

**Closing the
digital divide
in Central Asia
and the South
Caucasus**



GSMA

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Ubiquitous Wireless LLP, a consulting firm with vast experience and expertise in spectrum management, ICT policy and other related areas across the Commonwealth of Independent States and other emerging markets, contributed to the research (primary and secondary) for this report. The GSMA is grateful for their support.

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Executive summary

Mobile connectivity is at the heart of digitalisation ambitions

The Covid-19 pandemic has demonstrated that digitalisation can significantly improve access to services and expand opportunities, particularly for otherwise excluded population groups. Against this backdrop, countries in Central Asia and the South Caucasus¹ are undergoing a digital revolution, driven by ambitious government digital transformation initiatives and a general trend towards greater digitalisation, spurred by the pandemic. At both national and regional levels, governments have made commitments to fast-track the digital transformation of key sectors of the economy and wider society.

Digital connectivity is fundamental to the realisation of the digital transformation plans of governments, such as in Central Asia and the South Caucasus. It is the basis for creating and distributing innovative digital solutions and, perhaps more importantly, the channel for citizens to interact with the society around them in a digital environment. The profound implications of digitalisation for the way people live, work and socialise highlight the risk of exclusion from vital services for unconnected populations. As a result, closing the digital divide – and by extension, ensuring that no one is left behind in the emerging digital economy – has never been more important.

Mobile technology has been fundamental to expanding connectivity across Central Asia and the South Caucasus. This is based on the capability of wireless networks to cover a wide area with greater efficiency than many other technologies. This is especially true in developing regions with underdeveloped fixed network infrastructure and relatively low levels of urbanisation. Across Central Asia and the South Caucasus, more than 40% of the population on average live in rural, and often mountainous, areas. In such places, mobile connectivity is typically the first, and often only, form of access to internet connectivity because of limited fixed broadband infrastructure and the costs associated with deployment in rural environments.

The mobile landscape in Central Asia and the South Caucasus is diverse. 4G is now the dominant technology in Azerbaijan and Kazakhstan, but 3G still accounts for around a third or more of total connections across the other markets. The 5G era is still in its infancy, relative to more advanced markets in Europe, the Gulf region, North America and Northeast Asia. As of April 2023, commercial 5G service was available in only three countries: Kazakhstan, Tajikistan and Uzbekistan. However, 5G activities are beginning to ramp up. These are expected to translate to commercial deployments and customer adoption in the coming years.

Mobile technology has been fundamental to expanding connectivity across Central Asia and the South Caucasus



¹ This report focuses on Armenia, Azerbaijan, Georgia, Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan and Uzbekistan, based on similarities in their digital transformation journeys.

Collaboration is required to close the digital divide

Around 45 million people now use mobile internet across the eight countries in Central Asia and the South Caucasus that this report focuses on. While this is more than three times the number of mobile internet users (14.1 million) a decade earlier, nearly 50 million unconnected people remain at risk of missing out on the benefits of mobile internet. Connectivity will play an even more integral role in society over the next decade and beyond, underlining the urgency to close the digital divide and bring unconnected people online.

An important step in efforts to address the digital divide is to identify the nature and scale of the challenge, as well as the most affected segments of the population. GSMA Intelligence data shows that the coverage gap² has narrowed markedly in the South Caucasus region but remains a challenge in parts of Central Asia, where around 10% of the population in most markets still live in underserved areas. While the industry continues to invest in innovative solutions and partnerships to extend connectivity to still underserved and far-flung communities, the adoption of mobile internet services has not kept pace with the expansion of network coverage. This has resulted in a significant usage gap.³ In 2022, the usage gap was widest in Georgia and Turkmenistan at around 52% and 50% of the population, respectively, while the usage gap was lowest in Armenia and Azerbaijan at 33% and 36%, respectively, compared to the global average of 41%.

Closing the digital divide in Central Asia and the South Caucasus region will require substantial collaborative actions to both provide coverage for those living in areas without mobile broadband and address the barriers to usage for those already living within the footprint of a mobile broadband network. Collaboration is already occurring, but there is scope for more collaboration to increase digital skills and literacy and improve affordability, in addition to investing in local digital ecosystems and an enabling policy environment that can accelerate growth in local content, services and applications.

Nearly 50 million unconnected people remain at risk of missing out on the benefits of mobile internet



Collaboration is required to close the digital divide

Effective and enabling policies are essential to complement the collaborative efforts of mobile industry players and other key stakeholders in closing the digital divide. To this end, governments and policymakers should implement policies and measures that can attract much-needed investment in the deployment of network infrastructure in underserved areas, create innovative digital services to stimulate demand and address the various non-infrastructure barriers to mobile internet adoption. Specifically, governments and policymakers should take the following steps:

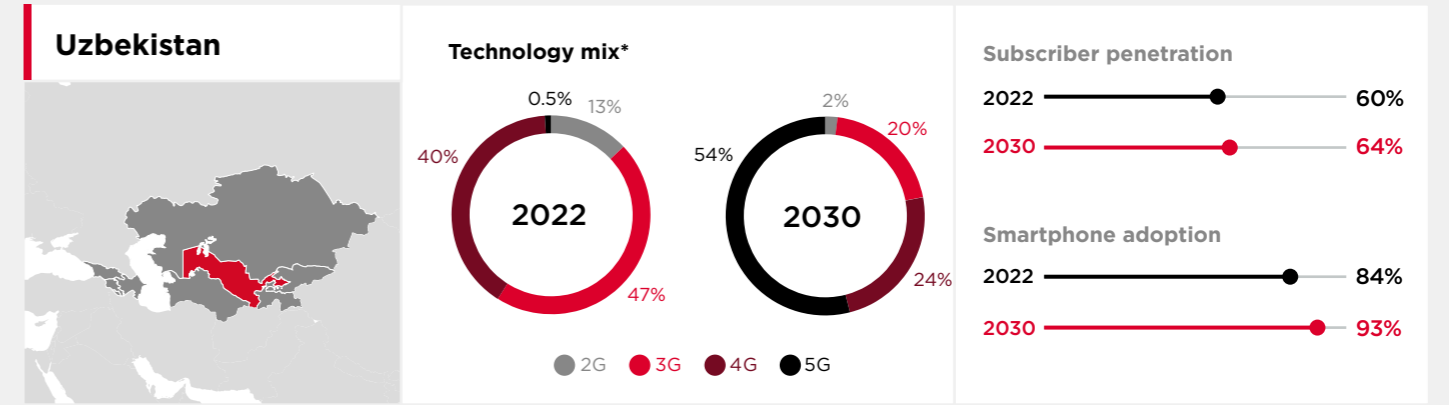
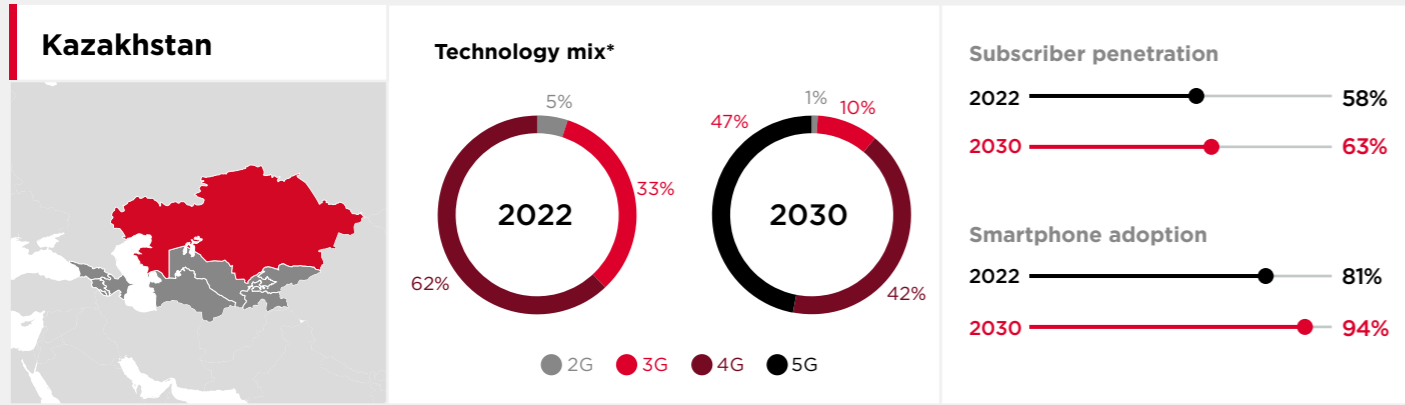
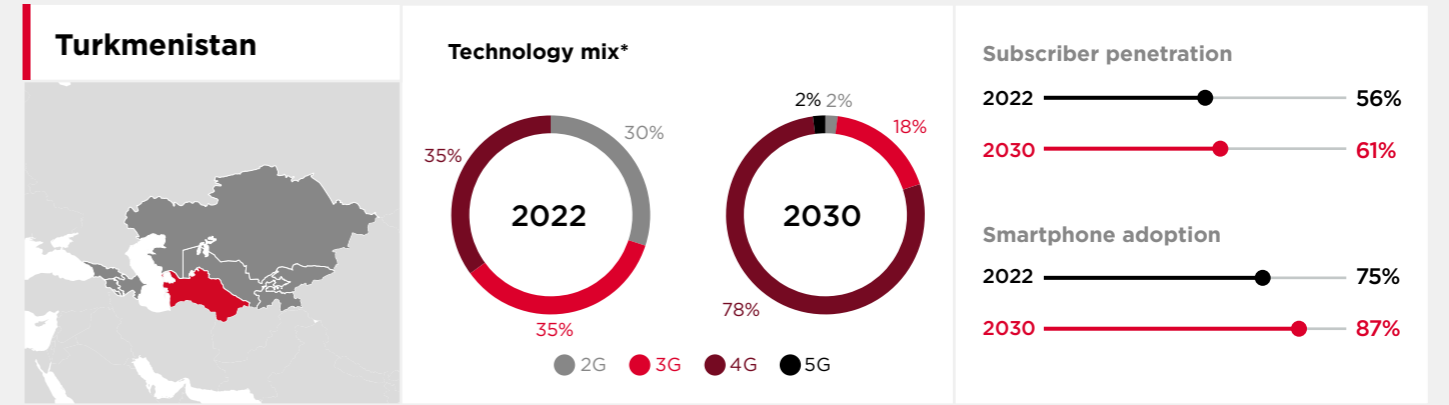
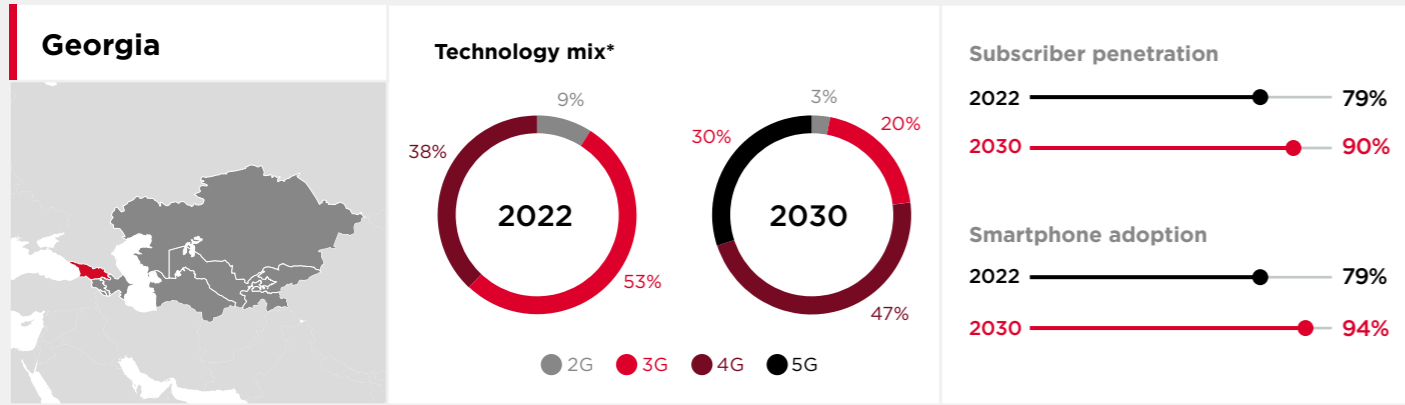
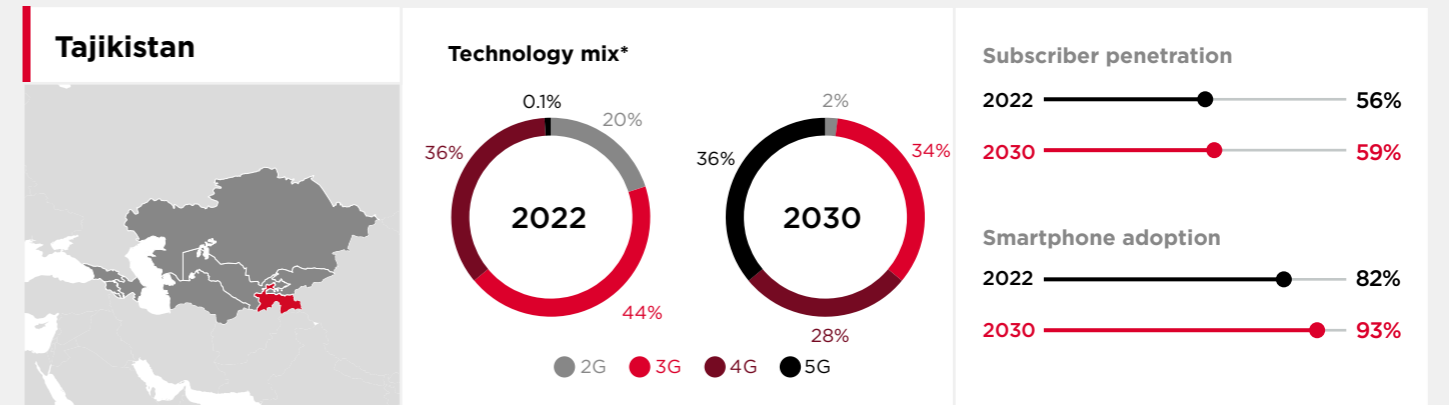
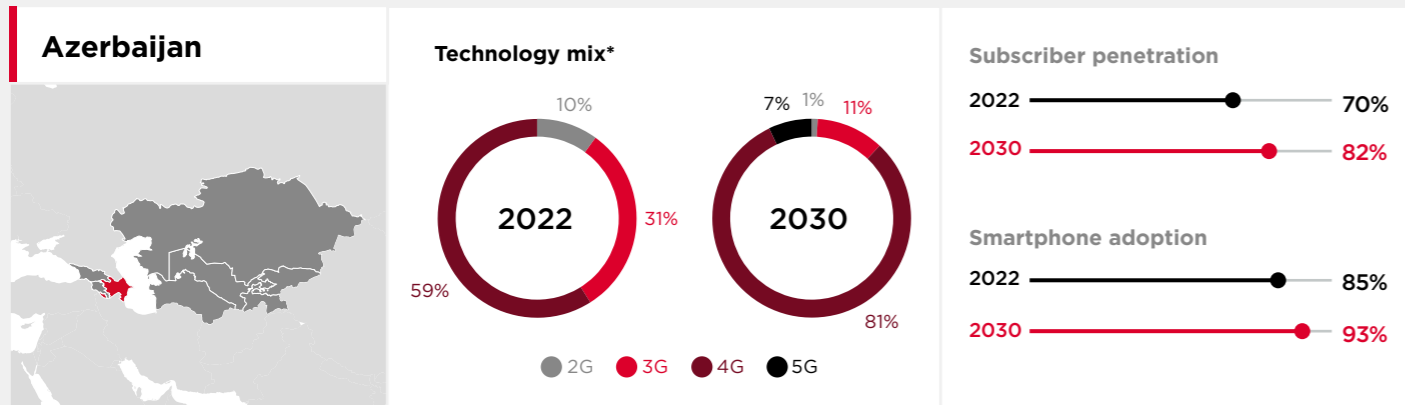
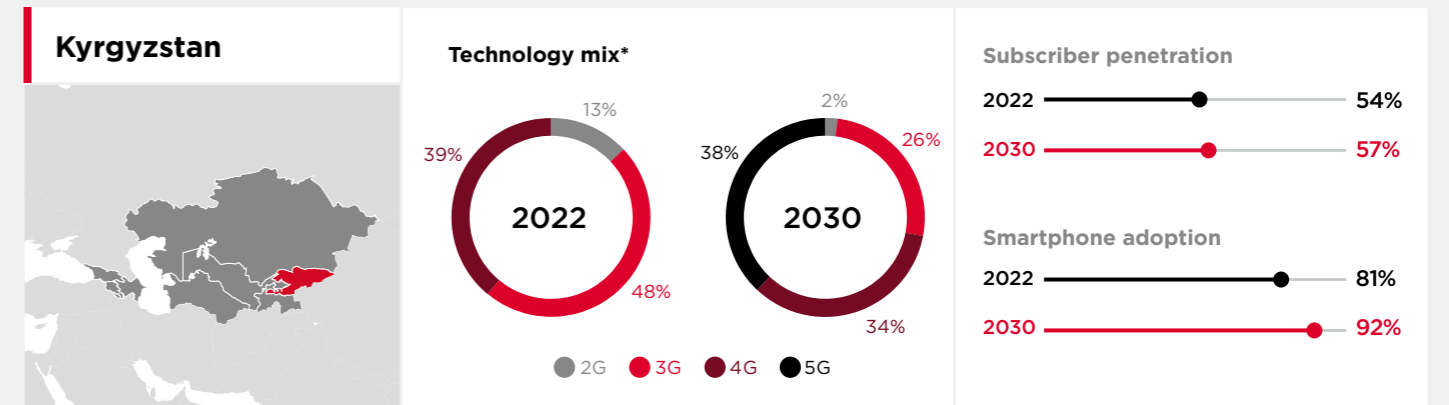
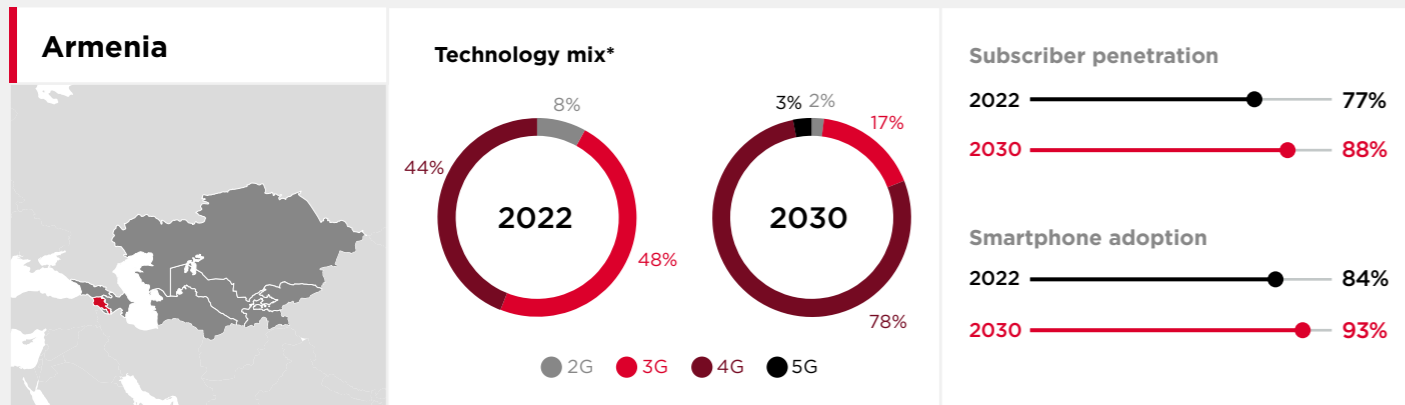
— **Facilitate infrastructure rollout:** This involves implementing a spectrum policy that aims to improve coverage in rural areas, creating incentives for operators to invest in network infrastructure and ensuring the effective and sustainable use of state intervention measures, such as subsidies and universal service funds (USFs). Governments should also streamline approvals for rights of way (RoWs), encourage voluntary network-sharing and establish uniform electromagnetic field (EMF) rules in line with internationally agreed levels.

— **Stimulate demand for mobile broadband:** This involves alleviating the affordability barrier by rebalancing the tax burden on mobile consumers and supporting digital skills training to help people understand how to use the internet and take advantage of its social and economic benefits.

² The 'coverage gap' refers to those living outside of areas covered by mobile broadband networks.

³ The 'usage gap' refers to those who live within areas covered by mobile broadband networks but do not yet subscribe to mobile broadband services.

Subscriber and technology trends for Central Asia and the South Caucasus



* Percentage of total connections
Note: Totals may not add up due to rounding

01 Digital transformation trends

1.1 Governments outline digital transformation ambitions

Around the world, governments and businesses are increasingly leveraging digital technologies and services to improve service delivery and business processes. Indeed, the last three years have demonstrated that digitalisation can significantly improve access to services and expand opportunities, particularly for otherwise excluded population groups. For example, integrating digital technologies in agriculture, commerce, education and finance can create new opportunities to earn and learn, including for women and young people.

Digital transformation is at the heart of the social and economic development plans of governments in Central Asia and the South Caucasus. In recent years, authorities across the region have committed to medium-to-long-term initiatives to coordinate the formulation and implementation of their digitalisation plans. In February 2022, the Central Asia Regional Economic Cooperation (CAREC) Program, a partnership for countries in Central Asia and beyond

(including Azerbaijan and Georgia) launched CAREC Digital Strategy 2030,⁴ a mechanism to scale up digital technology in the region to drive socioeconomic progress in the wake of the Covid-19 pandemic and the rise of disruptive technologies.

At the national level, governments have also announced digitalisation strategies to fast-track the digital transformation of key sectors of the economy and wider society. In Azerbaijan, for example, the government is implementing the 'smart villages' concept, which has the potential to transform the lives and livelihoods of rural dwellers through digitally enabled services.⁵ Another example is in Turkmenistan, where Unicef and Turkmenistan's Ministry of Health and Medical Industry introduced the first digital application for mother-and-child home visiting services in March 2023 to increase the quality of these services and optimise home visiting by health professionals.⁶

Figure 1

Examples of digitalisation initiatives in Central Asia and the South Caucasus



Armenia

In February 2021, the government of Armenia approved a new digitalisation strategy that envisages digital transformation of the government, the economy and society through innovative technologies, cybersecurity, data policy and e-services. The strategy also involves the coordination of digitalisation processes, the creation of common standards and a digital environment, and initiatives to promote the use of digital technologies in the private sector.⁷ In May 2019, the government created the Ministry of High-Tech Industry to develop, implement and monitor Armenia's digital transformation agenda.



Azerbaijan

Digital transformation is a key part of Azerbaijan's national goal for socioeconomic development by 2030.⁸ To this end, the Ministry of Communications and Transportation was renamed the Ministry of Digital Development and Transport to help spearhead the realisation of the government's ambitions.⁹ In December 2022, a working group on development of the digital economy strategy commenced work to produce a single national strategy that will determine the direction of the development of the digital economy in Azerbaijan.¹⁰ Azerbaijan aims to achieve nationwide FTTH coverage by the end of 2024.

⁴ CAREC Digital Strategy 2030, Asian Development Bank, CAREC, 2022

⁵ "Azerbaijan to prepare digital map on creating smart cities, villages", Trend News Agency, March 2023

⁶ "UNICEF and Ministry of Health are introducing the first digital application for Mother and Child Home Visiting services", Unicef, March 2023

⁷ "Armenia to go digital as government approves new strategy", Public Radio of Armenia, February 2021

⁸ "Order of the President of the Republic of Azerbaijan on approval of 'Azerbaijan 2030: National Priorities for Socio-Economic Development'", President.az, February 2021

⁹ "Azerbaijan plans to become leading player in region in terms of digital transformation - President Ilham Aliyev", Trend News Agency, March 2023

¹⁰ "Azerbaijan starts developing digital economy strategy", Trend News Agency, December 2022



Georgia

In March 2022, Georgia's Minister of Economy and Sustainable Development announced that a digital transformation council will be established to facilitate collaboration between the public and private sectors to fully transform the economy through digital technologies.¹¹ Furthermore, the Georgian central bank plans to roll out a pilot scheme for a digital version of the national currency, the lari, as part of the country's digitalisation efforts.¹²



Kazakhstan

Kazakhstan's government approved the Digital Kazakhstan programme in 2017 to drive the technological modernisation of the country's industries and economy for the period between 2018 and 2022. In 2022, Kazakhstan set a new ambitious goal to ensure that 100% of the country is covered by high-speed internet and that 95% of homes have access to high-speed fixed broadband networks by 2025.¹³



Kyrgyzstan

In 2019, the Kyrgyz government adopted the Digital Kyrgyzstan 2019–2023 strategy, which aimed to improve digital infrastructure and internet connectivity; increase digital literacy and provide IT education to promote domestic employment opportunities; develop e-government services and platforms; and promote economic growth through the digital transformation of the financial technology and banking sectors.



Tajikistan

In December 2019, the government of Tajikistan approved the 2020–2030 National Development Strategy of Tajikistan, which includes a general vision to use digital technologies to achieve long-term development in terms of improving the standard of living of the country's population, reaching middle-income status, significantly reducing poverty and achieving the country's priority economic development goals, such as energy independence and food security.¹⁴



Turkmenistan

In February 2022, the Programme of the President of Turkmenistan on Socioeconomic Development of the Country for 2019–2025 was approved. A key objective of this is to grow the digital economy by applying modern technologies in key sectors to improve the business environment, create new jobs, strengthen social security and further improve the social and living conditions of the population.¹⁵



Uzbekistan

The government in Uzbekistan is implementing the Digital Uzbekistan 2030 Strategy, in addition to the Development Strategy of New Uzbekistan for 2022–2026, which aims to drive digital transformation across the economy, industry and wider society.¹⁶ Key targets include improving e-government services, implementing a mobile identification system for accessing public services, introducing digital passports for citizens and digitalising public administration to optimise administrative procedures at central and local levels.

Source: GSMA Intelligence, based on government websites

11 "Georgia to create Digital Transformation Council", Trend News Agency, March 2022

12 "Georgian central bank plans to roll out pilot scheme for digital currency", Agenda.ge, November 2022

13 "Building a Digital Kazakhstan: Kazakhstan Seeks to Provide 100 Percent of Population With Internet By 2025", The Astana Times, August 2022

14 Concept of the Digital Economy in the Republic of Tajikistan (Government Decree No. 642 of 2019), Asia Pacific Energy Portal

15 "The Program for the socio-economic development of the country in 2022 was approved", Turkmenistan.gov, February 2022

16 "Uzbekistan on the path of digitalization: achievements and plans", Diplomat Magazine, April 2022

1.2 Connectivity as a key enabler of digital transformation

The Covid-19 pandemic underlined the digital divide in many countries as various services moved online during lockdown. Some studies suggest that countries with better broadband connectivity were able to mitigate some of the economic losses incurred by the pandemic.¹⁷ Conversely, countries with a wider digital divide were less able to deliver digital public services (including healthcare and education) and other life-enhancing services during the pandemic.

Despite the easing of lockdowns, connectivity will play an increasingly central role in society, especially in the context of the continuously expanding digital economy. Digital connectivity is fundamental to the realisation of the digital transformation plans of governments, such as in Central Asia and the South Caucasus. It is the basis for creating and distributing innovative digital solutions and, perhaps more importantly, the channel for citizens to interact with the society around them in a digital environment.

Digitalisation has a profound impact on the way people live, work and socialise, which emphasises the risk of exclusion from vital services for unconnected populations. As a result, closing the digital divide – and by extension ensuring that no one is left behind in the emerging digital economy – has never been more important. This is especially true for countries where connectivity can serve as a tool to improve the social and economic outcomes for vulnerable citizens, particularly low-income families and people living in rural and remote communities.

The intention to close the digital divide is apparent among countries in Central Asia and the South Caucasus. In Georgia, for example, a new constitution that declares internet access as a fundamental right came into force in December 2018,¹⁸ while the Kazakhstani government expects the entire country's population to be covered by high-speed internet by 2025.

Digitalisation has a profound impact on the way people live, work and socialise, which emphasises the risk of exclusion from vital services for unconnected populations



17 Raúl Katz, Juan Jung and Fernando Callorda, "Can digitization mitigate the economic damage of a pandemic? Evidence from SARS", 2020

18 Georgie opinion on the draft constitutional amendments adopted on 15 December 2017 at the second reading by the Parliament of Georgia, The Venice Commission

02 The connectivity landscape

2.1 Mobile connectivity is the dominant form of internet access

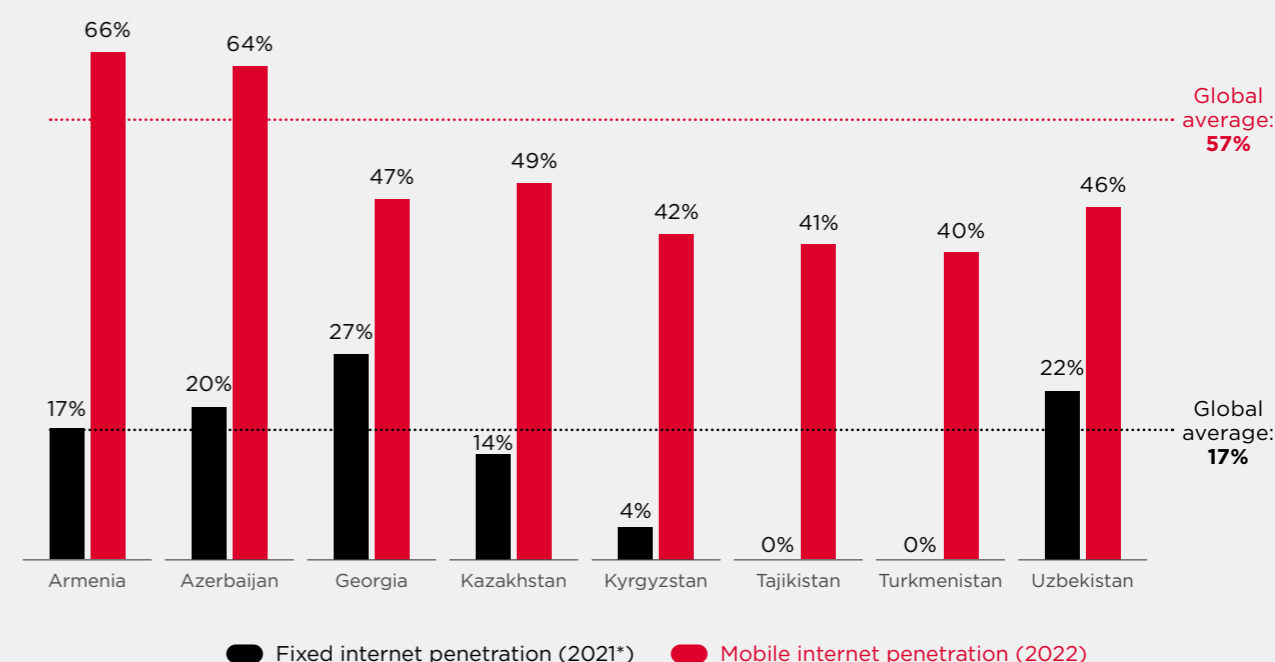
Mobile technology has been fundamental to expanding affordable connectivity across Central Asia and the South Caucasus. This is based on the capability of wireless networks to cover a wide area with greater efficiency than many other technologies, especially in developing regions with underdeveloped fixed network infrastructure and relatively low levels of urbanisation. Across Central Asia and the South

Caucasus, more than 40% of the population on average live in rural, and often mountainous, areas. In such places, mobile connectivity is typically the first, and often only, form of access to internet connectivity because of limited fixed broadband infrastructure and the costs associated with deployment in rural environments.

Figure 2

Fixed internet versus mobile internet penetration in Central Asia and the South Caucasus

Percentage of population



* Latest available data for fixed internet penetration is from 2021
Source: ITU, national regulators, GSMA Intelligence

Mobile technology has evolved considerably over the last two decades, including the development of high-speed mobile broadband technologies, such as 4G and 5G, and the increasing availability and affordability of smartphones capable of supporting a variety of digital services. Mobile networks also support new business models, allow users to

connect on the go and facilitate network effects for interoperable digital platforms. The arrival of 5G creates an opportunity for mobile to play an even more significant role in the digital transformation of societies, thanks to key features such as lower latency and larger capacity.



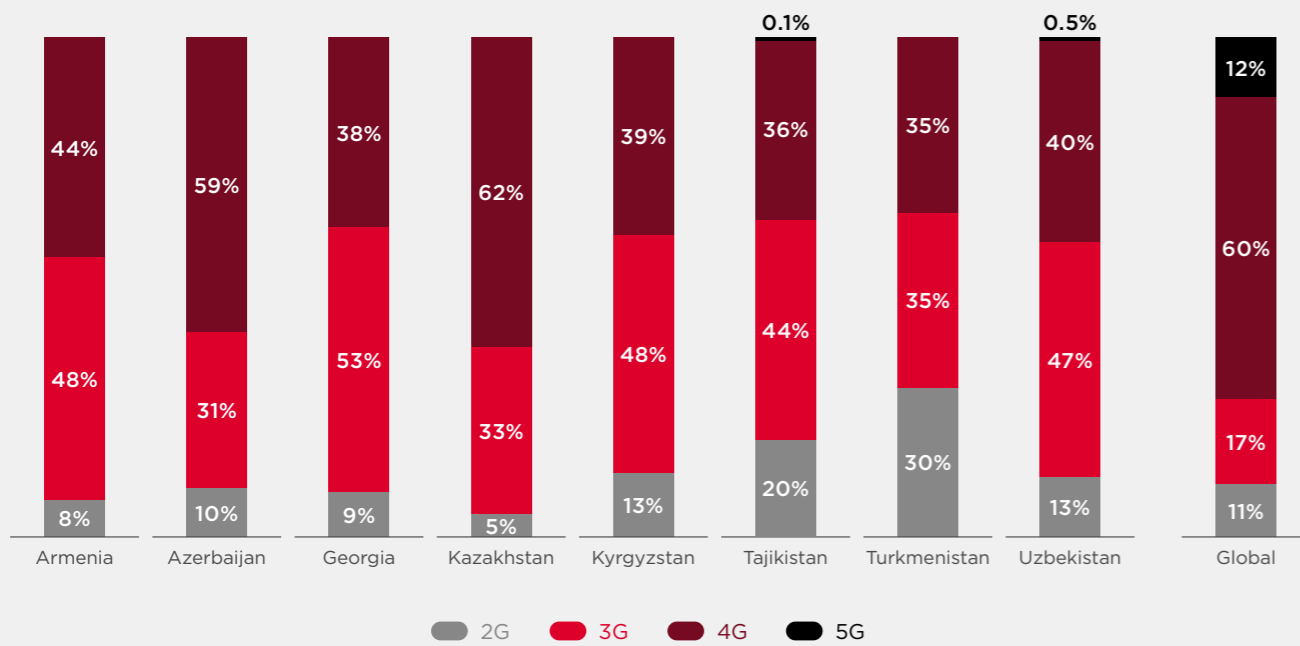
2.2 4G adoption is growing, but 5G is on the horizon

4G is now the dominant technology in Azerbaijan and Kazakhstan, but 3G still accounts for around a third or more of total connections across the other markets in Central Asia and the South Caucasus. Globally, 4G adoption peaked at 60% and is now declining, along with 2G and 3G adoption, as 5G adoption continues to accelerate. Although 5G is on the horizon in several markets in Central Asia and the South Caucasus, the

focus for many operators in the medium term is to expand 4G capacity in urban areas and 4G coverage to underserved areas, and accelerate uptake among consumers. For example, in August 2022, Azercell initiated a network modernisation and expansion project that aims to install more than 300 new base stations and upgrade around 1,600 existing ones in Azerbaijan.¹⁹

Figure 3
Mobile adoption by technology, 2022

Percentage of total connections



Source: GSMA Intelligence

¹⁹ "Azercell launches 4G in Nakhchivan", AZERTAC, January 2023

The 5G era in Central Asia and the South Caucasus is still in its infancy, relative to more advanced markets in Europe, the Gulf region, North America and Northeast Asia. As of April 2023, commercial 5G service was available in only three countries: Kazakhstan, Tajikistan and Uzbekistan. However, 5G activities are beginning to ramp up. These are expected to translate to commercial deployments and customer adoption in the coming years.

For example, Azercell and Bakcell launched 5G pilots in Azerbaijan in early 2023, while the country's telecoms regulator plans to create a 5G working group to design a common 5G strategy. In Kazakhstan, a consortium of Kazakhtelecom subsidiaries (Kcell and Tele2-Altel) won two 100 MHz blocks in the 3.6–3.7 GHz and 3.7–3.8 GHz spectrum bands. The consortium plans to launch 486 5G base stations in Astana, Almaty, and Shymkent in 2023.²⁰ These developments notwithstanding, the pace of 5G rollout and customer adoption largely depends on the required capital outlay and availability of affordable 5G devices.

Figure 4
Live versus planned 5G services in Central Asia and the South Caucasus



Source: GSMA Intelligence

²⁰ "Kazakhtelecom units bag all available spectrum in 5G auction", Developing Telecoms, January 2023



The 5G FWA opportunity

Like in many developing markets, fixed wireless access (FWA) will be an important use case for 5G in Central Asia and the South Caucasus. FWA networks have been around for several decades, with the majority of commercial services using 4G. However, FWA market adoption has been limited so far, mainly due to performance concerns, especially in comparison to fixed-line options. 5G is making FWA a more competitive solution versus FTTH and cable, as 5G FWA provides speeds of over 10x that of 4G FWA. As a result, there has been renewed interest in FWA solutions; there were over 90 commercial 5G FWA services globally across 50 countries as of January 2023. This means that around 40% of 5G commercial mobile launches worldwide include an FWA offering – a relatively high proportion at this early point in the generational cycle.

5G FWA provides an opportunity to deliver enhanced connectivity solutions to homes and businesses, especially in scenarios where fibre deployment is impractical and/or uneconomical, such as in remote locations and difficult terrains. Here, we highlight four FWA deployment scenarios:

- **Targeting new fixed broadband users in underserved markets** to drive first-time broadband adoption in developing markets such as in Central Asia and the South Caucasus. This can be cost effective compared to FTTH, particularly where new fibre infrastructure needs to be built, so it is a suitable and timely tool to tackle the digital divide in emerging markets more quickly.
- **Targeting fixed broadband users looking for faster speeds**, for instance to tackle the digital divide in rural towns and suburban areas lacking access to FTTH or areas with few alternatives. This occurs in markets where fibre infrastructure is concentrated in urban areas.

– **Complementing fibre offerings**, generally in urban and suburban areas with difficult terrain and/or regulatory red tape or areas with few fixed broadband alternatives.

Targeting enterprise segments to connect micro-, small and medium-sized enterprises in underserved areas or areas with few alternatives. The embedded security, reliability and high capacity of 5G make for a valid value proposition for the enterprise segment. Other targets include temporary work sites, such as construction zones, and large campuses, to avoid the cost of wiring the premises.

The above scenarios are all applicable in countries across Central Asia and the South Caucasus. The option of targeting consumers in underserved areas is one of the biggest FWA opportunities. Here, low- and mid-band spectrum for 5G FWA will be crucial to realise efficient network deployment. 5G FWA will also be a primary 5G use case for enterprises of all sizes, given the challenges around access, cost and reliability of existing connectivity services, including fixed broadband and satellite. As such, early 5G deployments will likely target locations with a high concentration of enterprises, including public institutions.

Apart from demand, the FWA opportunity also benefits from an expanding device ecosystem. According to the Global mobile Suppliers Association, as of April 2022 there were 120 5G FWA customer-premises equipment (CPE) models available from 72 different vendors, up from just 16 models in May 2020. 5G FWA rollout will be boosted by growing CPE model diversity, an expected fall in CPE costs and continuing CPE innovation.

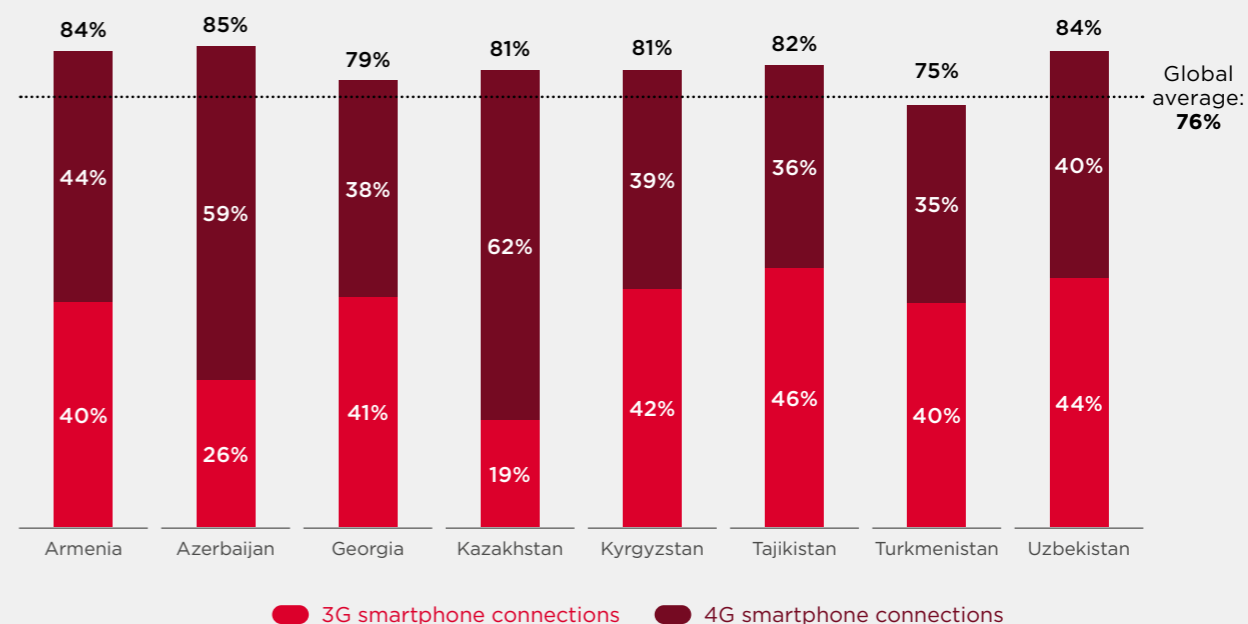
2.3 Smartphone adoption is rising

Smartphone adoption has risen markedly in recent years, helped by the influx of more affordable smartphone models. Adoption levels in countries in Central Asia and the South Caucasus are generally higher than the global average (with Turkmenistan being the only outlier), although a significant proportion of these devices are 3G smartphone connections (Figure 5).

The average selling price of 4G devices is falling rapidly – now below \$150 in many markets. The improving affordability of 4G and, ultimately, 5G devices through various measures, such as lower retail prices and smartphone financing solutions, will support efforts to migrate customers away from legacy (2G and 3G) networks.

Figure 5
Smartphone adoption, 2022

Percentage of total connections



Source: GSMA Intelligence

Moving customers to 4G and 5G networks and consequently driving the uptake of higher-value data services and advanced connectivity use cases is crucial to reversing the downward trend in average revenue per user (ARPU) for mobile. In 2022, mobile ARPUs in Central Asia and the South Caucasus ranged from \$3 to \$6, compared to the average of \$8 globally and \$16 in Western Europe.

Low ARPU weighs on the long-term financial health and sustainability of the mobile industry,

with potential implications for quality of service for customers and coverage expansion. For example, the potential for service rollout in low-income areas to further depress ARPU levels could serve as a disincentive for network deployment in those areas. As a result, governments and policymakers should consider giving operators more flexibility to account for inflation in their tariffs, in order to strengthen the business case for further 4G investment and 5G rollout.

03 The digital divide



3.1 Understanding the digital divide

Around 45 million people now use mobile internet across the eight countries that this report focuses on in Central Asia and the South Caucasus. While this is more than three times the number of mobile internet users (14.1 million) a decade earlier, nearly 50 million unconnected people remain at risk of missing out on the benefits of mobile internet. Connectivity will play an even more integral role in society over the next decade and beyond, underlining the urgency to close the digital divide and bring unconnected people online.

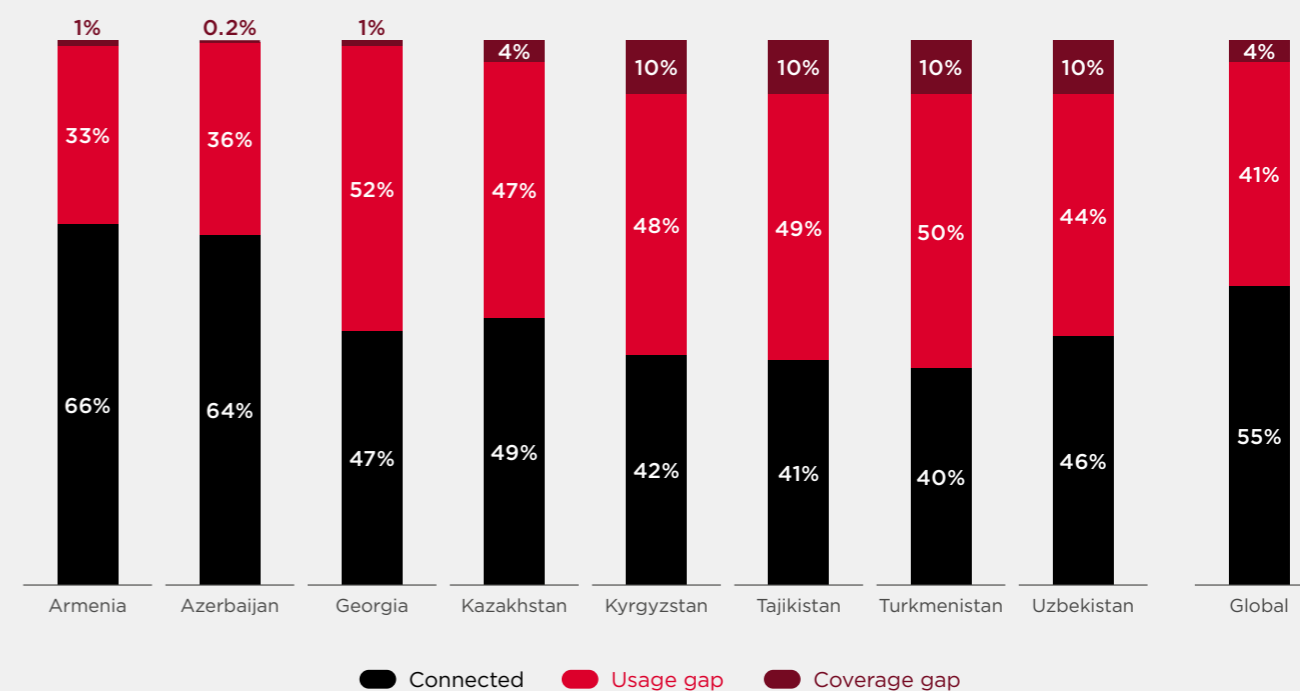
An important step in efforts to address the digital divide is to identify the nature and scale of the challenge, as well as the most affected segments of the population. Figure 6 highlights the status of mobile internet connectivity in Central Asia and the South Caucasus. Operators' investments in network infrastructure over the last decade have helped to shrink the coverage gap for mobile broadband

networks from more than a quarter of the population, on average, to current levels. The coverage gap has narrowed markedly in the South Caucasus region but remains a challenge in parts of Central Asia, where around 10% of the population in most markets still live in underserved areas.

While the industry continues to invest in innovative solutions and partnerships to extend connectivity to still underserved and far-flung communities, the adoption of mobile internet services has not kept pace with the expansion of network coverage. This has resulted in a significant usage gap. In 2022, the usage gap was widest in Georgia and Turkmenistan at around 52% and 50% of the population, respectively, while the usage gap was lowest in Armenia and Azerbaijan at 33% and 36%, respectively, compared to the global average of 41%.

Figure 6
Unique mobile internet subscribers, 2022

Percentage of population



Source: GSMA Intelligence

3.2 Addressing the digital divide

Closing the digital divide requires the collective effort of stakeholders across the public and private sectors, as well as civil society and development partners, to address the factors sustaining and exacerbating the coverage and usage gaps. The need for a multistakeholder approach reflects the fact that there is no single path to greater inclusion; rather, it is a continuous process of improving access to connectivity, creating and integrating digital services across society and educating citizens on how to access relevant content.

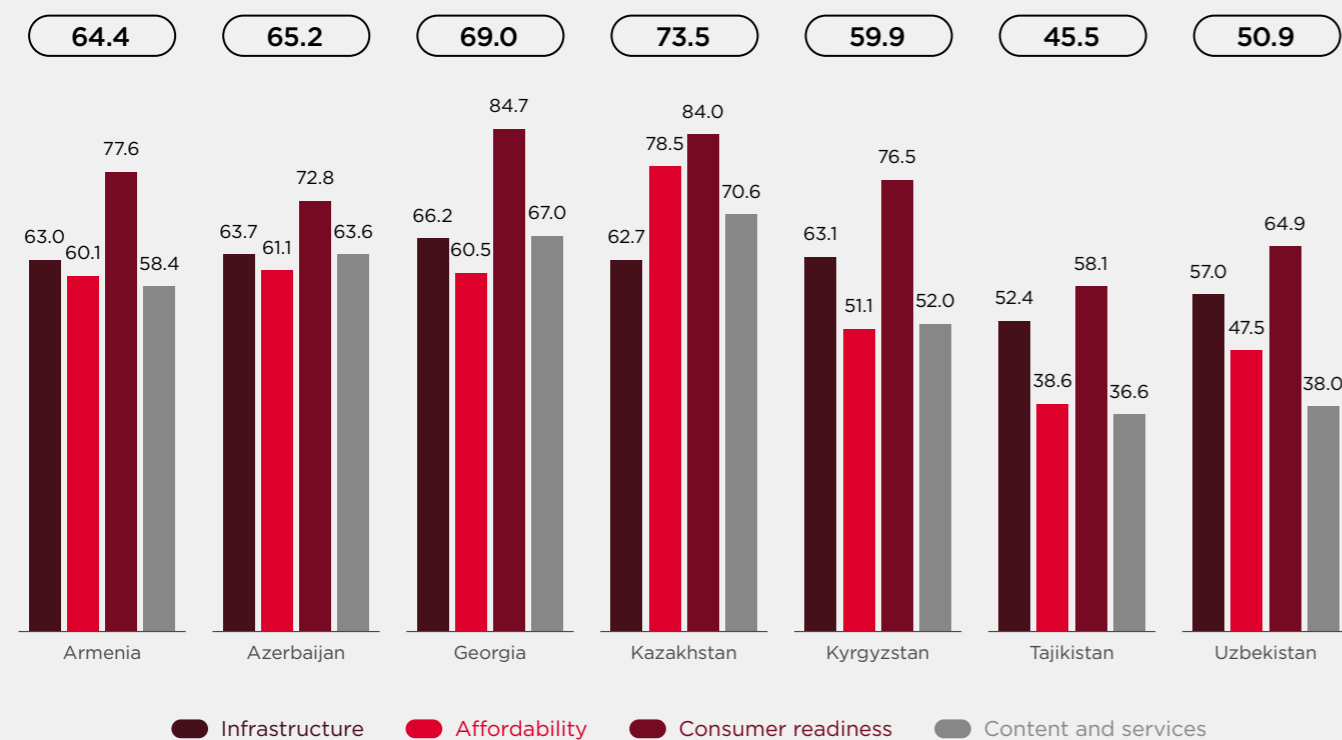
The GSMA's Mobile Connectivity Index (MCI) helps key stakeholders to focus efforts and policy actions to address the prevailing coverage and usage gaps. The latest iteration²¹ measures the key enablers of

mobile internet connectivity across 170 countries (representing 99% of the world's population) against 42 indicators for the period 2014-2021. The indicators are grouped into four overarching enablers: infrastructure; affordability; consumer readiness; and content and services. Together, these provide objective, quantitative metrics to track the key enablers of mobile internet adoption and usage, as well as insights from consumers on what they use mobile internet for or what prevents them from using it.

The MCI covers all the focus countries in Central Asia and the South Caucasus region except for Turkmenistan. Figure 7 highlights the aggregate score and performance of the various markets against the four enablers of the index. These scores are in line with the UN's view of the barriers to digital inclusion.²²

Figure 7

Aggregate scores and performance against the four enablers in the MCI



Source: GSMA Intelligence

²¹ The State of Mobile Internet Connectivity 2022, GSMA, 2022

²² UN E-Government Survey 2022, United Nations, 2022

Infrastructure

While the proportion of people who live outside of areas covered by a mobile broadband network has reduced considerably in the last decade, the task of extending coverage to the last frontier can be costly and complex. This is evidenced by the discernible difference in the levels of broadband connectivity between rural and urban regions: across low- and middle-income countries (LMICs), adults living in rural areas are still 33% less likely to use mobile internet than those living in urban areas.²³ Meanwhile, 4G and 5G technologies enable mobile internet users to access a greater range and quality of services. As such, these technologies have become the focus for many countries in recent years.

In Central Asia, 4G coverage has reached 83% of the population, on average, and as much as 95% in Armenia and Azerbaijan. However, the remaining populations that are yet to be covered live in rural and remote locations. Extending high-speed broadband infrastructure, particularly 4G, is a vital step to closing the digital divide. In 2022, for example, Beeline Kazakhstan installed over 4,000 base stations

throughout the country, taking its total to more than 25,000 base stations. The operator, through its LTE Everywhere programme, also extended 4G LTE coverage to an additional 1,000 villages (covering around 1 million people) in the same period.

Given the high costs of deploying physical infrastructure for mobile broadband in rural areas, investment, alternative technology solutions (such as satellite backhaul and solar/wind powered base stations) and innovative partnerships between various stakeholders could all play an important role in extending network coverage. This is an area where operators and other providers have been increasingly active. For example, Uz-Sat, a joint venture between Uzbektelecom, Satelin Group and private Uzbek enterprises, has partnered with the Hughes Jupiter System ground platform for satellite broadband solutions to help close the digital divide in Uzbekistan. Uz-Sat will employ Jupiter gateways and terminals to bring broadband connectivity via geostationary satellites to remote and rural parts of the country.



Kazakhstan's 250+ programme to expand coverage

Kazakhstan has set an ambitious goal of 100% population coverage for high-speed internet and 95% coverage of home broadband access networks by 2025. The 250+ programme was launched in 2020 to provide settlements with a population of over 250 people with internet connectivity. According to the government, there are 6,459 such settlements in the country. As of the end of 2022, over 750 settlements had benefited from improved connectivity.²⁴

To provide internet connectivity to small, remote and hard-to-reach villages, the government is considering partnerships with satellite providers, such as OneWeb and Starlink, while also providing an enabling environment for mobile operators to implement rural coverage initiatives. For example, to reduce the financial burden of rural deployment by operators, the government offers discounts of up to 90% on spectrum fees to help offset operators' investment in building infrastructure in rural areas.²⁵ To further optimise capex and opex, mobile operators Beeline (Kar-Tel), Kcell and Mobile Telecom Service (Tele2-Altel) have formed a partnership to jointly extend their mobile broadband offerings to rural customers.

²³ GSMA Consumer Survey 2021

²⁴ "Building a Digital Kazakhstan: Kazakhstan Seeks to Provide 100 Percent of Population With Internet By 2025", The Astana Times, August 2022

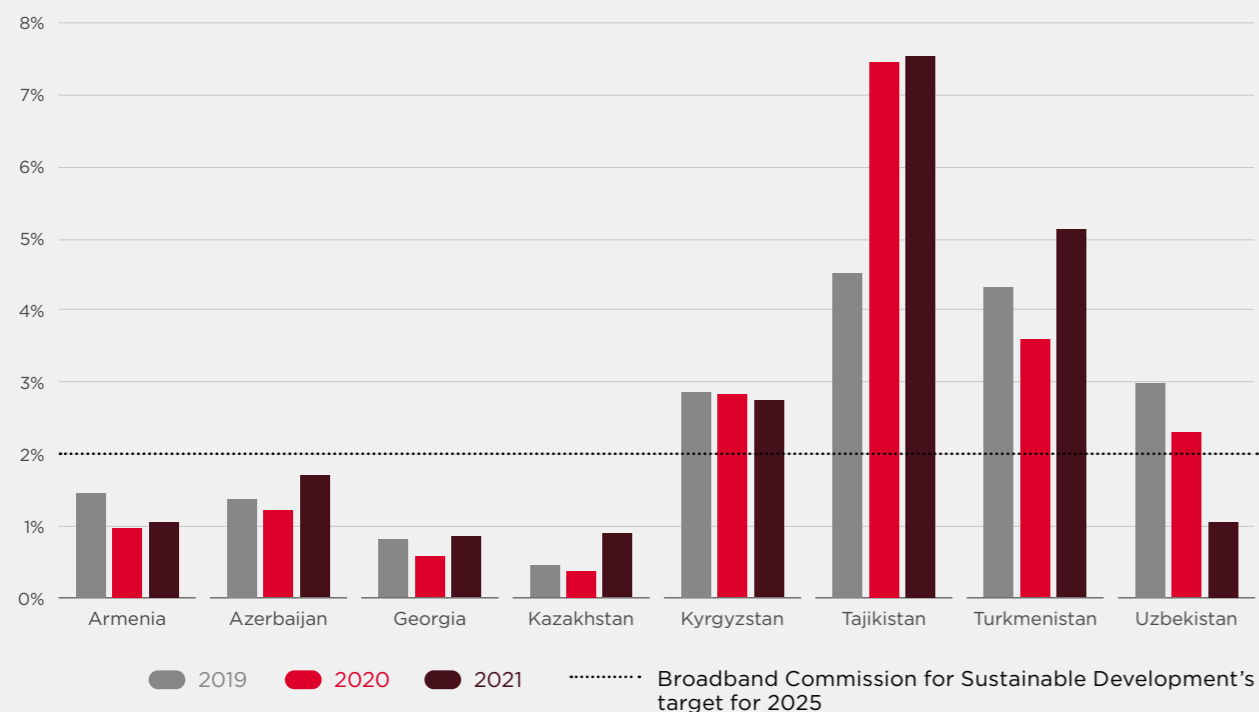
²⁵ The Mobile Economy Russia & CIS 2021, GSMA, 2021

Affordability

Affordability refers to the ability of consumers to both pay for a handset and cover the cost of a suitable data bundle. The affordability of mobile data and handsets is composed of two parts: the cost in local currency of purchasing mobile data and an internet-enabled handset; and a consumer's income.^{26 27} According to the MCI, the affordability challenge is more acute in Tajikistan. This reflects the relative high cost of mobile data in the country, where

2 GB of data is equivalent to 7.5% of monthly gross national income (GNI) per capita. The Broadband Commission for Sustainable Development's target for 2025 is for entry-level broadband services in developing countries to be less than 2% of monthly GNI per capita. For other countries, affordability is mostly affected by the cost of entry-level smartphones, which in most cases is more than 20 times greater than ARPU.

Figure 8
Cost of 2 GB of data as a percentage of monthly GNI per capita



The urban/rural divide in Central Asia and the South Caucasus also affects the affordability enabler, with rural households more likely to have lower incomes and, by extension, less able to afford data bundles and devices. For example, the total household income

levels of rural areas in Armenia are almost three times lower than those of urban areas, making even entry-level LTE smartphones unaffordable for many rural dwellers.

²⁶ Income is an important factor to consider. If two consumers with different levels of income face the same handset and data costs, the consumer with the lower income will be less likely to purchase and will remain unconnected.

²⁷ Changes in affordability over time can therefore be the result of changes in the costs of handsets and data, an individual's income or both.

Consumer readiness

Awareness of mobile internet continues to increase in developing countries, including in Central Asia and the South Caucasus, as more people access various services online. As a result, the eight focus countries perform strongly in the consumer readiness enabler of the MCI. In Azerbaijan, for instance, government estimates put the digital literacy rate at 53-55%,²⁸ which is comparable to many developed regions. But a lack of literacy and digital skills nevertheless remains a top barrier to mobile internet adoption for many consumers, particularly for women, the elderly, those from low-income families and those living in rural areas.

While solutions exist for low-literate populations, such as voice assistants, voice response chatbots and customer support in local languages,²⁹ people are often unaware of these. Most of these innovations require access to internet-enabled handsets, which frequently come with useful accessibility features as standard, but these handsets are often the least affordable. Tackling the affordability barrier remains important in order to allow users to make use of many of these innovations.

The gender gap is less of a challenge in the South Caucasus, such as for Armenia and Georgia, where the gender gap in mobile internet usage is much narrower than the global average. The gender gap is more stark in some countries in Central Asia, particularly Kyrgyzstan, Tajikistan and Turkmenistan. A number of initiatives have been launched in recent years to address this challenge, such as the following:

- In December 2020, a new EU-funded project (Building a Transparent Future for Rural Communities via Digitalisation) was launched in Kyrgyzstan to support rural youth and women in the Osh and Issyk-Kul regions by improving digital literacy and skills development, promoting inclusion in public affairs on the local level and strengthening digital entrepreneurship education and training.³⁰
- In July 2022, the GAP Women IT Union project was launched in Uzbekistan to attract women to the field of information technology by increasing their digital literacy and providing opportunities for training and employment.³¹



Enhancing digital literacy in Kazakhstan

In 2018, the government announced a basic digital literacy skills training programme in every region of Kazakhstan. Training courses were provided free of charge for anyone who wished to increase their competence in:

- **basic digital skills** (confident use of a computer, mobile devices and the internet, and understanding of security and data protection)
- **e-government and e-government services** (working with the e-government portal, including obtaining the necessary e-government services online)
- **open government** (skills to use the four components of the open government portal: open data, open legal acts, open dialogue and budgets)
- **electronic commerce** (skills to buy, sell and promote goods and services online).

The training was conducted in schools, colleges and libraries, with around 2,729 institutions participating.

²⁸ "Azerbaijan reveals population's digital literacy rate", Trend News Agency, February 2023

²⁹ "Making mobile internet more accessible for people with reading or writing difficulties", GSMA, 2021

³⁰ "Youth and women in Kyrgyz rural areas to go online", Delegation of the European Union to the Kyrgyz Republic, February 2021

³¹ "A new project 'GAP' Women IT Union was launched", IT Park Uzbekistan, July 2022

Content and services

Besides digital skills, the availability of online content and services that are accessible and relevant to the local population is a key enabler of mobile internet adoption and usage. Without this, people will not have a compelling reason to invest the time and financial resources needed to access the internet. In recent years, many countries have seen improvements in the volume of content developed locally, mainly from the proliferation of government online services as part of their digital transformation drive. In Kazakhstan, for example, the digitalisation of pensions meant that around 93% of pension services were received by Kazakhstanis remotely as of July 2022.³²

The use of Russian and, to a lesser extent, English in some countries also makes large amounts of relevant content available to a considerable proportion of the population. However, limited translation of such content to local languages is still an issue, especially for consumers in rural areas. This presents an opportunity for stakeholders, especially public institutions, civil societies and development partners, to support the creation of locally relevant content to stimulate demand for connectivity among the most vulnerable consumers.

Kyrgyz Internet Society Chapter focuses on online resources for schools

In 2017, the Kyrgyz Internet Society Chapter started installing devices containing downloaded internet content, which can be accessed by communities in remote locations. The IlimBox (which translates to 'science in a box') is used to deliver valuable digital content in the form of educational videos, audio and text resources to teachers and students in hard-to-reach schools. It serves as a digital library for schools and public libraries, containing Wikipedia (in Kyrgyz, Russian and English), the Khan Academy electronic library (in English) and thousands of audio and video lessons and electronic books. All of these digital training materials can be used offline, meaning users do not need immediate access to the internet, although the library also connects to services through Wi-Fi.³³



³² "Level of digital literacy in Kazakhstan grows to 87%", el.kz, August 2022

³³ "Member News: Kyrgyzstan Chapter Focuses on Online Resources for Schools", Internet Society, September 2020



Closing the digital divide requires collaboration

Closing the digital divide in Central Asia and the South Caucasus will require substantial collaborative actions to both provide coverage for those living in areas without mobile broadband and address the barriers to usage for those already living within the footprint of a mobile broadband network. Moreover, relevant, timely and accurate data on digital inclusion remains critical to highlight the digital gaps and to better understand the context, circumstances and needs of individuals not yet using mobile internet. No single actor or action can close this divide, given the multifaceted nature of the underlying factors of the digital divide; but by working together, policymakers and industry stakeholders can ensure that no one is left unconnected in an increasingly connected world.

Collaboration is already occurring in many cases, but there is scope for more collaboration in existing and new areas, notably to:

- increase digital skills and literacy, as well as

drive awareness and understanding of mobile internet and its benefits

- improve affordability, including efforts to lower the cost of internet-enabled handsets and data, offer innovative data pricing strategies and handset financing options, and provide targeted subsidies and tax policies that promote the uptake of internet-enabled devices and data services
- invest in local digital ecosystems and an enabling policy environment that can accelerate growth in local content, services and applications that meet the needs of people in their communities and in their own language.

These measures should be accompanied by enabling regulatory and financial conditions to retain and expand mobile infrastructure in rural areas, but also in urban areas, which is crucial for affordability of data services.

04 Policies to close the digital divide



Effective and enabling policies are essential to complement the efforts of mobile industry players and other key stakeholders in closing the digital divide. To this end, governments and policymakers should implement policies and measures that can attract much-needed investment in the deployment of network infrastructure in underserved areas,

create innovative digital services to stimulate demand and address the various non-infrastructure barriers to mobile internet adoption. In turn, this will bring more citizens online and accelerate progress on the digital transformation initiatives of governments and policymakers in Central Asia and the South Caucasus.

4.1 Facilitating infrastructure rollout

Infrastructure is at the core of the inclusive digital transformation of society. There have been a growing number of interventions to support services in areas that are challenging to cover due to the higher costs and lower revenue potential. These include liberalising spectrum access regulations and

addressing issues around cross-border coordination, which are not uncommon among countries in Central Asia and the South Caucasus. It also includes other approaches such as public-private partnerships and community networks.

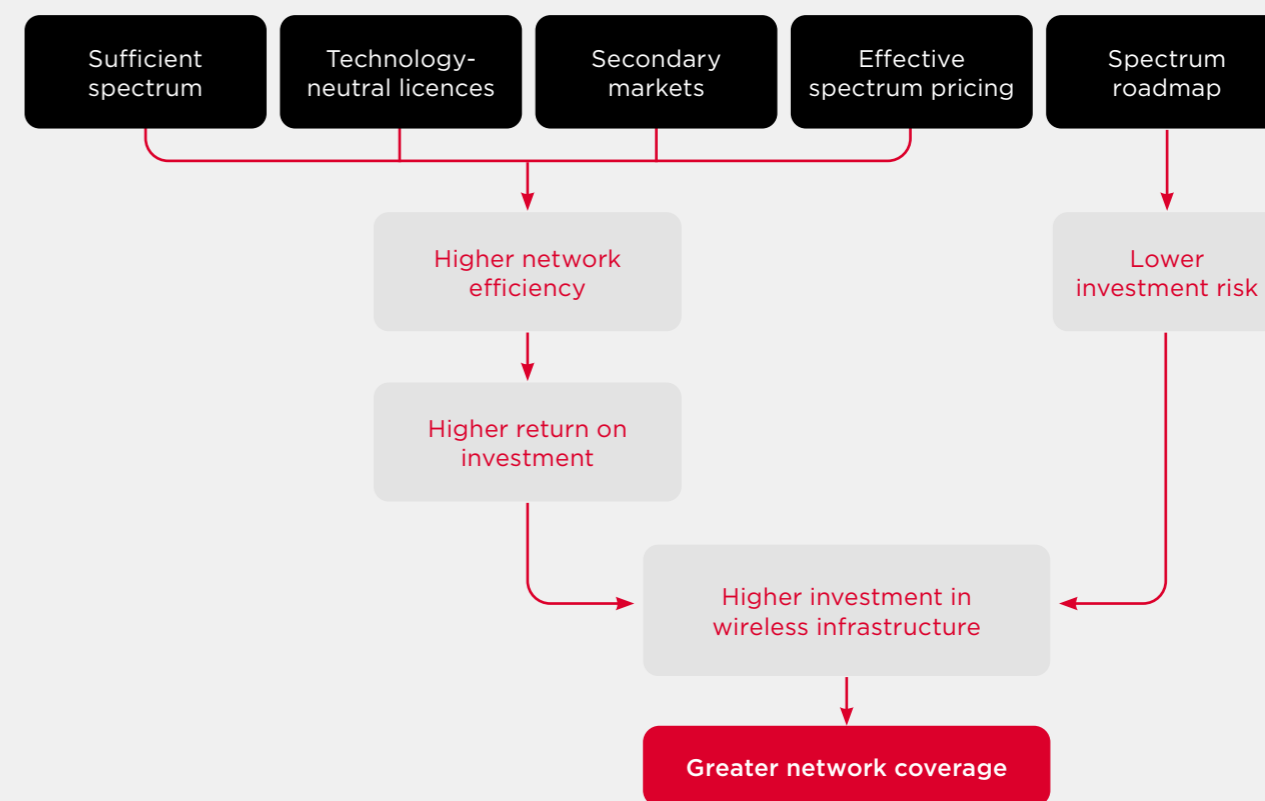
Spectrum availability

Policymakers should implement a spectrum policy that aims to improve coverage in rural areas and create incentives for operators to invest in network infrastructure, in addition to avoiding spectrum licence terms and conditions that discourage network

investment and innovation and needlessly increase costs. Figure 9 maps the impact of forward-looking spectrum policies on the realisation of higher network coverage.

Figure 9

Features of a spectrum policy conducive to network expansion



Source: GSMA

Lower bands are crucial to close the digital divide. Due to its propagation characteristics, sub-1 GHz spectrum is essential to build coverage in sparsely populated areas and provide indoor coverage in built-up areas. However, with the uptake of digital services, additional spectrum is required to provide capacity in rural areas, where densification of cell sites and usage of higher bands are economically impractical. Additional low-band spectrum will help connect rural areas to better-quality services by reducing the number of cell sites needed to reach the same level of performance. Among the eight focus countries in Central Asia and the South Caucasus, none have made the 700 MHz band available, except

for Uzbekistan – and Uzbekistan only has limited usage of the band due to cross-border issues. In order to extend coverage and capacity in rural areas it is necessary to finalise already ongoing processes of cross-border coordination and reallocation of TV broadcasting on national levels.

Mid-bands, such as 3400–3800 MHz, could also play a role in closing the digital divide. The use of 5G technology, together with wide channels of 80–100 MHz and CPE with external antennas, could provide FWA services with up to gigabit data rates.³⁴ With proper network planning, such base station sites could provide FWA coverage beyond a range of 10 km.

Learnings from other markets: regional initiatives for cross-border coordination and reallocation of TV broadcasting

Replanning of TV broadcasting requires active cross-border coordination on a multilateral basis, involving other neighbouring countries, and not just adjacent ones. To take into account different requirements and the technical details of replanning, such a process is usually facilitated by regional organisations or by the ITU. For example, the 700 MHz band in Africa has been cleared from TV broadcasting by the joint replanning effort between 47 countries, which consisted of 33 iterations of calculating conditions for different frequency channels. The process was completed in 2012 after 18 months of work, with three conferences and a significant amount of communication between these countries. A similar process has been used in Arab states and in Latin America. European countries were able to establish a number of sub-regional groups, first to replan the 800 MHz band and later in 2017–2018 to replan the 700 MHz band. After cross-border coordination has been established, countries usually reach agreement on the dates of actual TV broadcasting reallocation in the bands below 694 MHz to be able to roll out mobile networks without cross-border interference.

The countries in Central Asia and the South Caucasus are among the few in the world to have not finalised the reallocation process of the 700 MHz band. The process is ongoing on a bilateral basis as well as in the Regional Commonwealth in the Field of Communications (RCC). However, due to the complex cross-border situation of Central Asia and the South Caucasus and the cross-border coordination with countries outside of the RCC, the process may require additional help from the ITU to balance the requirements of all countries involved. There is a need to increase efforts not only to finalise cross-border coordination within Central Asia and the South Caucasus, but also to reach agreement between the countries on actual reallocation of TV transmitters operating in the 694–790 MHz range.

³⁴ Report ITU-R M.2518-0 (11/2022), Terrestrial International Mobile Telecommunications for remote sparsely populated areas providing high data rate coverage

Promoting investment

State intervention in coverage expansion, especially for the most challenging areas, should also be considered, but only after exhausting all regulatory measures to maximise coverage through market-driven mechanisms. In other words, governments should focus first on creating a regulatory environment and tax optimisation that maximises operators' incentives to increase coverage, and only after exhausting these options should they start considering more direct interventions to expand coverage even further. Selecting the most cost-effective intervention is a case-by-case exercise that should rely on the cost-benefit analysis of the available alternatives.

The cost of attracting capital in the telecoms industry is usually higher than reserve interest rates. Combined with slower growth of revenues and inflation trends in recent years, this creates pressure on available funds to invest in mobile infrastructure. Additional opportunities for revenue growth are expected from the wider digitalisation of the economy, but only after the next cycle of 4G networks expansion and 5G rollout. Therefore, even developed countries are introducing tax relaxations for operators to release additional funding for infrastructure rollout both in urban and rural areas. The exact tax optimisation varies from country to country, but the implementation of such

measures usually provides a substantial boost to capital expenditures within the mobile industry, characterised by capital intensity of around 15–20% of revenues.

In many developing regions, regulators and policymakers have devised regulations to create incentives, such as subsidies and USFs, for unprofitable areas. Sustainability and effectiveness are vital for such measures to yield the desired result. Furthermore, there is a need for these measures to address specific pain points in deploying network infrastructure in remote locations, such as energy costs in off-grid locations and backhaul infrastructure buildout. However, the effectiveness of USFs is highly dependent on openness and competitiveness of its usage. Otherwise, USFs may become just another tax, which will actually diminish investment initiatives across the industry.

Even without USFs, many governments establish dedicated projects and funding to promote infrastructure deployment in rural areas. In Kazakhstan, for example, the government has announced measures supporting its DigitEL project, including switching from satellite backhaul to fixed links and fibre optics in 120 settlements and enhancing mobile broadband connectivity in another 361 settlements.

Learnings from other markets: government approaches to spurring investment

Governments in many countries provide indirect support measures in the form of various tax incentives to accelerate investment in digital infrastructure:

- The **US** has legislation to reduce tax payments for enterprises developing Industry 4.0 solutions, including 5G network operators.
- **Japan** has tax laws to account for accelerated depreciation of cellular equipment.
- In **South Korea**, taxes for operators have been reduced by several percent in order to incentivise 5G networks development.
- In the **UK**, taxes associated with fibre infrastructure deployment, including for mobile communications, have been reduced.
- In **India**, similar measures are under discussion, following the start of 5G rollout.

Specific actions will depend on the tax systems in the various countries in Central Asia and the South Caucasus. In many cases, however, the telecoms industry could benefit from the lowering of corporate taxes or the optimisation of equipment depreciation. For example, coefficients for depreciation rates in relation to assets acquired or created as part of 4G and 5G network development may be increased to release capital for new infrastructure. Investment deductions for infrastructure investments are another tax benefit that could have a significant effect.

Considerations for wider coverage obligations

It is not unusual for governments to tie coverage obligations to spectrum licences as a means of encouraging wider infrastructure rollout. However, it is essential to balance any coverage obligations with market realities, especially around the economic viability of network rollout in remote locations against the backdrop of low ARPU levels, reliance on off-grid energy sources, the complexity of building various aspects of the network (including backhaul) and, in some cases, red tape around RoW permits.

In this context, it is important that governments strongly consider how they can achieve ambitious coverage goals by offering discounted spectrum

in return for targeted coverage obligations. A growing number of governments are using reduced spectrum fees in return for operator commitments to provide coverage in carefully targeted areas. These approaches include offering spectrum for a very low cost or for free when licences are due for renewal, reductions in annual fees, or reimbursements of a fixed amount of upfront costs in return for coverage commitments in designated areas. These approaches recognise the difficulty in providing coverage, or upgrading networks, in specific geographic areas where the economics of mobile service delivery are most challenging.

Learnings from other markets: balancing obligations and incentives

Coverage obligations can affect rollouts both in positive and negative ways. Unrealistic or erroneously formulated obligations could divert investment from areas where it is actually needed from a demand perspective. Therefore, thorough analysis on how to use coverage obligations is required before any spectrum award. Some countries, such as South Korea, have used obligations in the form of a percentage of 4G base stations that should be upgraded with 5G in the newly auctioned 3400–3700 MHz band. Italy used a specific list of settlements for which operators should introduce new 5G services. A percentage of population to be covered is also used by some countries, but the impact of such obligations is difficult to assess in advance of a spectrum award, which may lead to unrealistic requirements. In many cases, coverage obligations are combined with smaller spectrum prices or other discounts to compensate for more capital-intensive rollouts.

In Kazakhstan, the government has offered operators a 90% discount on spectrum fees for investing in rural coverage for the period 2021–2025 as part of the Digital Kazakhstan initiative. Such initiatives should be sustained until the digital divide has been successfully tackled. The government should also consider direct funding or state intervention measures to address other critical areas around infrastructure rollout in rural areas. In Georgia, for example, policymakers have an opportunity to adopt realistic coverage obligations for the forthcoming 700 MHz and 3400–3800 MHz auction in order to drive investment in rural rollout. In Central Asia and the South Caucasus, special attention should be paid to the availability of backhaul and electric facilities, the lack of which in many cases limits achievable coverage in rural areas. These issues require separate initiatives from governments and stakeholders to fund such infrastructure in rural areas.

Encouraging innovative technologies and deployment models

The mobile industry has been exploring innovative approaches to improve the business case for rural connectivity. Newer mobile technologies make mobile data more affordable,³⁵ while a new generation of lower-cost base stations that can exploit evolving backhaul options help extend networks more widely, including in rural areas in developing markets. Similarly, the declining cost of renewable energy sources and energy-efficient mobile equipment can help in areas where consistent energy supplies are not available. The growth of various infrastructure-sharing models is also helping to reduce operator costs in rural areas.

Governments and policymakers in Central Asia and the South Caucasus can take advantage of these innovations through policies that support their implementation locally.

These include:

- simplifying planning procedures and regulations for site acquisition, colocation and upgrades of base stations
- offering a reasonable expectation of approval for voluntary network-sharing deals while avoiding mandated sharing agreements that may amount to an access obligation
- avoiding network monopolies, such as single wholesale networks, which can stifle competition and investments in network rollout
- providing operators access and RoW to public/government facilities for antenna siting and fibre deployment on reasonable terms and conditions
- establishing uniform EMF rules that are no more restrictive than internationally agreed levels.

Tackling concerns around EMF limits

Prescribed EMF limits in countries in Central Asia and the South Caucasus continue to be much more stringent than the global standards prescribed by the International Commission of Non-Ionizing Radiation Protection (ICNIRP). This significantly affects the expansion of digital infrastructure, especially in newly awarded bands.

Both the World Health Organization and the ITU recommend the human exposure guidelines developed by the ICNIRP. In its recently updated guidelines, the ICNIRP (2020) states that there is no evidence that additional precautionary measures will result in a benefit to the health of the population. The updates to the limits are based on improved scientific accuracy and provide limits for exposure that were not considered in the ICNIRP (1998) guidelines.

Harmonising domestic standards with the international standards adopted by the majority of countries³⁶ is important to support network deployment and, by extension, close the coverage gap and accelerate the rollout of new technologies. While prevailing stringent EMF norms might have been implementable for 2G and 3G technologies, 4G deployment has already been affected by additional restrictions. The future expansion of 4G, along with 5G and technologies beyond 5G, will not be practical with existing constraints, as these technologies will require additional bands and, by extension, transmitters to existing sites. Furthermore, stringent EMF norms essentially preclude small cells deployment, both in urban areas and when creating spot coverage in rural environments.

Policymakers in Central Asia and the South Caucasus should adopt a national mobile network deployment policy that simplifies planning procedures for small cells, improves operator access to public sites for antenna siting and establishes uniform radiofrequency exposure rules based on the international safety guidelines.

³⁵ The move to a newer mobile technology generation (2G to 3G, 3G to 4G etc.) improves spectrum efficiency, enabling more data to be carried in the same amount of spectrum. This means the cost per bit to provide data falls and this can be passed on to consumers. In recent years, the cost per MB for consumers has fallen considerably around the world. For more details, see [The Benefits of Technology Neutral Spectrum Licences](#), GSMA, 2019.

³⁶ See www.gsma.com/publicpolicy/emf-and-health/emf-policy



4.2 Stimulating mobile internet demand

Mobile network infrastructure deployment is the most resource-intensive part of closing the digital divide. However, closing the usage gap is a more intricate process, which requires both improved affordability and the ability of consumers to use digital services. These areas usually require much broader efforts beyond just the promotion of new technologies, including the involvement of agencies responsible for

education, social policy, trade, finance and others, depending on the nature of measures employed. Measures to drive mobile internet usage are vital to overcoming the usage gap. These will also reduce the coverage gap, as increased demand improves the business model for rural connectivity and makes rural base stations more economically viable.

Supporting affordability for consumers

The affordability aspect related to lowering capex and opex for infrastructure rollout has been considered in the previous section; however, to close the digital divide, measures to improve affordability on the consumer side are also necessary. Mobile data is becoming more affordable in Central Asia and the South Caucasus, although three countries – Kyrgyzstan, Tajikistan and Turkmenistan – still fall short of the target of 2% of monthly GNI per capita set by the Broadband Commission.³⁷ In Kazakhstan, for instance, the government’s guidance on ‘social tariffs’ is seen as a positive step towards improving the affordability of mobile data services for the most vulnerable. However, extending social tariffs beyond the population groups most affected could

further diminish ARPU levels and affect network infrastructure investment in the future. Therefore, government intervention in mobile tariffs should be limited and not preclude market-based mechanisms.

Governments have an opportunity to help address the affordability barrier by rebalancing the tax burden on mobile consumers. Mobile-specific taxes are felt most acutely by the poorest in society, including women, as they account for a larger proportion of their incomes. These include a variety of taxes on activating mobile services (e.g. SIMs), on the use of the services and on devices. Countries that have removed a number of these taxes have experienced growing mobile internet device and service adoption.³⁸

³⁷ Broadband Advocacy Target 2, Broadband Commission
³⁸ Rethinking mobile taxation to improve connectivity, GSMA, 2019



Learnings from other markets: making smartphones affordable for those most in need

In many markets, operators have made efforts to improve the affordability of smartphones:

- In **Bangladesh**, Robi Axiata partnered with Bank Asia and Cignifi to launch Joyeeta, a monthly smartphone bundle programme with preferential rates for female customers. Robi works with big-data analytics company Cignifi to identify suitable creditworthy customers for the Joyeeta offer to increase the number of female subscribers who use mobile data services.
- In **Kenya**, Safaricom partnered with Google to launch Maisha Ni Digital, a campaign that aims to drive access to smartphones and the internet through subsidised low-cost 4G devices.
- In **Pakistan**, the main barrier to internet adoption has been the affordability of smartphones. To help address this barrier, Jazz has partnered with KaiOS Technologies to release the Jazz Digit 4G smart feature phone. It is the most affordable smart feature phone in the world, with an upfront payment of just \$12. The customer is required to sign up for a one-year service with Jazz at an extremely affordable \$2 per month, which includes 1,000 minutes, 1000 MB of data, free SMS and free calling to doctors.

In countries across Central Asia and the South Caucasus, efforts are often made to cap tariffs on mobile communications for the wider population. However, such an approach may negatively impact the mobile industry in the long run due to a slower return in investment and, ultimately, a slow-down in the process of economy digitalisation. Instead, regulators and stakeholders could focus on affordability for the most-affected population groups, which is a usual practice for social policy. This requires closer cooperation and greater information exchange to identify such customers, which may require legislative initiatives or specific government projects to facilitate such measures.

Promoting digital skills

A lack of digital skills, including awareness and understanding of the mobile internet, is another key barrier to uptake. In some rural settings, there is a misconception that digitalisation is just for people in cities. This underlines the need for training of residents in these areas to provide them with the necessary digital skills to benefit from technology, such as on how to use e-commerce to access new markets and how to share content online (e.g. pictures and videos of scenic rural areas), which can boost tourism and the local economy. Governments have a role here to help people understand how to use the internet and take advantage of its social and economic benefits.

Empowering the digitally excluded to use digital services is vital for closing the digital divide. While countries have clear mandates for prioritising education, the same may not be true for digital literacy. At least three quarters of countries in all regions except Oceania have specific mechanisms or measures in place to help vulnerable groups build digital literacy and skills.³⁹ While a growing number of countries at all socioeconomic levels are extending or expanding support for digital skills development, much more still needs to be done.

Learnings from other markets: national initiatives to promote digital skills

The GSMA Mobile Internet Skills Training Toolkit (MISTT) is a set of free resources to teach people the basic skills they need to access and use mobile internet. It uses a 'train the trainer' approach and consists of short lessons available in PDF and video format that can be easily adapted to local needs and languages:

- In February 2023, Reliance Jio in **India** collaborated with GSMA Mobile for Development (M4D) to roll out a digital skills programme to train rural women and those from low-income groups, to improve digital adoption and access. As part of the programme, teams from Jio and the GSMA worked together to assess prevalent digital skills gaps and developed need-based digital skills training toolkits specifically for the local market. The programme is being rolled out in 10 states, with a focus on reaching women and marginalised groups.
- In **Rwanda**, Tigo (now Airtel Rwanda), in cooperation with the GSMA, launched the MISTT in June 2017. Spread across 11 of Rwanda's 30 districts, the project aimed to improve digital literacy among Tigo's customer base. The scheme has experienced rapid and radical success. Over the three-month pilot, 300 points of activation trained 80,000 customers, 77% of which increased their data usage following the training.
- In 2019, Banglalink in **Bangladesh** partnered with the GSMA to increase mobile internet adoption among its customer base. A total of 117,000 Banglalink customers received MISTT training during a three-month pilot. At the end of the pilot, mobile internet use increased by 228% among trained users, compared to the 59% increase in data use in the network overall.⁴⁰

To overcome the digital skills barrier, projects supported at all governmental levels are necessary. As the digital world can be intimidating for new users, there is a need for effective programmes that actively support the building of digital literacy, skills and confidence across the primary, secondary and tertiary levels, with policy priority given to vulnerable groups. Governments should ensure that digital literacy policies and programmes keep pace with advancements in technology, are flexible enough to meet the diverse needs of different vulnerable groups and are empathetic to the challenges faced by certain groups of learners, including women and girls, older people and people with disabilities.

³⁹ UN E-Government Survey 2022

⁴⁰ Mobile Internet Skills Training Toolkit: Banglalink pilot evaluation, GSMA, 2019



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