers upgrade to 4G. The challenge will be sustaining that growth over the medium term, given that competition will eventually erode the price premium that drives initial adoption. In this respect, operators across the region are offering more innovative mobile plans and packages that

are tailored to evolving ways of consuming data and consumers' spending limits.

Having invested a total of \$77 billion over the last five years, mobile operators' capex levels will remain high through to 2020, driven by LTE network rollout and upgrades. Aggregate capex will total \$47 billion between 2018 and 2020, with broadly stable capex margins, after which a gradual increase is likely as operators continue to invest in mobile broadband capacity (to accommodate rapidly rising mobile video data usage) as well as the initial phases of 5G deployments.



Mobile ecosystem is a major contributor to the regional economy

In 2017, mobile technologies and services generated 5% of GDP in Latin America, a contribution that amounted to \$280 billion of economic value added. By 2022, the mobile economy in the region will generate around \$330 billion of economic value added (or 5.2% of Latin America's GDP), as countries continue to benefit from the improvements in productivity and efficiency brought about by increased take-up of mobile services.

The mobile ecosystem supported around 1.6 million jobs in 2017. This includes workers directly employed in the ecosystem and jobs indirectly supported by the economic activity generated by the sector. Additionally, the mobile sector makes a substantial contribution to the funding of the public sector, with approximately \$36 billion raised in 2017, taking into account general taxation as well as the sector-specific levies on the consumption of mobile services that exist in the region.



Mobile driving innovation across the region

The mobile ecosystem in Latin America continues to thrive and is experiencing rapid innovation, driven by growth in new technologies, services and use cases. Mobile operators across the region are contributing significantly to the Internet of Things (IoT) market, implementing the necessary infrastructure to take advantage of it. Overall, the number of IoT connections in the region is set to triple between the end of 2017 and 2025, reaching 1.3 billion. Many operators, such as those in Mexico, are moving beyond connectivity to become end-to-end service providers of IoT, in an attempt to exploit new revenue streams.

The widespread availability and increasing adoption of mobile services in Latin America has also spurred a paradigm shift in the creation, distribution and consumption of content in the region. Facing increasing competition from global OTT service providers, major operators and pay-TV providers in Latin America have ramped up investment in their distribution capabilities, on-demand services, as well as various content forms, including original series in Spanish and Portuguese. While the appetite for original and exclusive content continues to grow, the race for original content is not viable for every player in the longer term. Content licensing and aggregation will therefore continue to be the most common model for major providers of content in the region.



Mobile helping bridge the digital divide, promoting employment and improving health and education

Mobile connectivity is a key enabler of digital inclusion and economic & social development in Latin America. It is the primary way to access the internet and therefore generates substantial benefits in areas such as financial services, health, education and entrepreneurship. However, despite the significant progress to date, half of the region's population remain offline, and by 2025 nearly 242 million people in Latin

America will remain digitally excluded, unable to benefit from the social and economic opportunities of the internet. The mobile ecosystem, in tandem with governments and other stakeholders, must address the barriers to mobile internet adoption, including affordability and infrastructure challenges, to help accelerate digital inclusion and reap the associated socioeconomic benefits.



Resetting policy to promote investment and development through intelligent connectivity

Growing digitisation has radically changed the way we communicate. The emergence of new products and services, and rapidly growing mobile data traffic, provides the opportunity to transition to the fourth industrial revolution (or Industry 4.0). To achieve this, it is essential that public policies are aimed at fostering the development of digital infrastructure. This means promoting investment and innovation, and a regulatory context that ensures the digital economy can maximise benefits for citizens, with digitised sectors, new verticals and opportunities in the value chain.

With changes in electoral cycles, governments across the region have an opportunity to reset outdated policy towards a future-proof regulatory framework that enables digital inclusion. Focus areas for regulatory modernisation include the following:

- It is important to have flexible policy frameworks designed to provide certainty and predictability, ensuring that companies continue investing in networks and that users can access the benefits of high-quality connectivity.
- Taxation policy must be consistent with the goal of connecting the unconnected. Mobile networks are the primary facilitator of internet access in the region and should not be subject to tax burdens and fees that are barriers to affordability and access.
- With the fourth industrial revolution, the arrival of 5G and the expansion of IoT, it is even more important to have spectrum available in high, mid and low bands to meet the demand not only from users, but also from things. This requires ultra-fast and ultra-reliable connectivity, with almost no latency.
- Connectivity is supported by digital infrastructure, which is increasingly important when thinking ahead to the next generation of mobile technology. Removing barriers to infrastructure deployment is essential.

Mobile Economy Latin America and the Caribbean

Unique mobile subscribers

2017

436m

67% PENETRATION RATE (% of population) 74%

517m

2025

CAGR 2017-25

2.0%



SIM connections

Excluding licensed cellular IoT

674m

2017

775m

2025

104% PENETRATION RATE (% of population) 111%

CAGR 2017-25

2.0%



Mobile broadband connections

477m

2017

% of total connections

71%

733m

2025

% of total connections

94%



Smartphone adoption

62%

2017

78%

2025



Revenues and operator investments

Mobile operator revenues

\$74.2bn

2017

2025

\$82.6bn



Operator capex of

\$47bn

for the period 2018-2020

Mobile contributing to economic and social development across the region

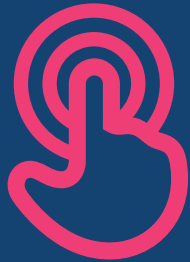
Digital inclusion

Mobile internet penetration

49.8%

2017 ————— 2025

65.1%



Innovation

Total IoT connections

444m 2017

1.3bn

2025

Cellular M2M connections

2017

31m 49m



Mobile industry contribution to GDP

\$280bn 2017

\$330bn

2022

5.0%

of GDP

5.2%

Public funding

Mobile ecosystem contribution to public funding (before regulatory and spectrum fees)

\$36bn

2017



Employment

1.6m Jobs

supported by the mobile ecosystem



0.7m

Direct

0.9m

Indirect



01

Industry overview



1.1

Subscriber penetration to reach three quarters of population by 2025

By mid-2018, there were 442 million unique subscribers in Latin America and the Caribbean, representing just over two thirds (or 68%) of the population. At this level, the penetration rate stands marginally ahead of the global average (66%), but behind developed mobile markets including Europe (85%) and Northern America (84%).

While subscriber growth in Latin America and the Caribbean has slowed in recent years, the region still has substantial room for growth and will account for 10% of all new subscribers globally out to 2025. By

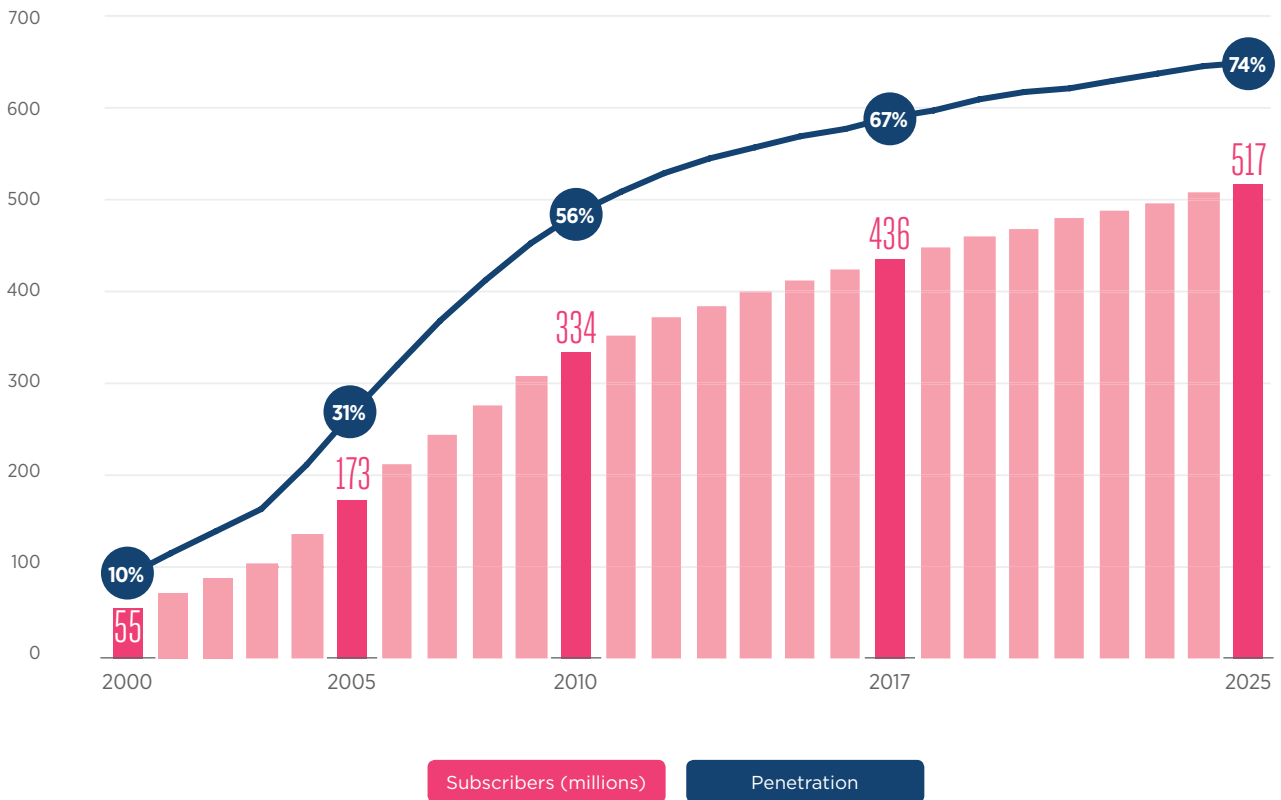
this time, there will be 517 million unique subscribers in the region, taking the penetration level to around three quarters of the population, closing the gap on the developed market average (87%).

With an average of 1.5 SIM cards per subscriber, there were 674 million mobile connections¹ across the region at the end of 2017, equating to connections penetration of 104%. Connections (excluding licensed cellular IoT) will grow at a similar rate to unique subscribers over the period to 2025 – around 2% annually – taking the total to 775 million.

Figure 1

Source: GSMA Intelligence

Unique subscriber dynamics in Latin America and the Caribbean

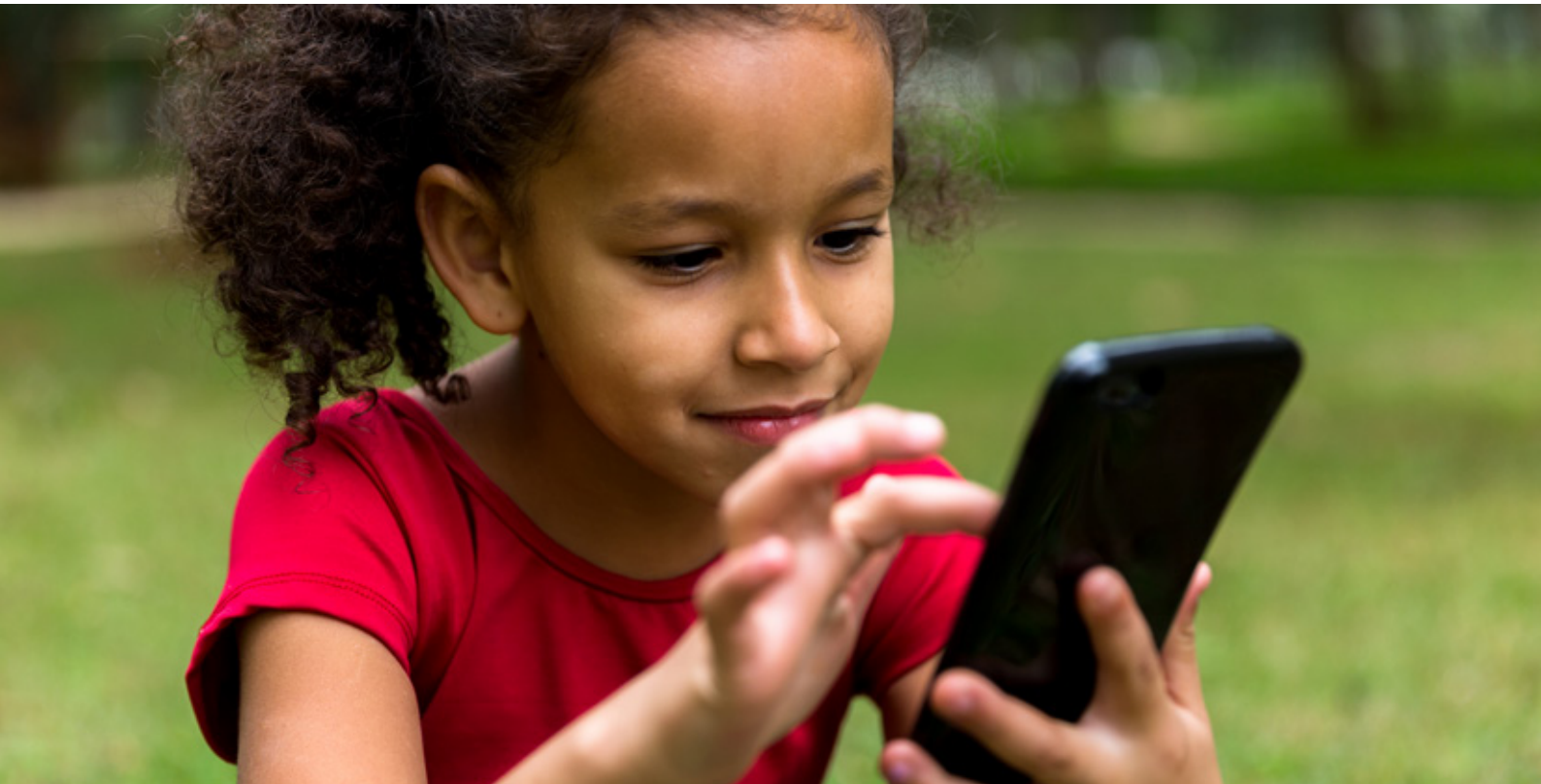
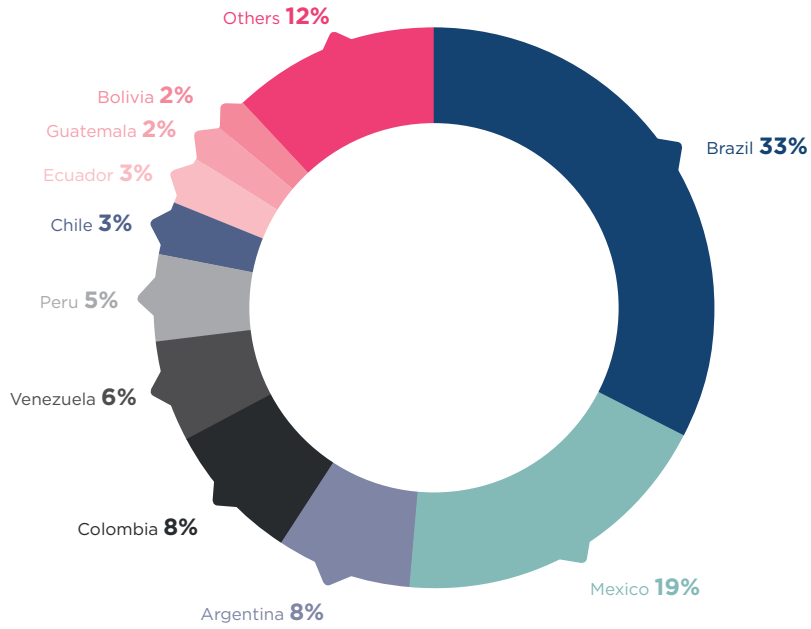


1. Total unique SIM cards (or phone numbers, where SIM cards are not used), excluding licensed cellular IoT, that have been registered on the mobile network at the end of the period.

Figure 2

Source: GSMA Intelligence

Share of unique subscribers, 2017



1.2

Subscriber growth to be delivered by the region's larger countries

Latin America and the Caribbean is characterised by varying levels of mobile subscriber penetration. A number of countries – including Chile, Uruguay, Panama, Puerto Rico and Argentina – are approaching saturation of the total addressable market, with penetration levels in the range of 81-83%, leaving limited room for further growth in subscribers.

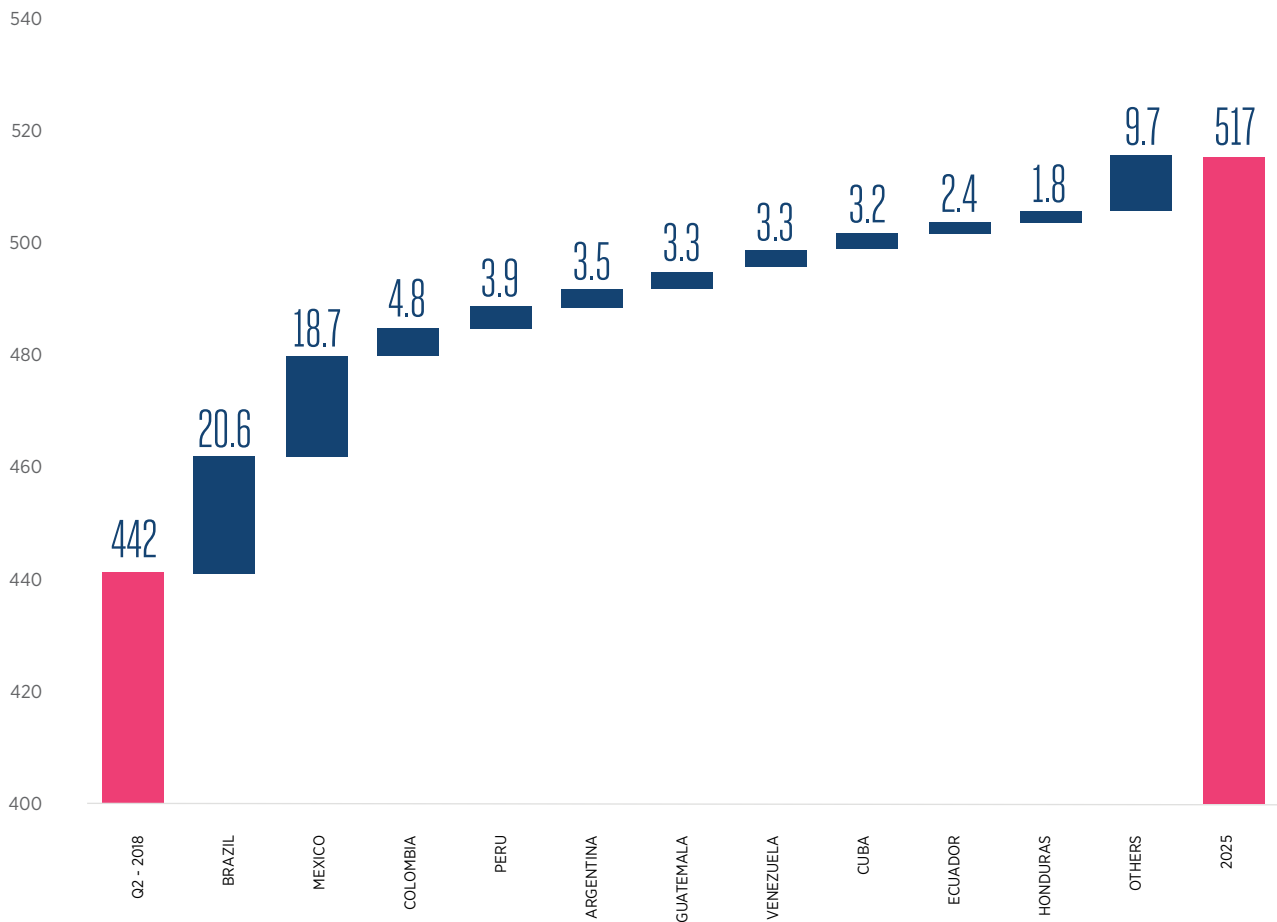
In contrast, mobile markets including Cuba, Honduras, Guatemala and Nicaragua have relatively low levels of penetration, and are forecast to experience marked growth out to 2025. Nevertheless, material increases in subscriber numbers will be delivered by major markets including Brazil, Mexico and Colombia, which have penetration levels close to the regional average.

Figure 3

Source: GSMA Intelligence

Unique subscriber growth

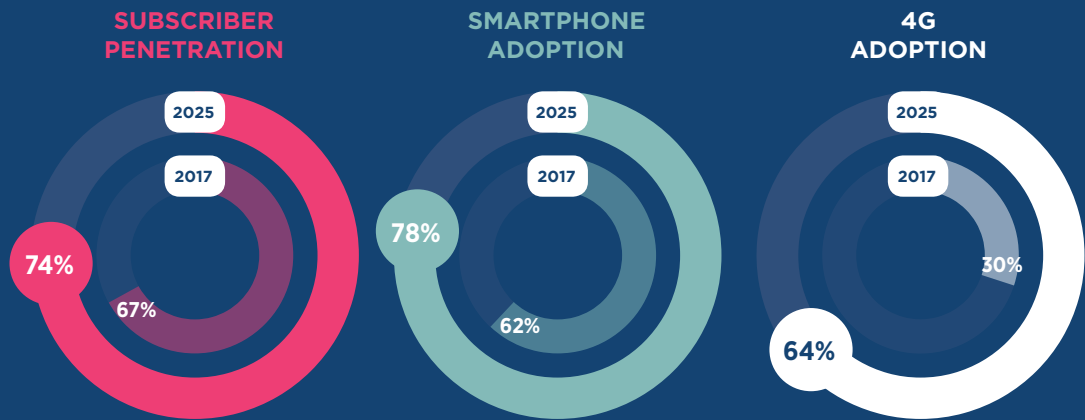
Millions



KPIs by country



Latin America and the Caribbean



	Subscriber penetration		Smartphone adoption		4G adoption	
	2017	2025	2017	2025	2017	2025
Argentina	81%	83%	55%	77%	38%	72%
Bolivia	63%	69%	35%	65%	28%	70%
Brazil	68%	75%	75%	86%	46%	87%
Chile	83%	86%	52%	82%	38%	75%
Colombia	69%	76%	51%	76%	23%	64%
Costa Rica	77%	82%	52%	75%	7%	44%
Cuba	36%	65%	42%	70%	-	-
Dominican Rep.	62%	69%	59%	74%	12%	36%
Ecuador	68%	75%	57%	73%	30%	72%
El Salvador	63%	68%	41%	68%	5%	22%
Guatemala	50%	61%	60%	71%	13%	24%
Haiti	54%	64%	35%	67%	0%	10%
Honduras	51%	64%	55%	67%	5%	16%
Mexico	63%	72%	62%	76%	20%	52%
Nicaragua	46%	56%	42%	69%	6%	20%
Panama	83%	88%	63%	80%	6%	28%
Paraguay	65%	72%	49%	67%	15%	45%
Peru	71%	77%	49%	70%	23%	63%
Puerto Rico	82%	87%	60%	79%	11%	58%
Uruguay	83%	86%	55%	80%	44%	76%
Venezuela	76%	79%	66%	77%	11%	60%

1.3 Smartphone adoption accelerating

At a regional level, smartphone adoption continues to see rapid growth, despite affordability challenges accentuated by macro-economic pressures and the depreciation of many currencies in the region. The total number of smartphone connections reached 417 million at the end of 2017, representing 62% of total connections. Adoption has increased a further 2 percentage points in the first half of 2018 to reach 64%.

Smartphone adoption is consistently strong across the region and is set to accelerate in key markets including Chile, Colombia, Argentina and Peru. In

the region's largest market, Brazil, smartphone connections stood at 171 million in mid-2018 – 40% of the region's total smartphone installed base. Smartphones represent three quarters of total connections in the country, and are forecast to reach 86% by 2025.

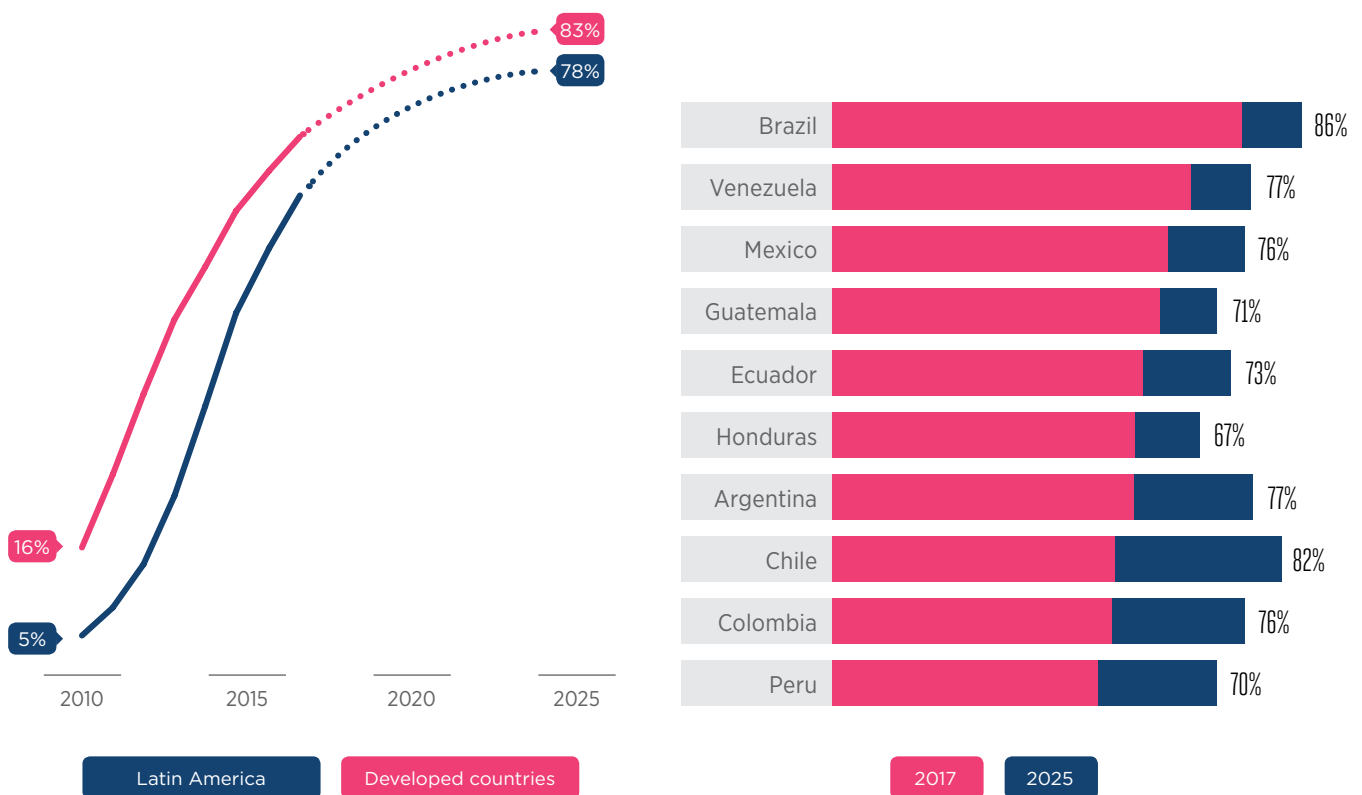
From a regional perspective, a further 189 million smartphone connections are expected to be added in the period out to 2025, boosting the adoption rate to 78%.

Figure 4

Source: GSMA Intelligence

Smartphone adoption accelerating in key markets

Percentage of connections



1.4 4G adoption starting to gather pace

With 124 live LTE networks across Latin America and the Caribbean, 4G coverage has continued to expand across the region, now reaching 82% of the population, equivalent to 529 million individuals. Having reached critical mass in terms of coverage, operators are also investing substantially in network upgrades to support accelerating smartphone and data use. For example, there are now 30 live LTE Advanced networks across 20 markets in the region, while deployments of the latest standard – LTE Advanced Pro – are also underway.

A combination of improved coverage, growing smartphone adoption, greater use of data-heavy services, and demand for higher speeds means consumers are now rapidly migrating to 4G services, ushering in a new era of digital connectivity in many of the region’s markets.

With 234 million 4G connections, adoption of 4G reached 35% of total connections in Q2 2018 and is set to overtake 3G as the dominant technology by the end of the year. It will reach 64% of the total base by the end of 2025. However, while smartphone adoption is consistently strong across the region, customer adoption of 4G services varies substantially. In countries such as Venezuela, Paraguay and Panama, 4G adoption is currently below 20% of connections, though a concerted push can significantly increase aggregate penetration by 2025.

This 4G adoption gap versus smartphones also exists in several of the region’s major markets, presenting operators across the region with a significant opportunity for further growth, if supported by an enabling regulatory environment.

Figure 5

Source: GSMA Intelligence

Share of connections by technology

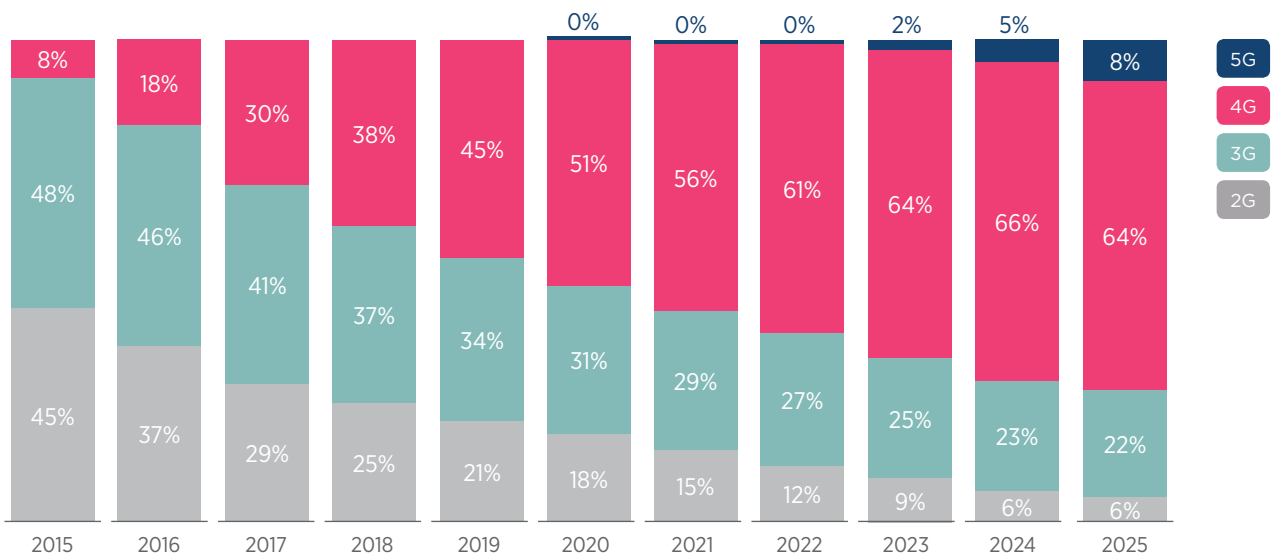
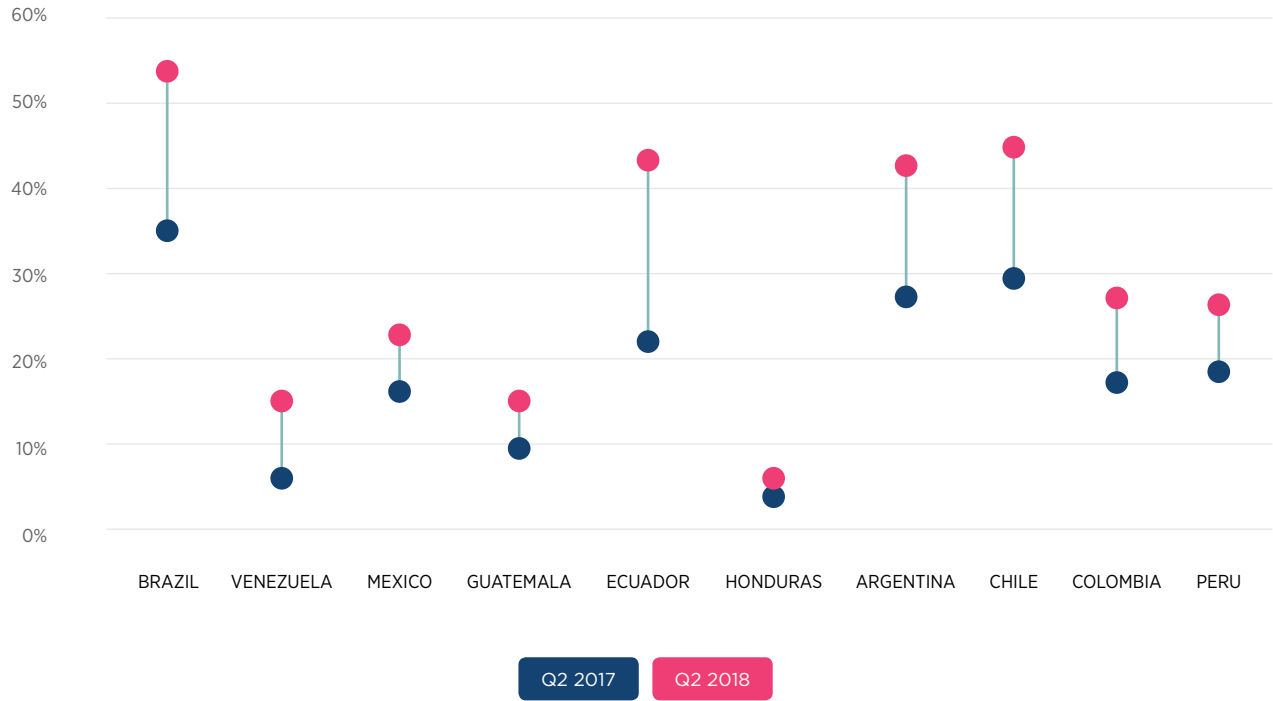


Figure 6

Source: GSMA Intelligence

4G adoption increasing in major Latin American markets



1.5 5G impact to come from next decade

With 4G investments still underway and with consumer adoption of the technology still in its infancy, 5G is viewed as a technology for the medium to long term in Latin America and the Caribbean. This is particularly the case considering short-term limitations around 5G device availability and potential regulatory (including spectrum) challenges.

While the first phase of 5G commercial devices is expected in the region in late 2019, the majority of 5G launches in the region are not expected until the middle of the next decade, after Release 16 and significant improvements in the economies of scale of devices and infrastructure. Ultimately, the readiness of each market for 5G is a multi-factorial

reality, with different markets in the region at various stages of maturity and readiness.

GSMA Intelligence expects 5G coverage to begin to rapidly expand by 2025, reaching just over 40% of the population. Adoption will begin to scale once coverage reaches critical mass in key markets, with 5G connections forecast to reach 62 million by 2025, equivalent to 8% of total connections in the region. From a global perspective, China, Japan, the US and South Korea are set to be the front-runners in terms of 5G commercial realisation. GSMA Intelligence forecasts that South Korea, Japan and the US will account for by far the largest share of 5G connections in 2025.

Figure 7

Source: GSMA Intelligence

5G forecasts for Latin America

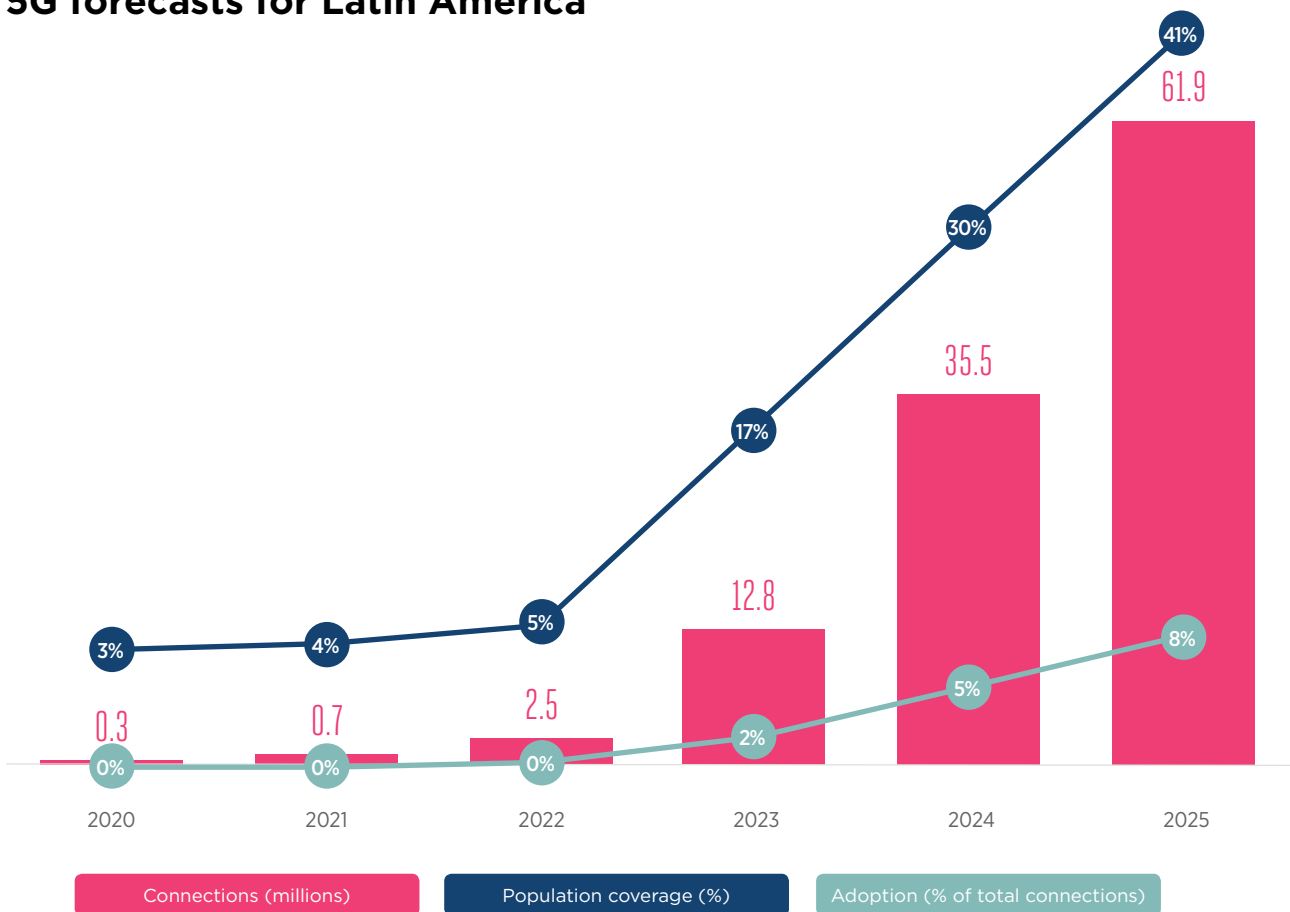
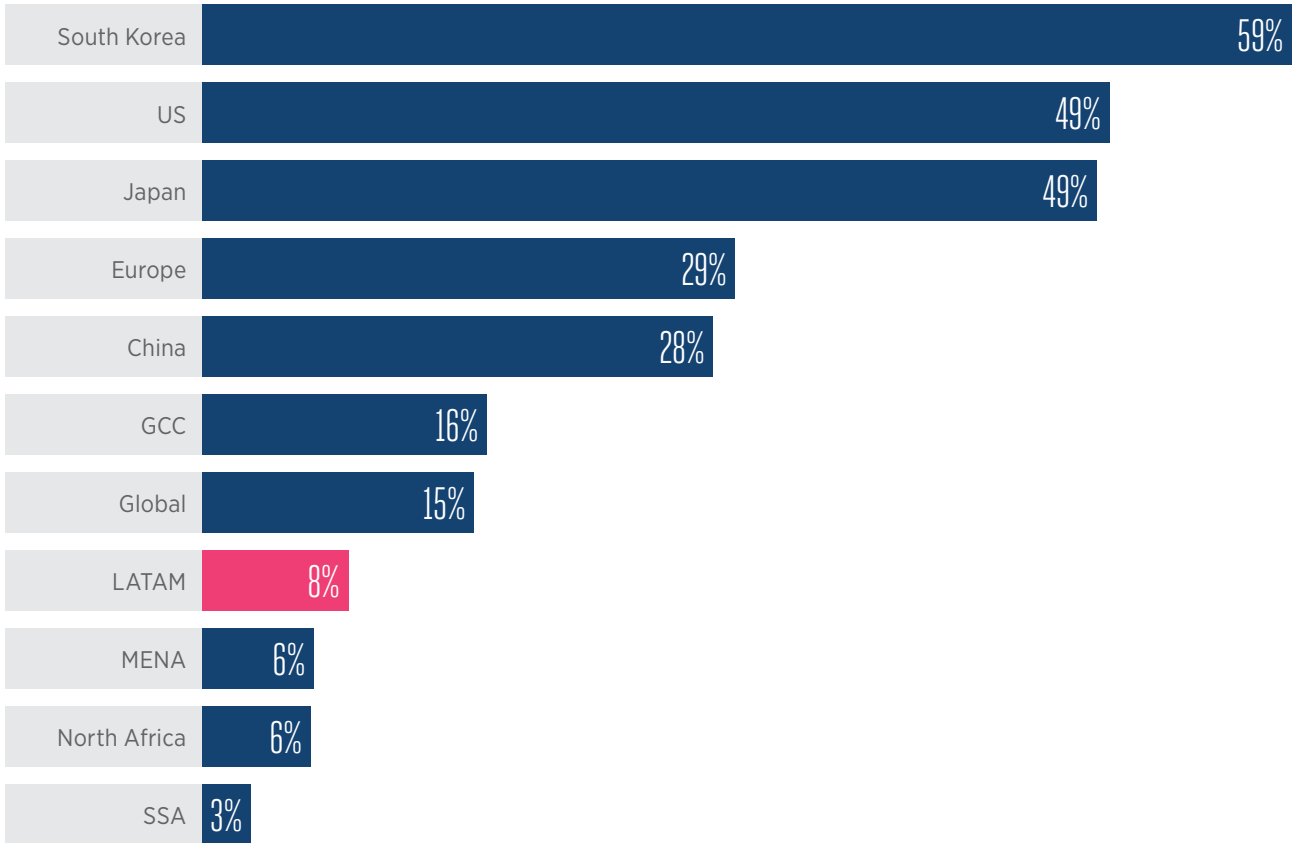


Figure 8

Source: GSMA Intelligence

Regional adoption of 5G in 2025

5G a percentage of total mobile connections excluding licensed cellular IoT



In Latin America’s major markets, as governments, regulators and companies in the mobile industry prepare for the 5G era, several operators are undertaking 5G trials and evaluations. Some operators have trialled 5G in millimeter wave, predominantly for localised and specialised deployments.

Figure 9

Source: GSMA Intelligence

5G trials in major Latin American markets



Mexico is expected to be the first market to launch commercial 5G services, led by Telcel and AT&T. While trials are also underway in Brazil, 5G services are not expected to launch in the country until 2023, as operators continue to focus on LTE-A upgrades. As a result, Mexico is expected to see the fastest adoption of 5G, with 18 million connections (14% adoption) by 2025, followed by Brazil with 26 million connections (11% adoption) and Peru with 4 million connections (10% adoption).

5G use cases: opportunities for mobile to further transform Latin American economies

Although 5G is not expected to scale in the region until the middle of the next decade, hype is already building around the technology's potential transformative impact in Latin America. As the industry transitions from 4G to 5G, mobile's potential to play a significant role in key industry verticals including smart cities, mining, manufacturing and agriculture will only continue to grow.

Mobile operators in the region have identified that the enterprise segment will be the most significant source of incremental revenue in 5G and that industrial IoT will make full use of new 5G features and capabilities. The provision of enhanced mobile broadband to B2C and B2B markets will be the core proposition in early 5G deployments, supplementing the capacity and capabilities of existing 3G and 4G networks. Operators in Latin America are currently prioritising the non-standalone (NSA) deployment model for 5G to meet initial market requirements. This model is most suitable for providing enhanced mobile broadband services – as a capacity layer (hotspot) overlaying the 4G network, and leveraging existing significant network investments.

Fixed wireless access also represents a significant opportunity in some markets that meet specific criteria (e.g. low fixed broadband penetration), though the associated cost and technology requirements present challenges to achieving wide adoption. Furthermore, while operators in the region are already deploying Mobile IoT, 5G's next phase can further propagate massive IoT; ultra-reliable and low-latency communications will be utilised in a number of emerging or future areas such as industrial and vehicular automation, remote medical surgery, and advanced AR and VR.

In addition to regulatory challenges, there are several aspects to 5G deployment that need to be addressed, including technical hurdles (such as security, interconnect and roaming), identification of business models and the development of standardised solutions. These challenges come against a backdrop of a low-growth, low-ARPU environment for mobile operators, which are continuing to invest significantly in LTE upgrades. Importantly, clarity will be needed in several areas, including the regulatory framework and infrastructure/device availability before operators can commit serious investment to 5G.

As part of this, operators in Latin America recognise the need to develop a clear roadmap for shutting down legacy 2G and/or 3G networks

before commencing mass-market 5G rollout. The initial upfront painpoints for 5G will come from the complexity of managing legacy networks, the challenges of integrating legacy networks with the new 5G network, and the expertise of engineers to manage these challenges.

From a services perspective, industry-wide collaboration and innovation centres, where companies from across different sectors can experiment with the 5G ecosystem to develop new products and services, are also key in the 5G era. Only once these challenges are addressed will some of the more sensationalised and ambitious services become a reality.

Spectrum policy to facilitate 5G and IoT

- **Roadmap:** Administrations need to work in advance to clear bands and present a roadmap of spectrum allocation that can facilitate investments. It is key that operators support WRC-19 preparations, specifically in terms of the bands key for the mobile industry (e.g. 26 GHz, 40 GHz).
- **Pricing:** There is significant concern around the potential impact of high prices and ‘artificial’ auctions for 5G spectrum, which could lead to slower network rollout or higher consumer prices.
- **Backhaul:** It will be critical to have National Broadband Plans and rural fibre for 5G backhaul, provision of access to public infrastructure and significant alignment with other sectoral regulations in terms of network reliability, such as for drones/air traffic control, medical applications and utility management.
- **Flexibility:** Licensed spectrum will be fundamental but there will be a need for greater flexibility in the assignment methods and licence conditions (e.g. differentiated coverage, QoS obligations with technology neutrality) and allowing for secondary spectrum usage/sub-leasing.

1.6 Revenue and capex trends stabilising

From a macro-perspective, economic performance in Latin America and the Caribbean has slowly improved, helped by a rebound in domestic demand and a recovery in commodity prices, which has benefited the many commodity-fuelled economies. However, sizeable challenges remain and economic prospects of the region’s major markets are increasingly diverging. As the region goes through its election super-cycle – with 14 presidential elections being held between November 2017 and 2019 – it remains vulnerable to further economic shocks. Political and institutional uncertainty,

polarisation and internal tensions for and against reforms are among the factors that will shape the short- to medium-term outlook for the region.

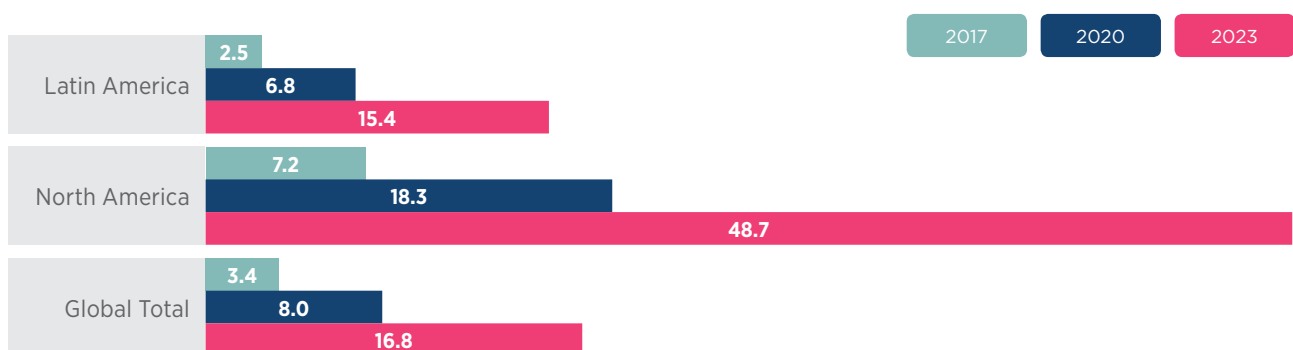
For mobile operators, the recovery in mobile revenue growth will continue to benefit from an improving subscriber mix, as take-up of 4G services scales. Moreover, sustained growth in data demand will see mobile data traffic in Latin America (per smartphone, per month) grow at a CAGR of 35% out to 2023 according to Ericsson forecasts.

Figure 10

Source: Ericsson

Mobile data growth

Mobile data traffic per smartphone (GB/month)



As the majority of mobile connections in the region are prepaid, the decline in traditional voice and messaging revenues is a long-term, rather than cyclical, phenomenon. In the context of a deflationary pricing environment for telecoms compared to other consumer-facing industries, increasing price competition in the prepaid segment, particularly in Mexico, is a further brake on renewed growth in mobile revenue.

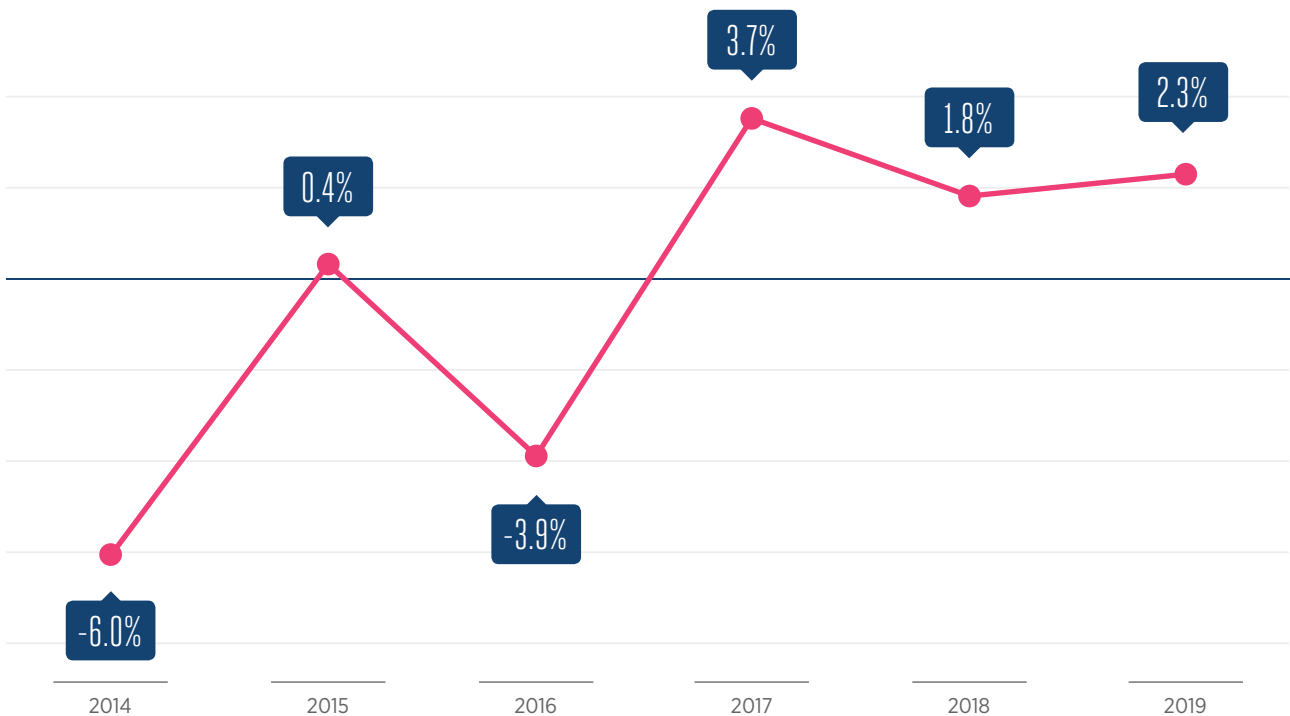
Growth over the next 12-18 months should be helped by the mix effect as customers upgrade to 4G – still significantly underpenetrated in the region compared to the US and Europe. Sustaining

that over a 2+ year period is the difficult part, given that competition will eventually erode the price premium that drives the initial tick up. In this respect, operators across the region are offering more innovative mobile plans and packages that are tailored to evolving ways of consuming data and consumers' spending limits (e.g. leveraging partnerships to bundle zero-rated popular apps). Consequently, a combination of rising smartphone and 4G adoption means mobile revenue growth in 2018 and 2019 is expected to remain at around the 2% level.

Figure 11

Source: GSMA Intelligence

Revenue trends in Latin America



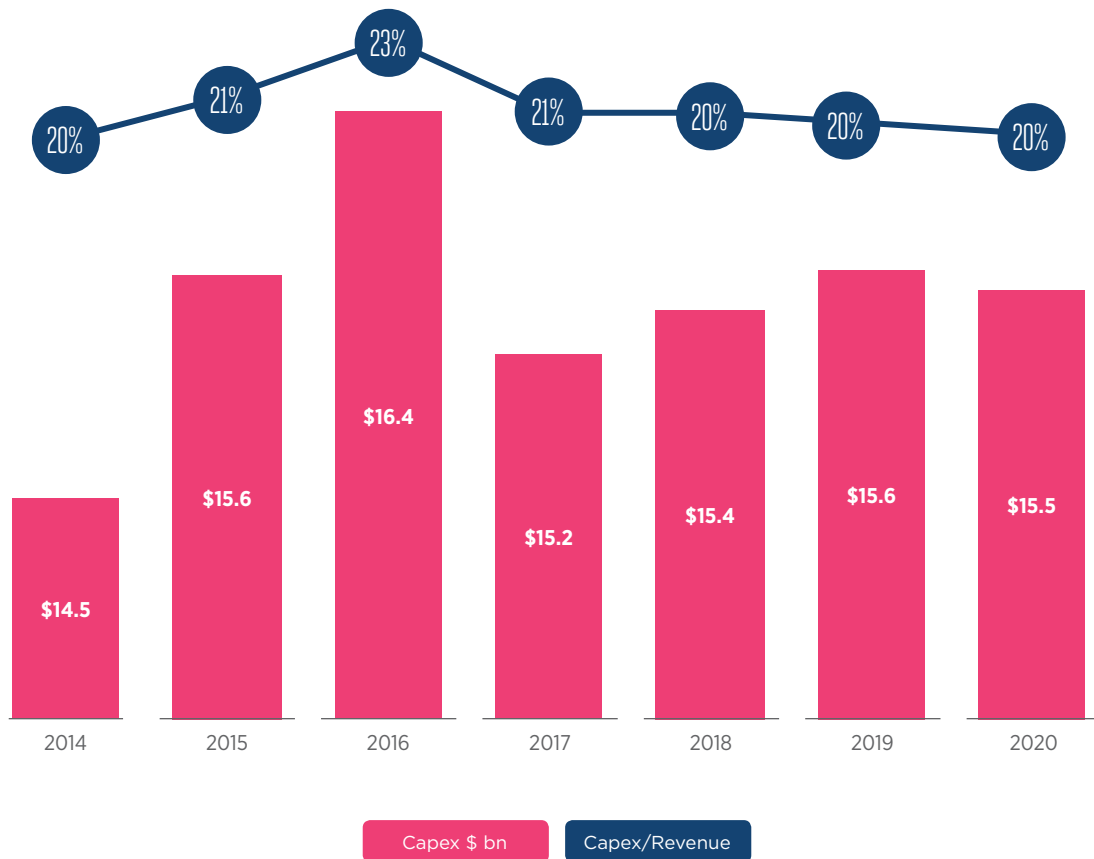
Having invested a total of \$77 billion over the last five years, mobile operator capex will remain high through to 2020, mostly driven by LTE network rollout and upgrades. Aggregate capex will total \$47 billion between 2018 and 2020, with broadly stable capex margins, after which a gradual increase is likely as operators continue to invest in mobile broadband capacity (to accommodate rapidly

rising mobile video data usage) as well as the initial phases of 5G deployments. While the majority of 5G radio network spend will not come online until after 2020, there is an increased focus on investment in fibre networks across many markets in the region, which could provide the backhaul element of future 5G architectures.

Figure 12

Source: GSMA Intelligence

Capex in Latin America





02

Mobile contributing to growth, innovation and social development

2.1 Mobile delivering growth and jobs

The mobile ecosystem makes a significant contribution to the economy in Latin America, with an economic value added of more than \$280 billion (5% of GDP). This overall impact includes the

direct impact of the mobile ecosystem as well as the indirect impact and the increase in productivity brought about by increased use of mobile services and technologies.

The direct economic contribution of the mobile ecosystem

The mobile ecosystem consists of mobile operators; infrastructure service providers; retailers and distributors of mobile products and services; mobile handset manufacturers; and mobile content, application and service providers. The direct economic contribution to GDP of these firms is estimated by measuring their value added to the economy, which includes employee compensation, business operating surplus and taxes.

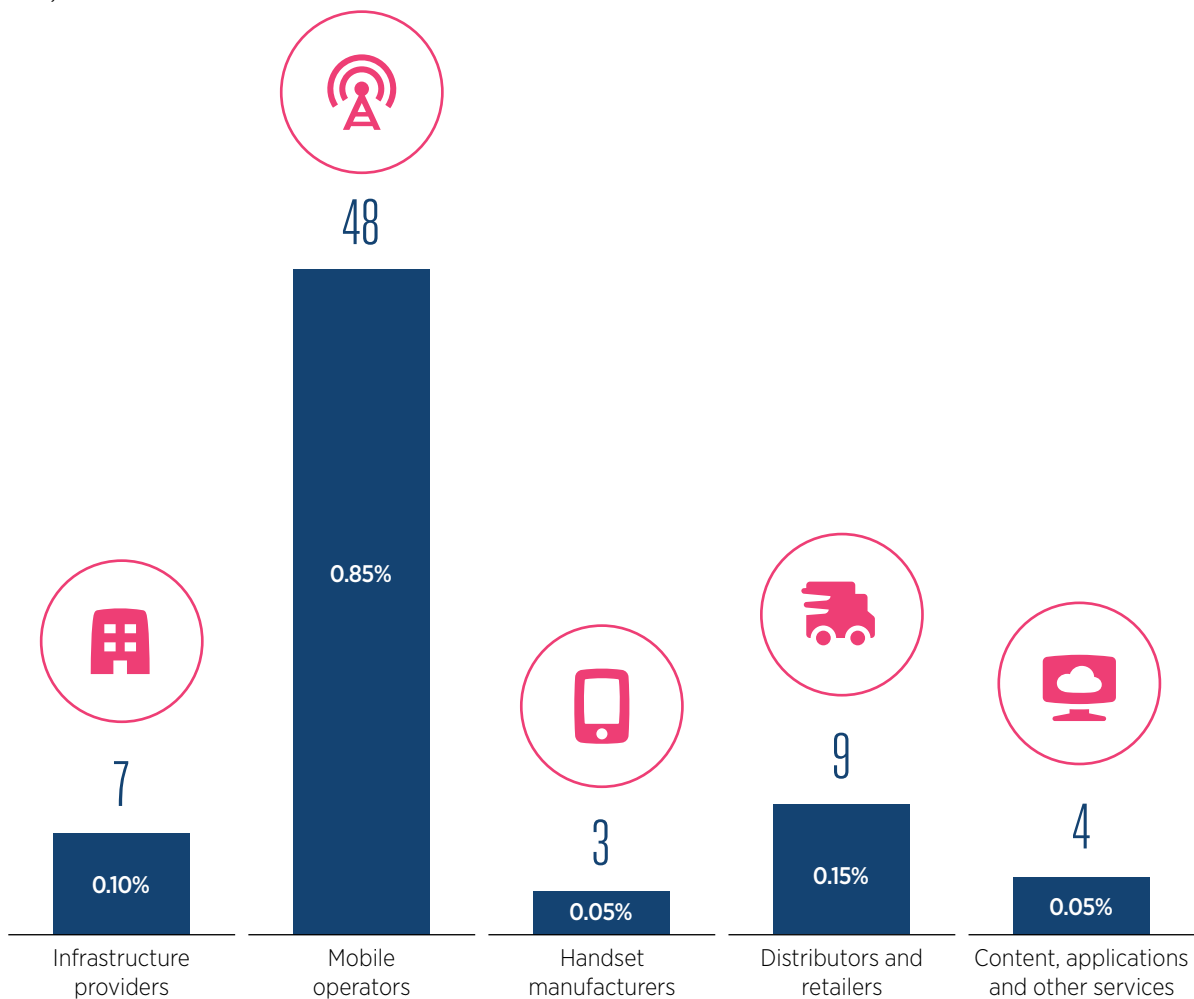
In 2017, the total value added generated by the mobile ecosystem in Latin America was around \$70 billion (1.2% of GDP), with network operators accounting for more than 70% of this. Content, applications and other services has been the fastest growing part of the ecosystem over the last five years.

Figure 13

Source: GSMA Intelligence

Direct GDP contribution of the mobile ecosystem

\$ billion, % 2017 GDP



Indirect and productivity impacts of mobile technology

In addition to their direct economic contribution, firms in the mobile ecosystem purchase inputs from their providers in the supply chain. For example, handset manufacturers purchase inputs from microchip providers, and mobile content providers require services from the broader IT sector. Furthermore, some of the profits and earnings generated by the mobile ecosystem are spent on other goods and services, stimulating further economic activity in those sectors. We estimate that in 2017, this additional economic activity generated a further \$20 billion in value added in the region (0.4% of GDP).

The use of mobile technology also drives improvements in productivity and efficiency for workers and firms, which could play an increasingly important role in accelerating Latin America’s growth. Recent analysis shows that productivity growth in Latin America is stagnant, and total factor productivity has made a negative contribution to economic growth in the region over the last 15 years.² This has altogether contributed to an increasing gap in GDP per capita versus other OECD countries. Mobile technology can help bridge this gap.

Different types of mobile technology have their own impact on the productivity of the regional economy:

- Basic mobile voice and text services allow workers and firms to **communicate more efficiently and effectively** (reducing unproductive travel time, for example).
- 3G and 4G technology allow workers and firms to use mobile data and internet services. This **improves access to information and services**, which in turn drives efficiency in business processes across many industries, including finance and health. The impact of mobile internet is particularly significant in developing countries, where fixed infrastructure is poor and mostly confined to large cities and business/industrial districts.
- M2M and IoT allow for the **digitisation of services and improvement of industrial processes**. As these technologies become increasingly adopted, we expect them to create significant benefits by driving cost savings and operational efficiency gains in areas such as manufacturing, logistics and retail.

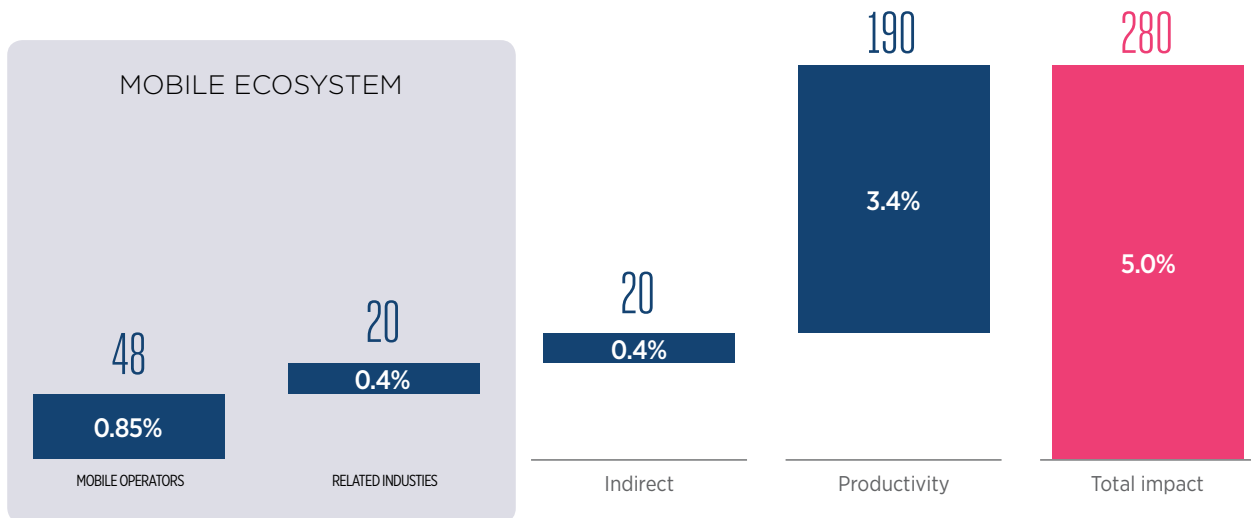
Together, these productivity impacts generated more than \$190 billion in 2017 (3.4% of GDP). Overall, taking into account the direct, indirect and productivity impacts, in 2017 the mobile industry made a total contribution of more than \$280 billion in value added terms, equivalent to almost 5% of the region’s GDP.

Figure 14

Source: GSMA Intelligence

Total (direct, indirect and productivity) contribution to GDP

\$ billion, % 2017 GDP



Note: totals may not add up due to rounding

2. Observatorio de Economía Digital de Colombia, 2018

Employment

In 2017, mobile operators and the wider mobile ecosystem provided direct employment to 675,000 people across Latin America. In addition to this, economic activity in the ecosystem generated jobs in other sectors. Firms that provide goods and services as production inputs for the mobile ecosystem (for example, microchips or transport services) will employ more workers as a result of the demand generated by the mobile

sector. Furthermore, the wages, public funding contributions and profits paid by the mobile industry are spent in other sectors, which provide additional jobs.

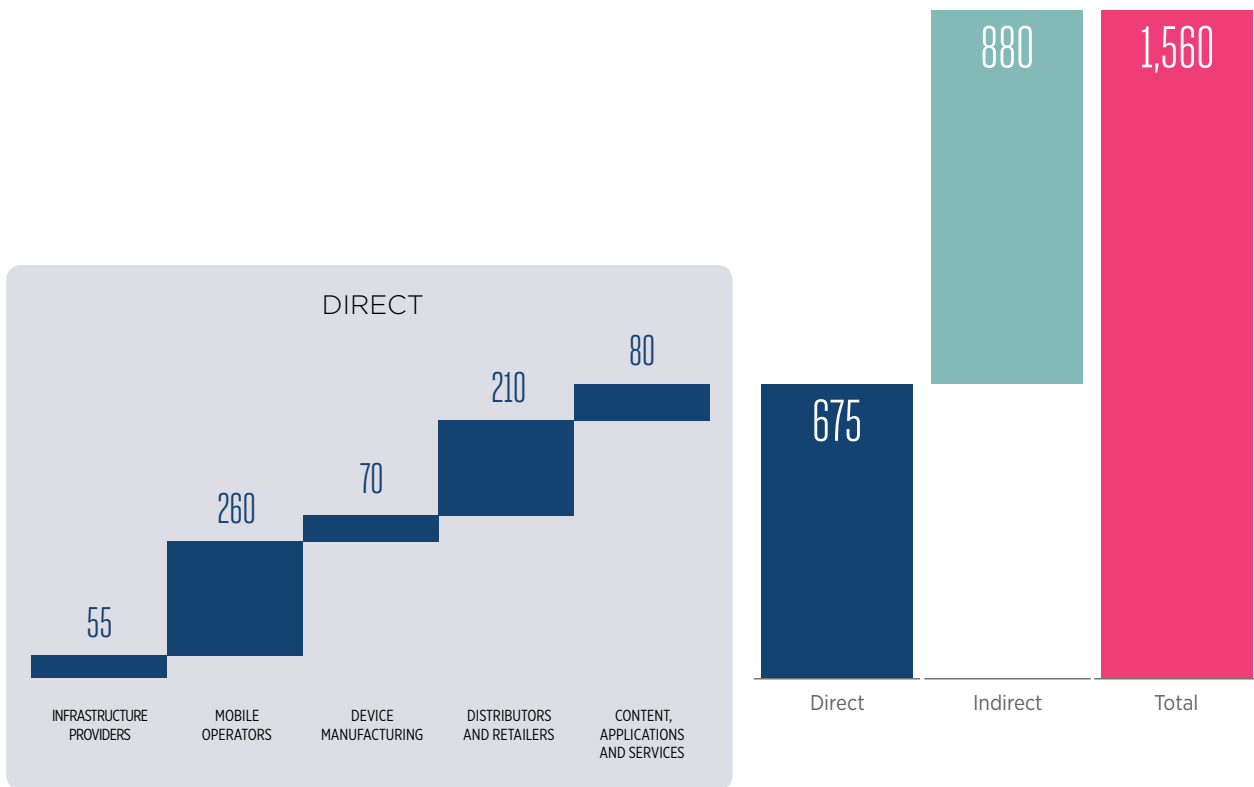
We estimate that in 2017, almost 880,000 additional jobs were indirectly supported in this way, bringing the total impact (both direct and indirect) of the mobile industry to almost 1.6 million jobs.

Figure 15

Source: GSMA Intelligence

Employment impact

Jobs, thousands



Note: totals may not add up due to rounding

Public funding contribution

The mobile ecosystem also makes a significant contribution to the funding of the public sector. In most countries, this includes value added tax or sales tax, corporation tax, income tax and social security from the contributions of firms and employees. In some countries, besides general taxation, consumption of mobile services is also subject to numerous levies specific to the industry. In 2017, more than half of the countries in the region had excise taxes on airtime, SIM cards or higher VAT rates on the use of mobile services. Overall, these represented almost 10% of all mobile taxes directly paid by consumers in Latin America.

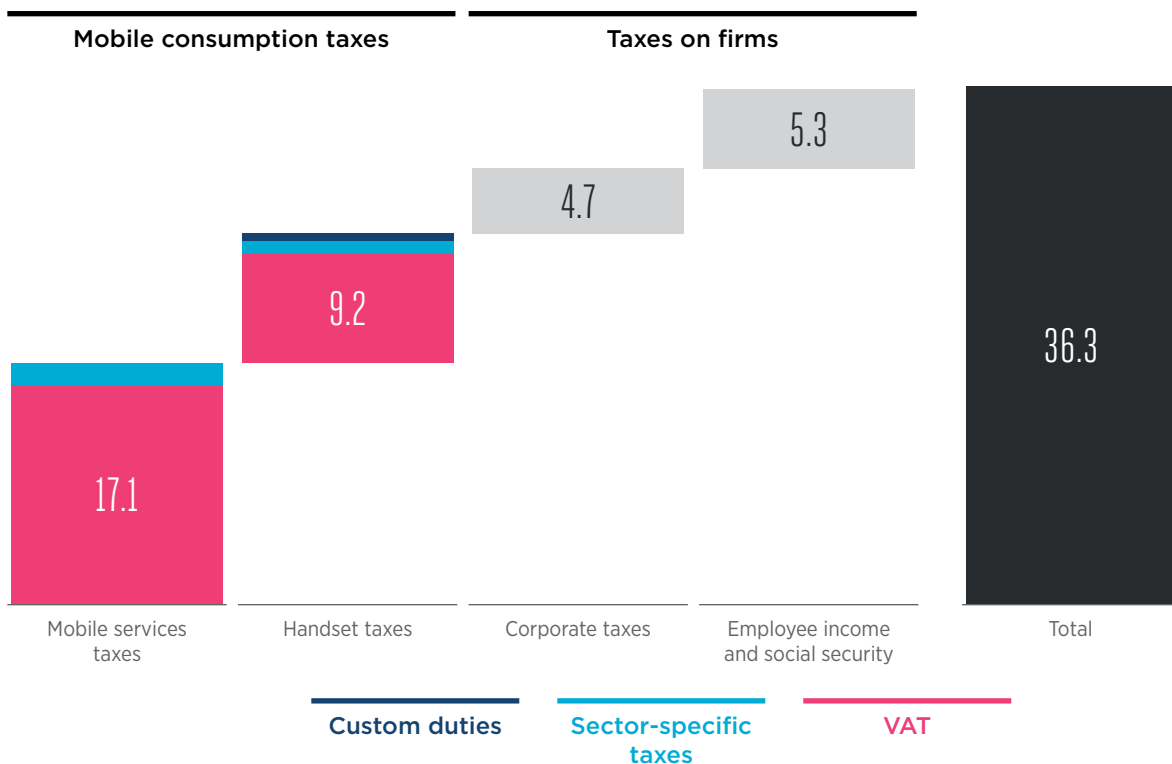
We estimate that the mobile ecosystem made a contribution to the public finances of governments of more than \$36 billion in 2017. This takes into account the general and sector-specific taxes directly paid by Latin American consumers when using mobile services and devices, as well as general taxes paid by firms in the ecosystem. It does not include contributions made by mobile operators through industry-specific taxes – e.g., spectrum fees, revenue share taxes or universal service obligation fund contributions.³ It also excludes revenues gained from spectrum auctions. In 2017, auctions in Argentina, Costa Rica and Uruguay accounted for more than \$330 million.

Figure 16

Source: GSMA Intelligence

Contribution to public funding by the mobile industry

\$ billion, 2017



Note: totals may not add up due to rounding

3. For further details, see Taxing mobile connectivity in Latin America, GSMA Intelligence, 2017

Outlook and trends for the next five years

We expect the economic contribution of the mobile ecosystem in Latin America to continue to increase in both relative and absolute terms. In value-added terms, we estimate that mobile will contribute \$330 billion to the Latin America economy by 2022 (5.2% of the region's GDP) up from \$280 billion in 2017 (5% of GDP).

The challenge of boosting productivity in Latin America remains an imperative for socioeconomic progress in the region. Looking out to 2022, mobile technology will play an increasingly important role

in reducing the productivity gap, with most of the forecast value-added increase accounted for by productivity gains, which will rise from \$190 billion in 2017 to almost \$235 billion by 2022. In a region as diverse as Latin America, productivity will increase for various reasons. In some countries, the adoption of IoT solutions will drive increased productivity. In developing countries in the region, productivity growth will be mostly driven by the adoption of mobile internet services.



2.2

Mobile enabling the digital economy

2.2.1. IoT market set to proliferate

The number of Internet of Things (IoT) connections in Latin America and the Caribbean will triple between 2017 and 2025, reaching 1.3 billion.

The majority of these connections will be in the consumer segment, due to increased adoption of connected devices within homes (e.g. connected thermostats and consumer electronics, including smart TVs).

Several operators in the region have started to offer smart home devices and services, which will drive connections growth in this segment. Many operators, such as those in Mexico, are moving beyond connectivity to become end-to-end service providers of IoT, in an attempt to exploit new revenue streams. For example, as part of their alliance, Samsung and Telcel recently announced new smart home IoT solutions, offered through Samsung's open platform SmartThings. Meanwhile, Claro Argentina and security company LoJack have partnered to launch an IoT security platform, Strix, to monitor home alarms, surveillance cameras and personal goods.

In total, consumer IoT connections in the region are set to increase 2.5x to 732 million by 2025. Although the majority of total IoT connections will come from the consumer segment, the industrial IoT sector in the region will increase more rapidly over the forecast period, driven by growth in smart buildings and smart utilities.

In Latin America, the most urbanised region in the world with over 80% of citizens living in urban areas, cities have an important role to play in the IoT ecosystem. Due to their size, geographical spread, entrepreneurial vibrancy and infrastructure challenges, cities can champion the deployment of IoT and smart city applications, and reap substantial socioeconomic benefits. IoT frameworks and initiatives are being implemented at regional, national and city levels. Examples include the following:

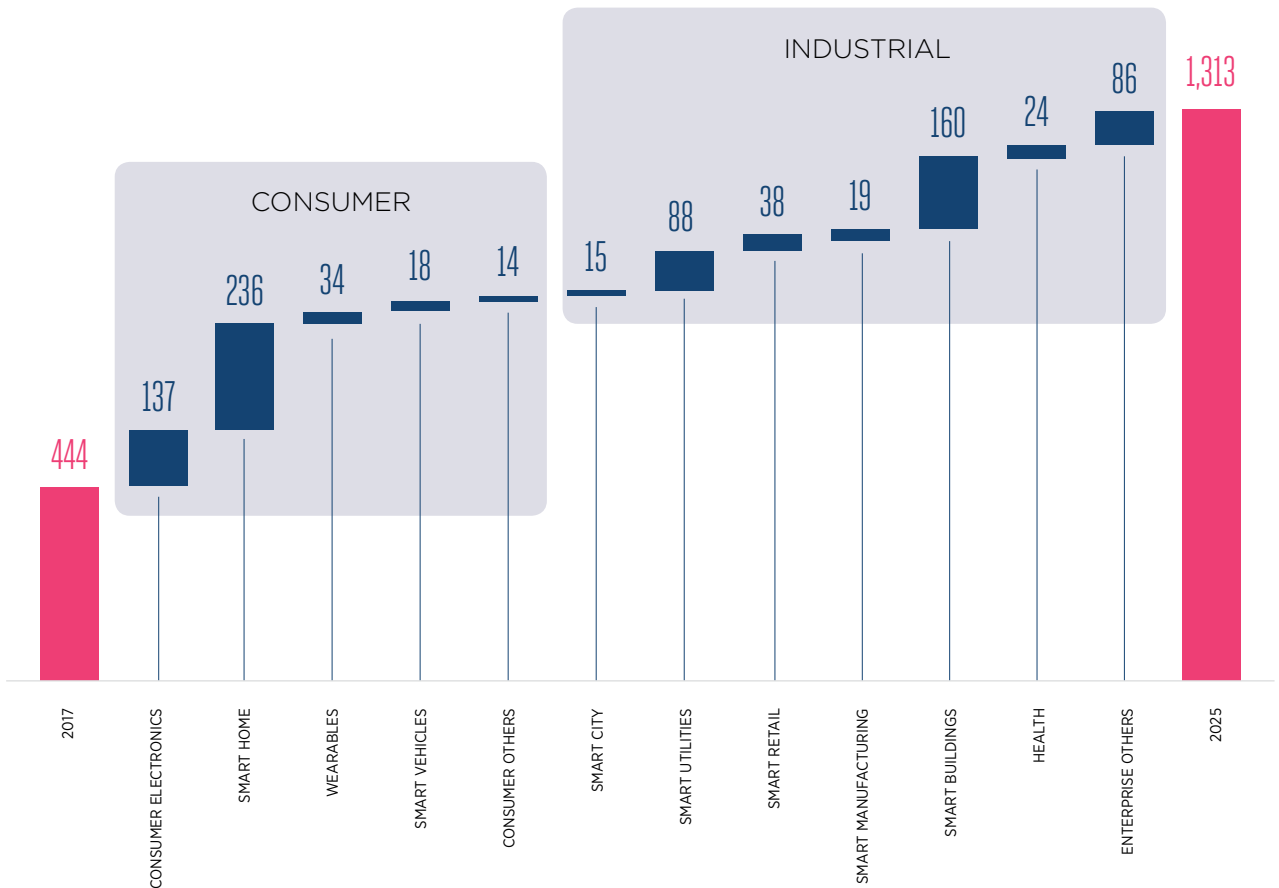
- In March 2018, the Brazilian government started deploying its national IoT plan. This includes 70 initiatives aimed at utilising IoT as a tool for sustainable development in the country in the areas of smart cities, healthcare, industry and agriculture. Initiatives include calling for IoT to be used in hospitals to improve efficiency and to manage patient information.
- The Ministry of Economic Development (SEDECO) in Mexico City began to implement the Connectivity Master Plan for Mexico City in 2016, aimed at increasing connectivity in the city. In late 2017, an agreement was signed with AT&T to run an IoT pilot in one of the city's public markets, to provide connectivity for transactions and improve customer experience.

Figure 17

Source: GSMA Intelligence

Total IoT net additions in Latin America

Connections (millions)



While most IoT connections will be short range, mobile operators are deploying licensed LPWA connectivity such as narrowband IoT (NB-IoT) and LTE-M. For example, AT&T Mexico launched LTE-M in January 2018 after successful trials in Tijuana and Puebla, to provide connectivity for smart cities, asset management and security. The company also plans to launch NB-IoT in 2019 to complement its existing LTE-M option. Meanwhile, TIM Brazil announced it is launching an NB-IoT pilot network in Santa Rita do Sapucaí and will deploy the technology in 1,000 cities in Brazil by the end of the 2018.

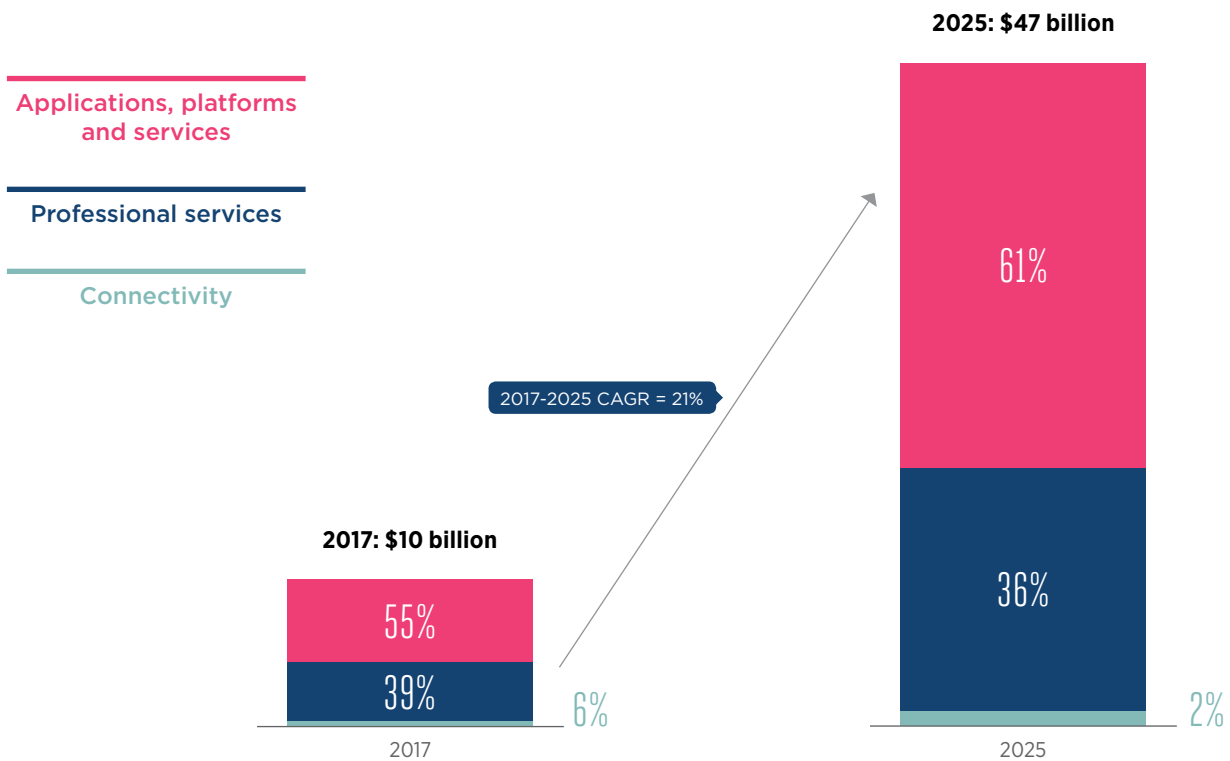
GSMA Intelligence forecasts that licensed LPWA connections in the region will reach 57 million connections by 2025, while cellular M2M connections will total 48.5 million by this time.

IoT revenue in Latin America and the Caribbean will increase at a CAGR of 21% to 2025 to reach \$47 billion, almost four times its current value. The majority (61%) of revenues will derive from applications, platforms and services. In targeting this opportunity, some operators in the region have started to form strategic partnerships to tap into key vertical markets, such as the connected car ecosystem. For example, in August 2018, AT&T partnered with Kia Motors in Mexico to provide connectivity for drivers to track the location of their vehicles, with AT&T providing the service over its Control Center platform. Partnerships between operators, service providers and ecosystem players in the region will be crucial to navigate the wide-ranging challenges they face as IoT scales.

Figure 18

Source: GSMA Intelligence

IoT revenue composition in Latin America



Smart agriculture: improving farm productivity

According to the World Bank, the world will need to feed a projected 9.7 billion people by 2050, meaning an increase in food production of 50%. One way to help achieve this is to reduce food waste. The Food and Agriculture Organization (FAO) estimates that roughly one third of the food produced in the world for human consumption every year — approximately 1.3 billion tonnes — is lost or wasted. In developing countries, 40% of losses occur at post-harvest and processing levels. According to IBM, 90% of all crop losses are weather-related. Predictive weather measurement through the application of precision agriculture systems, such as those enabled by IoT, can reduce this crop damage by about 25%.

Agribusiness can derive significant benefit from full, real-time visibility along the value chain. In Cordoba, Argentina, Claro built a partnership to develop an IoT solution for an agricultural exporter that connects machines and farm animals with sensors, and analyses drone and satellite images. The data generated can be analysed through an online dashboard with reports, graphs and predictive analytics. This gives traceability to products, and helps the producer meet the high standards of their international customers.

Building communities resilient to climatic extremes

Telefónica and the United Nations Food and Agriculture Organization (FAO) launched a partnership in February 2018 to undertake initiatives in support of rural communities in Hispanic America.⁴ As a first project, with support from the GSMA, Telefónica and the FAO are working in Colombia to leverage mobile big data as a mechanism to measure how and to what extent climate change contributes to the internal displacement and movement of citizens. With 84% of the population vulnerable to experience two or more extreme climate events,⁵ building understanding of climate-related internal displacement by increasing the availability of quality data of the phenomena has the potential to transform local and national responses.

Based on the information and decision-making requirements of the FAO, Telefónica has built an interactive dashboard that provides visualisations and insights to describe the movement of internally displaced people. The focus of the proof of concept was the La Guajira region of Colombia, which is strongly affected by climate extremes. Data for the dashboard was drawn from a mix of complementary sources. The dashboard can be updated with new mobility data regularly, allowing continuous monitoring of displaced people. The tool can help provide much needed data to contextualise the impact of climatic variability on Colombian citizens.

By identifying and quantifying migration flows in La Guajira, mobile big data was able to help identify 12,000 people who left the region during the drought and never returned. Mapping these movements uncovered an outward flow of individuals from rural to urban areas. Identifying this urbanisation trend will help the government and organisations to make more informed decisions and targeted policy interventions for issues that arise from climate-related migration with the ultimate aim to facilitate long-term support to vulnerable communities. The success of this pilot has led to trials for the tool in two other departments in Colombia, Tolima and Huila.

Working together, Telefónica and the FAO aim to address two of the United Nations' Sustainable Development Goals (SDGs): SDG 13 to address climate change and its impact, and SDG 10 to reduce inequality within countries that experience climate-related internal displacement. The GSMA is closely tracking this initiative as a major example of how mobile big data can provide the international development community and governments with innovative tools to help them build resilient communities.

2.2.2 Mobile transforming the content landscape in Latin America

The widespread availability and increasing adoption of mobile services and, in particular, smartphones in Latin America has spurred a paradigm shift in the creation, distribution and consumption of content in the region. With a young and dynamic population, Latin American millennials⁶ are at the heart of this content transformation.

According to the GSMA Intelligence Consumer Survey,⁷ millennial smartphone users in Latin America are among the most engaged users of free-to-access online video services for their age group globally. For example, more than three quarters of millennials in Argentina, Brazil, Guatemala and Mexico watch free-to-access online video at least once per month on their smartphones.

4. Telefónica's footprint in Hispanic America includes Argentina, Chile, Colombia, Ecuador, Mexico, Peru, Uruguay, Venezuela, Costa Rica, El Salvador, Guatemala, Nicaragua and Panama.

5. Global Facility for Disaster Reduction and Recovery. 25 September 2018. <https://www.gfdr.org/colombia>

6. 18-34 year-olds

7. Preliminary Consumer Survey results for 2018

Table 1

Source: GSMA Intelligence

Mobile entertainment among millennial smartphone users in Latin America

	Play game	Watch free to access online video	Listen to free online music	Pay for on-demand TV/movies	Pay to download or stream music online
Argentina	48%	81%	59%	15%	17%
Brazil	48%	85%	64%	32%	31%
Dominican Republic	51%	88%	57%	16%	7%
Mexico	59%	76%	51%	33%	32%

Millennials = 18-34 year-olds. Percentage of smartphone users engaging at least once per month. Preliminary Consumer Survey results for 2018



Facing increasing competition from global OTT service providers including Netflix, which launched across the region in 2011, and Amazon Prime Video (launched in 2016), major telecoms groups and pay-TV providers in Latin America have ramped up their investment in distribution capabilities, SVOD⁸ services, as well as various content forms, including original series in Spanish and Portuguese.

While the appetite for original and exclusive content continues to grow, the race for original content is not viable for every player in the longer term and risks content fragmentation, potentially making it difficult for consumers to access and discover content. What's more, one of the major challenges for content and media players across Latin America is to drive usage beyond free content, where affordability remains an issue for a significant part of the addressable audience.

Although local OTT services offered by mobile operators (such as ClaroVideo and Movistar Play) have a lower number of paying subscribers than Netflix or Amazon Prime Video, their vast distribution channels enable them to reach a greater proportion of the population when their OTT services are bundled as part of their pay-TV or mobile subscriptions. Content licensing and aggregation will therefore continue to be the most common model for major providers of content. We have seen several related developments in Latin America during 2018:

- Mass media company Televisa announced the launch of Televisa Alternative Originals (TAO), its new premium content division that seeks to develop, produce and distribute premium content with an emphasis on Latin American and multicultural stories and characters. As part of

this, TAO signed a distribution agreement with Amazon Prime Video, which will distribute several series to its clients around the world. This marks the streaming giant's entry into original content production in Latin America.

- Telefónica launched the Movistar Series Channel in Latin America, through which Movistar Series will offer original series and a selection of Latin American productions through its Movistar TV and Movistar Play platforms. Subsequently, in May 2018, Telefónica announced a partnership with Netflix, to integrate Netflix's service into Telefónica's TV and video platforms in Europe and Latin America.
- The same path has been taken by Telecom Argentina VOD TV Everywhere service Flow, which is the second most viewed platform in Argentina after Netflix. The Flow app had more than half a million subscribers at the end of 2017 and experienced significant use during the recent 2018 FIFA World Cup. Enabling customers to watch World Cup matches without using their data allowance, the app recorded in excess of 200,000 users on 4G during the tournament.
- While it remains to be seen whether AT&T will re-attempt an IPO of Vrio Corp, its DirecTV business in Latin America, in October 2018 AT&T announced plans to launch a new D2C streaming service towards the end of 2019, focussed on WarnerMedia assets. AT&T's transformative \$85.4 billion acquisition of Time Warner, completed in June 2018, further enhances its presence in Latin America. For example, HBO adds an extensive distribution network and a vast library of original regional content.

8. Subscription video on demand

2.3

Mobile addressing social challenges

2.3.1 Connecting the unconnected

Mobile connectivity is a key enabler of digital inclusion and economic and social development. In Latin America and the Caribbean, internet adoption continues to scale rapidly, driven predominantly by mobile internet connectivity, due to limited fixed-line infrastructure. The number of mobile internet subscribers in the region reached 323 million at the end of 2017, representing an increase of 47 million since 2015. What's more, out to 2025, a further 130 million people will come online, the majority of them connecting via high-speed mobile broadband networks.

Despite this rapid growth, today half of the region's population remain offline, and by 2025 nearly 242 million people will remain digitally excluded, unable to benefit from the social and economic opportunities of the internet. The digital divide is currently greatest in markets such as Haiti, Guatemala, Nicaragua and Honduras, where 70-80% of the population remain unconnected. There remain significant barriers to adoption, particularly

for underserved population groups (rural, women, low income and youth).

Although challenges differ from market-to-market, the recently published GSMA report, *State of Mobile Internet Connectivity*,⁹ found that the two largest barriers to mobile internet connectivity in Latin America remain infrastructure and affordability, the latter driven by higher levels of inequality and taxation; consumers and operators in Latin America are subject to a substantial tax burden.¹⁰

Network coverage alone does not guarantee access. Latin America and the Caribbean has achieved near-universal 3G coverage, with more than 90% of the population covered by 3G networks as of the end of 2017, while significant investment by mobile operators has resulted in 4G coverage reaching 78% of the population; this rose to 82% by mid-2018. The 'coverage gap' – populations with no access to at least 3G network coverage – reduced by 9 percentage points to 7% of the Latin American population between 2014 and 2017.

9. State of Mobile Internet Connectivity, GSMA, September 2018

10. A GSMA Study found that in 2016, the mobile sector in Latin America paid, on average, 25% of its revenues in the form of taxes and regulatory fees. Sector-specific taxes and fees are often the driver of the high tax burden. Sector-specific consumer taxes are imposed in 11 of the 20 studied countries across the region and on average account for one in five dollars spent on taxes. For further details, see Taxing mobile connectivity in Latin America, GSMA Intelligence, 2017

Source: GSMA Intelligence; Speed data from GSMA calculations based on analysis by Ookla of Speedtest Intelligence data

Mobile internet connectivity in Latin America, 2014-2017

Infrastructure

3G population coverage



An additional

70m people

4G population coverage



An additional

300m people

Average download speeds:

Increased

2014

0.9 Mbps

2017

5.6 Mbps



Average upload speeds:

Increased

2014

0.3 Mbps

2017

2.5 Mbps

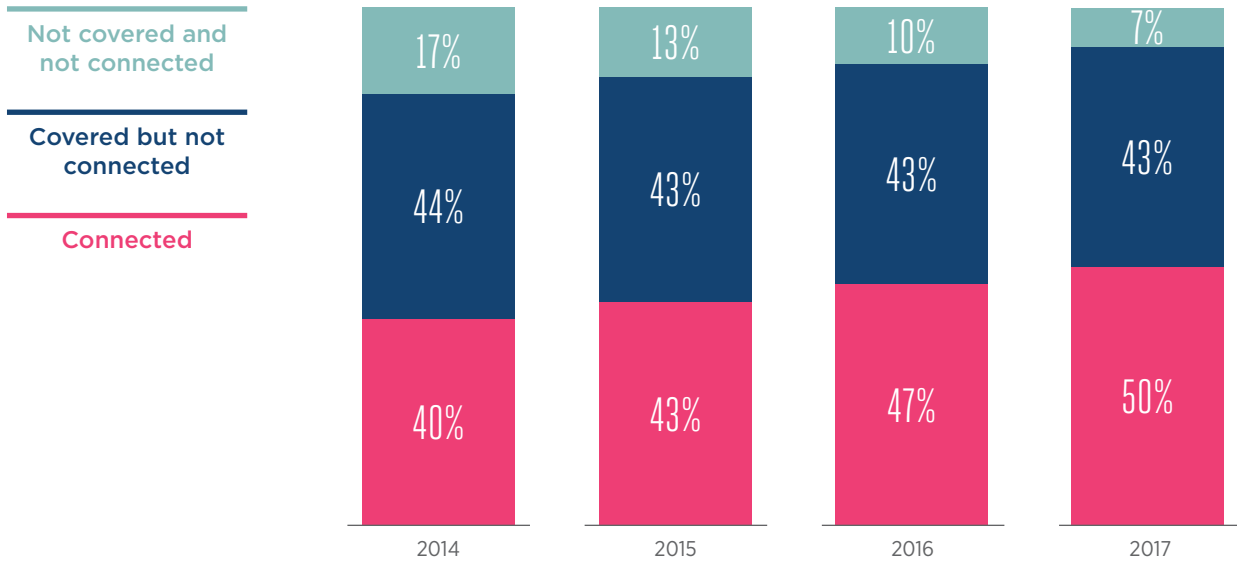


Figure 19

Source: GSMA Intelligence

Connected and unconnected populations

Latin America, 2014-2017



However, while 50% of the region’s population subscribe to mobile internet services, 43% of the population are covered by at least a 3G network but are not connected. This ‘usage gap’, which

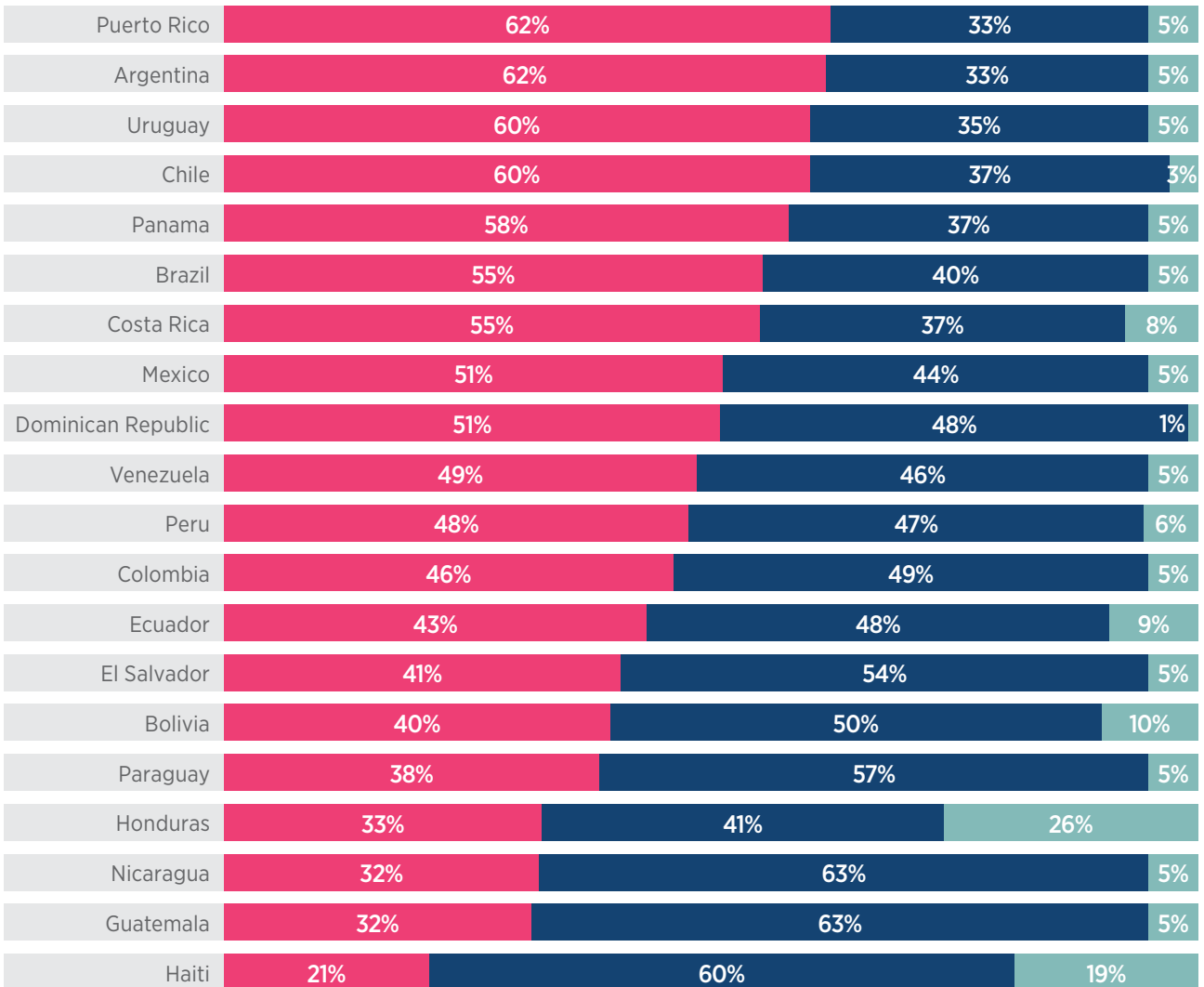
has remained around the same level since 2014, is most pronounced in countries such as Nicaragua, Guatemala, Haiti and Paraguay.



Figure 20

Source: GSMA Intelligence

Connected and unconnected populations, by country in 2017



Connected
Covered but not connected
Not covered and not connected

Part of this gap is driven by affordability, which represents a significant barrier to uptake of mobile services in the region. The total cost of mobile ownership (purchasing a handset and accessing 1 GB of data per month) is more than 5% of the disposable income across every income group in Latin America, compared to 1% in Europe and North America.

High prices, affected by significant telecoms-specific taxes, have the most adverse impact on those on lower incomes, who are to benefit the most from

access to mobile technologies. For the lowest 20% of earners in Latin America, adopting even the most basic mobile service would require 12% of total monthly income, well above the 2% threshold recommended by the UN Broadband Commission. Moreover, consumer taxes represent almost 20% of the total cost of mobile ownership, compared to about 10% in North America, exacerbating affordability issues, especially for those on the lowest incomes.

Source: GSMA Intelligence calculations based on data from Tarifica; World Bank

Mobile internet connectivity in Latin America, 2014-2017

Affordability

Fall in average monthly cost of data



100 MB

2.0%
2014

of monthly GDP per capita

1.3%
2017

500 MB

3.3%
2014

of monthly GDP per capita

2.4%
2017

Average cost of entry-level internet-enabled device stable at

0.8%



of GDP per capita



Inequality – average Gini co-efficient of

45



The GSMA has extensively studied the effects of reforming sector-specific taxes and fees in a number of countries in the region.¹¹ The research argues that rebalancing sector-specific taxes and

fees on the mobile industry will be important to promote greater internet connectivity, which in turn can improve digital inclusion, mobile sector development and economic growth.

11. For further details, see Taxing mobile connectivity in Latin America, GSMA Intelligence, 2017

2.3.2 A regional ecosystem committed to an inclusive and sustainable future

In 2016, the mobile industry became the first to commit as a whole to the United Nations Sustainable Development Goals (SDGs). Since then, operators around the world have shown – through concrete action – their willingness to put aside competition and work together towards a better future.

Latin America is no exception to this collaborative approach to sustainability. Operators in each market have joined forces and aligned behind commitments designed to provide a safer experience for users, and facilitate mobile solutions to social problems. The framework for this cooperation is set out by the

GSMA's We Care Campaign, launched in 2014. Under this initiative, the industry works closely with local authorities and civil organisations to leverage their expertise in specific matters such as public safety, disaster prevention and environment protection.

This past year, the We Care campaign was deployed for the first time in Panama and Paraguay, while operators from Argentina, Mexico and Honduras renewed their engagement, undertaking new commitments. Most initiatives announced in the region focused on achieving SDG 5: Gender Equality, with operators agreeing to work together to help women feel safer, more connected and empowered.

We Care 2017/18 new initiatives

Honduras September 2017	Argentina December 2017	Panama April 2018	Mexico May 2018	Paraguay August 2018
Digital inclusion	Digital inclusion	Disaster response and digital inclusion	Digital inclusion	Handset theft
Tigo joined the GSMA's Connected Women initiative which aims to reduce the gender gap in mobile internet and mobile money services	Supporting the National Women's Institute of the Argentine Ministry of Social Development, Claro, Movistar and Personal ensured free-of-charge calls to #144, Argentina's national line providing advice and support for gender violence victims	Claro, Digicel and Telefónica Movistar signed up to the Humanitarian Connectivity Charter to strengthen response to natural disasters, and committed to foster the development of women in the corporate world	With the support of the Mexican National Telecom Association (ANATEL), AT&T, Telcel and Telefónica Movistar agreed to encourage girls to pursue education and careers in science and technology, and to foster career advancement among women in the corporate world	With the support of the National Telecommunications Commission (CONATEL), Claro, Personal, Tigo and Vox committed to connect to the GSMA IMEI (International Mobile Equipment Identity) Database to exchange stolen device information in order to prevent reactivation



We Care

Working together to provide a safer and more reliable mobile experience



1st
Campaign launched in February 2014



16
Country launches in the region



25
Public commitments of industry initiatives



8
SDGs impacted



10
Different areas of industry initiatives



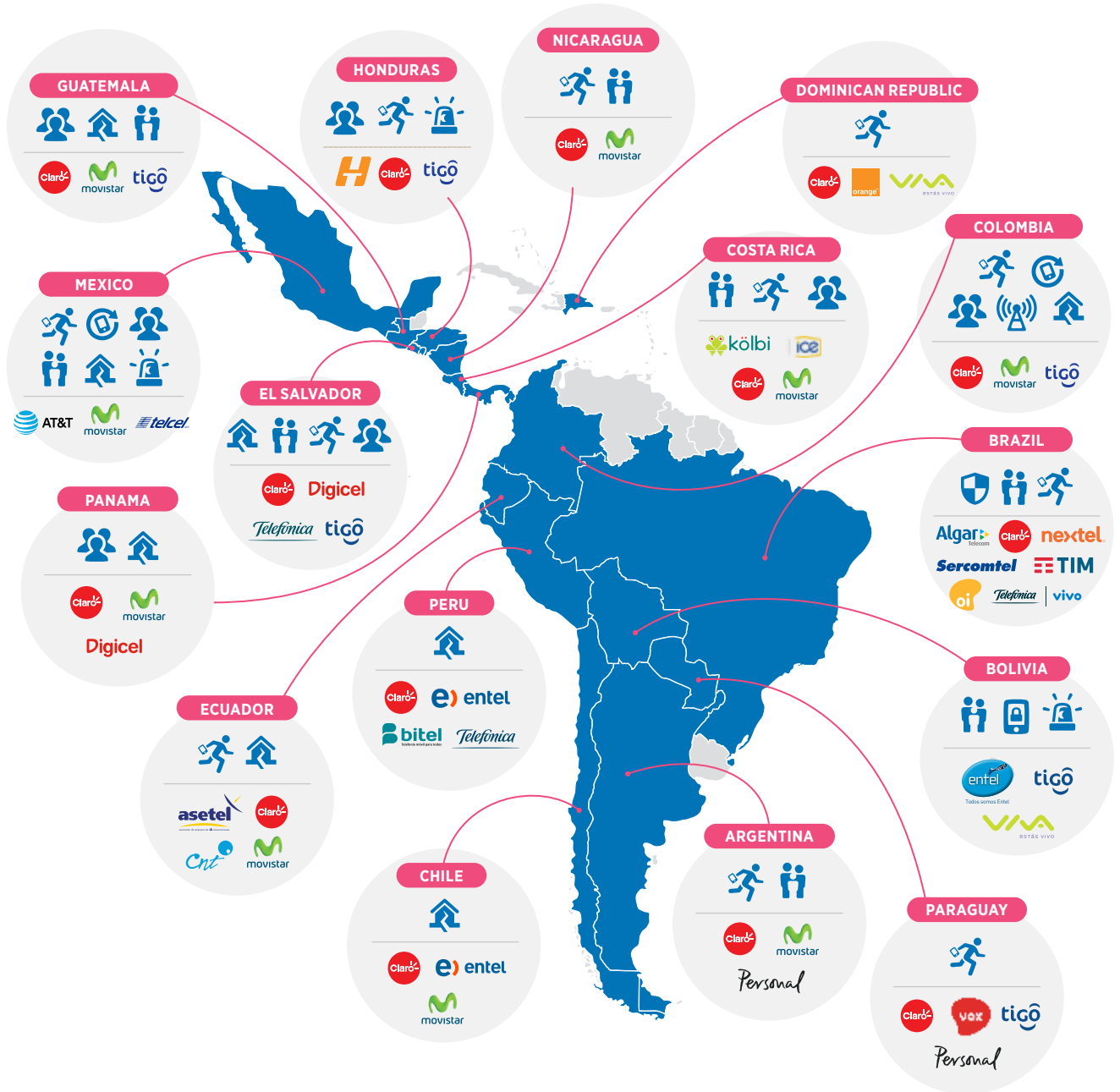
55
Mobile network operators committed to a better sustainable future

	2014	2015	2016	2017	2018
Countries making commitments/announcements	4	4	6	7	3
Operators involved	17	12	19	21	10
Targeted initiatives	4	7	5	4	3

Figure 21

Source: GSMA

Countries that have launched the We Care campaign with joint commitments on SDG-related initiatives



We Care Initiatives



Digital Inclusion



Child Protection



Environmental Care



Disaster Response



SMS Spam Control



Mobile Privacy



Mobile & Health



Infrastructure Deployment



Contribution to Public Safety



Reducing Handset Theft



Mobile's role in bridging the digital gender gap

The regional initiatives focused on SDG 5: Gender equality are a reflection of the mobile industry's understanding of its key role to ensure women empowerment, and its implications for economic development.

In Latin America, as in most parts of the world, mobile is the primary way to access the internet and therefore a source of substantial benefits in areas such as financial services, health, education and entrepreneurship. However, a persistent gender gap in mobile ownership and usage is preventing women from fully participating in the digital economy. This divide is driven by a complex set of social, economic and cultural barriers, in many cases related to the local context: such is the case with safety and

security concerns in Latin America. In Mexico, for instance, 40% of women who do not own a mobile reported concerns about strangers contacting them as a main barrier to ownership (versus 24% of men). In Chile, 49% of women (versus 23% of men) who used a phone but had not used mobile internet highlighted concerns that they or their family may be exposed to harmful content online as a barrier to using mobile internet.¹²

The mobile industry's commitment to bridging the digital gender gap is crucial to ensure that women, as well as societies and economies, do not miss out on the socioeconomic benefits of the digital economy.

Policy recommendations for bridging the digital gender gap

In 2018, digital inclusion was one of the focus topics of Women 20 (W20), the official engagement group of the G20 that advocates for policies towards gender equality. The GSMA undertook the role of Topic Chair on this theme, producing a Policy Brief that sets out recommendations for action to bridge the digital gender gap. These recommendations fed into W20's Final Communiqué submitted to G20 Heads of State, which placed women's access to and use of digital technologies and the internet at the top of the call to action to ensure their digital inclusion.

1. Collect, track and analyse data on women's access to and use of digital technologies and on the presence of women in STEM (science, technology, engineering and mathematics) related courses, careers and leadership positions.
2. Develop holistic policies that focus on the barriers to women's access to and use of digital technologies including accessibility, affordability, safety and security, digital skills and availability of relevant content and services.
3. Promote initiatives that drive equal participation of women and girls in STEM studies and digital-intensive work to ensure that women participate and lead in the design, development and governance of digital technologies.
4. Ensure that all analyses of the future of work, including educational needs and demands for new skills, are performed with a view to gender balance, social protection and job quality.

12. The Mobile Gender Gap Report, GSMA, 2018

Mobile and ICT are key to protecting the environment and tackling climate change

The mobile industry is undertaking initiatives with an impact on SDG 13 (Climate action); in fact, this is one of the goals to which operators are making the strongest contribution.¹³ Such efforts are important in Latin America as countries in the region are particularly vulnerable to the effects of climate variability and extreme weather events.

The ICT and mobile sectors are reducing their own carbon footprints but, more importantly, are enabling other sectors to do so. The application of

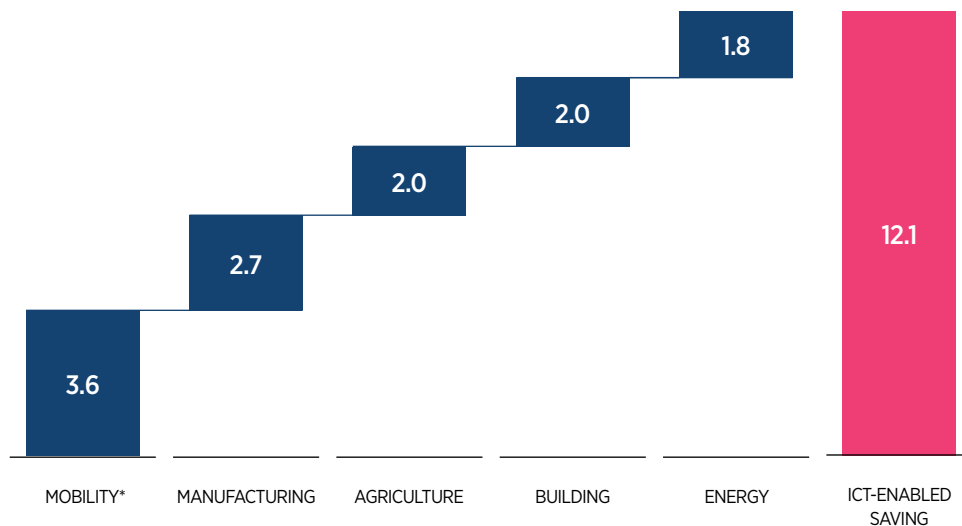
big data and IoT-enabled services and solutions, for example, has the potential to assist industry verticals such as transport, manufacturing and agriculture in reducing their greenhouse gas (GHG) emissions and increase the efficient use of resources, while protecting the environment. A recent joint report between the GSMA and IDB¹⁴ shows how the ICT and mobile sectors will contribute to reducing the world's carbon emissions within the next decade.

Figure 22

Source: GeSI (2015)

How ICT and mobile sectors will deliver substantial carbon dioxide reductions through to 2030

Gt CO₂e



*Mobility solutions include ICT-enabled improvements to private and commercial mobility, and the reduced need to travel from various sectors, including health, learning and commerce.

As an example of how the mobile industry is addressing environmental and social impact, in São Paulo, Telefónica launched a big data pilot to track human mobility, assess its impact on air quality, and gauge the health and wellbeing of inhabitants. Using mobility data, it has been possible

to predict pollution problems up to two days before they occur, allowing the city to take precautions to protect public health, such as guiding traffic via alternative routes and advising vulnerable populations, such as those with respiratory conditions, on areas of high pollution.¹⁵

13. 2018 Mobile Industry Impact Report: Sustainable Development Goals, GSMA, 2018

14. Technology for Climate Action in Latin America and the Caribbean – How ICT and Mobile Solutions Contribute to a Sustainable, Low-Carbon Future, GSMA and IDB, 2018

15. For further information, see: Telefónica Case Study: Predicting air pollution levels 24 to 48 hours in advance in São Paulo, Brazil, GSMA, 2018



03

Policy opportunities for regulatory modernisation



3.1

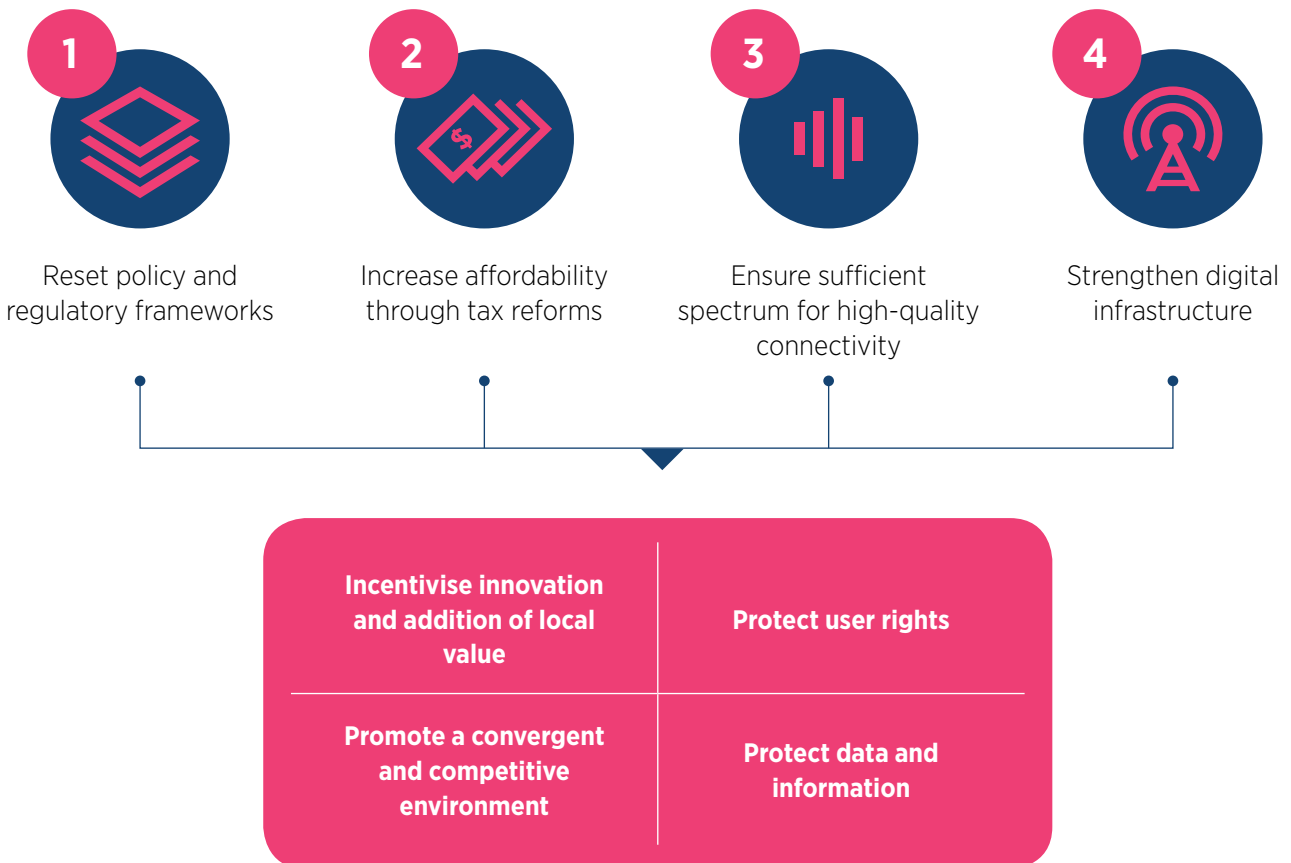
Towards a connected Latin America

Growing digitisation has radically changed the way we communicate. People demand better and faster connectivity, everywhere. The emergence of new products and services, and growing data traffic, provides the opportunity to help communities transition to the fourth industrial revolution (Industry 4.0). To achieve this, public policy must focus on encouraging the development of the digital infrastructure required. This means promoting investment and innovation, and a regulatory context that ensures the digital economy can maximise benefits for citizens, with digitised sectors, new verticals and opportunities in the value chain.

This challenge has arisen in the context of changes in electoral cycles, creating a unique policy opportunity. In 2018 and 2019, more than 435 million Latin Americans are electing new political leaders (in Costa Rica, Paraguay, Colombia, Mexico, Brazil and Venezuela in 2018 and El Salvador, Panama, Guatemala, Uruguay, Argentina and Bolivia in 2019). Governments have the opportunity to reset outdated policy and introduce a future-proof regulatory framework that enables digital inclusion.

Figure 23

How public policy can help fully integrate Latin America into the digital economy



3.1.1 Reset policy and regulatory frameworks

It is important to have flexible policy frameworks designed to provide certainty and predictability, ensuring that companies continue investing in networks and that users can access the benefits of high-quality connectivity.

A number of legislative initiatives have emerged in Brazil, Argentina, Ecuador and Colombia. Brazil's telecoms reform bill, PLC-79, is having a difficult passage through Congress, while Argentina's Law on the Promotion of Infrastructure Deployment and ICT Competition (known as the "Short Law") is going through the legislative process following many institutional and political changes in recent years.

The bill for the ICT Modernisation Law, submitted by Colombia's new administration, is an interesting example of promoting digital development by stimulating the market through incentives and a future vision. Signs of an administration seeking to expand digital inclusion are seen in proposed reforms that include extending licences to 30 years, the potential creation of a convergent authority, combining funds for universal TV and ICT access and service, and an attempt to maximise mid-term socioeconomic benefits (rather than short-term revenue from spectrum licences). Although Colombia may still need to revise its tax reform (which was insufficient with regards to access and affordability) and provide investment certainty in the sector, the country is clearly on the right path.

3.1.2 Improve affordability through tax reform

Tax policy must be consistent with the goal of connecting the unconnected. Mobile networks are the primary facilitator of internet access in the region and should not be subject to tax burdens and fees that act as barriers to affordability and access.

In countries such as Mexico, access to ICT and the internet is considered a constitutional right. Taxing it as a luxury service is inconsistent with this right. The Special Tax on Production and Services (IEPS) should be reconsidered. According to a study by Deloitte for the GSMA,¹⁶ if the IEPS were removed, Mexico could add 1.5 million new connections to the ecosystem and increase its contribution to GDP to \$4.5 billion.

Brazil and Argentina continue to have the region's highest tax burdens on market revenue, at 45% and 30% respectively, compared to a regional average

of 25%. Tax reform in Argentina in 2017 removed the mandatory contribution to fund elite sports body ENARD and lowered excise duty on handsets from 17% to 10%. However, it raised the duty on mobile services, followed a few weeks later by a rise in the value of annual fees for the use of spectrum, putting greater pressure on companies.¹⁷

The trend of maintaining sector-specific taxes is seen across the region. El Salvador, for example, maintains the Special Contribution for Citizen Security and Coexistence (CESC), a 5% tax on all forms of telecommunications. According to a study by Deloitte,¹⁸ reducing the CESC from 5.0% to 2.5% would equate to an estimated mobile sector tax payment reduction of around \$14.1 million in 2018. It is estimated that investment could increase \$70 million by 2021, resulting in better quality networks that meet user demand.

16. Tax reform in Mexico: Unlocking the potential of digital inclusion to support economic and social development, by Deloitte for the GSMA, 2015

17. For more information, see the studies on sector-specific taxes by Deloitte and EY, in Mexico, Argentina, Colombia, Brazil, El Salvador and Honduras, at <https://www.gsma.com/latinamerica>

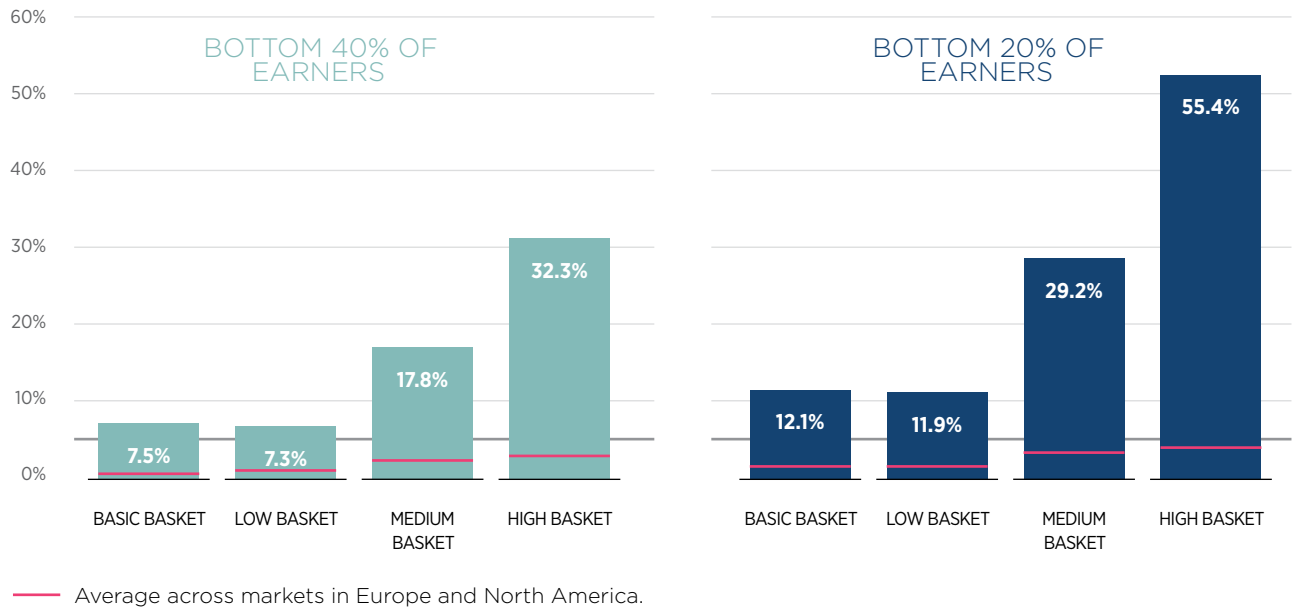
18. Digital inclusion and mobile sector taxation in El Salvador, by Deloitte for the GSMA, 2017

Figure 24

Source: GSMA Intelligence

Cost of mobile ownership as a proportion of monthly income in Latin America¹⁹

TCMO (% of monthly income)



Total cost of mobile ownership (TCMO)

Expressed on a monthly basis



DEVICE COST

ACTIVATION CHARGE

USAGE COST

Mobile services are not affordable for the bottom 40% of earners in all Latin American countries, primarily because of the high tax component.

Also noteworthy is the application of VAT to digital services in some countries, such as Colombia and Argentina, though the efficiency of this measure is yet to be demonstrated. Other countries in the region have expressed an interest in taxing digital

services. Meanwhile, the European Commission is planning to create the Digital Services Tax to address the problem of tax base erosion identified by the OECD.²⁰ Latin America has no supranational authority comparable to the European Union.

19. Taxing mobile connectivity in Latin America, GSMA Intelligence, 2017
 20. For more information about tax base erosion, see <http://www.oecd.org/tax/beeps/>

3.1.3 Ensure sufficient spectrum for high-quality connectivity

With the fourth industrial revolution, the arrival of 5G and the expansion of IoT, it is even more important to have spectrum available in high, mid and low bands to meet demand from users and things. This requires ultra-fast and ultra-reliable connectivity, with almost no latency.

Coverage bands

Some issues remain in the region with regards to the 700 MHz band. Colombia has postponed the release of this band, even though it has the potential to exponentially increase 4G access. It is a good sign, however, that reform includes extending licence terms. The country has also earmarked the 600 MHz band for IMT. Uruguay assigned this band at the end of 2017.

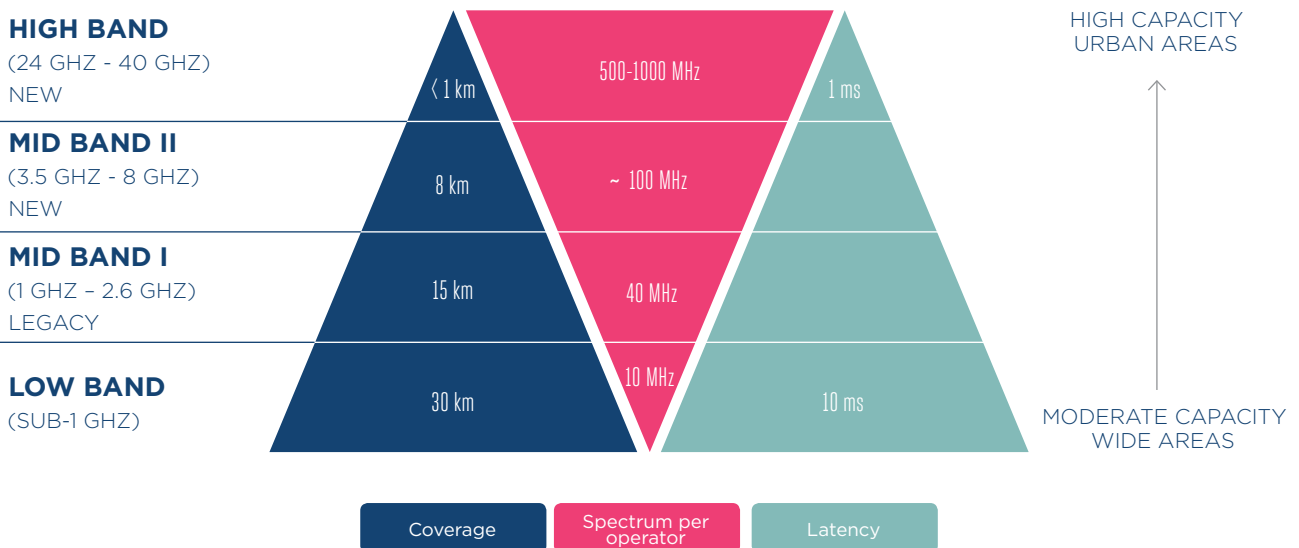
However, more than 30% of Latin American countries have still not assigned the digital dividend band. The figure rises to 60% for Central American countries. The sub-region is lagging behind in mobile broadband deployment and adoption, with a significant lack of available spectrum, having assigned only 21% of the ITU spectrum requirements estimate.²¹ Most governments in the sub-region recognise the importance of broadband access and the potential of digitisation to promote economic growth. However, 4G networks are available to only 35% of the population there, compared to 70% on average for countries in South America.²²

Figure 25

Source: Ericsson

The industry needs more spectrum in high, mid and low bands

5G performance in various spectrum bands



21. Report ITU-R M.2290: Future spectrum requirements estimate for terrestrial IMT, ITU, 2014
 22. Assessing the impact of market structures on innovation and quality, GSMA, 2018

Key bands for 5G

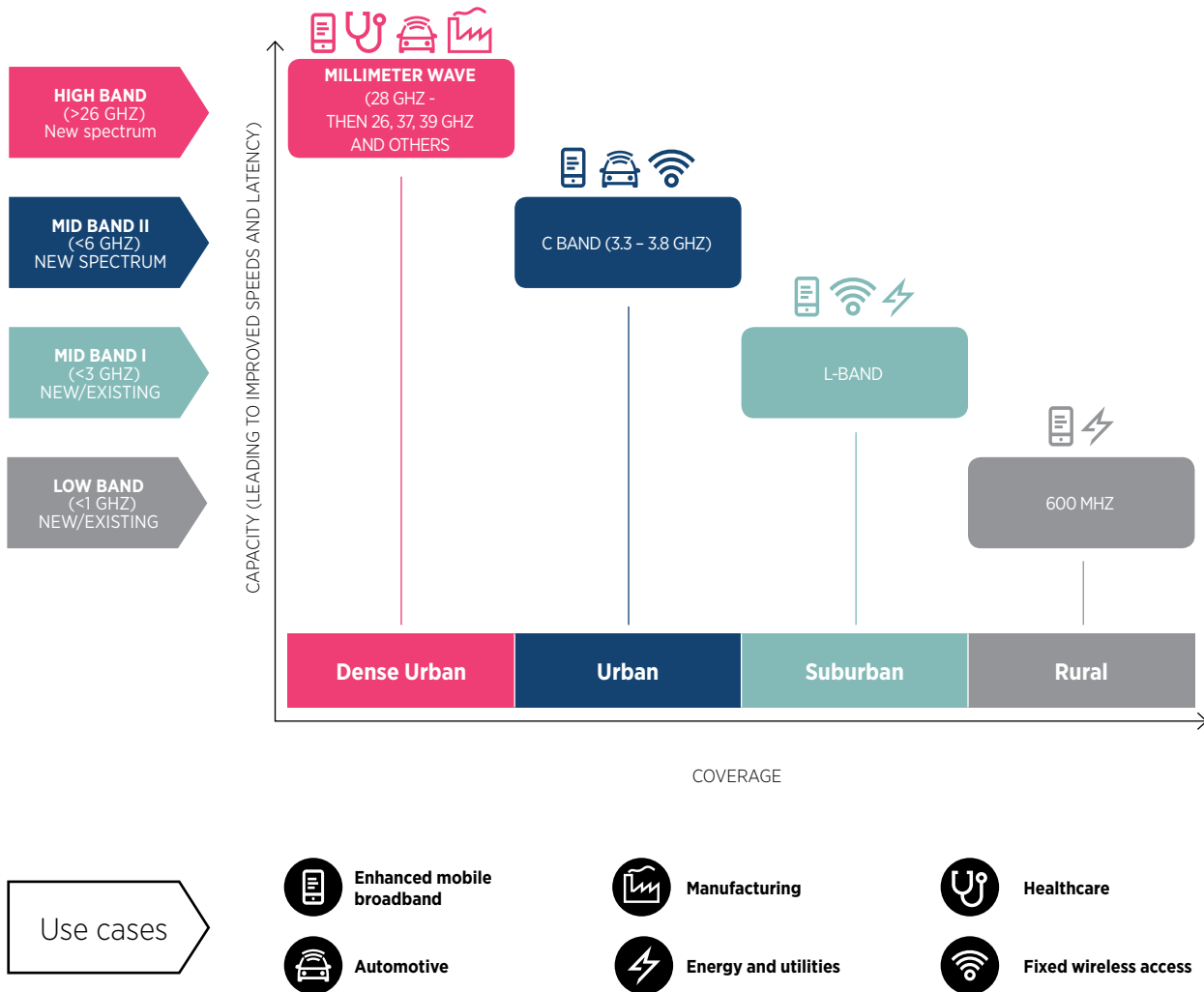
With regards to releasing key bands for 5G and future communications, Brazil has outlined a path by signing the Science and Technology Cooperation Agreement, between its Ministry of Science, Technology, Innovation and Communication and the European Union.²³ They will exchange information and experiences on 5G and IoT. In addition, “Project 5G Brazil” outlines public and private sector policies for rapid technology adoption, while consultation on the 3.5 GHz band and its possible auction in 2019 is ongoing.²⁴

Mexico is also in the leading group of countries in 5G planning, with the clearing of the 600 MHz band in 2018 and the intention to release it to the market in 2019. It is one of the first countries to do this for 5G services. Mexico also successfully auctioned the 2.6 GHz band in an election year, showing signs of an authority independent of political cycles.

Figure 26

Source: Ericsson, GSMA Intelligence

5G requires spectrum in low, mid and high bands



23. At Mobile World Congress 2017

24. In this band, Brazil has earmarked only 200 MHz (3.4-3.6 GHz). Considering that approximately 80/100 MHz per operator will be needed in the mid bands, the country will need to identify ways to extend this range and bring it closer to 3.3-3.8 GHz in order to maximise the full potential of 5G.

The spectrum pricing challenge

Latin American countries that artificially inflate spectrum prices are limiting broadband access and their digital economies. Policy decisions that distort market-based spectrum awards discourage efficient use and have negative outcomes in terms of consumer welfare. Particular issues in Latin America include artificial spectrum scarcity, high reserve prices and annual licence fees, short licence terms, inappropriate coverage obligations and uncertainty over renewals and new awards.

A case in point is Mexico, where spectrum pricing has two components: the amount paid at the time of the auction, determined by the regulatory authority (Federal Telecommunications Institute), which represents around 20% of the total cost, and the amount for annual duties or fees, which represent 80% of the total price on average and are exceptionally high.²⁵ This creates a risk for the sustainability of future networks. The annual cost of spectrum in Mexico represents, for the entire industry, 12.8%²⁶ of total mobile revenue, almost twice that of countries such as the US and three times the average for OECD member countries.

Figure 27

Source: GSMA

Consumers in developing countries hit hard by spectrum prices

Final spectrum prices

in developing markets were more than

3x 

those of **developed countries**

Reserve prices

In developing countries were more than

5x 

those of **developed countries**

A recipe for success



Set modest reserve prices and annual fees, and rely on the market to set prices



License spectrum as soon as it is needed, and avoid artificial spectrum scarcity



Avoid measures which increase risks for operators



Publish long-term spectrum award plans that prioritise welfare benefits over state revenues

25. Determined by Congress through the Federal Fees Law (administered by the Secretariat of Finance and Public Credit)

26. Supporting Mexican digitisation, Coleago Consulting, 2017

3.1.4 Strengthen digital infrastructure

Digital infrastructure is crucial to the development of next-generation technology. Removing barriers to infrastructure deployment is essential.

Growth in data consumption and the number of connected devices will require future networks to have nearly 20 times more capacity than currently. The Development Bank of Latin America, CAF,²⁷ estimates that, to meet broadband demand in Colombia, mobile operators will need to deploy 19,000 more base stations (representing investment of approximately \$6.7 million between 2016 and 2020). Mexico will need to deploy approximately 40,000 more base stations to meet user demand for connectivity by 2020.

Digital infrastructure is the vital structure that supports networks and quality of connectivity. However, its development is hindered by one of the key regulatory barriers in the region. In some municipalities, boroughs and departments, the rules for authorising deployment are so strict that implementing new sites is becoming impossible. Cases of automatic authorisation due to the failure of an authority to answer on time (also known as “administrative silence”), as seen in Nicaragua and Peru, represent first steps towards better practices for sufficient deployment. The procedures and requirements for infrastructure deployment must be simplified and standardised. This will reduce deployment costs for operators and enable them to cover currently unserved areas.

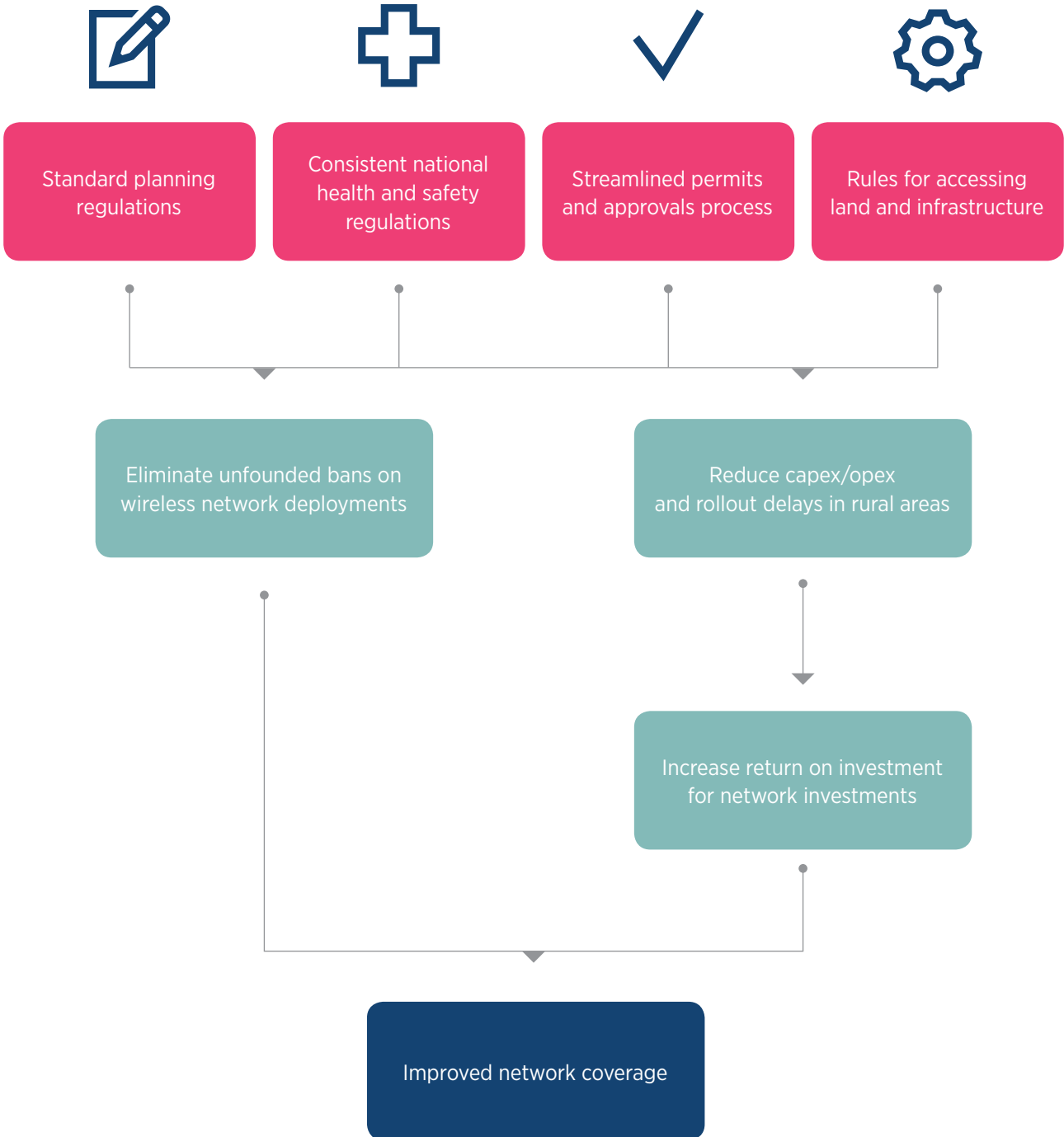


27. Expansión de la Band Ancha Móvil, CAF, 2017

Figure 28

Source: GSMA

Measures to reduce red tape at the local level²⁸



28. Enabling rural coverage: Regulatory and policy recommendations to foster mobile broadband coverage in developing countries, GSMA, 2018

3.2

Public policy focusing on digital inclusion, innovation and sustainability of investments

Defining coordinated public policy with a vision of the future

Having multi-year digital agendas, as suggested by the OECD for countries requesting membership (e.g., Costa Rica, Argentina and Peru), makes it possible to plan the creation of mid- and long-term policies. Such policies must have the flexibility to allow for the emergence of new digitised verticals (healthcare, transport, security, banking), the imminent arrival of 5G, and automation.

Digital agendas must have a clear entity responsible for them. This entity will build consensus through socio-political agreements among stakeholders which, as state policy, can continue beyond the term of the administration in power at the time.



Policy recommendations



Institutional design

1. Ensure a regulatory authority independent of political cycles that acts on a framework of convergence and incorporates the entire IT value chain.
2. Give preference to frameworks based on general principles, with ex-post interventions where necessary, avoiding restrictive regulation that holds back innovation.
3. Consult on international best practice to understand the risks and opportunities of policy decisions.
4. Conduct public consultations to enrich processes with the experience of associated interest groups.
5. Position the national digital agenda as a cornerstone of state policy. Clearly define powers and roles, seeking cooperation for policy implementation.



Tax policy

6. Consider providing tax exemptions as incentives for the installation of new infrastructure and voluntary sharing.
7. Remove sector-specific taxes that distort access to mobile devices and services.
8. Transfer the use of universal access/service funds to connectivity projects for the unconnected.
9. Encourage public-private ventures for connectivity projects.
10. Provide demand-side subsidies (particularly at the bottom of the income pyramid) and tax exemptions.
11. Incentivise investment through a broad-based tax system that is simple and transparent, with a stable and predictable design that generates fewer costs for companies and provides greater investment certainty.



Spectrum

12. Plan spectrum awards, understanding their role as an enabler of high-quality communications, availability and ubiquity rather than as a source of revenue.
13. Create a sustainable spectrum plan for the future, with regular goals. Roadmaps are essential to ensure sufficient spectrum is available to match growing user demand.
14. Regularly review roadmaps (as constantly evolving documents), available bands and their time horizons.
15. Implement a clear, timely process for spectrum licence renewal.
16. Participate in international dialogue on the bands necessary for the future of communications.



Digital trust

17. Ensure a horizontal and neutral privacy policy framework to strengthen digital trust.
18. Encourage the principle of consumer transparency so users can compare available offers, stimulating competition.
19. Plan a strategic vision of training in digital skills and digital literacy, both for educators and children/young people.
20. Encourage the creation of locally relevant content, particularly to boost the productivity of local communities.



Digital infrastructure

21. Promote the use of “one-stop shops” and streamlined processes for procedures and authorisations.
22. Make public buildings available for the installation of telecoms infrastructure.
23. Include in deployment forecasts the potential density needed for 5G
24. Create incentives to accelerate migration to new technologies.
25. Coordinate the agendas of ICT policymakers with sectors likely to enable development of 5G verticals. Promote ex-post regulation with frameworks of general principles so that innovation can bring new advanced, digital services to urban and rural areas.

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