ERICSSON

SOUTH EAST ASIA AND OCEANIA

ERICSSON MOBILITY REPORT APPENDIX

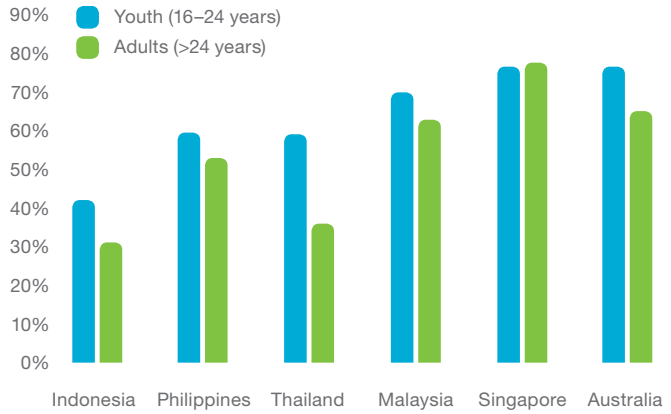
June 2014

MARKET OVERVIEW

South East Asia and Oceania is a truly diverse region, both culturally and in terms of Information and Communications Technology (ICT) market maturity. At one end of the scale there are mature ICT markets such as Australia and Singapore that are characterized by competing high speed mobile and fixed broadband networks, high uptake of broadband services and internet devices, and over 70 percent internet penetration.

At the other end, there are developing ICT markets such as Indonesia, Philippines and Thailand. In these places most mobile connections are over 2G and 3G networks. There are also significantly lower internet user penetration rates, as well as lower uptake of broadband services and internet devices.

Smartphone ownership among internet users/urban users



Source: Ericsson ConsumerLab (2013)

Base: Urban mobile users 16–60 years old in Indonesia, Philippines and Thailand and daily internet users 16–60 years old in Malaysia, Singapore and Australia

A wide range of factors are influencing the growth and development of ICT in South East Asia and Oceania. However, three key trends have been identified that are set to have a particularly big impact on the sector in the region. These are youth culture, urbanization and the rise of smartphones.

Youth culture

Relative to total population, the youth segment (those aged 10–24 years) is among the largest globally. It is especially big in the developing countries of South East Asia and Oceania. There are more than 170 million young people in this region. The youth population in Philippines is at 31 percent, while in Malaysia and Indonesia this figure is at 28 percent and 26 percent respectively. In more developed markets globally, the 10–24 year old age group represents on average 17 percent of the population, while for less developed markets this figure sits at 27 percent.[1]

The region's youth segment is crucial in driving the adoption of apps as well as the uptake of smartphones and mobile data services, particularly in the developing markets. The youth segment is enthusiastic about technology and is conscious of ICT developments. Young people often embrace new trends and therefore can be expected to be a main driver of ICT services growth.

A higher proportion of youth in the region owned smartphones compared with adults in 2013. The youth segment is also more active in using their smartphones for multiple purposes, from basic services such as voice and SMS, through to internet browsing, social networking and video streaming.

The youth segment in South East Asia and Oceania are active users of various messaging apps in different contexts and situations. Instant messaging services such as WhatsApp, WeChat, KakaoTalk and Line are popular among this group, with both international and locally developed services achieving strong take-up. These apps appeal to the youth market because they enable them to coordinate activities with different social groups, facilitate private chatting with friends and access social network platforms. Some of these services also provide games, digital stickers and music sharing.

Urbanization

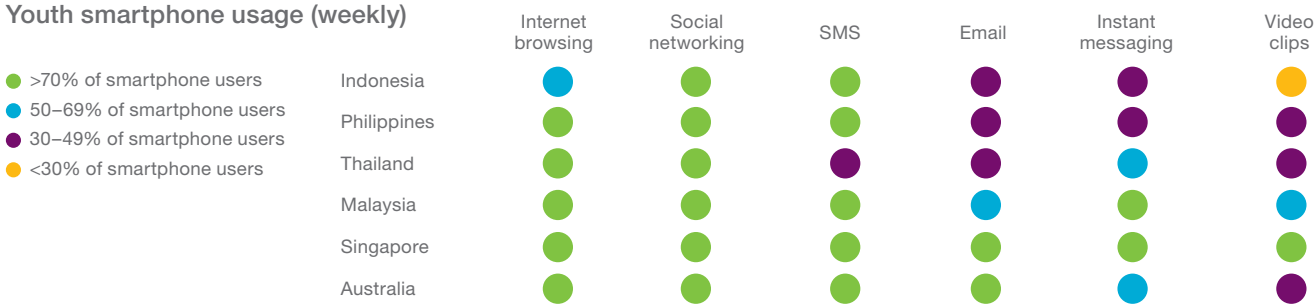
South East Asia and Oceania is experiencing a wave of urban growth. In the region's mature ICT markets such as Australia and Singapore, at least 90 percent of people already live in cities or large towns. In developing countries such as Indonesia, Thailand and Philippines this proportion is between 30 and 55 percent today, but the figure continues to increase.[2]

This trend is heightening the importance of cities as drivers of innovation and growth, and highlighting their role in addressing issues such as poverty. Cities offer a more favorable setting for job generation, and can deliver education, healthcare and other services more efficiently than areas with a low population density, because of economies of scale and proximity.

ICT availability is one of the top five factors affecting city life satisfaction, illustrating its wider social and economic importance. It also plays a central role in

[1] Population Reference Bureau, The World's Youth 2013 Data Sheet
[2] United Nations, Department of Economic and Social Affairs, Population Division (2012)

Youth smartphone usage (weekly)



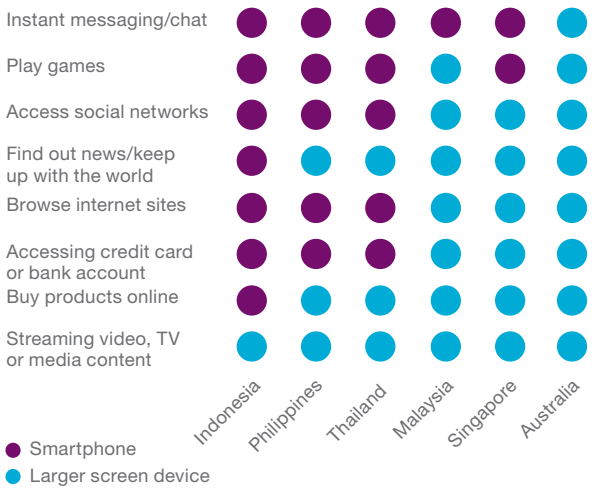
Source: Ericsson ConsumerLab (2013)
Base: Urban mobile users 16–24 years old in Indonesia, Philippines and Thailand and daily internet users 16–24 years old in Malaysia, Singapore and Australia

addressing social challenges – in fact, ICT maturity and its ability to support sustainable development is an important driver in enhancing collaboration and creating more connected cities.[3]

Bring Your Own Device (BYOD) is a growing global phenomenon where individuals use their own laptops, tablets, smartphones, etc. at work. It is the result of increasing globalization, technological advances and an improving economic environment. Ericsson ConsumerLab analysis shows that consumers believe BYOD enables a good work-life balance in cities. This is especially the case in developing markets such as Jakarta. Consumers in this city expressed a higher preference for achieving a work-life balance and were in favor of BYOD policies, ahead of other metropolitan cities in the global study. The proportion of online purchases made whilst commuting in Jakarta is among the highest studied.[4] These findings exemplify how ICT impacts work and personal lives in the region.

This trend will continue in the future, with ICT supporting social development in areas such as healthcare, communication between citizens and government, and access to education. Despite the urbanization trend, a significant proportion of the population will continue to live in rural areas in 2019. ICT can also improve people's lives in these places by providing services that meet their needs, and extending the availability of services that could not previously be offered outside of cities.

Most utilized device for online services



Source: Ericsson ConsumerLab (2013)

Base: Urban mobile users 16–60 years old in Indonesia, Philippines and Thailand and daily internet users 16–60 years old in Malaysia, Singapore and Australia

[3] Ericsson Networked Society City Index (2013)
[4] Ericsson ConsumerLab (2013)

Rise of the smartphone

Internet access is unevenly distributed worldwide. This gives rise to a digital divide, where some people are disadvantaged due to their inability to get online. This divide is widespread in South East Asia and Oceania, reflecting economic inequality and different attitudes to technology. Limited access to fixed line internet makes smartphones more important in these places. The influx of cheaper smartphones – increasingly costing less than USD 100 – gives more consumers the chance to get online. In the region's developing countries such as Indonesia, Thailand and Philippines the smartphone is the primary device for accessing most internet services. Video streaming, online shopping and news updates are the exceptions – a device with a larger screen is preferred for these activities. The situation is different in advanced markets, where laptops are still the primary device for accessing services online. Smartphones have a higher utilization and penetration rate among young people in the region. This segment has been a strong driver in smartphone growth in South East Asia and Oceania.

MOBILE SUBSCRIPTIONS AND MOBILE TRAFFIC

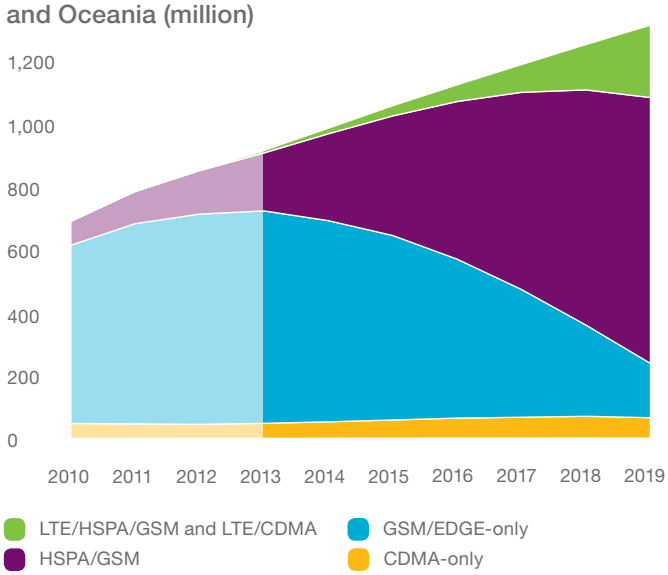
Given that the majority of mobile subscriptions in South East Asia and Oceania are concentrated in developing markets, it is unsurprising that a high percentage of mobile subscriptions are currently on GSM/EDGE. In 2013, the dominant technology in Australia and Singapore was WCDMA/HSPA, while in the other countries in the region GSM/EDGE still had a commanding lead. By the end of 2014, GSM/EDGE subscriptions in the region will be around 65 percent, while WCDMA/HSPA subscriptions will be just below 30 percent. It is also forecast that 4G/LTE will account for about 20 million, or a mere 2 percent of subscriptions in the region by the end of 2014. Almost all of these will be in Singapore and Australia.

By 2017, it is expected that WCDMA/HSPA will be the leading radio access technology in the region. It is predicted that subscriptions for this technology will see a fivefold growth between 2013 and 2019 and, by the end of 2019, will number almost five times those of GSM/EDGE. The uptake of LTE subscriptions is expected to rapidly increase as devices become cheaper due to high volumes being produced globally.

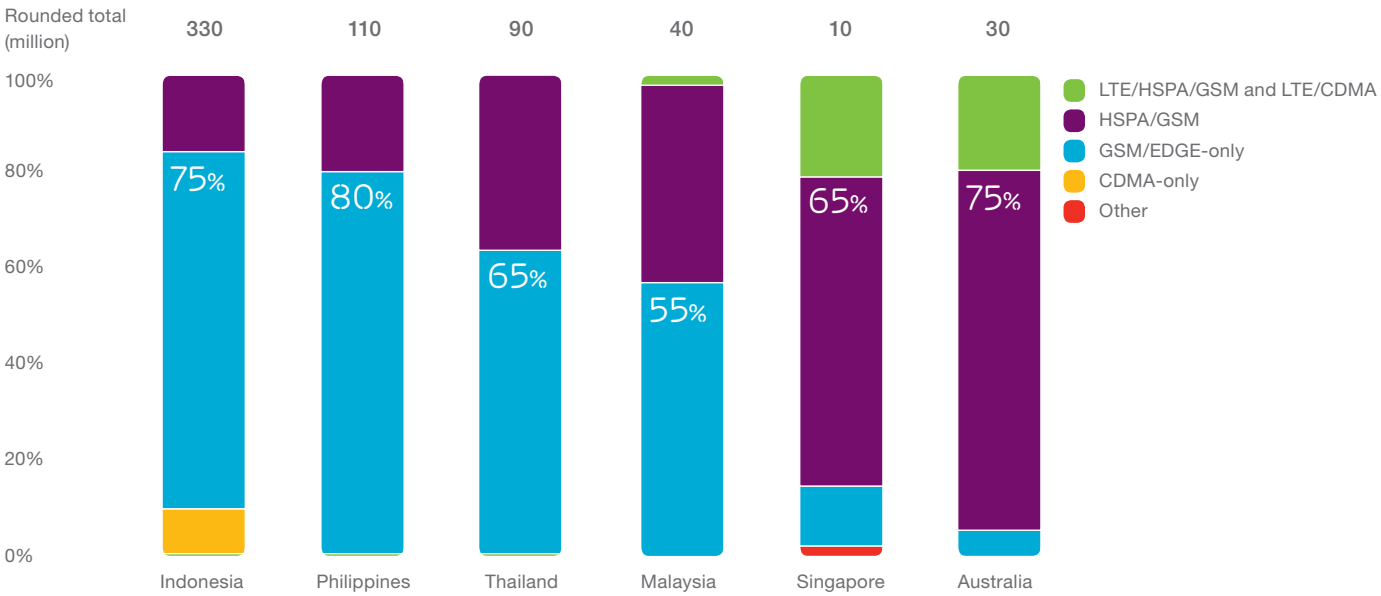
Beyond 2019, there is enormous potential for growth in LTE, since around 20 percent of mobile subscriptions in the region will be using this technology.

It is important to note that subscriber migration from earlier technologies is taking time and LTE rollouts have not yet taken place in most developing countries in the region. Also, cost-conscious users have taken longer to transition from GSM devices. Both of these factors have an impact on the technology forecast.

Mobile subscriptions, South East Asia and Oceania (million)



Mobile subscriptions, 2013



Mobile subscriptions do not include M2M subscriptions

Market evolution

GSM/EDGE accounted for most mobile subscriptions in Malaysia, Indonesia, Philippines and Thailand in 2013, but this will change in the near future. In Malaysia, GSM/EDGE constituted 55 percent of mobile subscriptions in 2013, while in Indonesia, Philippines and Thailand the proportions were 75 percent, 80 percent and 65 percent respectively. WCDMA/HSPA is forecast to be the dominant access technology for all these countries by 2019.

Operators have already launched LTE networks in Malaysia, Philippines and Thailand, while in Indonesia the first deployments are expected later this year. Due to limited uptake and availability, there is some way to go before this technology becomes established in these countries.

LTE has a larger subscription base in Australia and Singapore due to its earlier introduction. Nevertheless, WCDMA/HSPA is still the main access technology in these countries, with LTE expected to take over in the near future. In Australia, WCDMA/HSPA accounts for 75 percent of mobile subscriptions and in Singapore this figure is at 65 percent.

Smartphone subscriptions

The contrasting nature of the region's ICT markets is also evident in the differing rates of smartphone penetration. By the end of 2013, smartphone penetration had already exceeded 60 percent in developed countries like Australia and Singapore, yet this figure was below 20 percent in most of the region's heavily populated developing countries such as Indonesia and Philippines.

Smartphone adoption is predicted to increase dramatically during the coming years with smartphone subscriptions growing by almost five times between 2013 and 2019. By the end of this period there will be in excess of 700 million smartphone subscriptions in the region.

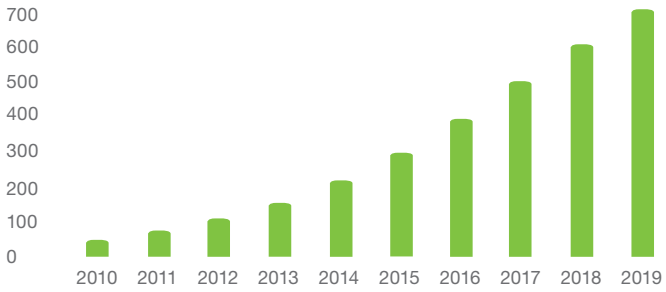
Mobile traffic

South East Asia and Oceania has been home to different narratives when it comes to mobile traffic and speeds. Over recent years, several world-firsts in mobile broadband have been achieved in the region, such as the first 42 Mbps data session on Dual-Carrier HSPA (DC-HSPA), the first LTE deployment in the 1,800 MHz band and the first LTE Broadcast calls in Australia, as well as the world's first commercial full-featured Voice over LTE (VoLTE) service in Singapore. However, overall LTE penetration for the whole region is still very low and total mobile data consumption in the region is also relatively low compared to global figures.

Network quality continues to contribute to the lower mobile data consumption for several markets in the region. Unnecessary handovers to earlier technologies that cannot offer high speeds are also an issue, and coverage holes are a common experience for users. Besides network quality, the main drivers for mobile broadband uptake include the affordability of services and devices. Public understanding of the benefits of different data services and how to use them are also major factors.[5]

Mobile data traffic for the region will grow by more than 10 times between 2013 and 2019, reaching 2 ExaBytes by the end of the forecast period. Growth in voice traffic will be around 20 percent during the same period of time.

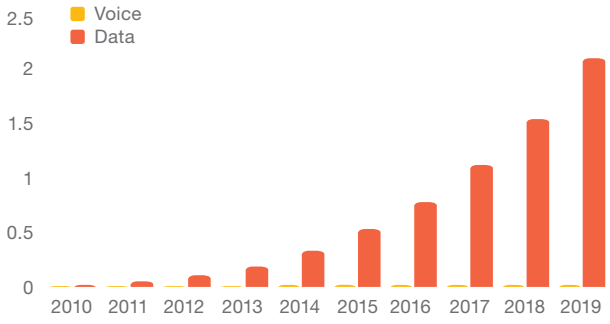
Smartphone subscriptions, South East Asia and Oceania (million)



5X

growth in **smartphone subscriptions** by the end of 2019

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



[5] Ericsson ConsumerLab (2013)

POPULATION AND APP COVERAGE

Population coverage

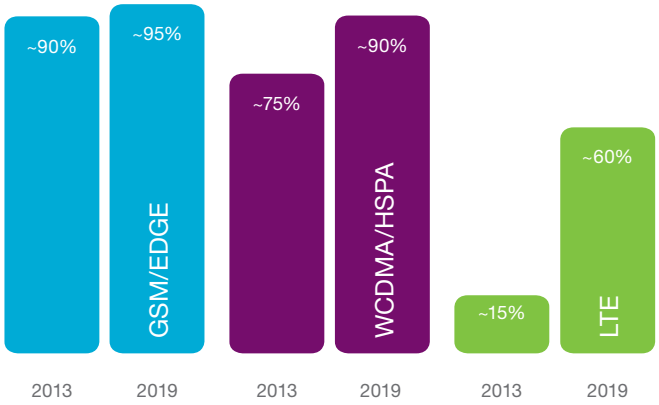
The population coverage of an area is broadly defined as the proportion of the population with sufficient signal to connect to a mobile network. It continues to be an important consideration for operators. The ability to utilize the technology is naturally subject to other factors, such as access to devices and subscriptions.

GSM/EDGE population in South East Asia and Oceania is already around 90 percent and it is predicted that WCDMA/HSPA will almost equal this in a few years. The LTE footprint is almost ubiquitous in the region's most developed markets: in Singapore the technology already covers the entire population, while in Australia, 85 percent was covered by the end of 2013. In the remaining markets in South East Asia and Oceania, the potential for LTE growth is remarkable, with coverage for the whole region set to grow four times between 2013 and 2019.

60%

LTE Coverage in South East Asia and Oceania by 2019

Population coverage, South East Asia and Oceania



Network performance

There are significant contrasts in speeds and network performance across South East Asia and Oceania. This is mainly due to differences in technology and levels of market maturity, but it is also influenced by geographical environment, population density and usage patterns. Peak speeds in mature markets where LTE has been deployed are at the upper end of the global scale. In Australia, downlink speeds of 450 Mbps have been demonstrated for the first time in a commercial network using LTE Advanced. However, data from Speedtest.net reveals a sharp contrast between several other markets in the region. These underlying differences in technological sophistication and network maturity affect consumer behavior, with people typically adapting to, and only using, those applications and activities that will perform satisfactorily using the quality of the network they can access.

Users in mature markets tend to consume more data, often via popular applications such as video streaming, while in less developed markets messaging and social networks are among the most popular activities for consumers.[6] Affordability of mobile data and consistent network performance drive data consumption.

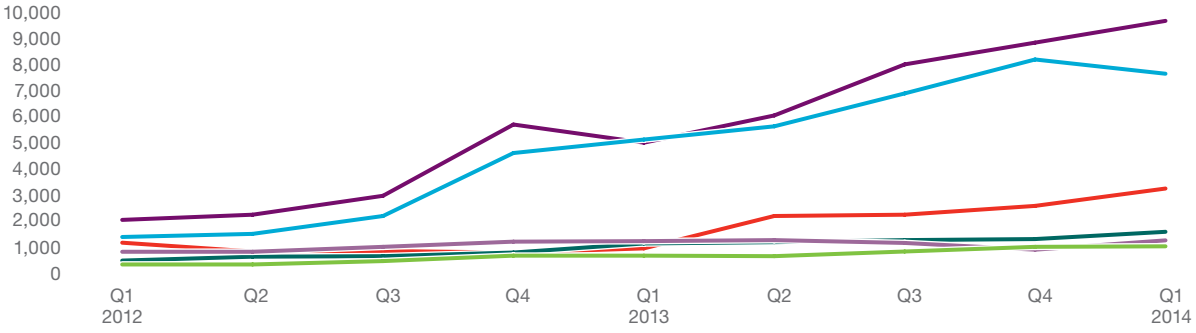
The graphs on the following page tell dramatically different stories for the mature and developing markets in South East Asia and Oceania. For advanced markets in the region, the introduction of LTE in 2012 has delivered median speeds in excess of 8 Mbps. Developing markets, on the other hand, will usually experience median speeds below 2 Mbps. It is important to note that network improvements and the introduction of Dual Carrier-HSPA and LTE will help to close this gap in the coming years.

Both graphs show that the user experience will be very different between developed and developing markets in the region. Since users expect a consistent level of performance throughout the entire network coverage area, the worst-case experience scenario (represented by the 90 percent probability throughput) can be used as a likely benchmark for the selected markets.

Median speeds in developing countries in South East Asia and Oceania are now close to those experienced by more developed countries before LTE was introduced. This serves to highlight the efforts made by operators to improve network performance in these countries. In mature markets, service providers that pursue a strategy of investing in network performance as a means of differentiation exhibit increasing financial returns.

[6] Ericsson ConsumerLab (2013)

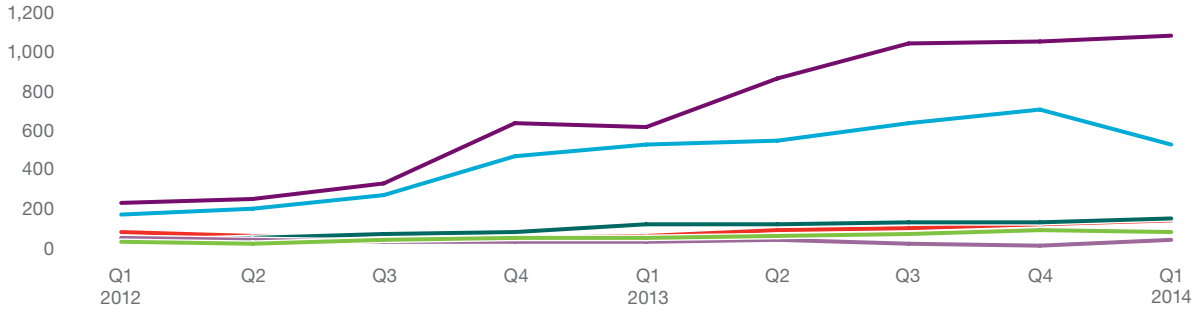
Median (50 percent probability) downlink throughput (Kbps)



Median throughput means users will have a 50 percent probability of experiencing these speeds or higher.

Source: Ericsson analysis of data from Speedtest.net provided by Ookla (2014)

Cell-edge (90 percent probability) downlink throughput (Kbps)



Cell-edge throughput means users will have a 90 percent probability of experiencing these speeds or higher.

Source: Ericsson analysis of data from Speedtest.net provided by Ookla (2014)

App coverage

Different networks, radio technologies and smart device penetration levels mean that in a diverse region like South East Asia and Oceania, the lowest consistent level of network experience will vary. This is supported by Ericsson's analysis on Speedtest.net data. The data tells us that users in selected markets in the region will have dramatically different mobile experiences indoors or at places with poor coverage, where signals are at their weakest. For example, in countries such as Singapore and Australia, mobile operators will be able to offer a reliable music streaming experience, across their entire networks. Providing a similar quality of service network-wide in other countries studied in the region may be more challenging for service providers.

Ericsson's app coverage concept can be used by operators as a guide to develop and set their network performance goals. While these goals should be dynamic over time as devices and apps evolve, a starting point is to define what the desired minimum acceptable experience for users is. Offering better app coverage will introduce a superior experience to mobile broadband users and will bring new business opportunities for operators.

App coverage
The coverage area for any given app is relative to the level of network performance needed for it to function. App coverage describes the area within which there is a high probability of experiencing sufficient network performance to run any given app, e.g. video streaming or web browsing. Its usefulness comes from the fact that smart devices and apps continually evolve and encompass newer capabilities and therefore require more network resources to provide a good user experience. App coverage is an integrated view of mobile broadband network coverage, capacity and quality.

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, businesses and societies 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 more than 110,000 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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