



ERICSSON



SOUTH EAST ASIA AND OCEANIA

ERICSSON MOBILITY REPORT

JUNE 2016

MARKET OVERVIEW

Key figures: South East Asia and Oceania

	2015	2021	CAGR 2015–2021
Mobile subscriptions (million)	990	1,250	4%
Smartphone subscriptions (million)	340	820	15%
Data traffic per active smartphone (GB/month)	1.2	9	40%
Total mobile traffic (EB/month)	0.5	6	55%

For people in South East Asia and Oceania, mobile broadband and mobile phones (particularly smartphones) have become an integral part of life. This allows consumers to be continually connected and perform various online tasks

The availability of mobile broadband and smartphones continues to grow in the region. In fact, smartphone subscriptions are anticipated to increase at a Compound Annual Growth Rate (CAGR) of 15 percent, up until 2021.

The rise of mobile broadband is attributed to a number of factors, including the affordability of smartphones and other devices, as well as the increasing popularity of data-intensive app types, such as video. Along with increased mobile broadband availability, consumers will require consistent access to a variety of online services.

Mobile technology is already playing an invaluable role in social, economic and environmental advances in the developing world – and mobile broadband has the potential to trigger an entirely new wave of growth and innovation in South East Asia and Oceania, through the introduction of local and regional applications and services.



In South East Asia and Oceania, smartphone subscriptions are expected to increase at a Compound Annual Growth Rate of 15 percent, up until 2021

YouTube dominates apps

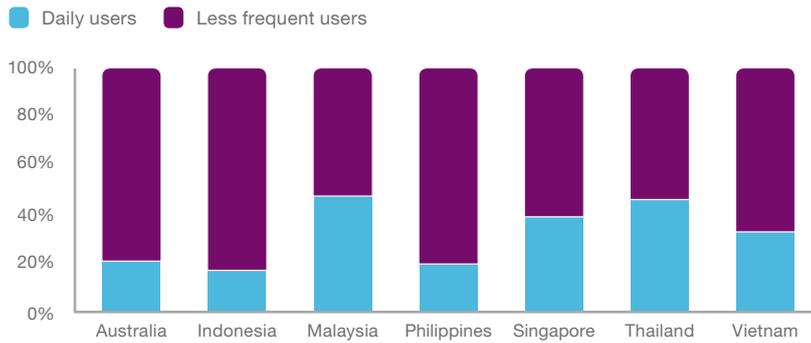
In South East Asia and Oceania, social networking, video streaming, messaging and browsing continue to be among the most popular smartphone apps, with some local variations. For example, Google Maps is in the top five smartphone apps for Australia.

Top five smartphone apps per country, based on number of monthly active users

	Australia	Indonesia	Malaysia	Philippines	Singapore	Thailand
1	Google Maps	YouTube	WhatsApp	Facebook	WhatsApp	LINE
2	Google	WhatsApp	Facebook	Facebook Messenger	YouTube	YouTube
3	Google Chrome	BBM	YouTube	YouTube	Google Chrome	Facebook
4	YouTube	Google	Google Chrome	Google Chrome	Facebook	Google Chrome
5	Facebook	LINE	Google	Google	Google	Google

Source: Ericsson analysis on App Annie data for Android smartphone apps (May 2016), in each country

Daily users of social networking, instant messaging and online videos



In Malaysia and Thailand, almost half of smartphone users access social networking, instant messaging and online videos on a daily basis

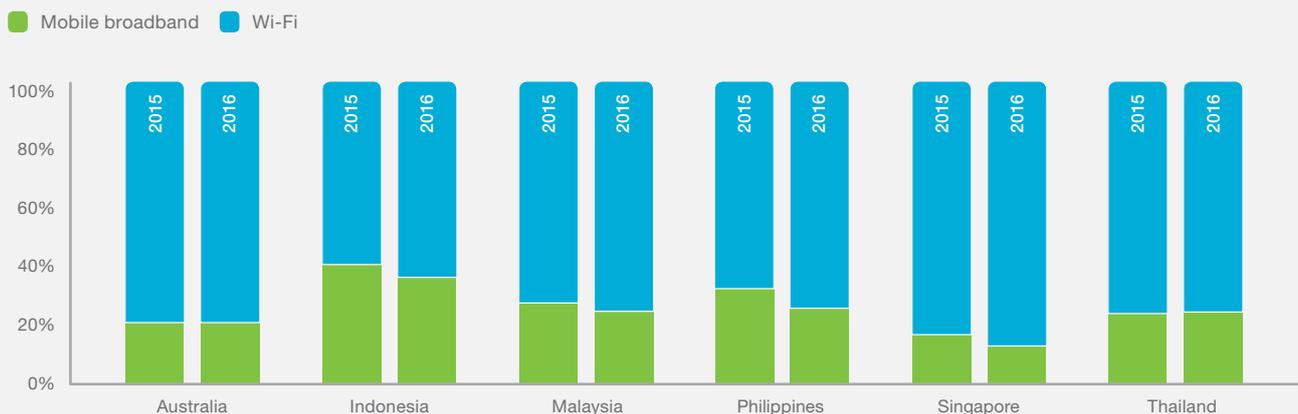
Source: Ericsson ConsumerLab Analytical Platform (2015)
Base: Smartphone and weekly internet users, aged 16-65 years old, in each country

Daily users of key application categories

In the region, around 20 percent or more of smartphone users access social media, instant messaging and online videos daily. In Thailand, Singapore and Malaysia, this number is higher, with between 40 to 50 percent

of smartphone users accessing these key application categories daily. When it comes to the profiles of this user group, there are differences between countries. However, on the regional level, there is an overrepresentation of those who are young, educated and single within the user group.

Share of smartphone data traffic on mobile broadband and Wi-Fi per user



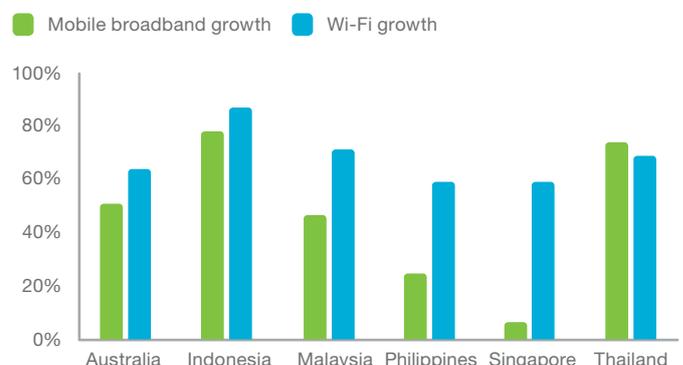
Source: Ericsson analysis on App Annie data for Android smartphones (March 2016), in each country

Mobile broadband data traffic vs. Wi-Fi data traffic

The region's mobile broadband and Wi-Fi data traffic on smartphones continues to grow. User-generated data¹ shows that all markets experienced increases in average data traffic per user for mobile broadband and Wi-Fi.

When comparing March 2016 and March 2015, the region's mobile broadband data traffic proportion slightly decreased, especially for Indonesia and Philippines, while Wi-Fi continues to have a larger share of the overall smartphone data traffic. This is due to users postponing the usage of data-intensive apps, such as video, until a cost-effective connection is available. Besides this, 'leisure time' apps, such as games, that may not necessarily be data-intensive but are usually accessed from the comfort of the home, also contribute to the Wi-Fi growth.²

Average mobile broadband data and Wi-Fi data traffic growth per smartphone user from 2015 to 2016



Source: Ericsson analysis on App Annie data for Android smartphones (March 2016), in each country

¹ Ericsson analysis on App Annie data for Android smartphone apps (March 2016), in each country

² Ericsson ConsumerLab Communication in the World of Apps (June 2015)

MOBILE SUBSCRIPTIONS

Mobile subscription penetration exceeded 100 percent at the end of 2015 in most parts of the region, with the exception of Bangladesh and Myanmar. When it comes to mobile broadband, Australia, Singapore, Malaysia and Thailand are expected to have more than 100 percent mobile broadband subscription penetration in 2016

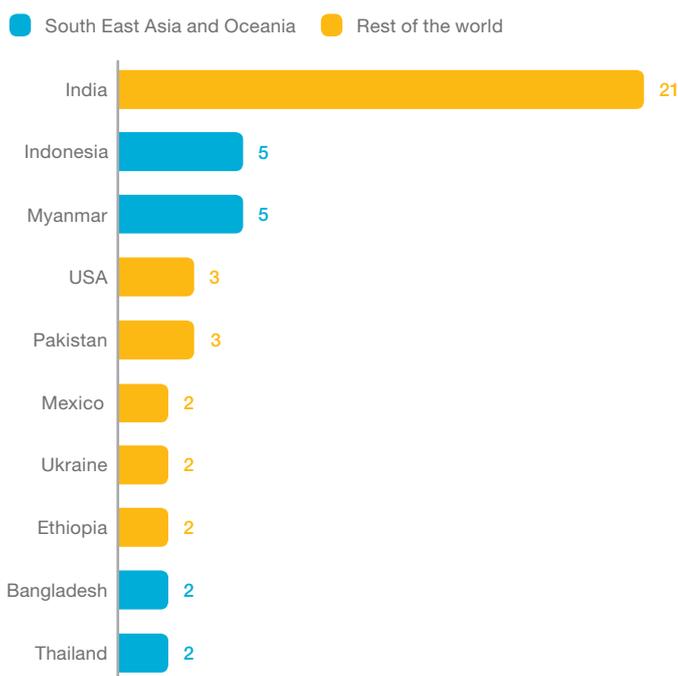
Mobile subscriptions in the region will grow annually at about 4 percent between 2015 and 2021, and having crossed 1 billion subscriptions in Q1 2016, are foreseen to amount to around 1.2 billion by the end of 2021. Indonesia, Myanmar, Bangladesh and Thailand are among the top countries globally for net mobile subscription additions.

Most of the growth in mobile subscriptions during 2015 came from mobile broadband – a trend that is predicted to continue. Mobile broadband subscriptions will grow at a CAGR of 15 percent, reaching more than 100 percent population penetration by 2021. In 2016, Australia, Singapore, Malaysia and Thailand are expected to pass 100 percent subscription penetration for mobile broadband. The largest growth in mobile broadband subscription penetration will be seen in Myanmar, Vietnam, Indonesia, Philippines and Bangladesh. Mobile broadband services are foreseen to account for more than 90 percent of total mobile subscriptions in the region by the end of 2021.

Fixed broadband subscription penetration is still very low in comparison to mobile broadband, especially in emerging markets in the region. However, the region has been seeing a growth in middle income households that will drive the demand for high speed broadband services in residential areas, particularly in emerging markets such as Indonesia, Thailand, Philippines, Vietnam and Malaysia. Fixed broadband is forecast to grow at a CAGR of 8 percent, with close to 20 percent household subscription penetration by the end of 2021.

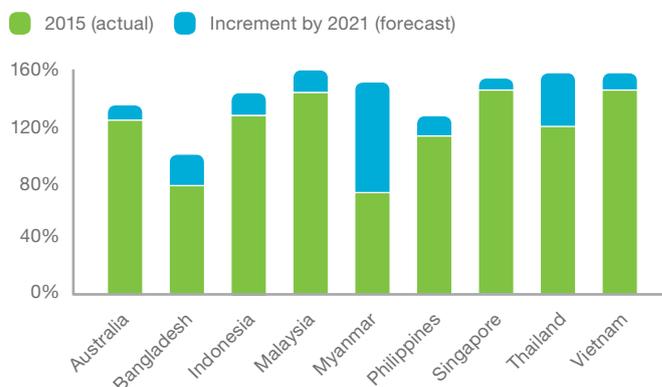
In most parts of the region, fixed broadband household and small and medium-sized enterprises (SMEs) penetration is still low. In contrast, mobile broadband will still be the main form of broadband access for the majority of people in the emerging markets of South East Asia and Oceania. This creates an opportunity for operators to fulfil the need for home broadband and SME solutions through alternative access technologies, such as LTE.

Top countries globally by net mobile subscription additions, Q1 2016 (million)



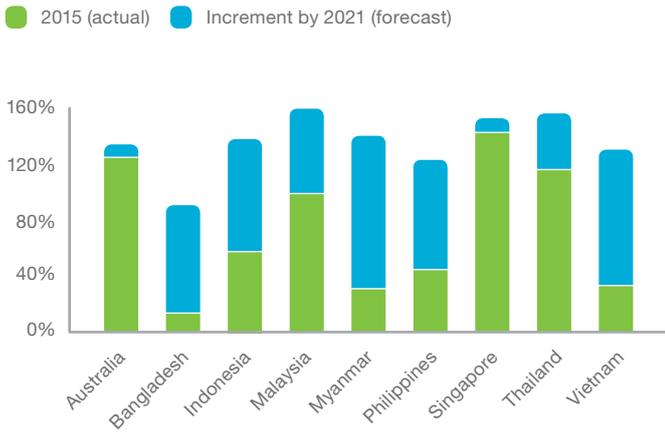
There is potential for mobile broadband and fixed wireless broadband in South East Asia and Oceania

Mobile subscription population penetration



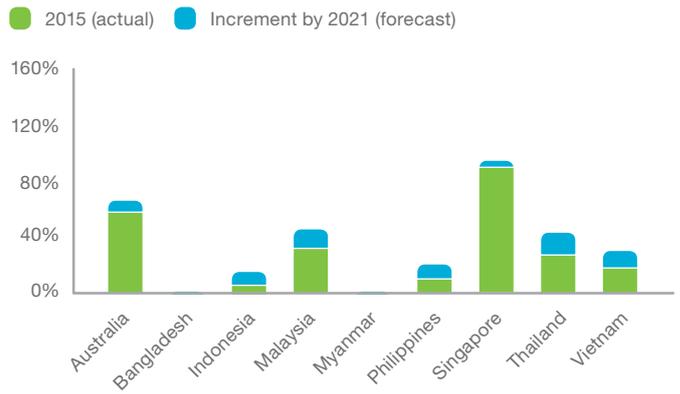
Source: Ericsson analysis on South East Asia and Oceania data published by operators, government bodies and industry analysts (March 2016)

Mobile broadband subscription population penetration



Source: Ericsson analysis on South East Asia and Oceania data published by operators, government bodies and industry analysts (March 2016)

Fixed broadband subscription household and SME penetration



Source: Ericsson analysis on South East Asia and Oceania data published by operators, government bodies and industry analysts (March 2016)

LTE subscriptions continue to grow

By the end of 2015, over 5 percent of all mobile subscriptions in South East Asia and Oceania were LTE – a figure that is expected to increase to more than 40 percent in 2021. The region is expected to reach 100 million LTE subscriptions in 2016. Australia, Singapore, Malaysia, Indonesia, Philippines and Thailand are among the countries in the region that are rolling out LTE and continuing to improve coverage. Over the next five years, mobile service providers will continue to transition customers to LTE in South East Asia and Oceania, as well as delivering new services like Voice over LTE (VoLTE) and enabling LTE Advanced features. This will provide faster and more effective connections to mobile users, especially in dense indoor environments.

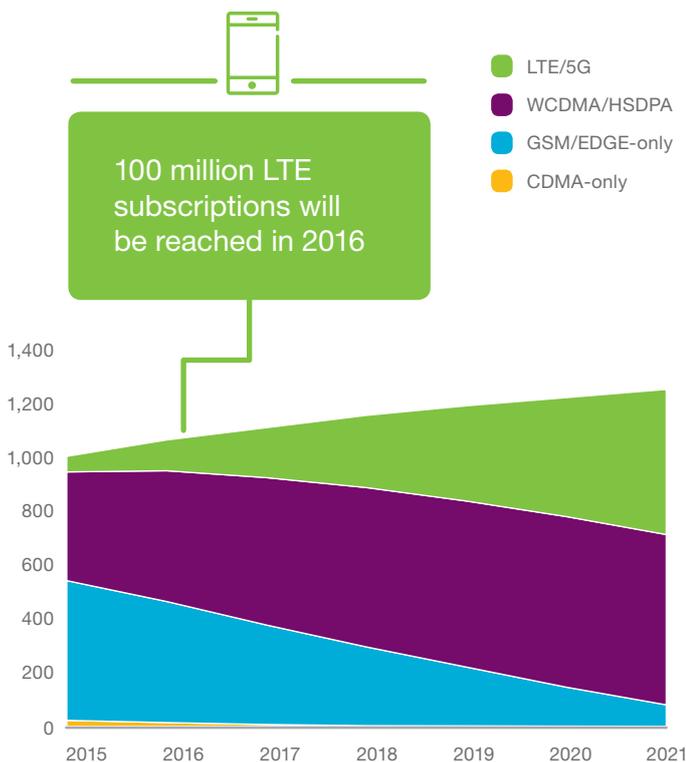
At the end of 2015, access to mobile technology varied across South East Asia and Oceania. In Australia and Singapore, LTE is the main mobile technology in 2016, while in other parts of the region the majority of subscriptions are on WCDMA/HSPA. In the region, there were more than 400 million WCDMA/HSPA subscriptions in Q1 2016.

Smartphone subscriptions growth

By the end of 2015, only Singapore had a smartphone subscription penetration above 100 percent in the region. By 2021, Vietnam, Australia, Thailand and Malaysia will also pass the 100 percent mark.

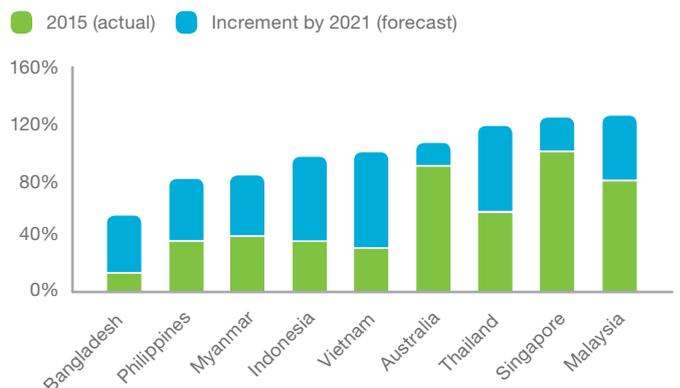
During the same period, the number of smartphone subscriptions in Bangladesh, Philippines, Myanmar, Indonesia and Vietnam will more than double.

Mobile subscriptions split by technology, South East Asia and Oceania (million)



Smartphone subscriptions in Bangladesh, Philippines, Myanmar, Indonesia and Vietnam will more than double by 2021

Smartphone subscription penetration



Source: Ericsson analysis on South East Asia and Oceania data published by operators, government bodies and industry analysts (March 2016)

NETWORK PERFORMANCE

Demands for greater capacity and higher data rates are just two of the many factors influencing network performance of wireless access technologies. The impact of other aspects like throughput, spectrum and latency will be fundamental to the success of future networks

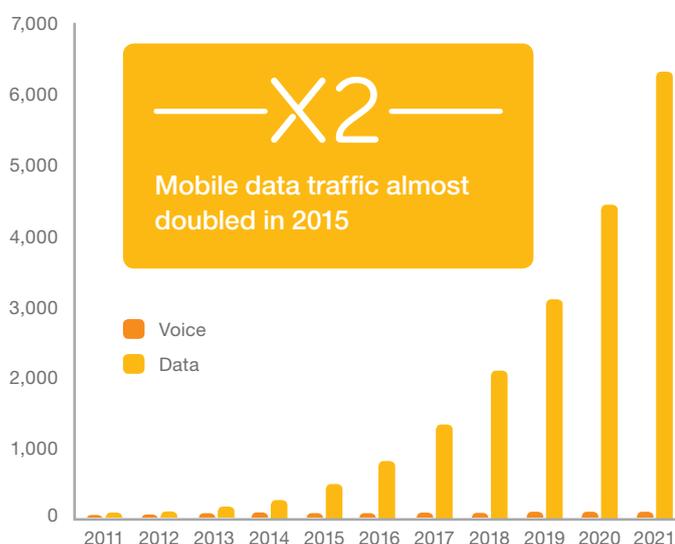
In the Networked Society, communications are increasingly app-centric. One of the most demanding application categories in terms of performance – video streaming – will account for almost 70 percent of all global mobile data traffic by 2021. The increasing popularity of video streaming services on smart devices is driving innovation in video compression, display technology and application processors. To support the smooth viewing and streaming of high quality video content, a high speed network is also needed.

Consequently, high expectations will continue to be placed on network performance. Different countries will, however, face different challenges, depending on the apps that users are consuming, as each app has its own set of requirements on network performance.

Unabated data traffic growth

While voice traffic remains flat in the region, mobile data traffic will exceed 6 ExaBytes (EB) per month by 2021, up from around 0.5 EB in 2015. This figure corresponds to about two full-length movies each month, per active smartphone user. This will yield opportunities to service providers as data traffic rises, but will also result in challenges as user expectations increase at the same time.

Mobile traffic, South East Asia and Oceania (monthly PetaBytes)



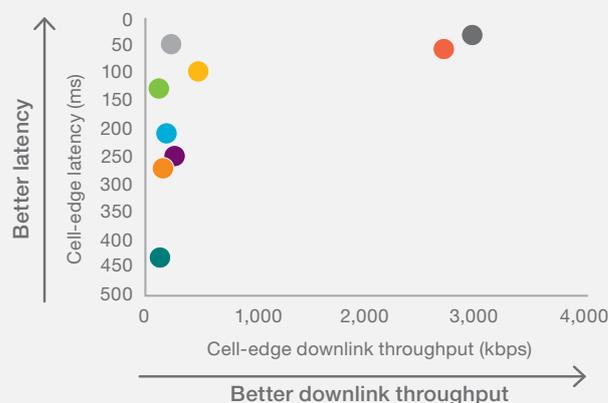
Optimizing end user experience

Growth of mobile data traffic will continue to test mobile operators. The operators will need to ensure that large amounts of data can be reliably and efficiently transferred. In order to ensure a good user experience, service providers have to optimize both throughput and latency.

High downlink throughput is required, in circumstances such as the downloading of large files and large web pages. When it comes to online gaming, teleconferencing or web browsing experience, latency plays a significant role. The latency directly contributes to time-to-content and greatly affects user experience. What consumers perceive as internet connection speed is a combination of throughput and latency in a data transfer.

Cell-edge throughput (kbps) vs. cell-edge latency (ms)

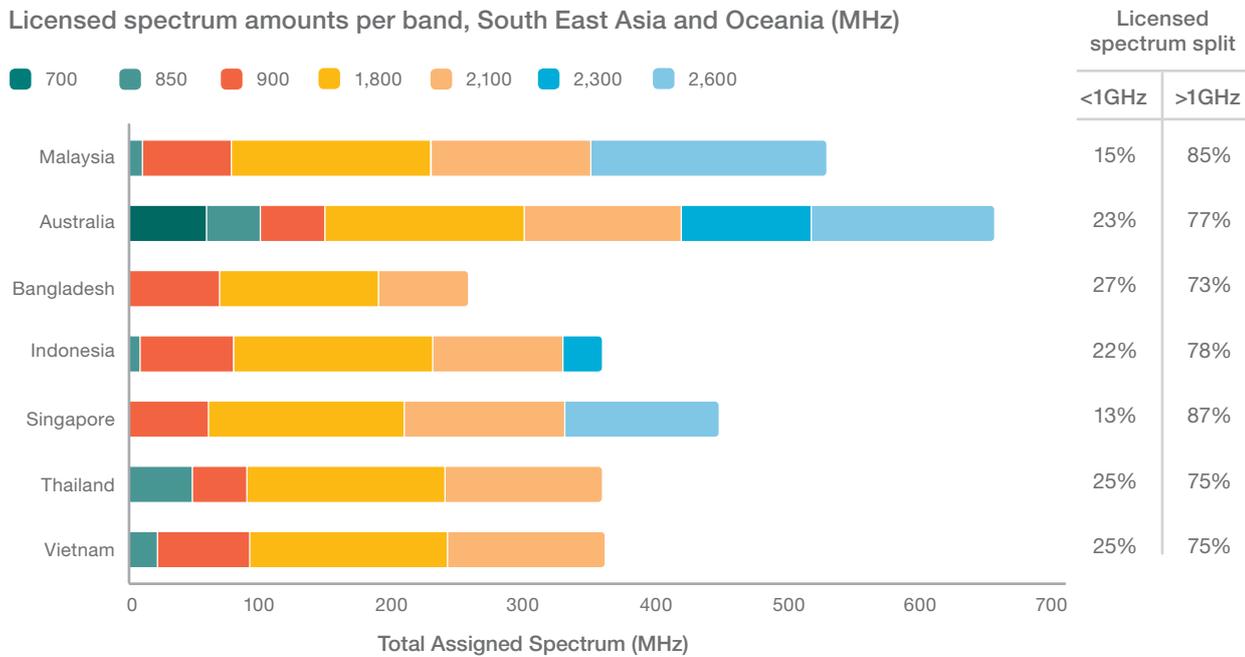
- Australia
- Malaysia
- Philippines
- Bangladesh
- Indonesia
- Myanmar
- Singapore
- Thailand
- Vietnam



Note: The user experience becomes better the higher the cell-edge downlink throughput and the lower the cell-edge latency

Source: Ericsson analysis on Speedtest Intelligence data from Ookla (Q1 2016)

Licensed spectrum amounts per band, South East Asia and Oceania (MHz)



Source: Information published by regulatory body (April 2016), in each country

Note: The chart focuses on mobile cellular spectrum

Based on analysis of user-generated network performance data in the region, operators in Singapore and Australia have the best cell-edge downlink throughput of close to 3 Mbps; with Australia gaining the top result overall for highest cell-edge downlink speed and lowest latency on Android and iOS devices.³

Harmonizing spectrum

Operators need a combination of spectrum bands in high frequencies to improve capacity to accommodate the increased traffic demands. LTE carrier aggregation is rapidly emerging as a way to achieve higher data throughputs by adding spectrum, but these new spectrum bands need to be regionally and globally harmonized.

This will secure economies of scale, improve regional roaming for easy cross-border coordination and benefit a whole new ecosystem of chipsets and devices.

The majority of spectrum assigned to operators in the Asia Pacific region since 2010 has been in higher frequency 'capacity' bands (above 1 GHz), which are not ideal for providing mobile broadband coverage in

rural areas. These higher frequencies are prioritized by mobile operators to cover urban and suburban areas where data traffic is dense, and substantial network capacity is required. However, based on their propagation characteristics, lower frequencies (below 1 GHz) provide extended coverage at lower cost, as fewer base stations are required to achieve greater geographic coverage, making these 'coverage' bands ideal for use in rural areas.

Globally, APT700 band has been adopted by 45 countries. In this region, only Australia has adopted this band. The main advantage of APT700, beyond its coverage characteristics, is its excellent potential for global roaming. Currently, there are 329 APT700 devices by 15 manufacturers that have been announced.⁴

Governments in the region should consider allowing operators to migrate from GSM to WCDMA/HSPA or to LTE, or from WCDMA/HSPA to LTE, based on their situation and needs. In addition, governments should look into future 5G spectrum requirements, which will be primarily driven by the combination of expected increases in traffic capacity demands and the support for new use cases.

Points for governments to consider:

- > Accelerating the allocation and release of new spectrum bands for WCDMA/HSPA and LTE networks. Future LTE capacity bands: APT700, 2300 MHz and 2600 MHz
- > Relaxing current spectrum caps
- > Applying a technology-neutral approach by allowing re-farming to most recent technologies
- > Providing new additional spectrum for the successful introduction of 5G services beyond 2020

³ Ericsson analysis on Speedtest Intelligence data from Ookla (Q1 2016)

⁴ Global Mobile Supplier Association (GSA), (April 2016)



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.