ERICSSON

LATIN AMERICA AND THE CARIBBEAN

ERICSSON MOBILITY REPORT

NOVEMBER 2016

MARKET OVERVIEW

Key figures: Latin America and the Caribbean

	2016	2022	CAGR 2016–2022
Mobile subscriptions (million)	705	790	2%
Smartphone subscriptions (million)	405	590	6%
Data traffic per active smartphone (GB/month)	1.6	9.6	35%
Total mobile traffic (EB/month)	0.7	5.5	40%

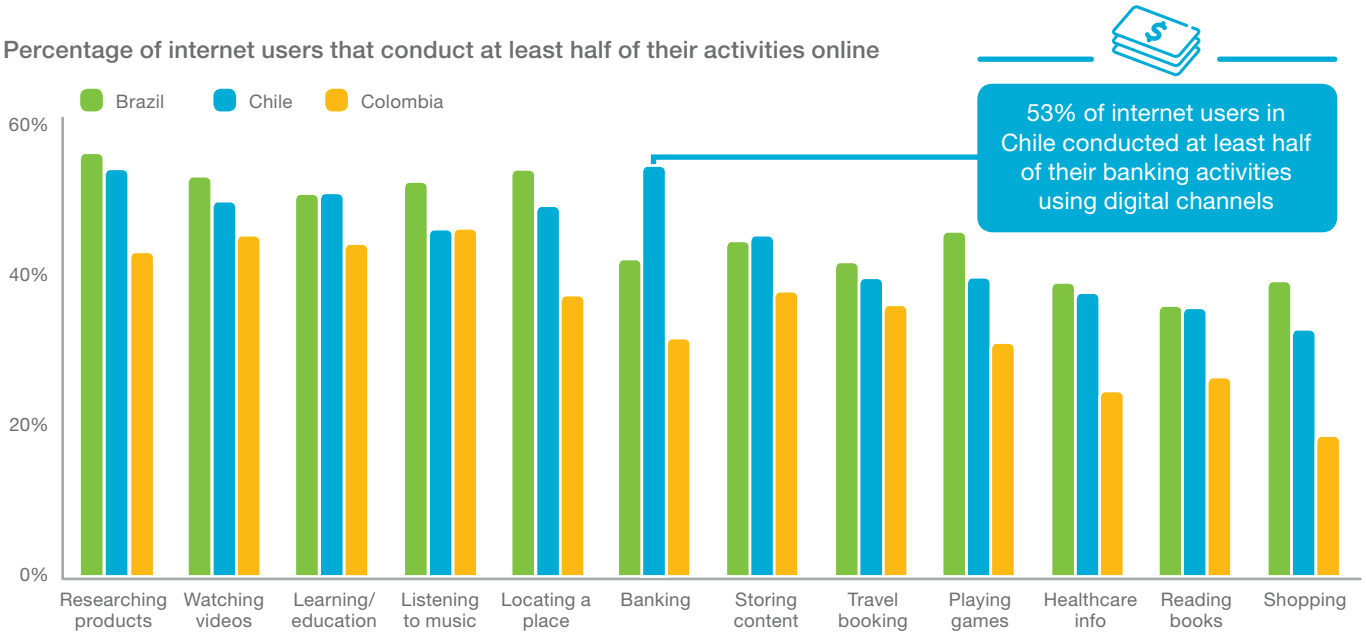
Industry opportunities despite the economic downturn

The region's economic conditions have deteriorated over the last year: the economy is contracting, inflation has reached the highest levels since 1995 and currency devaluation has affected many countries. A number of factors have contributed to the economic downturn, including a prolonged recession in Brazil, a severe economic crisis in Venezuela, as well as regional economic commodity dependence. Bright spots such as Mexico, Central America and the Caribbean do not compensate for the regional deceleration.

In the information and communications technology (ICT) industry, there is a general concern about shrinking revenues and capital investment levels. However, ICT constitutes an important driver for economic development. Mobile technology is already playing an invaluable role in social, economic and environmental advances, and mobile broadband has the potential to trigger innovation and growth in the region. In a networked society there will be an increasing demand for digital services and evolved communication technologies, as well as for Internet of Things (IoT) applications. By 2022, around 720 million mobile broadband subscriptions and around 100 million cellular IoT subscriptions are expected in the region.

Consumers in Latin America are fast moving towards a networked society. Life is more digitalized than ever and many daily activities are conducted online, rather than via the traditional channels. In Chile, over a period of 12 months, 53 percent of internet users conducted at least half of their banking activities using digital channels. Further to this, in Colombia, 44 percent used e-learning for educational activities at least half of the time; while in Brazil, 38 percent looked for health information on the web at least half of the time.[1]

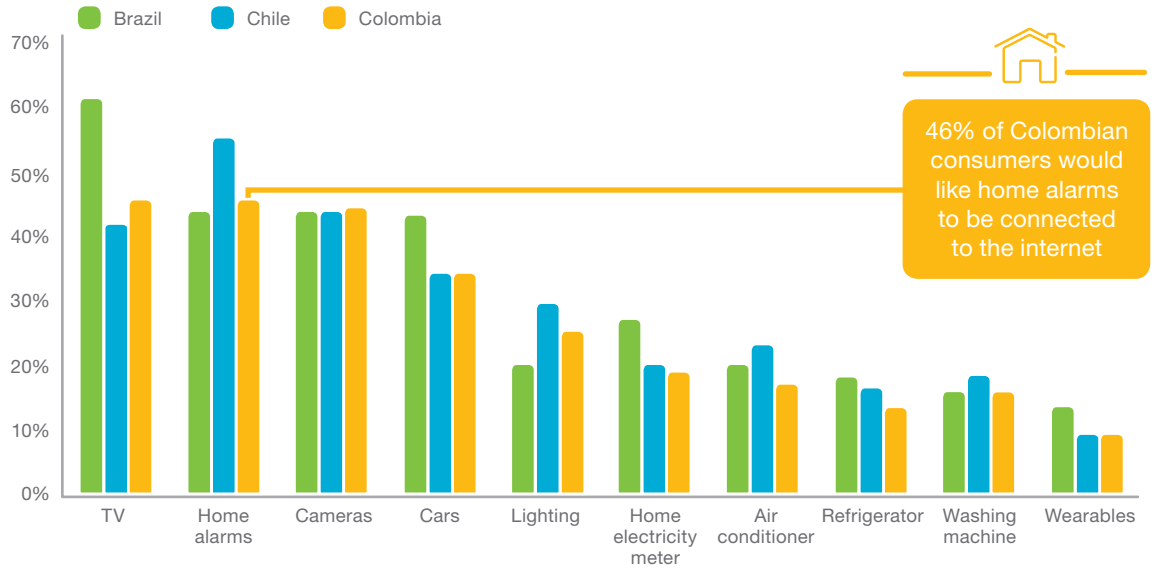
Percentage of internet users that conduct at least half of their activities online



Source: Ericsson ConsumerLab, The Networked Consumption (2015) Base: Brazil, Chile and Colombia

[1] Ericsson ConsumerLab, The Networked Consumption (2015) Base: Brazil, Chile and Colombia

Percentage of consumers that would prefer the following devices to be connected to the internet



Source: Ericsson ConsumerLab, The Networked Consumption (2015) Base: Smartphone users accessing the internet in Brazil, Chile and Colombia

Growing smartphone market

The region's smartphone market is increasing. By the end of the year, it will represent almost 60 percent of total mobile subscriptions. This, plus improved connectivity and an extensive choice of apps, is enhancing the usage of online services throughout the day. For many consumers, smartphones constitute the first way to experience internet services, as many have limited access to computers and fixed broadband. For others, smartphones and apps provide immediate and easy access to digital services, reducing the gap between early adopters and followers and accelerating adoption.

Mobile broadband subscriptions will continue to increase alongside a more connected lifestyle. Permanent and high-quality connectivity is essential to support this new ecosystem where people, society and industries rely on digital channels.

100 million cellular IoT connected devices by 2022

IoT is another area of growth opportunity for ICT. By 2022, it's estimated that there will be approximately 18 billion cellular and non-cellular connected devices worldwide. There will be around 1.5 billion global cellular IoT devices, and almost 100 million of these will be in Latin America.

TV is the device that consumers would most like to be connected to the internet for a better user experience; a result driven by the current awareness and popularity of smart TVs. Due to security being a common concern in the region, this is followed by home alarms in second place, with other items such as cars, cameras, wearables and smart home related devices also among the top 10 most wanted IoT devices.[2]

To provide the widespread connectivity that would make these IoT applications possible, the deployment of a digital infrastructure and efficient networks is necessary. LTE and 5G technologies will have the wireless data transmission speeds and latency rates needed to secure massive and critical IoT use cases.

[2] Ericsson ConsumerLab, Infocom (2015), Brazil, Chile and Colombia

MOBILE SUBSCRIPTIONS

By the end of 2016, over 10 percent of the 705 million mobile subscriptions in Latin America will be LTE. This figure is expected to increase to more than 50 percent in 2022, when around 420 million mobile subscriptions will make LTE the leading technology, surpassing WCDMA/HSPA

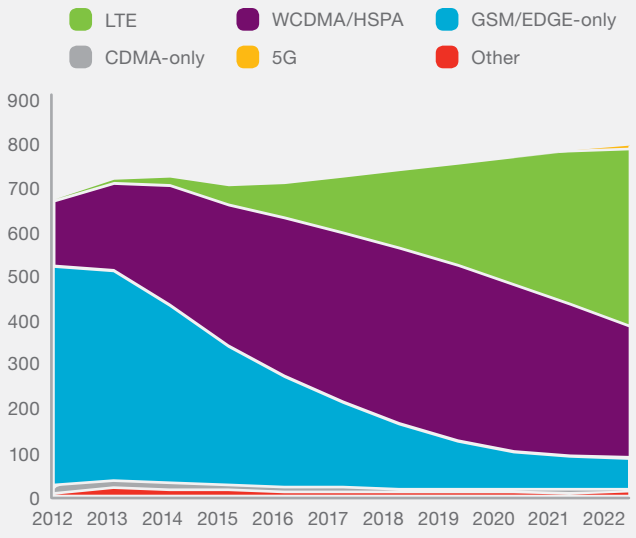
In the region, around 30 countries are rolling out LTE and continuing to improve coverage, with approximately 80 networks launched.[3] Over the coming years, operators are expected to continue transitioning mobile users to LTE in order to provide faster, more effective connections and advanced communication services.

WCDMA/HSPA accounts for around 50 percent of subscriptions in 2016. However, the proportion of subscribers will decrease during the forecasted period to 40 percent.

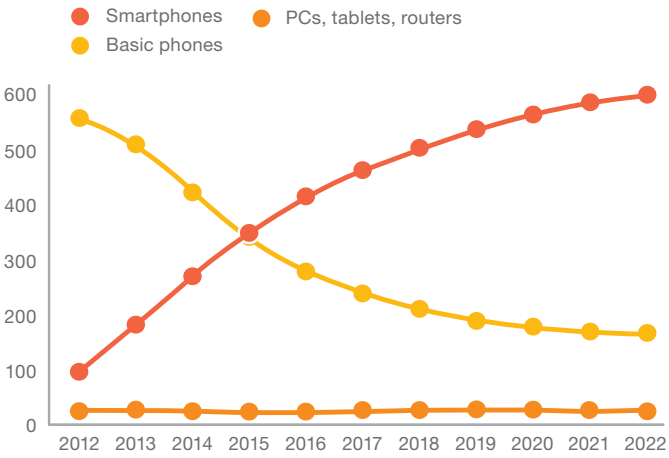
GSM/EDGE-only currently represents one third of subscriptions. However, a decrease to less than 10 percent is estimated by 2022, when the technology will be linked mainly to low cost subscriptions and IoT connections with small data traffic volumes.

5G trials are expected in the coming years. By 2022 it is estimated there will be 2 million 5G subscriptions in the region. 5G will support critical IoT connections that require ultra-reliability and very low latency, such as industrial applications, remote healthcare and traffic safety as well as enhanced mobile broadband.

Mobile subscriptions by technology, Latin America (million)



Mobile subscriptions per device, Latin America (million)

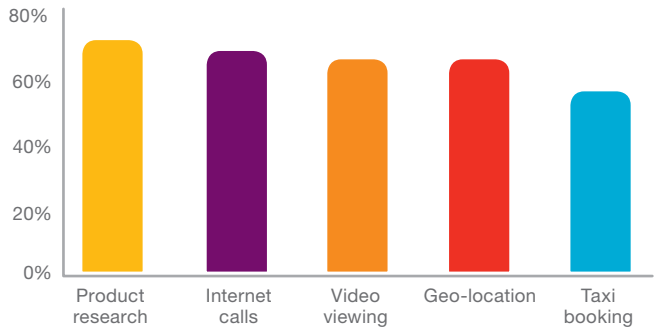


Smartphone and app usage is growing

Smartphone subscriptions have surpassed basic phone subscriptions, and will account for more than 75 percent of all subscriptions by 2022. Growing at a compound annual growth rate (CAGR) of over 6 percent between 2016 and 2022, they will represent around 595 million of the total 790 million mobile subscriptions in the region by the end of the forecasted period.

With the increased usage of smartphones, apps are flooding the market. Across all internet users, the use of mobile apps for different activities is growing. Digital services are no longer exclusively for advanced users, but are reaching the masses – and this has a direct impact on data traffic.[4]

Percentage of people in Latin America with increased usage of each mobile app over a period of 12 months



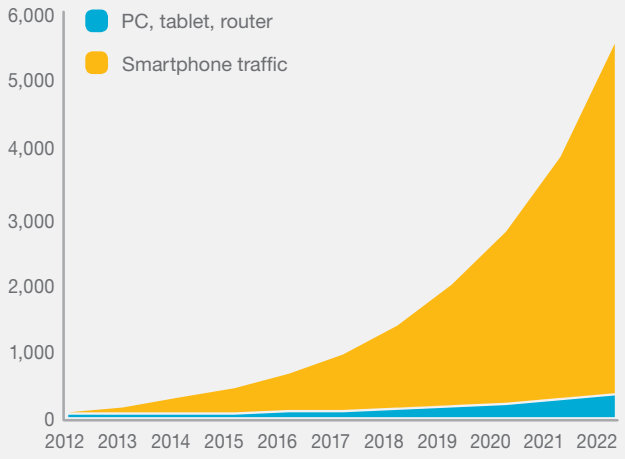
Source: Ericsson ConsumerLab, Analytical Platform 2015, Brazil, Chile and Colombia
Base: Smartphone users accessing the internet in Brazil, Chile and Colombia

[3] GSA (July 2016)
[4] Ericsson ConsumerLab, Analytical Platform 2015

MOBILE TRAFFIC

The growing smartphone subscription base and the usage of mobile broadband to access a wide range of services and information will lead to strong growth in mobile traffic. Total mobile traffic is expected to grow annually by 40 percent, increasing from 0.7 ExaBytes (EB) per month in 2016 to 5.5 EB per month by 2022. This equates to 8 times more mobile data traffic in 2022 than in 2016

Mobile data traffic, Latin America split per device (TB/month)



In 2022, almost all regional mobile traffic is expected to be from data, with voice representing less than 1 percent. Around 95 percent of data traffic is anticipated to be generated by smartphones, and only 5 percent will be linked to PCs, tablets or routers. Additionally, data traffic per active smartphone is expected to increase sixfold from 1.6 GigaBytes (GB) per month in 2016 to 9.6 GB per month by 2022.

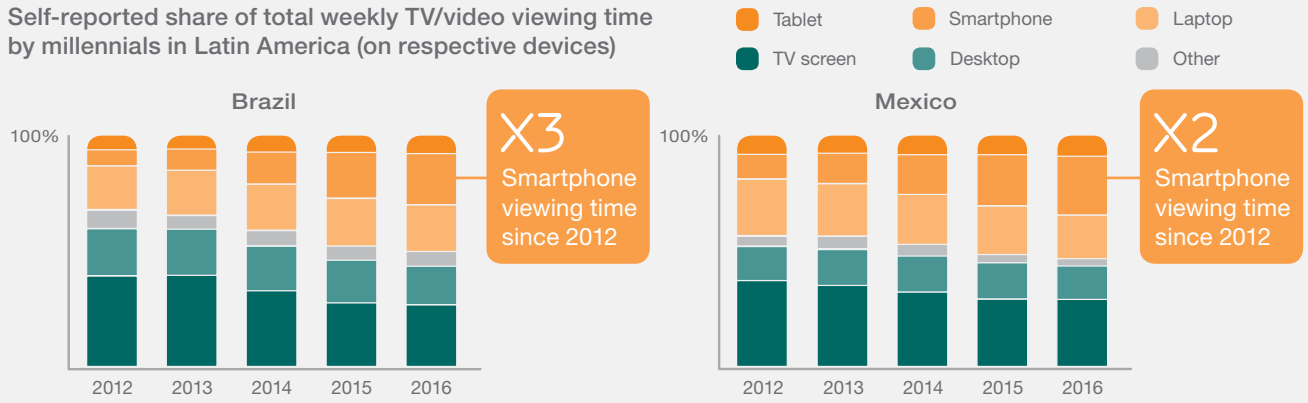
Video is the main generator of traffic. On top of the popularity of YouTube and Netflix, social networks such as Facebook, Twitter and Snapchat are moving to more live video streaming experiences. This is generating a large amount of traffic in the networks, with video now accounting for 50 percent of global mobile data traffic – a figure that is expected to increase to 75 percent by 2022.

Millennials' smartphone screen time keeps increasing[5]

TV and video viewing behaviors are changing, especially among younger generations. 78 percent of people aged 16–34 who watch TV/video at least weekly and have broadband at home in Brazil consider computers and the internet a natural part of TV and video consumption, while 67 percent of older generations think this way. In Mexico, 54 percent of millennials feel that their total TV and video viewing time has increased as it is now made easier thanks to smartphones or tablets. This compares to 38 percent of those in the country aged over 35 that share the same sentiment.

In fact, for millennials, mobile video viewing time has increased faster than for older groups; a trend particularly driven by smartphone screens. Interestingly, across all mobile devices, laptops have maintained around a 20 percent share of the total viewing time over the years. In comparison, in Brazil, the smartphone share of the total viewing time is now around 20 percent, tripling since 2012. In Mexico it has doubled and is now over 20 percent.

Self-reported share of total weekly TV/video viewing time by millennials in Latin America (on respective devices)



Source: Ericsson ConsumerLab, TV Study 2016, Mexico and Brazil
Base: Millennials aged 16–34 who watch TV/video at least weekly and have broadband at home

[5] Ericsson ConsumerLab, TV Study 2016, Mexico and Brazil

NETWORK PERFORMANCE

Video streaming on mobile devices is changing consumers' expectations of mobile networks. In terms of performance, video is the most demanding application category and, as a result, operators find it difficult to provide a good user experience. For example, in Brazil, 47 percent of smartphone users say they face video streaming issues daily, such as video load times and buffering effects[6]

A combination of uplink and downlink throughput and latency is what contributes to the users' perception of connection speed and time-to-content. The higher the uplink and downlink throughput, and the lower the cell-edge latency, the better the user experience. Operators must optimize these areas to achieve user satisfaction.

Cell-edge performance has shown a positive evolution over the last year. However, there is still room for network improvement in all countries, as can be seen in the chart on the right.

Among the analyzed countries, Mexico has the best throughput and latency trends and rates and, therefore, a higher possibility of a positive user experience. Low latency rates translate into better time-to-content; a key factor for activities such as online gaming or teleconferencing. On the other hand, a good downlink throughput rate improves the experience in circumstances such as downloading large files or large web pages.

The measurements on the right demonstrate that improvements are needed in Colombia to reduce latency, as well as in Chile to increase throughput. In Argentina and Brazil, both of these areas need attention; a fact that is reflected in the perception of consumers. In Brazil, 74 percent of smartphone users report that they face issues daily. Video streaming issues, such as delays loading video and buffering effects, are the most common issues, followed by slow data connection – with 47 percent and 39 percent of smartphone users facing these problems daily, respectively. The mobile broadband experience is of particular concern because, in Brazil, mobile broadband experience is twice as important for driving smartphone user loyalty than voice experience.[6]

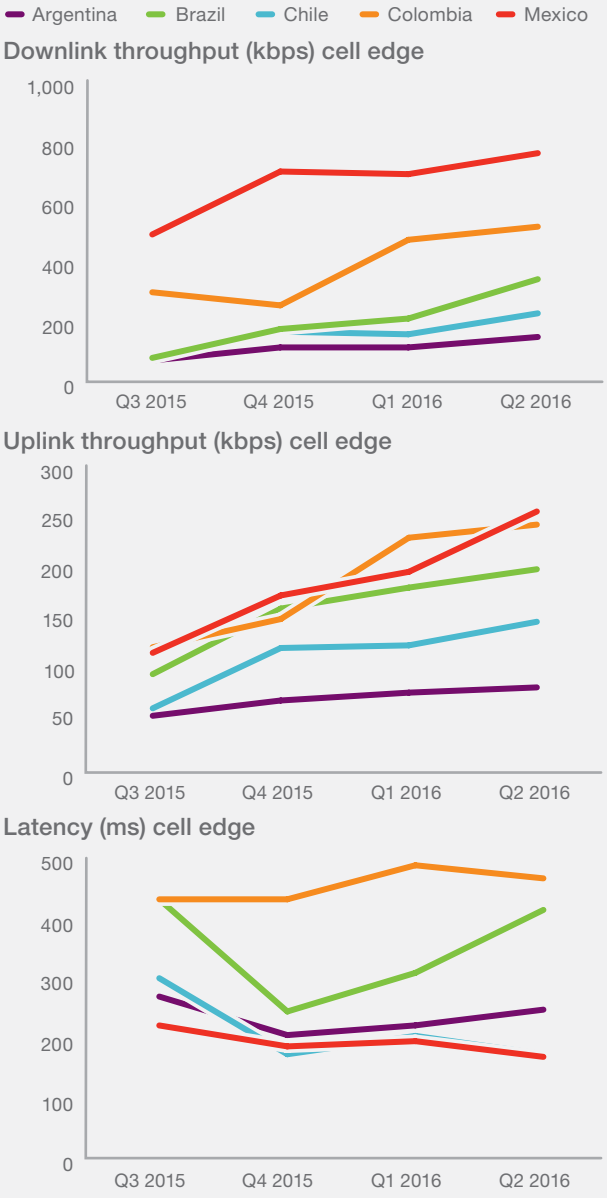
Top three issues and percentage of smartphone users facing them

Report issues with video streaming

Report issues with slow data connection

Report issues with slow web page download

Cell-edge throughput (kbps) and cell-edge latency (ms) per country



Source: Ericsson analysis on Speedtest intelligence data from Ookla (Q2, 2016). The user experience improves when there is higher uplink and downlink throughput and the lower the cell edge latency

[6] Ericsson ConsumerLab, Experience Shapes Mobile Customer Loyalty (2016), Brazil

MORE SPECTRUM, MORE INNOVATION

In Latin America, the assignment of new spectrum licenses is crucial in order to drive mobile industry investments that will close the digital divide and increase the level of innovation in a demanding macroeconomic environment

Some Latin American countries have made significant progress over the past year, assigning new spectrum licenses in 3rd Generation Partnership Project (3GPP) bands of 700 MHz, AWS-Extension and 2.5 GHz, and boosting the growth of much needed LTE services.

At the recent ITU-R World Radiocommunication Conference 2015 (WRC-15), a new set of frequencies was identified that will enable Latin American markets to cope with growing mobile traffic demand over the next few years. These included C-band (3.4–3.7 GHz) and L-band (1,427–1,518 MHz), and for some markets, 614–698 MHz and/or 470–608 MHz bands. These bands will be key to reaching the lower end of ITU-R estimates of 1,340 MHz spectrum requirements for the year 2020.

Points for governments to consider

- Continue expediting the release of 700 MHz, AWS extension and 2.5 GHz spectrum
- Introduce timely licenses of L-Band, 3.5 GHz and 470–698 MHz
- Relax current spectrum caps
- Allow LTE Licensed Assisted Access in unlicensed spectrum bands of 5 GHz
- Provide clarity for the early introduction of 5G service

Governments need to plan for the new spectrum bands required to successfully introduce 5G services by 2020. This is needed to support enhanced mobile broadband, as well as emerging machine-type communication and low-latency communication systems. 5G subscriptions will also support a wide range of use requirements for IoT. To enable this wide range of services, different types of spectrum will be needed, ranging from the so-called UHF spectrum (starting from 450 MHz) for coverage requirements, and 24.25–86 GHzfor the extremely high peak data rates; the latter will be considered at the ITU WRC-19. In alignment with leading nations, including the US, Japan and Korea, some governments may even consider designating new bands for 5G services before WRC-19, such as the 28 GHz, 600 MHz and/or 3.5 GHz bands.

In addition to this, operators are expected to focus on enhancing user experience as a main differentiator, by upgrading their networks with technologies such as LTE LAA (by aggregating 5 GHz spectrum) for increased capacity and improved indoor coverage. Spectrum leasing is already occurring in Latin America, providing a flexible approach for operators to optimize their spectrum utilization in cases where it is operationally viable. Additional spectrum will be required for microwave backhaul to cope with the evolution of 4G and 5G services; particularly for new bands such as the E-band (71–76/81–86 GHz), which is a priority for microwave backhaul in the Latin American region.

To keep up with the heavy capital investments required to close the digital divide in the region, the price per megahertz will be a key point in the next five years.

New 5G spectrum bands under consideration around 2020

- 24.25–27.5 GHz
- 31.8–33.4 GHz
- 37.0–43.5 GHz
- 45.5–50.2 GHz
- 50.4–52.6 GHz
- 66–76 GHz
- 81–86 GHz

Ericsson is the driving force behind the Networked Society – a world leader in communications technology and services. Our long-term relationships with every major telecom operator in the world allow people, business and society to fulfill their potential and create a more sustainable future.

Our services, software and infrastructure – especially in mobility, broadband and the cloud – are enabling the telecom industry and other sectors to do better business, increase efficiency, improve the user experience and capture new opportunities.

With approximately 115,000 professionals and customers in 180 countries, we combine global scale with technology and services leadership. We support networks that connect more than 2.5 billion subscribers. Forty percent of the world's mobile traffic is carried over Ericsson networks. And our investments in research and development ensure that our solutions – and our customers – stay in front.

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