



Pakistan
Telecommunication
Authority

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The background of the cover is a vibrant blue with a network of glowing white nodes connected by thin white lines, resembling a global communication network. Below this, a panoramic view of a city skyline is visible, with numerous vertical white lines of varying heights extending upwards from the city, some ending in small white dots. The bottom of the cover features a wide, curved band in shades of blue and orange.

ANNUAL REPORT 2021



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Acknowledgement

This report has been prepared as an obligation under Section 18 of the Pakistan Telecommunication (Re-organization) Act, 1996. It has been compiled by the Economic Affairs Directorate team of the Pakistan Telecommunication Authority (PTA), led by Mr. Muhammad Arif Sargana, Director General, Commercial Affairs. The chapters have been drafted by Ms. Malahat Obaid, Deputy Director, Economic Affairs; Dr. Shahbaz Nasir, Deputy Director, Commercial Affairs; Mr. Abdul Rehman, Deputy Director, Economic Affairs; Mr. Kashif Ellahi Bhatti, Deputy Director, ICT; Mr. Zeeshan Shafiq, Deputy Director, Web Analysis; and Mr. Waqas Hassan, Assistant Director, International Liaison and Training; and are based on input from multiple resources. Secretarial support for the publication was provided by Mr. Muhammad Riaz, Administration Officer, Economic Affairs. The Public Relations Directorate of PTA is acknowledged for the provision of photographs of various events. The authors would like to recognize input provided by the Divisions and Directorates of PTA, telecom operators, government bodies, and online sources accessed to prepare this report. Technical Editor and Co-Founder of 'WeFixIt Together,' Ms. Shahina Maqbool, provided copy-editing support. The valuable guidance and directions given by Members of the Authority, led by PTA's Chairman, Maj Gen Amir Azeem Bajwa (R), were the primary inspiration behind the contents of this report.

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A large, stylized keyhole is cut into a dark, textured wall. The keyhole's shape is a circle at the top, followed by a narrow vertical slit, and then a jagged, sawtooth-like bottom. Through the keyhole, a bright blue sky with scattered white clouds is visible. The lighting is dramatic, with the sky being very bright and the surrounding wall being dark and shadowed.

PTA's VISION

“Create a fair regulatory regime to promote investment, encourage competition, protect consumer interests, and ensure high-quality ICT services.”

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Acronyms

A4AI	Alliance for Affordable Internet
AIP	Administrative Incentive Price
AJ&K	Azad Jammu and Kashmir
APNIC	Asia Pacific Network Information Centre
ARPU	Average Revenue Per User
ATM	Automated Teller Machine
AWS	Amazon Web Services
BB	Branchless Banking
BSP	Broadband Service Provider
BTS	Base Transceiver Station
CEO	Chief Executive Officer
CERT/CC	Computer Emergency Readiness Team/Coordination Centre
CMO	Cellular Mobile Operator
CMPAK	China Mobile Pakistan
CMS	Complaint Management System
CNIC	Computerized National Identity Card
COD	Cash on Delivery
CPD	Consumer Protection Division
CPEC	China-Pakistan Economic Corridor
CSC	Consumer Support Center
CTDISR	Critical Telecom Data and Infrastructure Security Regulations
CVAS	Class Value Added Services
DIRBS	Device Identification, Registration and Blocking System

DPO	Disabled Peoples' Organization
DVS	Device Verification System
FAB	Frequency Allocation Board
FBR	Federal Board of Revenue
FIA	Federal Investigation Agency
FLL	Fixed Local Loop
FTTH	Fiber to the Home
GB	Gilgit-Baltistan
GoP	Government of Pakistan
GPON	Gigabit Passive Optical Network
GSMA	Global System for Mobile Communications Association
GSR	Global Symposium for Regulators
HEC	Higher Education Commission
ICT	Information and Communication Technology
IMEI	International Mobile Equipment Identity
IMT	International Mobile Telecommunication
IOS	iPhone Operating System
IoT	Internet of Things
IP	Internet Protocol
ISP	Internet Service Provider
IT&T	Information Technology and Telecom
ITU	International Telecommunication Union
IXP	Internet Exchange Point
KIU	Karakoram International University

KKH	Karakoram Highway
KPI	Key Performance Indicator
LDI	Long Distance and International
LEAs	Law Enforcement Agency
LL	Local Loop
LSDS	Lost/Stolen Device System
MDM	Mobile Device Manufacturing
MoITT	Ministry of Information Technology and Telecommunication
MTR	Mobile Termination Rate
MWC	Mobile World Congress
NCSA	National Cyber Security Authority
NFTP	National Freelance Training Program
NGMS	Next Generation Mobile Services
NPS	Network Performance Score
nTCERT	National Telecom Computer Emergency Readiness Response Team
nTSOC	National Telecom Security Operations Center
OEM	Original Equipment Manufacturer
OFC	Optical Fiber Cable
OTT	Over The Top
PBS	Pakistan Bureau of Statistics
PCP	Pakistan Citizen Portal
PECA	Prevention of Electronic Crime Act
PITB	Punjab Information Technology Board
PSIG	Pakistan School on Internet Governance

PMCL	Pakistan Mobile Communications Limited
PMD	Pakistan Mobile Database
POS	Point of Sales
PSEB	Pakistan Software Export Board
PSLM	Pakistan Social and Living Standards Measurement
PSP	Payment Service Provider
PTA	Pakistan Telecommunication Authority
PTCL	Pakistan Telecommunication Company Limited
PTML	Pakistan Telecommunications Mobile Limited
QoS	Quality of Service
R&D	Research and Development
RoW	Right of Way
SATRC	South Asian Telecommunications Regulators' Council
SBP	State Bank of Pakistan
SCO	Special Communication Organization
SDG	Sustainable Development Goal
SME	Small and Medium-sized Enterprise
SMP	Significant Market Power
SMS	Short Message Service
TIP	Telecom Infrastructure Provider
TRC	Telecommunication Regulatory Commission
USF	Universal Service Fund
VPN	Virtual Private Network
WLL	Wireless Local Loop

The Authority



Maj Gen Amir Azeem Bajwa (R)
Chairman PTA



Mr. Muhammad Naveed
Member—Finance



Dr. Khawar Siddique Khokhar
Member—Compliance and Enforcement

Chairman's Message

The resilient telecom sector has led the new normal in an even more connected world.

Transitioning from an enabler of keeping governments, capital markets, and societies connected, the sector has cleared a stress test to become a cross-cutting catalyst of change and development across all sectors. The world is witnessing the foundation of future networks, where disruptive innovations and technologies like 5G, Internet of Things (IoT), Artificial Intelligence (AI), Virtual Reality (VR), block chain, and mobile edge computing are being embedded in economies, causing massive digitalization. Following a customer-centric approach, the name of the game is availability, adaptability, flexibility, speed, and technological advancement. In the emerging environment, the role of the regulator has become more challenging due to considerations like speed of transition, accessibility, quality, competition, consumer protection, data privacy, and the need to bridge the digital divide.



I am pleased to share that today, Pakistan has over 110 million broadband subscribers out of a total of 191 million subscribers (mobile and fixed); our data usage has registered significant growth, increasing by about 52% in just a year. The stellar progress of the telecom sector has resulted in highest-ever revenue (PKR 644 billion) being generated in Financial Year (FY) 2021. The sector has substantially contributed to the national exchequer in the form of taxes, proceeds from spectrum auctions, and license renewals fees. A handsome amount of US\$ 486 million (FY 2021-till date) has been generated through spectrum auctions and license renewals in Pakistan, Azad Jammu and Kashmir (AJ&K), and Gilgit-Baltistan (GB).

Mindful of the increased focus and dependency on the telecom sector, we have progressed rather speedily. To this effect, the Next Generation Mobile Services (NGMS) spectrum auctions for Pakistan, AJ&K, and GB have been successfully completed, ensuring better quality services and boosting the digital economy. Quality of Service (QoS) conditions and coverage obligations have been suitably enhanced to provide accessibility and better user experience. We are continuously striving for improved accessibility of telecom services to unserved, underserved, and difficult areas like merged tribal Districts (erstwhile tribal areas), and AJ&K and GB. The implementation of the Device Identification, Registration and Blocking System (DIRBS) by PTA, in conjunction with other stakeholders, has been a huge success and catalyst for transforming Pakistan into a major manufacturer of mobile devices. Post-DIRBS implementation, the uptake of smart phones connectivity on our networks has increased from 41% to 52%. To address the issues of availability and affordability of mobile devices, especially of smart phones, today, we are not only manufacturing mobile handsets (feature and 4G smartphones) but also exporting them. In this regard, PTA has so far issued manufacturing authorizations to 30 applicants, attracting investments to the tune of US\$120 million and creating 2,000 jobs. The world's leading brands like Samsung, Xiaomi, Oppo, Vivo, Nokia, Tecno, ZTE, etc., are now being manufactured in Pakistan. Our efforts for automation of processes, consumer facilitation, and transparency include app-based mobile registration, app-based consumer management system, app-based reporting of lost and stolen mobiles, manufacturer device registration system, and Internet Protocol (IP) Whitelisting. This cross-sector collaborative approach is resulting in stable, secure, and rapidly enhancing digital financial services and growing e-commerce services. Moreover, a multi-dimensional cyber security approach is being adopted to ensure safety and security of our networks and users' data under the emerging cyber threat scenario.

Our progress notwithstanding, we still face challenges that we would like to turn into opportunities. Outreach to unserved/underserved areas and underprivileged segments—especially reducing the gender gap in ownership and usage of Information and Communication Technologies (ICTs)—needs to be prioritized through collaborative efforts. The need for massive fiberization to support high-capacity digital networks and future technologies has become pronounced. The same requires a National Action Plan involving both public and private sectors. While some progress has been achieved with respect to Right of Way (RoW) facilitation, the issue still needs focused efforts and involvement of all stakeholders. Similarly, increasing the industry's profitability also merits prompt attention of policymakers for the sector to mature.

I feel honored that the leadership has once again trusted the regulator and the sector at a time when the local and global economy is passing through challenging times. We owe the success of our mutual endeavors to the efforts of our industry partners, pro-competition and transparent policies of the Government of Pakistan (GoP), and professionalism and dedication of the entire PTA team. Our consumers and all those who are digitally connected inspire us to outperform ourselves. I look forward to the leadership's continued patronage and guidance for our vibrant and growing sector to truly transform our country into 'Digital Pakistan,' as envisioned by Prime Minister Imran Khan.

Maj Gen Amir Azeem Bajwa (R)
Chairman
Pakistan Telecommunication Authority



Executive Summary

Broadband Subscribers

110 million

Telecom and ICT services
covering over

89% population

Teledensity

87%

Highest-ever telecom revenues

PKR 644 billion

Foreign Direct Investment

US\$ 202 million

Pakistan has not only braved the fatal strains of the COVID-19 pandemic but has also emerged more formidable through the turbulent year-and-a-half. Both the ICT sector and the regulator worked as enablers alongside the government, facilitating the management of COVID-19 and supporting economic recovery. Despite all odds, the digital marvel is unfolding under the leadership of Prime Minister Imran Khan. The year under review has been exhilarating for the Pakistan Telecommunication Authority (PTA) as it traversed tough times and bagged multiple successes. PTA's regulatory approach and strategic maneuvers were directed towards industry facilitation and consumer protection, which in turn paved the way for all-inclusive connectivity and sustained economic growth.

Broadband services reached a remarkable milestone of 100 million subscribers in March 2021, now standing at 110 million. Fifty percent of the country's population has subscribed to broadband, with the bulk (49%) consisting of mobile broadband connections. Telecom and ICT services have a nationwide spread, covering over 89% of the population. Teledensity has touched 87%, of which cellular mobile penetration comprises over 86%. Similarly, the number of cellular subscribers has risen to 188 million, taking the total telecom subscriber base to 191 million. For the first time ever, smart phones have outnumbered feature phones (2G) on domestic networks, capturing a market share of 52%.

With the expansion of 3G and 4G services, in tandem with the impact of COVID-19, broadband data usage increased by 52% during FY 2021. Increased Internet

usage also had a significant impact on the sector's financial outlook. Telecom revenues touched the highest-ever figure of PKR 644 billion in FY 2021, compared to PKR 592 billion in the previous year. The sector also attracted US\$ 202 million in the shape of Foreign Direct Investment (FDI) and contributed PKR 226 billion¹ to the national exchequer. With successful spectrum auctions and license renewals in Pakistan and Azad Jammu and Kashmir (AJ&K) and Gilgit-Baltistan (GB) during the period, an amount of US\$ 486 million (FY 2021-till date) has been generated.

PTA was also pivotal in facilitating the expansion of telecom and ICT services in AJ&K and GB. Teledensity and broadband penetration in this important region stood at 95.4% and 40%, respectively. The Pak-China Optical Fiber Cable (OFC) Project connecting China and Pakistan through terrestrial links, is now carrying commercial traffic.

Pakistan's telecom statistics have demonstrated an impressive increase, which is attributable to progressive regulatory initiatives and market interventions undertaken by PTA. The hallmark of its efforts was the spectrum auction in 1800 MHz band in Pakistan, in which Ufone was the successful bidder. Moreover, another auction for 1800 MHz and 2100 MHz in AJ&K and GB was held in September 2021, with Zong, Telenor, and Ufone successfully acquiring the spectrum. In addition, cellular mobile licenses of operators in AJ&K and GB were also renewed for provision of uninterrupted, reliable, and enhanced connectivity. Besides, integrated licenses of Pakistan Telecommunication Company Limited (PTCL), National Telecommunication Corporation (NTC) and

Special Communication Organization (SCO) were also renewed. Apart from financial gains to GoP, the spectrum auctions and license renewals will result in availability of high-speed broadband connectivity with widespread availability of services across Pakistan. PTA also facilitated the industry by preparing the Rolling Spectrum Strategy 2020-2023, approved by the federal government; the strategy provides a roadmap for operators to streamline their network planning over the next few years. The impact of Device Identification, Registration and Blocking System (DIRBS), which was introduced back in 2019, became more obvious as legal commercial imports of mobile phones increased by around 125% in three years. The revenue collected on these imports between 2018 and 2020 crossed the PKR 122 billion mark. PTA further reinforced this impact by issuing the Mobile Device Manufacturing (MDM) Regulations, 2021, that eased the process for obtaining a No-Objection Certificate (NoC) for manufacturing and local assembly of mobile phones in Pakistan. As many as 30 companies have obtained licenses so far, producing 10.1 million smart phones in 2021 while creating 2,000 jobs. Samsung also joined the local manufacturing market in collaboration with local partners. Pakistan made history by exporting its first-ever smart phone consignment to the United Arab Emirates (UAE) under the 'Manufactured in Pakistan' tag.

To improve the end-user experience, PTA revised the Cellular Mobile Quality of Service Regulations that will raise the bar higher for network performance for all operators. Moreover, PTA acquired state-of-the-art 'SmartBenchMarker' system in September 2020. This tool helped PTA to conduct Quality of Service (QoS) surveys

Pakistan's telecom statistics have demonstrated an impressive increase, which is attributable to the progressive regulatory initiatives and market interventions undertaken by PTA.

1- Telecom contributions include: PTA Deposits, GST/FED, WHT, Custom Duty and Other Taxes.



for cellular mobile, fixed line, and third-party independent vendors to assess network performance across Pakistan.

Market competition and consumer protection were priority areas for PTA during the year under review. Competition was analyzed and Significant Market Power (SMP) operators were determined for 10 markets of AJ&K and GB, and 11 markets of Pakistan. For ease of business and consumer facilitation, PTA introduced an online portal for Internet Protocol (IP) Whitelisting and Virtual Private Network (VPN) registration for software houses, call centers, and freelancers. A new automated Lost and Stolen Device System (LSDS) was also launched for blocking of lost, stolen, and snatched mobile phones. PTA blocked approximately 1.1 million URLs containing objectionable material. To eliminate illegal telecom setups and grey telephony, PTA conducted 53 raids during the last three years, leading to the confiscation of 163 illegal gateways and 35 arrests. On the direction of the regulator, cell sites of Cellular Mobile Operators (CMOs) in Waziristan were upgraded for 4G in its quest to provide high-speed connectivity to marginalized segments in unserved areas. Similarly, PTA, in collaboration with the Special Talent Exchange Program (STEP) and The British Council, developed and launched 'Equal Access'—an application that provides information in sign language interpretation, sound description, dark mode, and resizable text formats. In addition to other features, the app also provides information and laws on Disabled Peoples' Organizations (DPOs). Being the trendsetter, PTA added further value to its own website by upgrading it to a bilingual mobile responsive website. The site is now compliant with the Universal Web Accessibility Standards for Persons with Disabilities, thereby making it one of the pioneering government websites focusing on inclusivity and accessibility for all.

In a synergetic exercise, PTA was instrumental in securing the cyberspace of Pakistan by introducing several measures with the assistance of other stakeholders. Compliant with the National Cyber Security Policy 2021, PTA established Telecom Sector Computer Emergency Readiness Team/Coordination Committee (CERT/CC). It also identified and blocked numerous sources such as apps and social media pages involved in fraud and illegal sale of telecom subscribers' data. Public awareness advertisements and notices were regularly issued in the media; PTA also partnered in conducting the virtual edition of the Pakistan School on Internet Governance (pkSIG). During FY 2020-21, PTA's Consumer Support Centre (toll-free number 0800-55055) received over 38,200 calls per month (1200-1300 calls per day). PTA received 165,944 complaints against Cellular Mobile Telephony, Internet Service Providers (ISPs), Fixed Local Loop (FLL), and Wireless Local Loop (WLL) during 2020-21, with 98% of the complaints being addressed. Moreover, PTA received 49,601 complaints on the Pakistan Citizen Portal during the period between November 12, 2018, to June 30, 2021. Of these, 96% were resolved. The Consumer Protection Division of PTA obtained ISO 9001:2015 quality management system certification, following an audit conducted by the British Assessment Bureau.

Digital financial inclusion is a key area of focus for GoP and PTA. Under the National Financial Inclusion and Digital Payment Strategy, PTA has been working together with other regulators and federal bodies to increase the adoption of digital financial services. The m-banking network has expanded to over 534,460 m-banking agents and 75 million m-wallet accounts. This network has enabled more than 2 billion annual transactions worth over PKR 8 trillion. According to the State Bank



of Pakistan (SBP), the e-commerce market in 2020 is estimated to have expanded to PKR 235 billion, up by 56% from the previous year.

It is imperative that the achievements of the country's telecom sector are highlighted at international forums to attract foreign companies, including prospective investors. In this context, PTA represented Pakistan's telecom sector in high-level virtual events organized by reputed global and regional forums. The Mobile World Congress (MWC) 2021 was the only in-person event held last year, where Chairman PTA interacted with the top leadership of International Telecommunication Union (ITU), Global System for Mobile Communications Association (GSMA), and Alliance for Affordable Internet (A4AI), among others. Owing to COVID-19 restrictions, almost all events and capacity building initiatives were shifted to virtual space. As such, PTA conducted virtual training sessions and workshops in collaboration with GSMA, Ericsson, and Commercial Law Development Program (CLDP). During the reported period, PTA also provided technical assistance to the telecom regulators of Sri Lanka and Oman for important regulatory initiatives in their countries.

PTA is also cognizant of the alarming digital gender gap that exists in mobile ownership, mobile penetration, internet usage, and social media usage. Females have a particularly low subscription percentage in every major telecom/ICT indicator. However, various government bodies such as the Ministry of Information Technology and Telecommunication (MoITT), Ignite, and the Punjab Information Technology Board (PITB), as well as telecom operators, are taking practical steps through development projects and awareness campaigns to reduce the gender divide in digital inclusion.

Broadband services reached a remarkable milestone of 100 million subscribers in March 2021, now standing at 110 million. Fifty percent of the country's population has subscribed to broadband, with the bulk (49%) consisting of mobile broadband connections.

The regulator is a strong proponent of innovation, facilitation, cooperation, and unification to ensure connectivity for all. PTA believes in a collaborative approach driven by contemporary services, technology trends such as 5G deployment, Artificial Intelligence (AI), edge computing, Internet of Things (IoT), high-resolution content, and Software-Defined Wide Area Networks (SD-WANs). PTA has resolved to ensure that those already connected move on to an enhanced experience; all stakeholders get a level playing field; the Internet remains a secure and safe space; and that Pakistan increases its manufacturing capacities. To achieve these goals and more, efforts are underway to strengthen cross-sectoral cooperation with a focus on legal frameworks and international collaboration to accelerate Pakistan's digital agenda. Steps in the right direction and at the right time will translate into a more stable and robust telecom sector amid soaring investments, with all key players contributing their best to witness satisfied end-consumers.

CELEBRATING



BROADBAND SUBSCRIPTIONS



Messages



Celebrating 100 Million Broadband Subscriptions

Asia Pacific Telecommunity



I would like to congratulate the Government of Pakistan for touching the milestone of 100 million broadband subscribers. This has been made possible due to appropriate policy and regulatory mechanisms, as well as the efforts of the private sector. In 2012, there were less than 2 million subscriptions, and within seven years, the number has reached a historic 100 million. This is indeed a remarkable achievement! APT is always ready to work with Pakistan and its other members so that your success will be the success of APT as a community.

Masanori Kondo

Secretary General of APT

International Telecommunication Union



I am pleased to learn that Pakistan has managed to achieve the milestone of 100 million broadband subscribers. This is a marvelous achievement! According to ITU's ICT Regulatory Check, Pakistan has been ranked among very few countries in Asia and the Pacific with a Generation 4 regulatory environment. Due to the cross-cutting nature of ICTs, a 'Whole of Government' approach is required. Any unused spectrum is a national loss. In order to enhance connectivity and take advantage of emerging technologies, we also need modern, efficient, quick, light touch, and collaborative regulations. We can only benefit from emerging technologies like Artificial Intelligence, Blockchain, Internet of Things, and robotics if our regulators and regulations are geared towards supporting and enabling their deployment. ITU is always there to assist Pakistan.

Houlin Zhao

Secretary General of ITU

GSM Association



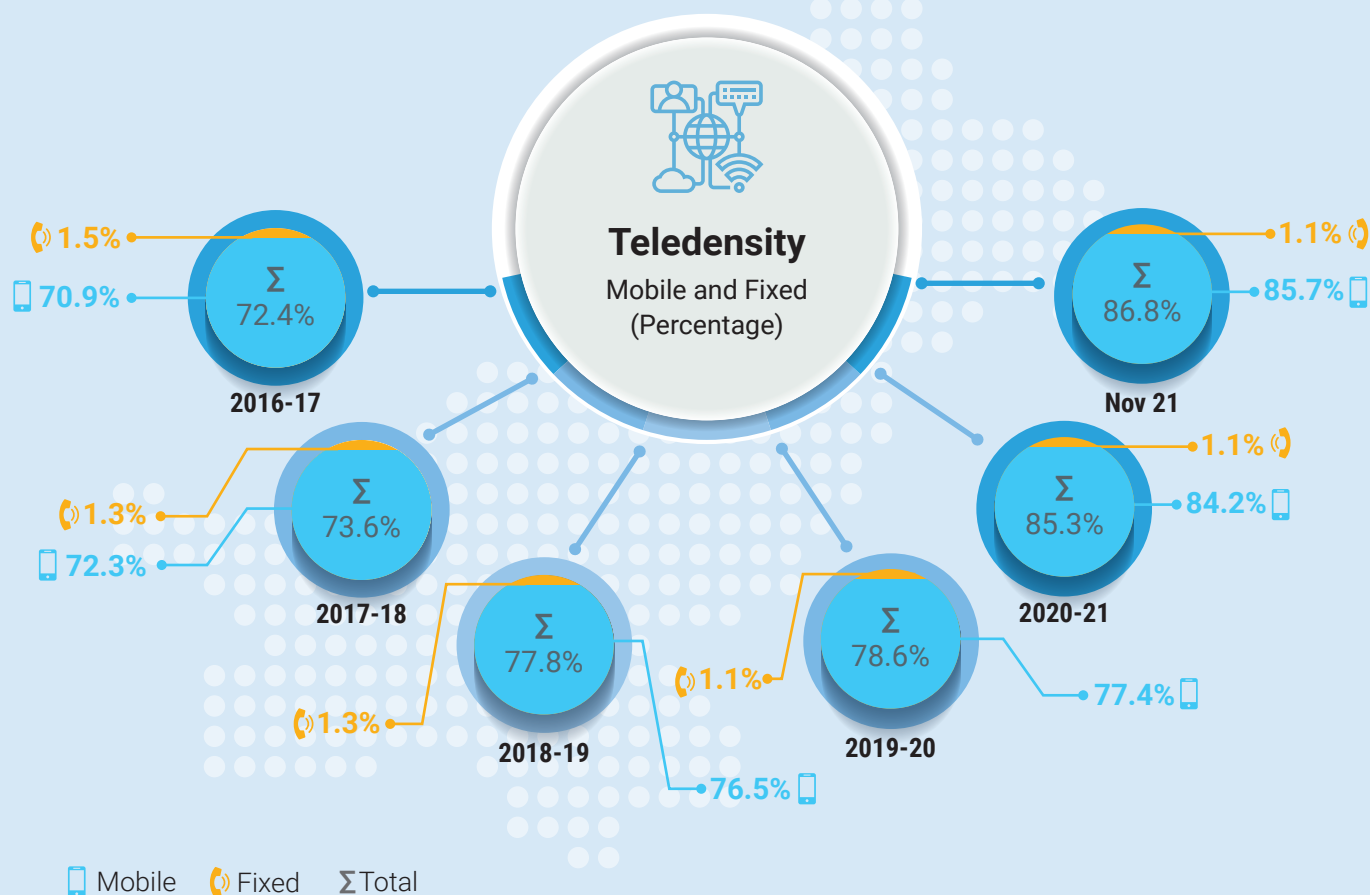
My sincere congratulations for reaching the milestone of 100 million people that can now use mobile broadband in Pakistan. This achievement is a testament to your recognition of the power of mobile broadband and your ambition, with every one of your recent policy steps including the Spectrum roadmap, tax reforms, and Rights of Way policies. Each confirms your admirable commitment to becoming a regional digital nation leader. These are exciting times in a country where the mobile ecosystem is already contributing some 5.4% to the GDP, and we are also seeing progress in closing the mobile gender gap. The GSMA is proud to be supporting digital transformation in Pakistan with our Asia Pacific leading nation program.

Mats Granryd

Director General of GSMA

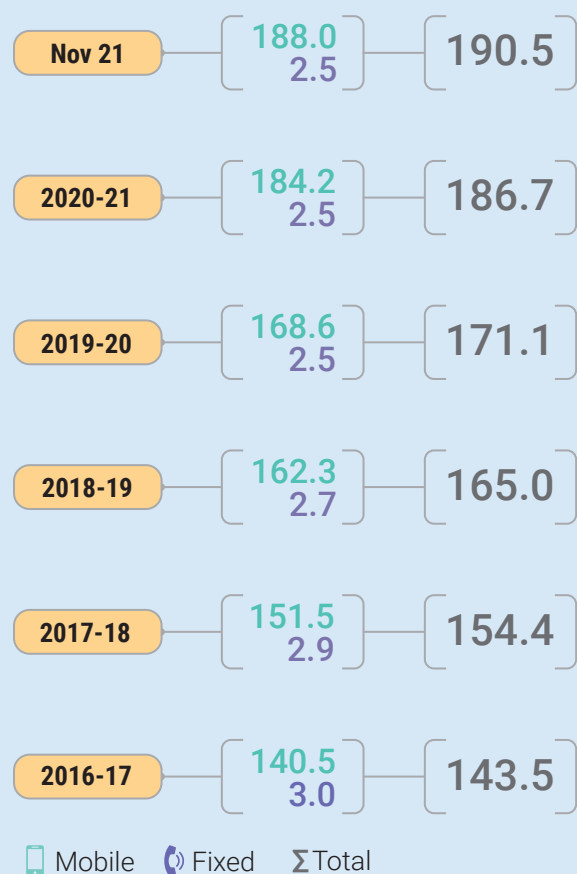


• TELECOMMUNICATION MARKET STATISTICS



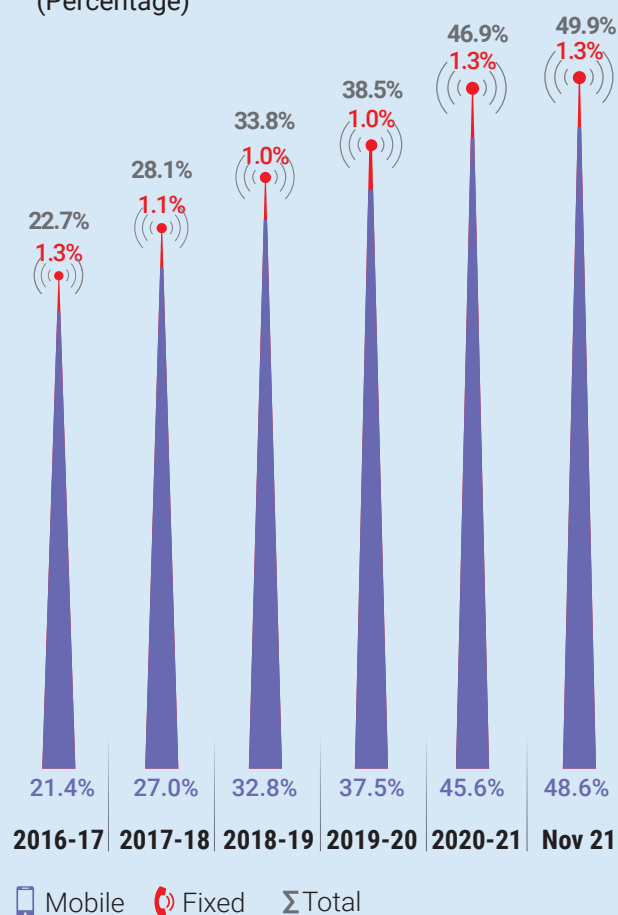
Subscribers

Mobile and Fixed (Million)



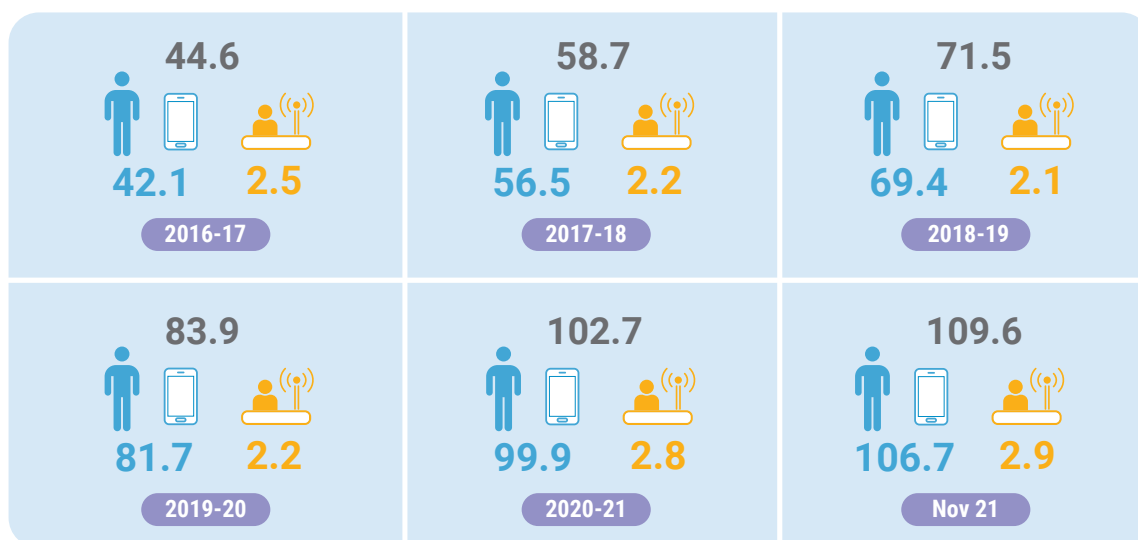
Broadband Penetration

Mobile and Fixed (Percentage)



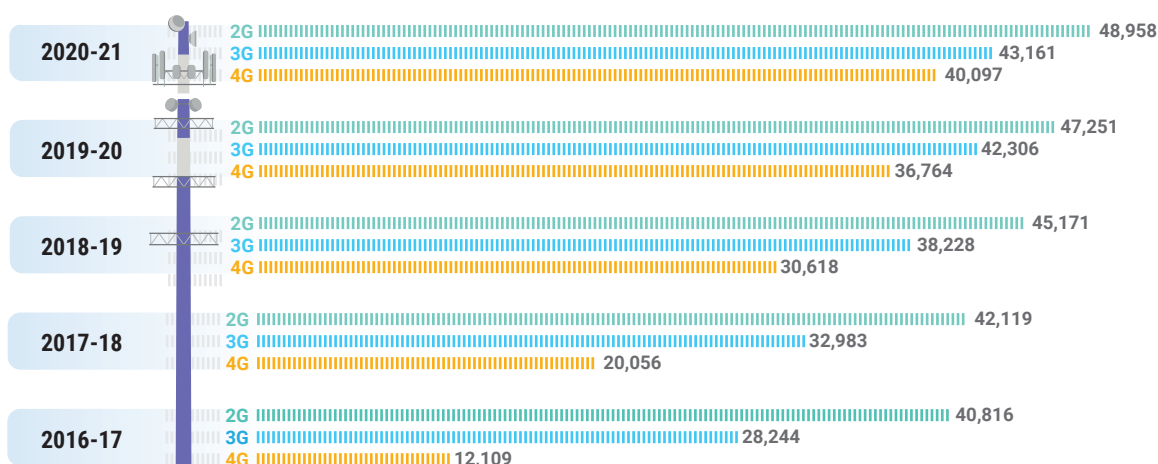
Broadband Subscribers

Mobile and Fixed
(Million)



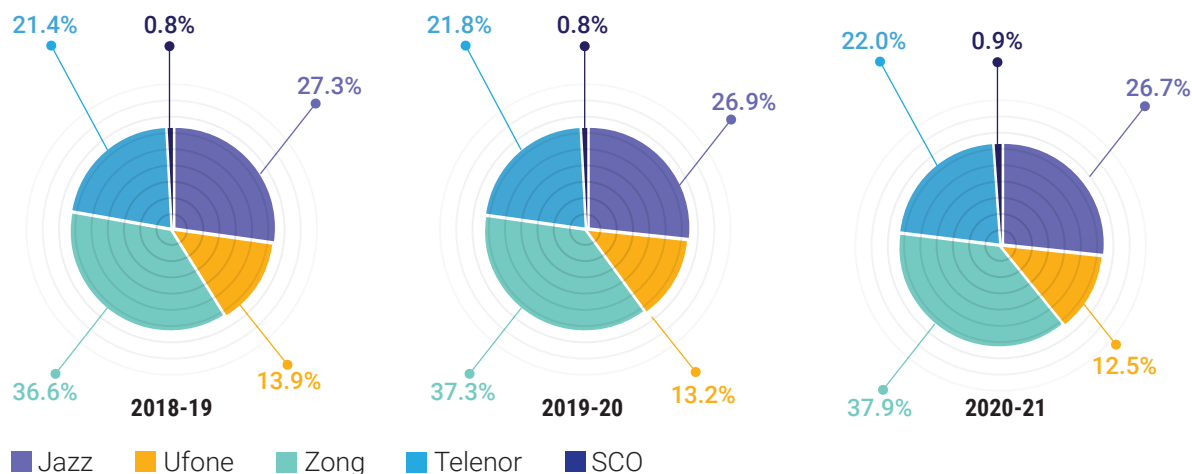
Mobile Fixed Σ Total

Cellular Mobile Cell Sites



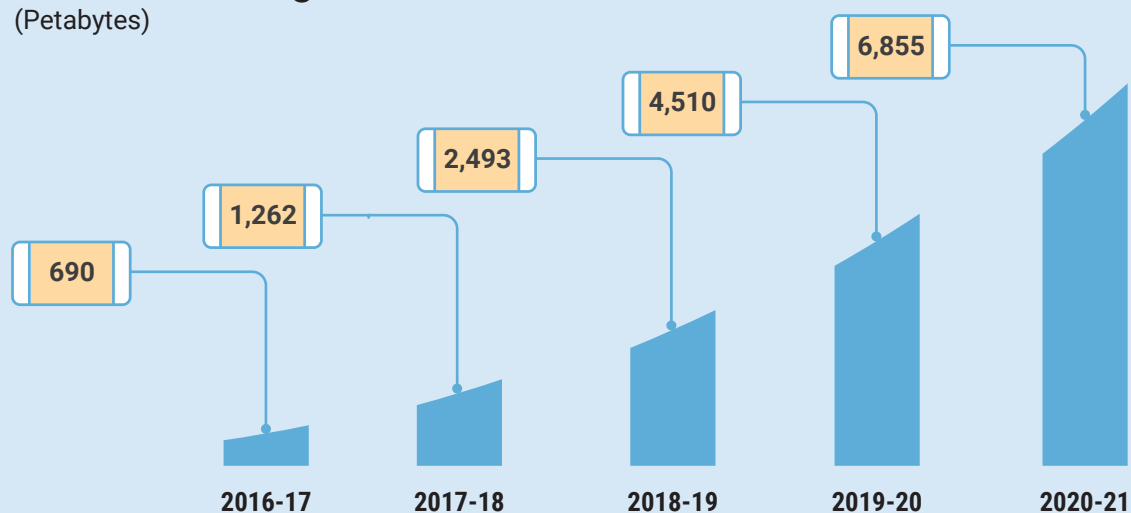
Mobile Broadband Subscriber Share

(Percentage)



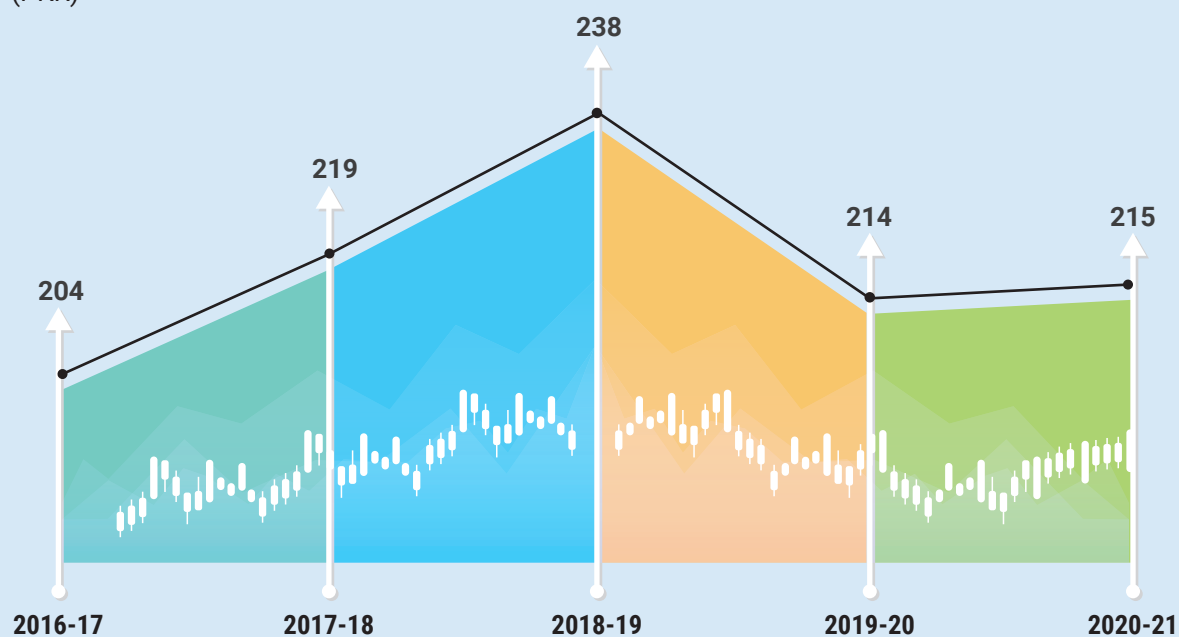
Mobile Data Usage

(Petabytes)



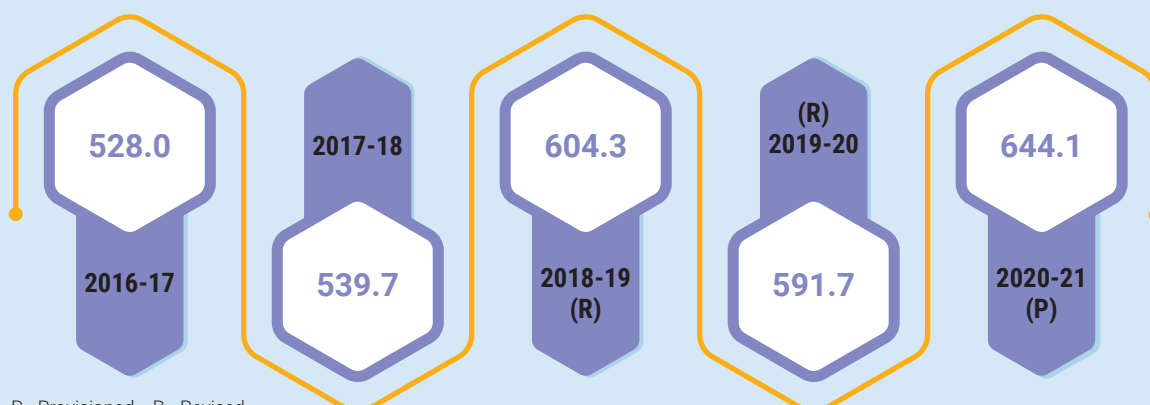
Mobile ARPU Per Month/Subscriber

(PKR)



Telecom Revenues

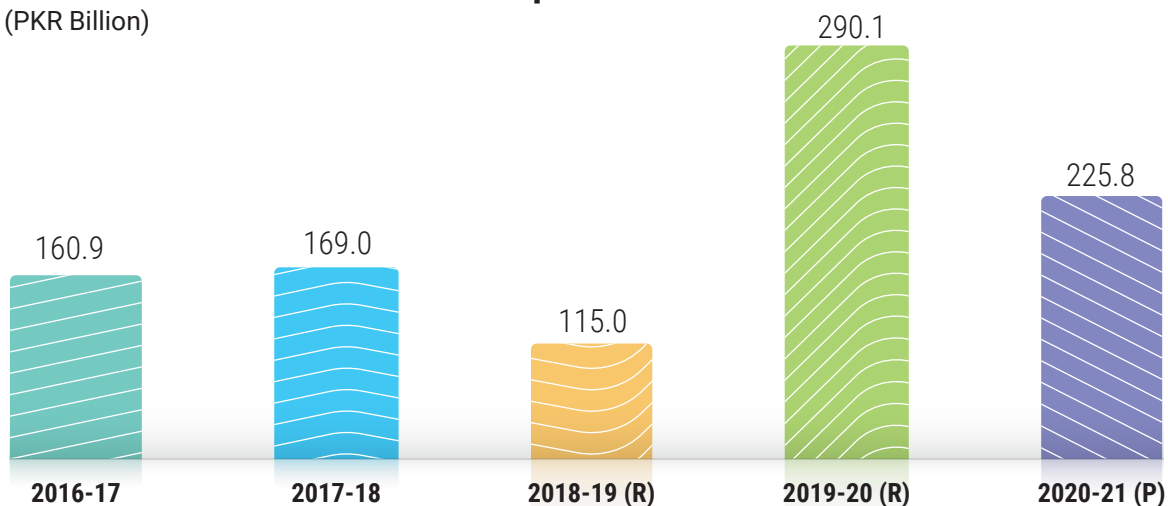
(PKR Billion)



P= Provisioned R= Revised

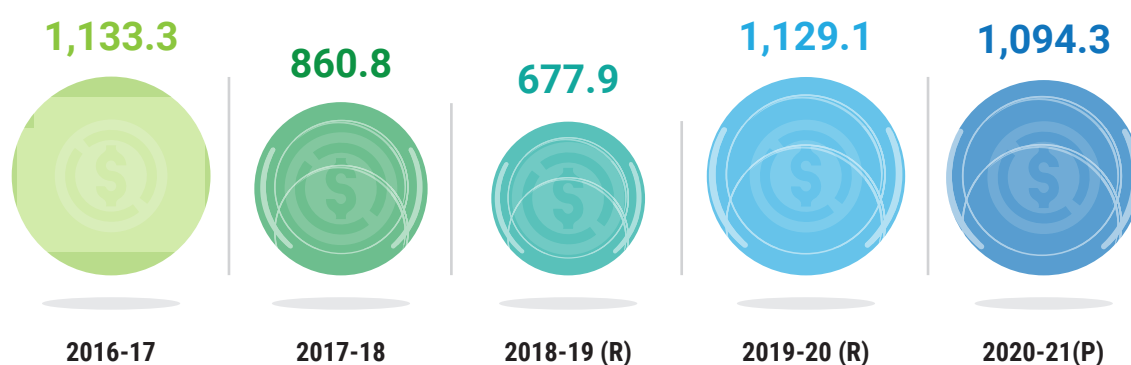
Telecom Contribution to Exchequer

(PKR Billion)



Telecom Investment (Local)

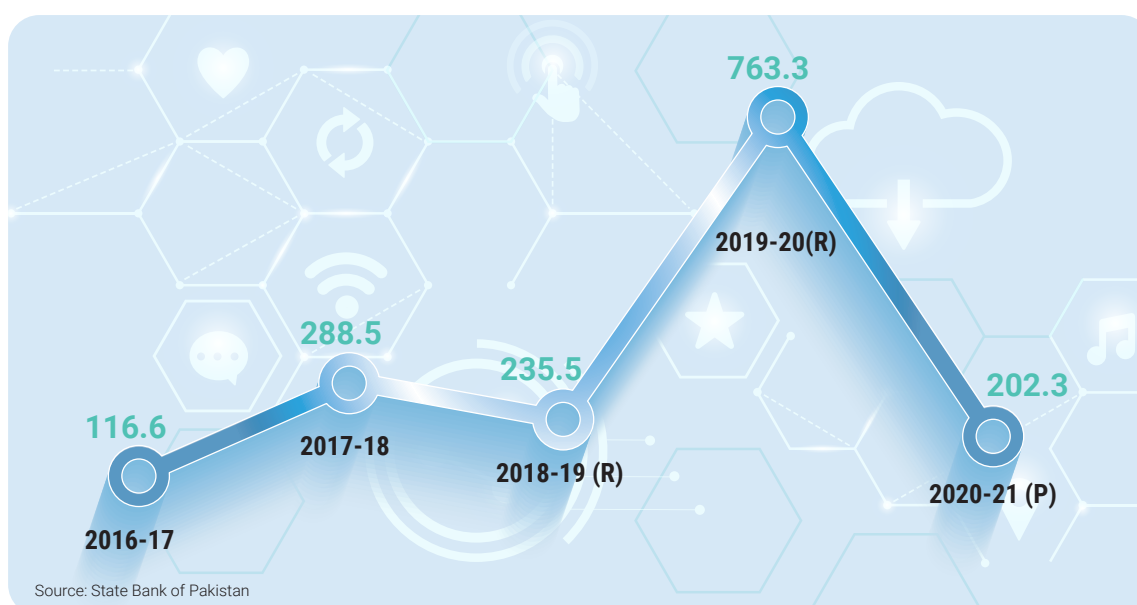
(US\$ Million)



Note : Investment figures updated and include CVAS, TIP and TTP

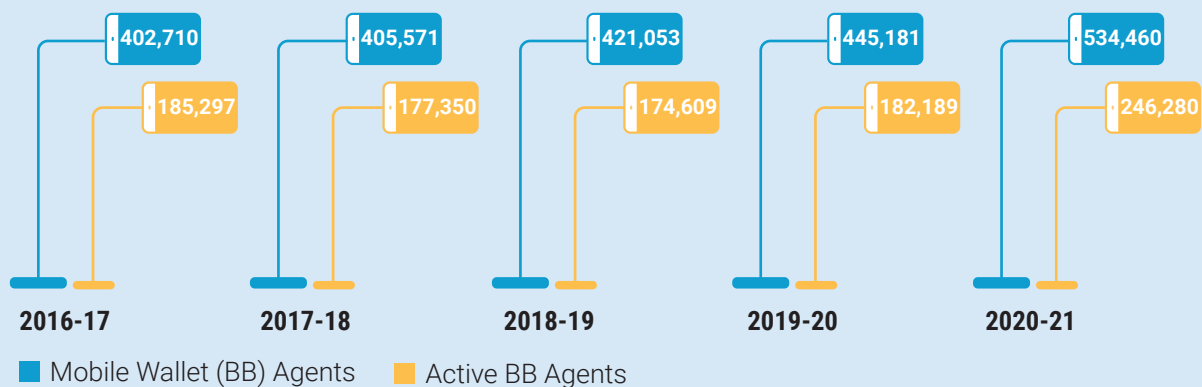
FDI (Inflow) in Telecom

(US\$ Million)



P= Provisioned R= Revised

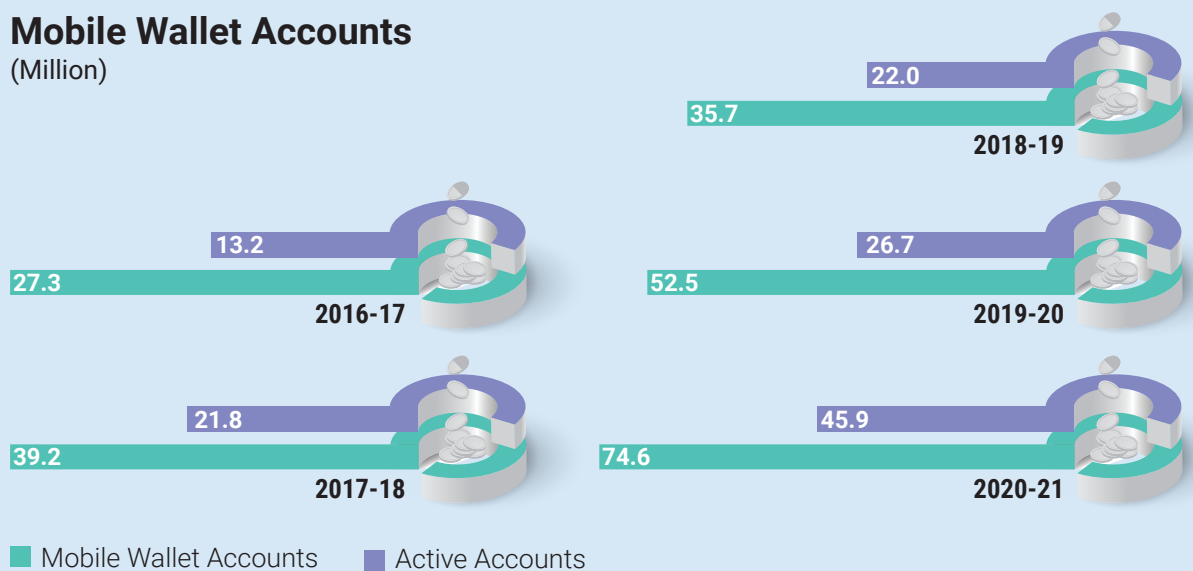
Mobile Wallet Agents



Source: State Bank of Pakistan

Mobile Wallet Accounts

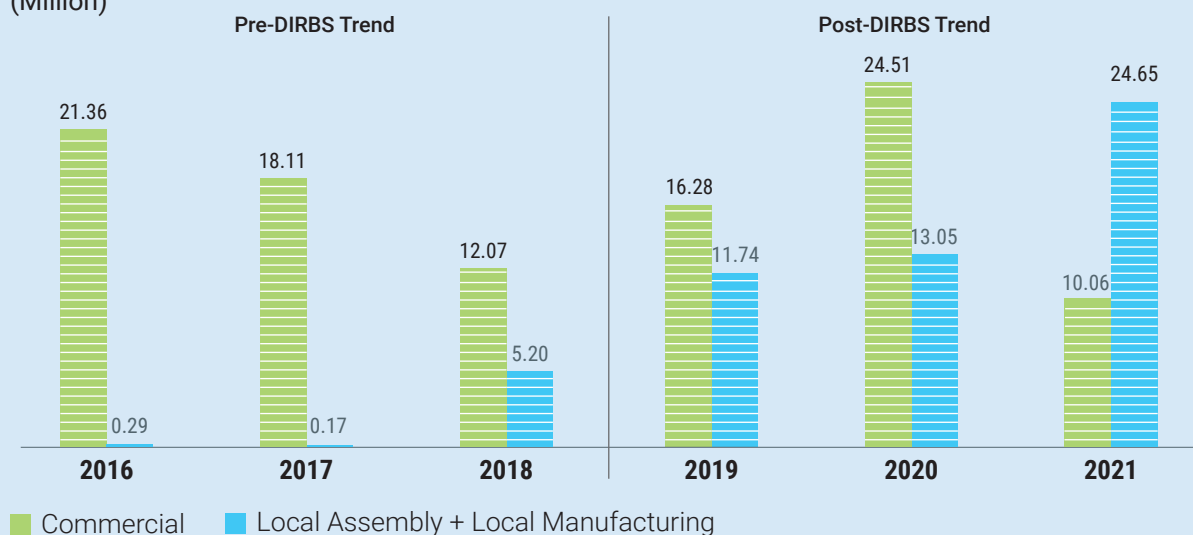
(Million)



Source: State Bank of Pakistan

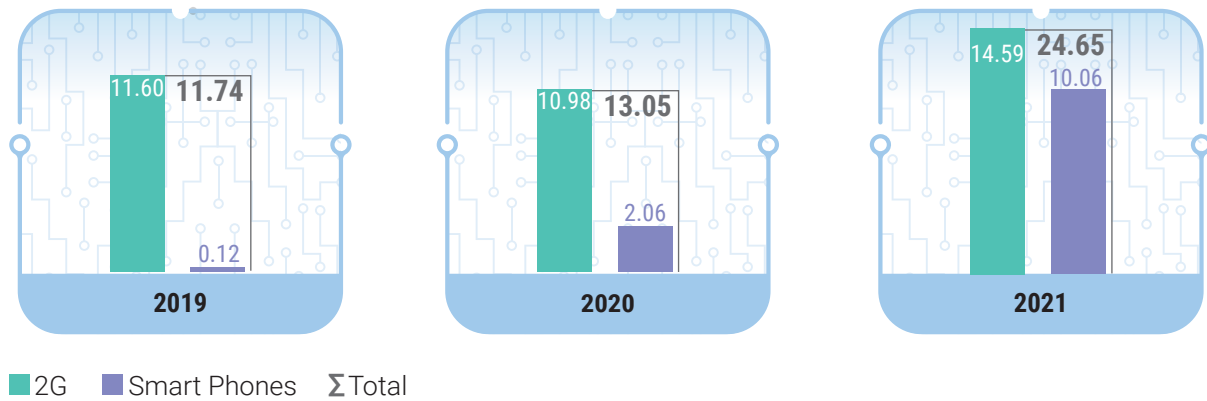
Mobile Devices: Commercial Import Vs Manufacturing Assembly Trends 2016-2021

(Million)



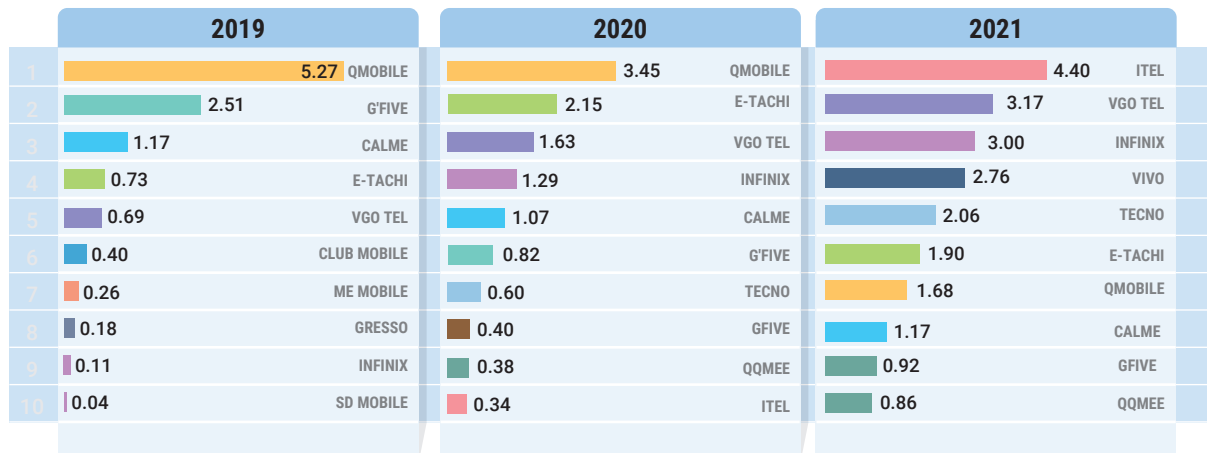
Mobile Devices: Manufacturing and Local Assembly

(Million)



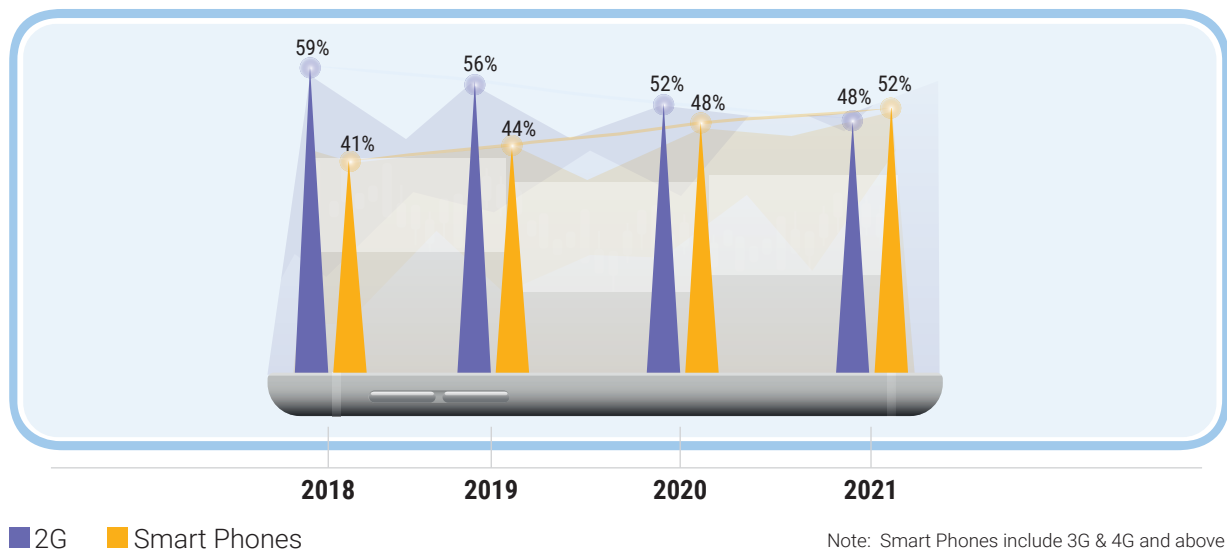
Mobile Devices: Manufacturing and Local Assembly by Top 10 Brands

(Million)



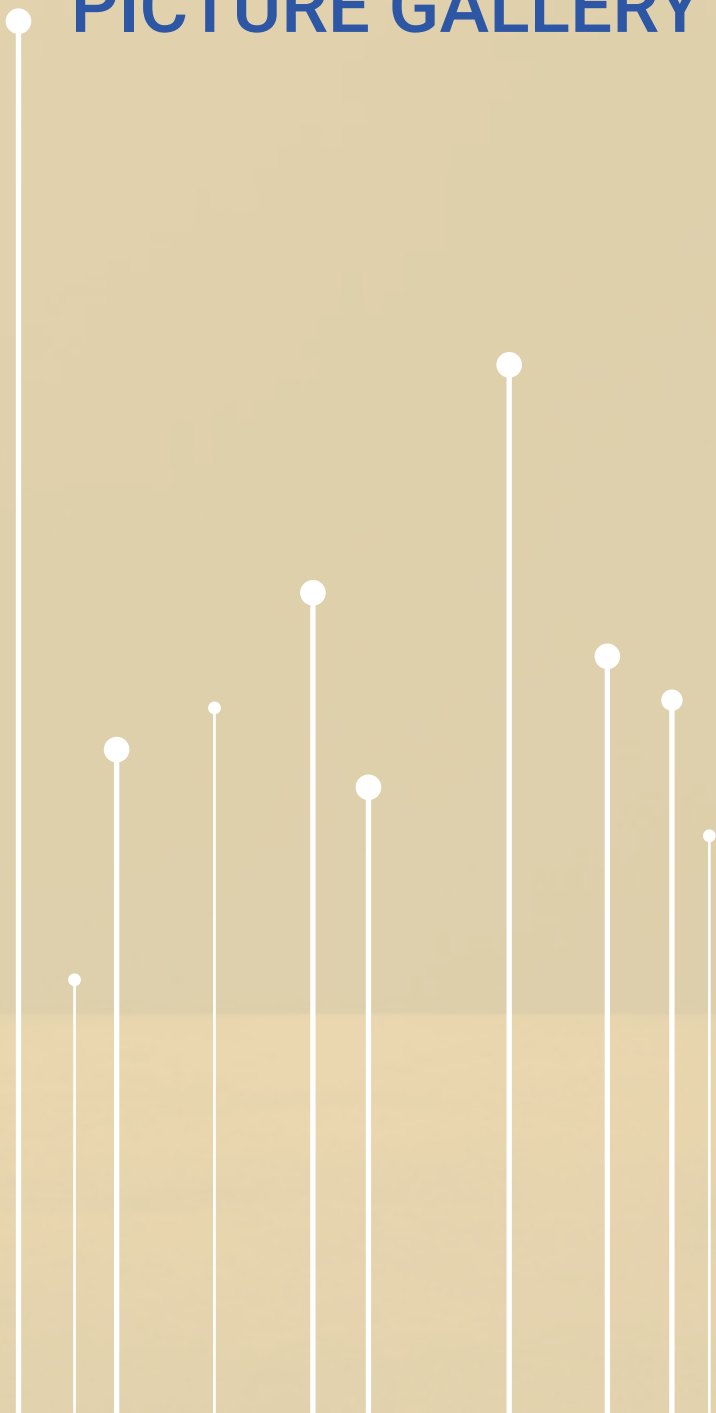
Mobile Devices on Pakistan Network

(Percentage)





PICTURE GALLERY





President of the Islamic Republic of Pakistan, Dr. Arif Alvi, and Chairman PTA, Maj Gen Amir Azeem Bajwa (R), addressing Pakistan's First National Broadband Network Forum 2021 held in Islamabad on November 10, 2021. Organized by PTA, in collaboration with Huawei, the forum's theme was "Broadband for All." President Dr. Arif Alvi was the chief guest on the occasion.



Representatives of PTA, Telenor, and Zong putting their signatures on documents at the NGMS license signing ceremony held in Islamabad on October 11, 2021. Federal Minister for AJ&K and GB, Ali Amin Khan Gandapur, Chief Minister of GB, Khalid Khursheed, Federal Secretary IT&T, Dr. Muhammad Sohail Rajput, Chairman PTA, Maj Gen Amir Azeem Bajwa (R), Member Finance PTA, Muhammad Naveed, Member Compliance and Enforcement PTA, Dr. Khawar Siddique Khokhar, and Executive Director Frequency Allocation Board (FAB), Brig Mohammad Tahir Ahmed Khan (R), witnessing the license signing.



Chairman PTA, Maj Gen Amir Azeem Bajwa (R), Member Finance PTA, Muhammad Naveed, and Member Compliance and Enforcement PTA, Dr. Khawar Siddique Khokhar, presenting mementos to Federal Minister for AJ&K and GB, Ali Amin Khan Gandapur, and Chief Minister of GB, Khalid Khursheed, at the license signing ceremony for AJ&K and GB, held in Islamabad on October 11, 2021.

Chairman PTA, Maj Gen Amir Azeem Bajwa (R), Member Finance PTA, Muhammad Naveed, and Member Compliance and Enforcement PTA, Dr. Khawar Siddique Khokhar, presenting a memento to Federal Secretary for IT&T, Dr. Muhammad Sohail Rajput, at the PTA Headquarters on June 23, 2021. During the interaction, the Federal Secretary was comprehensively briefed on the role and functions of PTA, with a specific focus on license renewals and spectrum auctions.



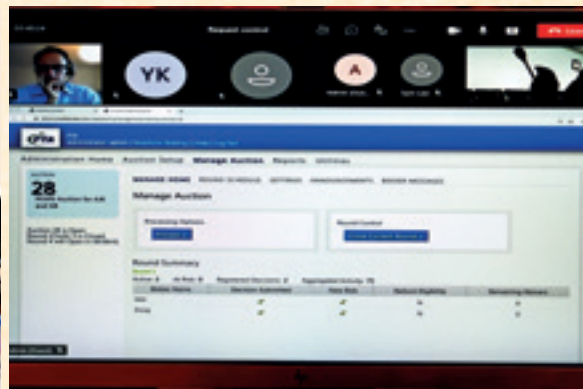
Chairman PTA, Maj Gen Amir Azeem Bajwa (R), Member Finance PTA, Muhammad Naveed, and Member Compliance and Enforcement PTA, Dr. Khawar Siddique Khokhar, at the launching ceremony of iOS Mobile App for Device Verification System, held on November 5, 2020. In order to check whether a particular mobile phone is registered and recognized by DIRBS, mobile users need to verify the IMEI number.



Chairman PTA, Maj Gen Amir Azeem Bajwa (R), Member Finance PTA, Muhammad Naveed, Member Compliance and Enforcement PTA, Dr. Khawar Siddique Khokhar, and Executive Director FAB, Brig Mohammad Tahir Ahmed Khan (R), during a media briefing on spectrum auction in Pakistan. The briefing was held on September 13, 2021.



Federal Minister for IT&T, Syed Amin Ul Haque, Federal Secretary for IT&T, Dr. Muhammad Sohail Rajput, Chairman PTA, Maj Gen Amir Azeem Bajwa (R), Member Finance PTA, Muhammad Naveed, Member Compliance and Enforcement PTA, Dr. Khawar Siddique Khokhar, and Executive Director FAB, Brig Mohammad Tahir Ahmed Khan (R) during the Ufone license signing ceremony held on September 15, 2021.



Chairman PTA, Maj Gen Amir Azeem Bajwa (R), Member Finance PTA, Muhammad Naveed, and Member Compliance and Enforcement PTA, Dr. Khawar Siddique Khokhar, ahead of the AJ&K and GB spectrum auction held on September 28-29, 2021.



The Ambassador of Turkmenistan, Mr. Atadjan Movlamov, called on Chairman PTA, Maj Gen Amir Azeem Bajwa (R), at the PTA Headquarters on September 23, 2020. Aside from matters of mutual interest, the meeting offered an opportunity for discussion on the proposed fiber optic link between Turkmenistan and Pakistan.



Chairman PTA, Maj Gen Amir Azeem Bajwa (R), and Director of ITU's Development Bureau (ITU-BDT), Ms. Doreen Bogdan-Martin, had a bilateral meeting on the sidelines of the Mobile World Congress on June 29, 2021. Ms. Bogdan-Martin appreciated the efforts of GoP and PTA in the sphere of digital transformation, and assured to extend maximum cooperation to PTA and other ICT stakeholders in Pakistan.

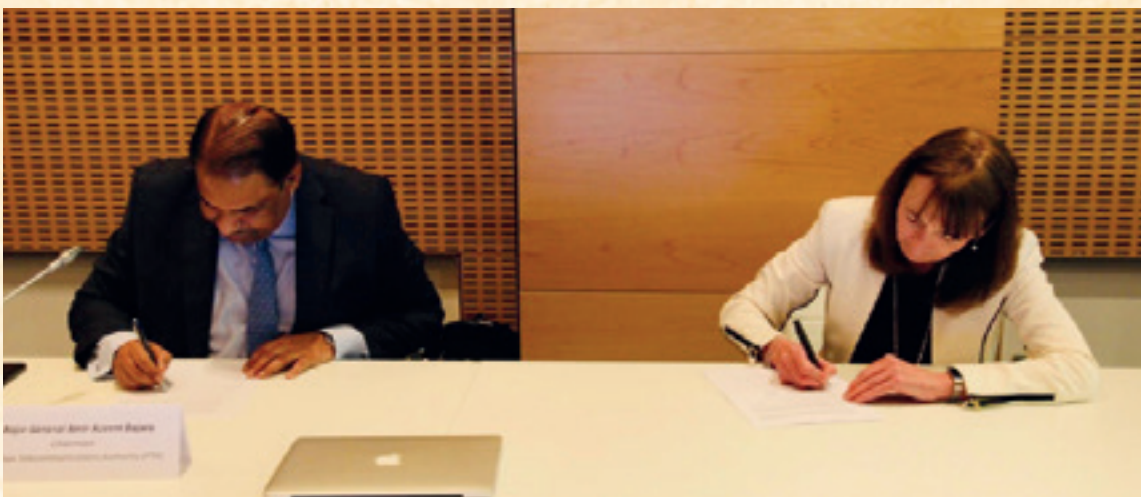
Chairman PTA, Maj Gen Amir Azeem Bajwa (R), and CEO of Universal Service Fund, Mr. Haaris Chaudhary, after a briefing in which the Director of ITU's Development Bureau (ITU-BDT), Ms. Doreen Bogdan-Martin, was apprised of USF's important role in providing digital connectivity to unserved and underserved areas of Pakistan.





Chairman PTA, Maj Gen Amir Azeem Bajwa (R), reaffirmed Pakistan's commitment to support the digital transformation of Afghanistan during a bilateral meeting with Ms. Masooma Khawari, Minister of Communications and Information Technology, Government of Afghanistan. The meeting was held at the GSMA Mobile World Congress in Barcelona on June 29, 2021.

Chairman PTA, Maj Gen Amir Azeem Bajwa (R), and President of Huawei Middle East Region, Mr. Charles Yang, convened a meeting to discuss the role of tech vendors in bringing latest telecom and ICT solutions to Pakistan. The meeting took place on June 28, 2020, during a visit to the Huawei booth at the GSMA Mobile World Congress held in Barcelona.



On June 29, 2021, PTA and GSMA signed a cooperation agreement at an exclusive 'Realizing Digital Pakistan Milestone Roundtable' held at the GSMA Mobile World Congress in Barcelona. Chairman PTA, Maj Gen Amir Azeem Bajwa (R), and Head of Public Policy GSMA Asia Pacific, Ms. Jeanette Whyte, signed the agreement in the presence of key stakeholders in the digital ecosystem of Pakistan.



Inspector General Motorways, Mr. Kaleem Imam, called on Chairman PTA, Maj Gen Amir Azeem Bajwa (R), at the PTA Headquarters on November 26, 2020. The two discussed issues related to telecom coverage on various motorways and highways, including M-3 and the Hazara Expressway.

The Co-Chief Operating Officer of VEON Group Jazz, Herrero Sergi, along with the CEO and CRO of Jazz, Aamir Ibrahim and Syed Fakhar Ahmed respectively, visited the PTA Headquarters in Islamabad on October 21, 2020, for a meeting with Chairman PTA, Maj Gen Amir Azeem Bajwa (R). The meeting featured a discussion on matters of mutual interest including future plans of Jazz, telecommunication advancements for the socio-economic benefit of Pakistan, and investment opportunities in the sector.



German Ambassador to Pakistan, Mr. Bernhard Schlagheck, engaged in a conversation with Chairman PTA, Maj Gen Amir Azeem Bajwa (R), at the PTA Headquarters on February 18, 2021. Both sides discussed matters of mutual interest including enhanced cooperation in the field of ICT and telecommunications, and opportunities for foreign investors in Pakistan's fast-growing telecom sector.



PTA team headed by Member Compliance and Enforcement, Dr. Khawar Siddique Khokhar, visited Coastal Jade on August 26, 2021.

Chief Minister of GB, Muhammad Khalid Khursheed, called on Chairman PTA, Maj Gen Amir Azeem Bajwa (R), at the PTA Headquarters on February 11, 2021. The PTA Chairman assured the Chief Minister of PTA's full support in removing any hurdles impeding the provision of quality voice and Internet (3G/4G) services in GB.



Chairman PTA, Maj Gen Amir Azeem Bajwa (R), presenting a memento to CEO of Etisalat Group, Mr. Hatem Dowidar, who called on him at the PTA Headquarters on March 11, 2021. The meeting featured a discussion on investment opportunities in the ICT sector in Pakistan, as well as future plans of Etisalat Group, PTCL, and Ufone. The two sides agreed to further expand mutual collaboration for realization of the PM's 'Digital Pakistan' vision.





President of the Middle East Region of Huawei Technologies, Charles Yang, along with CEO of Huawei Technologies Pakistan, Mark Meng, and Deputy CEO, Ahmed Bilal Masud, visited the PTA Headquarters on March 2, 2021 for a meeting with Chairman PTA, Maj Gen Amir Azeem Bajwa (R). The two sides discussed future plans of Huawei Technologies in Pakistan, and development of innovative digital and financial solutions to accelerate progress towards 'Digital Pakistan.'



Chairman PTA, Maj Gen Amir Azeem Bajwa (R), Member Finance PTA, Muhammad Naveed, and Member Compliance and Enforcement PTA, Dr. Khawar Siddique Khokhar, sharing a light moment at the inauguration of the National Telecom CERT Portal on April 5, 2021.



Vice President of Public Affairs and Communications, Huawei Middle East, Mr. Li Xiangyu (Spacelee), visited the PTA Headquarters for a meeting with Chairman PTA, Maj Gen Amir Azeem Bajwa (R) on May 4, 2021. Both sides discussed matters of mutual interest.



Chairman PTA, Maj Gen Amir Azeem Bajwa (R), Member Finance PTA, Muhammad Naveed, and Member Compliance and Enforcement PTA, Dr. Khawar Siddique Khokhar, at the signing ceremony of Mobile Device Manufacturing Authorization, held at the PTA Headquarters on May 20, 2021.



PTA high officials in a group photograph taken at the signing ceremony of Mobile Device Manufacturing Authorization held on May 20, 2021.



Chairman PTA, Maj Gen Amir Azeem Bajwa (R), presenting a shield to Director General NLC, Maj Gen Yousaf Jamal during a meeting held at the PTA Headquarters on September 3, 2020.

01 

• **DIGITAL PAKISTAN
INITIATIVE AND
REGULATORY
MEASURES**



Digital Pakistan Initiative and Regulatory Measures

The telecommunication sector—being the frontrunner for Pakistan’s economy over the last couple of years—has played a pivotal role in the country’s digitalization. International connectivity, bandwidth capacity, fiber footprint, and network redundancies are being improved to meet the ever-increasing demand for telecom and related services. Encouraging fair competition, keeping pace with rapid modernization of telecom systems, contributing to policymaking, and creating synergies by working in a partnership mode are just a few priority intervention areas wherein the Pakistan Telecommunication Authority (PTA) has achieved substantive improvements. In extending modern telecom services, conscious efforts are made to offer an effective governance and regulatory environment that would safeguard the interests of telecom users, service providers, investors, and the Government of Pakistan (GoP). Highlights of PTA’s regulatory performance under the Pakistan Telecommunication (Re-organization) Act, 1996, and other telecom/ICT-related policies during FY 2021 are elaborated below.

Regulatory Initiatives

A robust regulatory framework, accompanied by a broader strategic framework, are essential prerequisites for the creation of a pro-competitive and pro-investment telecom environment. The foundation of the digital agenda for the government in general and the regulator in particular rests on a satisfied consumer with accessibility, availability, and affordability of ICT services. Key regulatory initiatives implemented during the period under review include the following:

□ National Broadband Forum

Fiberization plays an important role in a world heading towards broadband technologies. In Pakistan, relatively lower speed of fixed broadband networks is causing staggered growth of broadband subscribers and lower Internet speed. To address this issue, PTA and Huawei Technologies Pakistan jointly organized a national broadband network forum themed ‘Broadband for All,’ where local and



President of the Islamic Republic of Pakistan, Dr. Arif Alvi, Federal Secretary for IT&T, Dr. Muhammad Sohail Rajput, Chairman PTA, Maj Gen Amir Azeem Bajwa (R) and Members of the Authority along with other dignitaries at Pakistan's First National Broadband Network Forum 2021 held in Islamabad on November 10, 2021. Organized by PTA, in collaboration with Huawei, the forum's theme was "Broadband for All." President Dr. Arif Alvi was the chief guest on the occasion.

foreign stakeholders shared their insight on transformative technologies and viable solutions to challenges impeding broadband proliferation in Pakistan.

President Dr. Arif Alvi, who was the guest of honor on the occasion, linked Pakistan's progress to extensive digitalization of all sectors—particularly education and health—and stressed the need for fast decision-making in this regard to match global advancements in Information Technology (IT). He said, had the decision to expand the broadband infrastructure been taken a decade earlier, the country would have witnessed a revolution in the IT sector. He was of the view that Pakistan needs a paradigm shift in the IT sector with an ability to process and analyze more data, and devise policies as per contemporary needs.

Addressing the participants, Secretary MoITT Mr. Muhammad Sohail Rajput said, without an effective broadband infrastructure, the dream of a 'Digital Pakistan' would be difficult to materialize. The President and Group CEO of PTCL and Ufone, Hatem Bamatraf, emphasized on 'digital deepening' in the country, driven by an economic approach. Chairman PTA Maj Gen Amir Azeem Bajwa (R) said, the forum was a step towards deliberating upon augmentation of broadband infrastructure, data analytics, spectrum management, and emerging technologies.

The forum was followed by a panel discussion on challenges and issues confronting operators in the expansion of fiber networks across the country. The effectiveness of Fiber to the Home (FTTH) and wireless technologies for spread of broadband were highlighted in relation to different geographical areas. The private sector underlined the importance of government support as efforts to improve the footprint continue. The broadband network forum was the first of its kind arranged by the regulator, and will now be convened on a regular basis to expedite broadband proliferation in the country.

□ Spectrum Auction in AJ&K and GB

The first-ever cellular spectrum auction for Next Generation Mobile Services (NGMS) in AJ&K and GB successfully concluded at the PTA Headquarters on September 28, 2021. Two operators—CMPak (Zong) and PMCL (Jazz)—participated in the electronic auction for 1800 MHz band. After 18 rounds, Zong was declared winner of 10 MHz (2 blocks of 5 MHz) in 1800 MHz band against a price of US\$ 14.398 million. The spectrum sold in 1800 MHz band constituted 85% of the total offered spectrum in the said band for AJ&K and GB. Furthermore, Telenor, Ufone, and Zong also won 1.2 MHz in 1800 MHz band. Telenor Pakistan was declared winner in 2100 MHz band for a spectrum of 15 MHz against the set base price. The spectrum sold in 2100 MHz band constituted 50% of the

total offered spectrum in the said band. The total revenue generated from the spectrum auction for AJ&K & GB stood at over US\$ 30 million.

New licenses were issued to CMPak (Zong), Telenor Pakistan, and Pakistan Telecommunications Mobile Limited (PTML; Ufone) for the spectrum secured in the auction process for AJ&K and GB. The license signing ceremony for auctioned NGMS spectrum was held in Islamabad on October 11, 2021. The event was attended by Federal Minister for Kashmir Affairs and GB, Ali Amin Khan Gandapur, Chief Minister GB, Muhammad Khalid Khurshid, Federal Secretary MoITT, Dr. Suhail Rajput, Chairman PTA, Maj Gen Amir Azeem Bajwa (R), Members of the Authority, Special Assistant to Prime Minister AJ&K for Information Technology, Secretary Kashmir and GB Affairs, Executive Director FAB, and senior management of mobile companies.

Speaking on the occasion, Mr. Ali Amin Khan Gandapur appreciated PTA for successful completion of the spectrum auction process. He congratulated the winning mobile operators and expressed confidence that through NGMS, the digital divide will be reduced and tourism will flourish further in the regions. The Chief Minister of GB congratulated the mobile operators on award of NGMS licenses. He said, this will open up a new era of modern telecom services for the people of AJ&K and GB. The Federal Secretary for IT&TT said, the Ministry of IT&T is committed to enhance connectivity and improve digital infrastructure in the country.

Chairman PTA said, PTA is working to ensure that Pakistanis have access to high-quality services and benefit from ubiquitous coverage. Continuous efforts are being made to spread state-of-the-art telecommunication services to far-flung areas, enabling access to a multitude of opportunities for businesses, education, and health.

The award of licenses for NGMS in the two regions will contribute towards strengthening uninterrupted provision of better telecom services to the people of AJ&K and GB in line with GoP's 'Digital Pakistan' vision.



Chairman PTA, Maj Gen Amir Azeem Bajwa (R), addressing the license signing ceremony for AJ&K and GB held on October 11, 2021.

Spectrum Auction in Pakistan



The process for cellular mobile spectrum auction teed off in September 2020. An internationally reputed consultancy firm—Frontier Economics Limited—was hired on January 13, 2021, upon fulfilment of procedural formalities. Through a consultative process involving all relevant stakeholders, PTA and the Frequency Allocation Board (FAB) team, alongside Frontier Economics, developed recommendations for spectrum auction of 1800 MHz and 2100 MHz bands. Final recommendations were presented to GoP's Auction Advisory Committee on April 29, 2021. In accordance with timelines mentioned in the 'Information Memorandum (IM) for the spectrum auction for NGMS in Pakistan 2021,' the opening of applications and sealed bid offers from prospective applicants was completed on September 9, 2021. PTML (Ufone) won the auction upon scrutiny of its submitted bid by PTA. Total spectrum won by Ufone is 9 MHz in 1800 MHz band, which is 70.3% of the total offered spectrum in the said band during the current auction. This addition will increase Ufone spectrum holdings from 6 MHz to 15 MHz in 1800 MHz band, thereby enhancing quality and increasing its coverage footprint for voice and data services.

This auction has generated revenue of US\$ 279 million. In addition to applicable advance tax amounting to US\$ 13.95 million, the government has received 50% upfront payment amounting to US\$ 139.50 million (PKR 23.45 billion) as per license condition. The remaining 50% is payable in five equal annual installments, along with applicable markup and advance tax, with the first installment due in September 2022.

At a signing ceremony held at the PTA Headquarters in Islamabad on September 15, 2021, PTA awarded a license to PTML (Ufone) against spectrum auction for NGMS in Pakistan 2021, which will entail enhanced network rollout obligations and QoS standards to ensure protection of consumer interests. The Federal Minister for IT&T, Syed Amin Ul Haque, Federal Secretary for IT&T, Chairman PTA and Members of the Authority, Executive Director of FAB, and senior management of PTML (Ufone) attended the event.

Addressing the ceremony, Federal Minister Syed Amin Ul Haque expressed his Ministry's commitment to enhance connectivity and improve the digital infrastructure in the country as part of efforts aimed at realization of the 'Digital Pakistan' vision. He congratulated Ufone on award of the NGMS license. The Chairman PTA said, PTA is working to ensure that Pakistanis have access to high-quality services and benefit from ubiquitous coverage. He appreciated the tireless efforts of concerned officials of PTA, FAB, and MoITT for timely conclusion of the spectrum auction process. The CEO of PTML (Ufone) expressed confidence that the additional spectrum will build on Ufone's existing assets and enable the operator to deliver long-term value and connectivity to its subscribers.



Chairman PTA, Maj Gen Amir Azeem Bajwa (R), Member Finance PTA, Muhammad Naveed, Member Compliance and Enforcement PTA, Dr. Khawar Siddique Khokhar and DG Licensing PTA, Amer Shahzad, receiving the bid document from the CEO of Ufone, Naveed Khalid Butt, on September 9, 2021.



Federal Minister for IT&T Syed Amin Ul Haque, Secretary for IT&T Dr. Sohail Rajput, Federal, Chairman PTA, Maj Gen Amir Azeem Bajwa (R), Member Finance PTA, Muhammad Naveed, Member Compliance and Enforcement PTA, Dr. Khawar Siddique Khokhar, and Executive Director FAB, Brig Mohammad Tahir Ahmed Khan (R), at the Ufone license signing ceremony held in Islamabad on September 15, 2021.

□ License Renewals in AJ&K and GB

In 2006, cellular mobile licenses for a term of 15 years were issued for provision of services in AJ&K and GB. This term expired on June 26, 2021. PTA carried out extensive consultations with all stakeholders and CMOs, culminating in renewal of three cellular mobile licenses for AJ&K and GB on June 24, 2021. Licenses were renewed for Telenor Pakistan, PMCL (Jazz), and PTML (Ufone), all three of which deposited 50% of the total license fee amounting to PKR 3.19 billion; the rest of the amount will be paid in 10 equal annual installments. The process for renewal of the license of CMPAK (Zong), which is due in August 2022, is underway.

As per the renewed license terms, the licensees are now required to annually add a minimum of 30 Base Transceiver Station (BTS) sites in their existing networks. Similarly, all existing cellular networks are required to upgrade to MBB (3G/4G) at enhanced Quality of Service (QoS) rates. The renewal of cellular licenses is expected to result in availability of uninterrupted, fast, and cheap mobile and broadband services to the people of AJ&K and GB. With enhanced broadband services, the region will benefit from increased tourism activities.

□ Renewal of Integrated and Special Licenses

Under sections 39, 40, and 41(3) of the Pakistan Telecommunication (Re-organization) Act, 1996, PTA granted integrated licenses to Pakistan Telecommunication Company Limited (PTCL), National Telecommunication Company (NTC), and Special Communication Organization (SCO) for a period of 25 years effective January 1, 1996. All three integrated licenses i.e., PTCL, NTC and SCO have been renewed by PTA with effect from January 1, 2021, for a period of 25 years, with enhanced QoS and network coverage obligations.

□ Device Identification, Registration and Blocking System

Following its successful launch in 2019, DIRBS entered its third year of seamless functioning. The system continued to achieve its specific objectives of eliminating the grey handset market in Pakistan and getting rid of counterfeit, substandard, and non-GSMA approved handsets. Similarly, the wider impact of DIRBS entailed a sharp decrease in incidents of snatching and theft of mobile handsets, increased government revenues, a newly established handset manufacturing ecosystem, and 100% registered handsets across all cellular networks of Pakistan. Today, commercial imports have grown by up to 125% in three years; revenue collected by the Federal Board of Revenue

(FBR) on these imports crossed PKR 122 billion between 2018 and 2021. Similarly, in the individual import category, the government collected PKR 35 billion between 2019 and 2021. Prior to implementation of DIRBS, this was an untapped area, with no revenue collection in this category. Following is the impact of DIRBS on the status of blocked, banned, and barred devices in Pakistan:

- 26.03 million fake/replica mobile devices blocked.
- 175,000 International Mobile Equipment Identity (IMEI) devices (reported stolen) banned.
- 880,780 IMEI devices identified as cloned/duplicated against 5.28 million MSISDN barred on networks.

Commercial Imports—Trends			
Calendar Year	Commercial Import + Local Manufactured Quantity (Million)	Revenue Collected by FBR (FY) (PKR Billion)	
2016	21.60	—	
2017	19.80	—	
2018	17.20	22.00	
2019	28.02	46.27	
2020	38.06	54.00	
2021	34.92	—	

□ Local Assembly and Manufacturing Trends

DIRBS has created a level playing field for all entities in Pakistan, resulting in establishment of local assembly plants. In view of the successful development of this industry, PTA issued MDM Regulations, 2021, in accordance with the Mobile Manufacturing Policy issued by GoP in June 2020. The policy offers incentives including tax exemptions etc., for all entities that establish manufacturing plants in Pakistan.

As many as 30 local and foreign companies—both standalone and joint venture—have obtained 10-year MDM authorization from PTA and have established manufacturing plants for the purpose. Leading brands including Oppo, Vivo, Nokia, Techno, and Infinix, among others, have established their plants in Pakistan. Local manufacturing has enabled smart phone manufacturing in Pakistan, created job opportunities in skilled areas, and promoted affordability for consumers. The accompanying Table provides a summary of local manufacturing and its impact on job creation, and reliability of locally manufactured 4G phones.

Local Manufacturing and Its Impact

	Local Manufacturing Quantity (Million)	DIRBS Impact	Job Creation (approx.)	# of Companies
2016	0.3		200	3
2017	1.7		600	3
2018	5.2		3,000	9
2019	11.7	Increase by 125% from 2018	8,000	11
2020	13.08	2.16 million 4G Smart Phones assembled in Pakistan	600	3
2021	24.65	10.06 million Smart Phones manufactured in Pakistan	2,000	30

Authorization has also been granted to Lucky Motor Corporation Limited for manufacturing of Samsung mobile devices, for which it will set up a plant in Karachi. The presence of major local and foreign players in the market is a landmark achievement that will further revolutionize the mobile manufacturing ecosystem in Pakistan.

In a recent development, Inovi Telecom Pakistan has started exporting smart phones. The company has exported its first consignment of 5,500 units of 4G smart phones, carrying the 'Manufactured in Pakistan' tag, to

the UAE—an achievement made within four months of receiving authorization from PTA.

A PTA team headed by Member Compliance and Enforcement, Dr. Khawar Siddique Khokhar, visited Coastal Jade on August 26, 2021. Coastal Jade is a 100% Chinese plant manufacturing smart phones under the brand Vivo. The company has established a state-of-the-art manufacturing facility employing a local workforce of over 2,000 plus. PTA envisions that the establishment of manufacturing plants in Pakistan will contribute towards the country's



A PTA team headed by Member Compliance and Enforcement, Dr. Khawar Siddique Khokhar, visited Coastal Jade on August 26, 2021.

development as a strong player in the mobile device manufacturing arena.

□ Mobile Device Manufacturing Regulations

Prepared by PTA, the MDM Regulations, 2021 came into force with effect from January 25, 2021. These regulations (accessible at https://www.pta.gov.pk/assets/media/mdm_regulations_29012021.pdf) aim to encourage local production of mobile devices in Pakistan. As per the regulations, all devices are to be manufactured in conformity with ITU Telecommunication Standardization Sector (ITU-T) technical standards, with the 'Manufactured in Pakistan' label duly displayed. For further authorization, PTA will carry out merit-based evaluation of applications, which will be determined by factors such as technical competence and management experience of the applicants, key staff members and local participation in the business, and technical viability of the proposed business plan for manufacturing. The authorization will be valid for 10 years.

□ Cellular Mobile Network QoS Regulations

In keeping with changing global standards of service provision, resulting from advancement of technology and speed enhancements, PTA revised the Cellular Mobile Network QoS Regulations. The aim was to assess and upgrade Key Performance Indicators (KPIs) so that operators are bound to improve the quality of services, thereby enabling consumers to enjoy their mobile usage experience. This revision, which was undertaken in consultation with stakeholders including CMOs and an international consulting firm, led to the development of Network Performance Score (NPS) for assessment of KPIs. NPS is a harmonized and integrative scoring methodology that characterizes the overall network performance based on automated tests, with commercial smartphones simulating the typical end-user behavior (voice call, browsing, watching videos, etc.) in a public network. NPS enables telecom regulators to compare and assess the quality of all mobile networks, based on international standard KPIs.

□ Protection from Spam, Unsolicited, Fraudulent, and Obnoxious Communication Regulations, 2020

As digitalization penetrates every sector of the economy and household, so too are fraudulent activities emerging in diverse forms and kinds. To proactively control and curb digital financial frauds, PTA notified the 'Protection from Spam, Unsolicited, Fraudulent, and Obnoxious Communication (Amendment) Regulations, 2020.' Under

these regulations, it is now possible to block fraudster number(s) within 24 hours, block number(s) mentioned in contents of text messages/SMS, block associated mobile handset i.e., IMEI(s), and issue warnings on all other active numbers subscribed against the fraudster's Computerized National Identity Card (CNIC). Repeat of a fraudulent activity leads to blocking of all mobile numbers issued against the fraudster's CNIC.

□ Mobile Phone Repeaters Technical Standards and Operations Regulations, 2020

In a bid to improve indoor mobile service coverage, PTA arranged a consultation with the industry and relevant stakeholders to develop standards and regulations allowing the use of indoor mobile phone repeaters. In view of best international practices and feedback from stakeholders, regulations and associated technical standards, parameters, and procedures have been approved and gazette notified.

□ Rolling Spectrum Strategy 2020-2023

In pursuance of the Telecom Policy 2015, which requires of MoITT, PTA, and FAB to formulate rolling spectrum strategy, the federal government approved the three-year Rolling Spectrum Strategy 2020-2023 in November 2020. This strategy is in line with the outcomes of the (ITU) World Radio-Communications Conference (WRC-19). The strategy is a future roadmap for spectrum allocation as well as spectrum related policy review requirements. The objective of the strategy is to assist telecom operators with their network planning investments. It is crucial to recognize that the pace of change of industry is rapid, and whilst the aim is to provide transparency and certainty to the industry.

□ Telecom Infrastructure Sharing Guidelines

The Telecom Policy 2015 mandates PTA to develop the necessary regulatory instrument to encourage, facilitate, and standardize infrastructure sharing in consultation with the federal government (MoITT) and stakeholders. To this effect, PTA is in the process of developing infrastructure sharing guidelines along the principles of neutrality, non-discrimination, and equal access. These guidelines will provide a mechanism for licensees and other stakeholders to share their telecom and other infrastructure facilities including space, electrical power, air-conditioning, security, cable ducts, and space on antenna and towers, etc. Based on international best practices and industry feedback, the guidelines will provide a framework for the telecom industry to facilitate infrastructure sharing.

Draft International Mobile Roaming Service Guidelines, 2021

In exercise of powers enshrined in Section 6(f) of the Pakistan Telecommunication (Re-organization) Act, 1996, read with License Condition 2.9.1 of NGMS license, PTA issued draft guidelines in respect of International Mobile Roaming (IMR) services for consultation and feedback of CMOs and SCO. These guidelines cover aspects of IMR service within and outside the country and include activation, written request of consumers through email, SMS, mobile app, short code, social media, confirmation message by operator, competitive tariff, and dedicated number, etc. Operators have submitted their comments on the draft guidelines. After due deliberations, final guidelines will be issued.

Draft Tariff for Telecommunication Services Regulations, 2021

PTA issued draft 'Tariff for Telecommunication Services Regulations, 2021' for industry consultation and requested all operators including Local Loop (LL), Long Distance and International (LDI), CMOs, Class Value Added Services (CVAS), and MoITT for comments. The regulation covers all aspects of regulating telecom tariffs in a manner where healthy competition is maintained and consumer interests protected. Separate set of regulations for SMP and non-SMP operators in the draft regulations will resolve tariff issues without affecting smaller operators, and while giving consumers a clarity and surety that their service providers' prices are fair. The responses against these regulations have been received and are under consideration. Final regulations will be notified in due course.

Regulatory Measures

Significant Market Power Determinations

Under section 4(1)(d), section 4(1)(m) and section 6(e) of the Pakistan Telecommunication (Re-organization) Act, 1996, PTA is mandated, inter alia, to: i) regulate competition in the telecom sector; ii) promote the availability of cost-effective and competitive telecommunication services; and iii) encourage fair competition in the telecommunication sector throughout Pakistan. To regulate matters related to competition, Rules 17(1) and 17(2) of the Pakistan Telecommunication Rules, 2000, provide the criteria to determine SMP operators. In line with the above-referred legal framework, PTA issued a consultation paper on determination of relevant markets and SMP operators in Pakistan and AJ&K and GB, and requested operators to provide comments along with relevant data. LL, LDI, and CMOs attended the hearing on the said date. Considering the operators' comments and hearing held during March-May 2021, PTA issued draft determinations for 11 relevant markets for Pakistan, and 10 relevant markets for AJ&K and GB for operators' comments. After detailed analysis based on comments and input from stakeholders and relevant operators, PTA issued determinations for declaring SMP operators for 10 markets of AJ&K and GB, and 11 markets of Pakistan. PTCL has appealed in the Sindh High Court against PTA's determinations of the markets wherein it has been declared SMP, except IP bandwidth market. The honourable court has granted stay against PTA's order. PMCL (Jazz) and Telenor Pakistan have also challenged PTA's SMP determination in cellular mobile market. However, the honourable court has not granted stay order against PTA's order and the matter is subjudice.

Determination of SMP Operators

#	Market	Pakistan	AJ&K and GB
Retail Level Markets			
1	Local Loop Fixed-Line Telecom	PTCL	SCO
2	LDI Fixed-Line Telecom	PTCL	SCO
3	Mobile Telecom	PMCL	Telenor
4	Fixed Broadband	PTCL	SCO
Wholesale Level Markets			
5	Domestic Leased Lines	PTCL	SCO
6	International Leased Lines	PTCL	–
7	Call Transit Service	PTCL	SCO
8	IP Bandwidth	PTCL and TWA	SCO
9	Individual Fixed Inter-connection	All LL Operators	All LL Operators
10	Individual Mobile Inter-connection	All Mobile Operators	All Mobile Operators
11	Broadband Access	Not Relevant	Not Relevant



□ Consultation on Review of Mobile Termination Rate

PTA, vide its determination dated November 16, 2018, reduced the Mobile Termination Rate (MTR) from Rs. 0.90 per minute to Rs. 0.80 per minute from January 2019 to December 2019, and to Rs. 0.70 per minute from January 2020 onwards. For further review, PTA issued a consultation paper on 'Review of Mobile Termination Rate' on July 2, 2021, providing international benchmarking analysis for determination of MTR in Pakistan. The paper noted that Pakistan's current MTR @ Rs. 0.70 per minute is still on a very high side compared to MTRs in the region and as per international best practices. A regional comparison shows that Pakistan's MTR @ US cents 0.41 per minute is much higher than that in Bangladesh, India, Malaysia, and Sri Lanka, where the rate is US cents 0.16, 0, 0.24, and 0.25, respectively. Furthermore, most of countries are continuously decreasing their MTRs.

The international benchmarking analysis undertaken in the paper shows that MTR calculated for Pakistan is between Rs. 0.28 to Rs. 0.30 as per Purchasing Power Parity (PPP) adjustment and between Rs. 0.12 to Rs. 0.24 as per Average Revenue Per User (ARPU) adjustments. This shows that the current MTR of Rs. 0.70 per minute is still much higher than the calculated MTR using benchmarking. Therefore, PTA proposed that MTR be determined @ Rs. 0.30 per minute. All CMOs including SCO, as well as LL and LDI operators, were requested to submit their comments and feedback

on issues highlighted in the paper. An Authority hearing with all stakeholders was also held on September 20, 2021. After due process and considering operators' comments, PTA issued determination on MTR on November 24, 2021 and determined the following MTR for Pakistan and AJ&K and GB for all types of calls (i.e. local, long distance and international incoming calls) terminated on mobile networks from other mobile networks or fixed networks.

Period	Mobile Termination Rate (Rs. per minute)
January 1, 2022 to June 30, 2022	0.50
July 1, 2022 to June 30, 2023	0.40
July 1, 2023 onwards	0.30

□ Anticompetitive Commercial Practices by Jazz

PTA observed use of the term 'Super 4G' in commercial advertisements of Jazz on the print, electronic, and social media, in contravention of the parameters laid down in Regulation 8(4) of the Telecom Consumer Protection Regulations, 2009. Jazz was asked to explain in writing, as to why PTA should not direct it to refrain from using the said term. Since Jazz's response was not consistent

with the requirements of commercial practices as set out in Regulation 8 of the Telecom Consumer Protection Regulations, 2009, PTA directed Jazz to discontinue usage of the term 'Super 4G' in its commercial advertisements/billboards, and to submit a compliance report. The matter is sub judice as Jazz approached the Islamabad High Court and obtained a stay order against PTA's directive.

□ Code of Commercial Practice and Facility Provision Agreement for Telecom Infrastructure Providers

Telecom Infrastructure Provider (TIP) licensees are required, under the terms and conditions of their licenses, to submit Code of Commercial Practice (CCP) and Facility Provision Agreement (FPA) to PTA for approval. To facilitate the operators and streamline the approval process, PTA prepared standard documents of CCP and FPA for TIPs in March 2021. Accordingly, TIP licensees are submitting their duly signed copies of CCP and FPA on PTA's format.

□ Assessment of LDI Market

Under the Telecom Policy 2015, PTA carried out an assessment of the LDI segment for issuance of new LDI licenses. It was concluded that the LDI sector is operating on thin margin; except for CMOs' LDIs, international incoming traffic is declining due to increase in Over-The-Top (OTT) services; and only a few operators have invested in infrastructure. PTA recommended the following two options for consideration by MoITT. One, that an interim LDI license on existing terms and conditions for a period of four years be issued as a majority of the existing LDI licenses will expire in July 2024. Two, that new LDI licenses be issued for a period of 20 years, covering infrastructure related obligations. MoITT has recommended that license duration be maintained for 20 years and that PTA issue new LDI licenses with enhanced terms and obligations. Accordingly, after industry consultations, PTA has started accepting applications for LDI license for Pakistan and the license shall be valid for a term of 20 years.

□ Procurement of New QoS Survey Monitoring and Benchmarking Tool

To equip its field teams with latest QoS monitoring and benchmarking capabilities, PTA acquired 'SmartBenchMarker' from Rhodes & Schwarz in September 2020. Subsequently, a training session was arranged for PTA's field teams. This was followed by use of the newly procured tool for conducting QoS surveys in eight cities across the country during the fourth quarter of 2020 for testing purposes. The tool is now being used to conduct surveys across Pakistan.

□ CMOs QoS Benchmarking

A nationwide CMOs QoS Benchmarking campaign/test of approximately 3,570 kilometers length was conducted in different cities, towns, and roads across Pakistan during February-March 2021 to assess the quality and performance of mobile networks in line with the latest NPS methodology. During this campaign, 10 cities, four towns, and 18 motorways, highways, and roads were surveyed and around 2,600 voice calls and 26,000 data tests were simultaneously performed while testing the networks with devices operating in 4G mode. Based on this systematic mobile network benchmarking methodology, PTA gained valuable insights about the performance of each mobile network operator. By making this survey public, PTA is spurring competition among CMOs to improve their existing infrastructure with the aim of increasing the overall countrywide mobile network quality. Bringing Pakistan's Long Term Evolution (LTE) networks at par with internationally adopted standards will lay the foundation for roll-out of 5G technology on a sound footing. (Complete NPS report accessible at <https://pta.gov.pk/en/consumer-support/qos-survey/qos-survey>).

□ Survey to Check Availability and Curtail Sale of GSM Boosters, Amplifiers, Repeaters

The import and use of GSM boosters was restricted to CMOs only prior to December 2020, and the same were required to be installed at the premises of mobile users by the respective CMOs. There was, however, an increasing trend of the use of substandard GSM boosters, amplifiers, and repeaters by the public, which eventually causes interference in CMOs' frequency bands, thus deteriorating the quality of mobile services. Public notices were published in national newspapers in August 2020, warning all importers, distributors, sellers and users of GSM boosters to refrain from import/distribution/sale/use of these boosters.

To ascertain the ground situation and to curtail the availability GSM boosters, amplifiers, and repeaters, PTA's field teams carried out an open market survey with the assistance of the Federal Intelligence Agency (FIA) during the last quarter of 2020. Based on the survey findings, the matter was referred to FBR (Customs) with a request to allow import of GSM amplifiers, boosters, and repeaters to CMOs only, and to restrict/stop import by all other entities (licensees/non-licensees) including shipments through online sales. Furthermore, the matter was referred to online sellers, who have been asked to stop the sale of all such devices to the public in Pakistan; their response was affirmative. Additionally, public notices were again published in national newspapers in February 2021.

Quality of Service Surveys



CELLULAR MOBILE

PTA periodically conducts nationwide mobile QoS surveys to assess the network performance of CMOs for voice, data and SMS services. In compliance with the performance agreement signed with the Prime Minister's office, surveys were carried out in various cities of Sindh, Punjab AJ&K, and Khyber Pakhtunkhwa. Additionally, service quality of mobile services on different roads, motorways, and highways was measured. PTA also carried out complaint-based QoS surveys and a third-party QoS survey. During FY 2020-21, QoS surveys were conducted in 47 cities and 30 roads, motorways, and highways of Sindh, Punjab, Khyber Pakhtunkhwa, AJ&K, and GB. On the basis of results of each quarterly QoS survey, the overall standing of the operators as 1st, 2nd, 3rd and 4th in each category of service i.e., 'Mobile Network Coverage,' 'Mobile Broadband (3G, 4G),' 'Voice,' and 'SMS' was ascertained for awareness and utilization of both subscribers as well as operators. The results were subsequently published on PTA's website for awareness of the general public and subscribers; the same were also taken up with concerned operators to ensure remedial actions for improvement in services, wherever required. The results are accessible on PTA's website. (<https://www.pta.gov.pk/en/consumer-support/qos-survey/qos-survey>).



COMPLAINT-BASED QoS SURVEYS

To resolve consumer complaints, the Enforcement Division—in collaboration with CMOs—carried out surveys and network optimization exercises in different cities of Pakistan. During the period under review, 70 surveys were conducted throughout the country to resolve user complaints, leading to significant improvements in quality of services and resolution of complaints.



FIXED-LINE BROADBAND SURVEY

In line with its vision, PTA supports and encourages the deployment of latest telecommunication technologies and services for provision of affordable and quality services to customers. To achieve this, Broadband Service Providers (BSPs) are required to maintain QoS KPIs as required under the Broadband QoS Regulations notified in the gazette in 2014. To assess the ground situation and to raise public awareness, PTA conducted a nationwide QoS survey for fixed line BSPs (FLL/WLL/CVAS, etc.) in major cities of Pakistan and AJ&K and GB. During the survey, 177 tests were carried out against 46 unique BSPs offering packages ranging from 1MB to 32MB. The results showed that packages like 2MB, 4MB, and 8MB were most commonly offered and used, followed by 10MB and 1MB packages. The KPIs measured during the survey included network availability, link speed, service availability, retainability, download/upload speed, round-trip time, jitter, and packet loss. The survey results revealed that most of the BSPs have met the minimum required threshold values, while some in selected areas need to improve their services. The results are accessible on PTA's website. (<https://www.pta.gov.pk/en/consumer-support/qos-survey/qos-survey-of-fixed-line-broadband-service-providers-2020-310321>)

Raids on Illegal Gateways

To curb the menace of grey traffic (illegal call termination), PTA—with the support of FIA—carried out a number of successful raids across Pakistan. During the period between August 2018 to June 2021, as many as 53 raids were conducted, leading to confiscation of 163 illegal gateways and arrest of 35 persons, against whom further proceedings in the court of law are being carried out by FIA. The accompanying Table presents a summary of raids conducted, gateways confiscated, and arrests made during the above-mentioned period.

Raids on Illegal Gateways
(2018-2021)

	Raids Conducted	Gateways Confiscated	Arrests
2018 (Aug-Dec)	2	18	2
2019	28	102	23
2020	21	43	9
2021 (Jan-Jun)	2	9	1
Total	53	163	35



Public Interest Initiatives

PTA's pro-competition policy is aimed at enhancing the welfare and safety of consumers, and protecting their interests. PTA believes in adopting an evidence-based approach to enhance consumer protection and empowerment through its all-inclusive policies, thereby creating a positive socio-economic impact across various segments of society. It also focuses on demand side analysis, which helps improve processes and systems. Key initiatives taken for telecom users during the period under review are discussed below.

□ Upgrading of 4G Data Sites in Waziristan

PTA conducted a QoS survey in South Waziristan to check the status of telecom services. CMOs were asked to not only improve their services but also upgrade their 3G data sites. Accordingly, Jazz and Ufone which were providing 3G data services in South Waziristan, upgraded all of their 3G sites to 4G, allowing subscribers to enjoy high-speed data services. PTA is continuously following up with CMOs

to install more sites in the area so that better voice and data services can be extended to subscribers in line with the vision of the Prime Minister of Pakistan.

□ Disability/Digital Accessibility

PTA's bilingual mobile responsive website (www.pta.gov.pk) is now compliant to the Universal Web Accessibility Standards for Persons with Disabilities, making it one of the pioneering government websites focusing on inclusivity and accessibility for all. As per international best practices, web accessibility standards for Persons with Disabilities have been introduced, for which the Global Alliance on Accessible Technologies and Environments (GAATES) has issued an accessibility certificate after successfully conducting an ICT accessibility audit. PTA believes that developing accessible digital resources will foster a more inclusive environment while improving skills and efficiency. PTA is determined to continue such efforts in the future for sustainable digital inclusion and accessible information.

Launch of 'Equal Access' App for Persons with Disabilities



Recognizing the need to provide access to Persons with Disabilities and to empower this marginalized segment, PTA—in collaboration with the Special Talent Exchange Program (STEP) and The British Council—developed 'Equal Access,' an app launched in November 2021 to provide information in sign language interpretation, sound description, dark mode, and resizable text formats. This equal access app provides information on disability services, disability stakeholders, and disability laws and policies in Pakistan, as well as information on DPOs and COVID-19. Users can also get news and updates related to disability in Pakistan. (<https://equalaccess.pk>)



Speaker National Assembly Mr. Asad Qaiser, PTA Chairman, Maj. General (R) Amir Azeem Bajwa, Executive Director STEP, Mr. Atif Sheikh, and Deputy Director British Council, Mark Crossey, at the launching ceremony of 'Equal Access' App at the Parliament House on November 24, 2021.

□ Taleemi Bundle for Online Education

In view of amplified dependence on digital media for education, the Higher Education Commission (HEC) requested PTA to introduce cost-effective and subsidized monthly broadband packages or 'Taleemi Bundles' for students. It was suggested that the bundle have a volume of 50 GBs, with limited access to mutually agreed whitelisted education-related websites. Accordingly, PTA identified and shared discounted monthly 'Taleemi Bundle,' with a volume of 50 GBs, which were below available prices for comparable monthly packages already being offered by CMOs. In addition, PTA also shared daily and weekly discounted work-from-home packages of CMOs for optimal use by students.

□ Launch of iOS Mobile App for Device Verification System

To check whether a particular mobile phone is registered and recognized by DIRBS, mobile users need to verify the IMEI number of their handset through any of the following three ways:

- ✉ PTA Device Verification System (DVS) via SMS
- 🌐 PTA DVS via website
- 📱 PTA DVS via downloading the DVS App

Previously, the mobile app for DVS was only available for Android. In its effort to facilitate consumers, PTA developed and deployed iOS version of the system. The mobile app is available for public on App store.

□ Online Portal for Lost and Stolen Device System

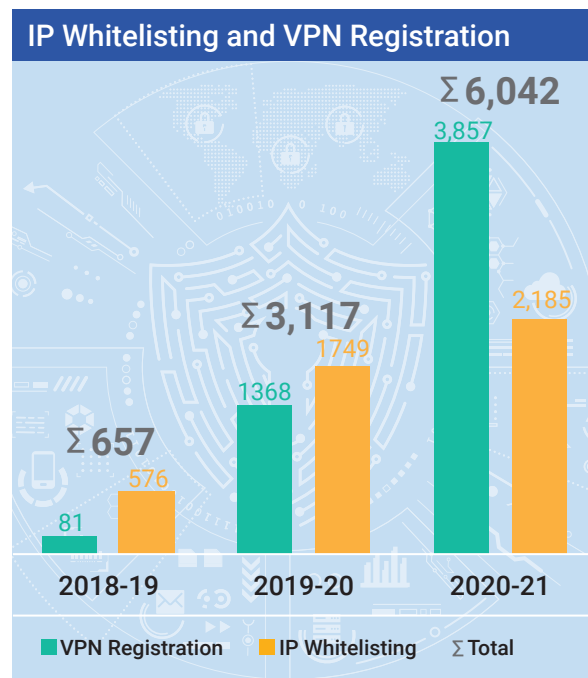
PTA has launched a new automated Lost and Stolen Device System (LSDS) for blocking of lost, stolen, and snatched mobile phones. The new system makes it easy to get a stolen/lost phone blocked. Complainants can easily file a request with PTA for blocking the IMEI of such a handset from potential misuse. LSDS is an automated system integrated with DIRBS and Pakistan Mobile Database (PMD) for credential verification. The stolen mobile phone will be blocked within 24 hours of reporting. Resultantly, complaints of stolen handsets have significantly reduced.

□ Online Portal for IP Whitelisting and VPN Registration

To promote ease of doing business in Pakistan, PTA—in collaboration with the Pakistan Software Export Board (PSEB)—launched an online portal for IP Whitelisting and VPN registration for software houses, call centers, and freelancers. Now, call centers, software development companies, and freelancers having at least one static

IP address and verification letter from their business concerns, can easily register at <https://ipregistration.pta.gov.pk>. Previously, call centers and IT companies had to route their applications through the relevant ISPs.

To further streamline the whitelisting process, including online application to facilitate legitimate businesses, a one-window has been established for PSEB Call Centers. During FY 2018 to FY 2021, a total of 9,816 IP addresses were whitelisted and VPN registrations were IP whitelisted. Of these, 3,500 IP addresses were of call centers, 762 were for video conferencing, 248 for LDI operators, and 5,306 VPN registrations.

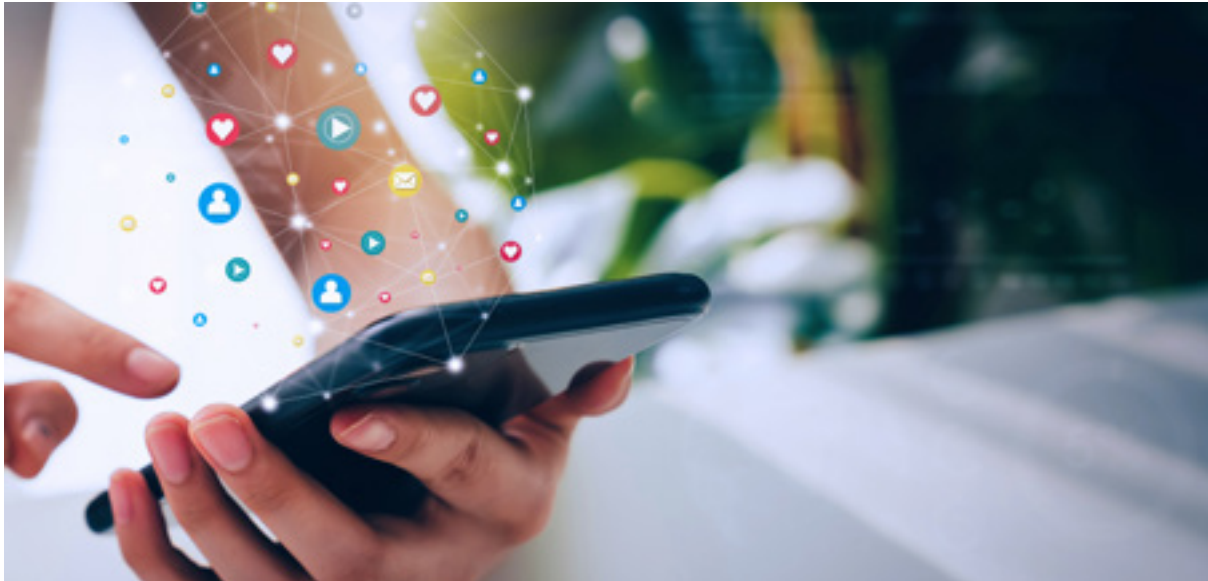


□ Multi-SIM Verification

To facilitate consumers and to ensure legal devices on network, PTA—in collaboration with multiple Original Equipment Manufacturers (OEMs) like Apple, Samsung, Huawei, OPPO, etc.—developed a module for verification of phones through OEMs which have multiple SIMs.

A consumer application containing devices with more than one SIM is sent to OEMs for verification. Once the application is verified by the relevant OEM, the request is forwarded to FBR for tax calculation. However, exemptions are given to international travelers as per Customs policies.

After the launch of Multi-SIM Verification, the registration of more than 7,000 devices of multiple brands has been rejected due to wrong declaration, which consequently helped in protecting revenue for the national exchequer.



Social Media Management

Internet and Social Media Content Management

Social Media (SM) platforms have connected people of all ages, irrespective of their geographical location. The GoP's continued support to tech companies for sustainable growth and launching of user-friendly social media applications has created a corps of over 60 million active social media users in Pakistan. To ensure safe and clean SM platforms containing informative, productive, and legitimate content for users, it is important to manage online content in accordance with local laws. To this end, PTA has implemented the SM Strategy under the umbrella








of PECA through Removal and Blocking of Unlawful Online Content (Procedure, Oversight and Safeguards) Rules 2021. PTA's consistent support to tech companies has resulted in tremendous growth of SM users as reflected in the accompanying Table.

Engagements with International Social Media Platforms

For effective removal of unlawful content, PTA has established dedicated liaison channels with major SM platforms including Facebook, YouTube, TikTok, Twitter, etc. SM companies have also nominated dedicated focal persons besides providing separate escalation channels for quick removal of sensitive reported content, wherever required. Frequent engagements occur between PTA and these SM platforms to remove gaps and improve understanding, especially with respect to content that is against local laws and societal norms of the country. Resultantly, major SM companies are hiring for their moderation teams, such human resource that possesses an understanding of local laws and norms.



TikTok

Upon failure to comply with PTA's instructions with respect to removal of unlawful content, the services of short video platform TikTok were suspended on July 20, 2021. After imposition of the ban, PTA remained in communication with senior management of the platform, which pledged to take necessary measures to control unlawful content in accordance with local laws and societal norms. TikTok also assured blocking of users who are continuously involved in uploading unlawful content. In view of the above assurances, PTA lifted the ban on November 19, 2021.

Social Media Statistics for Pakistan 2021	
	Users (Million)
 Facebook	50.0
 YouTube	45.0
 Twitter	3.7
 TikTok	31.2
 Snack Video	20.0
 Likee	3.0
 BIGO Live	0.5

Source: Statistics are from multiple sources

Overall URL Blocking, by Category (June 2021)

 Category	 Total Processed
Contempt of Court	8,673
Defense of Pakistan	36,820
Glory of Islam	77,692
Defamation/ Impersonation	7,690
Miscellaneous	6,562
Decency and Morality	903,074
Proxy	10,219
Sectarian/Hate Speech	40,365
TOTAL	1,091,095

Establishment of Monitoring Cell

A dedicated Monitoring Cell has been established at the PTA Headquarters to monitor online content and to resolve complaints received from the general public as well as government organizations. So far, 1 million URLs including 140 mobile applications involved in various unlawful activities have been processed for blocking, as reflected in the accompanying Table.

Awareness Campaigns

To increase public awareness on responsible and safe use of the Internet/SM, PTA regularly disseminates advisories in the print media and through short messages.

Removal and Blocking of Unlawful Online Content (Procedure, Oversight and Safeguards) Rules, 2021.

Under section 37(2) of the Prevention of Electronic Crime Act (PECA), 2016, the federal government approved Removal and Blocking of Unlawful Online Content (Procedure, Oversight and Safeguards) Rules, 2020. The said rules were, however, challenged in the Islamabad High Court, and in respectful compliance of the directions of the Honorable Court, the Prime Minister of Pakistan constituted a committee on recommendations of the Attorney General, to conduct a broad-based consultation with all stakeholders for revision of the rules.

After holding consultations with relevant stakeholders including tech companies, Bar associations, and social media activists, among others, the committee submitted its recommendations and the 'Removal and Blocking of Unlawful Online Content (Procedure, Oversight and Safeguards), Rules 2021' were subsequently notified in October 2021 after approval of the Federal Cabinet.

As per Rule 7(6), any SM company with half a million users in Pakistan has to get itself registered with PTA and appoint a dedicated local compliance officer and a grievance officer. All significant SM companies have been approached to fulfill the above obligations under the said Rules. A few companies have contacted PTA regarding registration and appointment of relevant officers; the process of their registration is expected to be completed in early half of 2022.



Way Forward for Management of Online Content

In view of the enormous volume of content being uploaded on digital media, a multi-pronged strategy needs to be devised to minimize uploading of unlawful content on various platforms. The following actions are intended to be taken in this regard:

- ▶▶ Registration of major SM platforms in line with Rule 7(6) of Removal and Blocking of Unlawful Online Content (Procedure, Oversight and Safeguards) Rules, 2021.
- ▶▶ Holding of special sessions with moderation teams of SM platforms, especially with regard to sensitive (sacrilegious/sectarian) content which can lead to real world harm.
- ▶▶ Creating short videos (15 to 30 seconds) about safe, responsible, legitimate, and productive use of the Internet/ SM. The videos will be disseminated through the electronic and social media for public awareness.
- ▶▶ Conducting seminars and training sessions in universities and judicial academies to educate students and the judicial fraternity regarding the challenges posed by SM.



Policy Engagements under Digital Pakistan Initiative

Recognizing the enabling role of digital services in the economy, the government announced the Telecom Policy in 2015 and the first-ever Digital Pakistan Policy in 2018. These documents laid the foundation for a holistic digital ecosystem, along with a strategy for rapid delivery of next generation digital services, applications, and content.

Being a significant stakeholder, PTA not only initiated the assigned tasks but also walked the extra mile for implementation of these policies in true letter and spirit. In doing so, PTA worked on the following legal frameworks during the period under review.

National Cyber Security Policy, 2021

The MoITT released the draft National Cyber Security Policy, 2021, in the first half of 2021 for consultations with stakeholders. Being the key stakeholder, PTA assessed and analyzed the draft policy within the purview of PECA 2016, Pakistan Telecom (Re-organization) Act, 1996, other relevant legislations, and sector-specific regulations i.e., Critical Telecom Data and Infrastructure Security Regulations (CTDISR) and provided comprehensive comments on the draft after deliberations with the industry. PTA shared its input on the following key areas:

Formation of National Cyber Security Authority (NCSA) to safeguard the entire cyberspace of Pakistan, and development of National Cyber Security Strategy;

Revival of the Electronic Certification Accreditation Council (ECAC) under the Electronic Transaction Ordinance (ETO), 2002, to establish national level Public Key Infrastructure (PKI);

Introduction of digital identity for all Pakistani citizens i.e., digital certificates in National ID Cards and Mobile SIMs, devising of HW/SW Security Evaluation Mechanism using existing Research and Development (R&D) labs, and 'Personal Reliability Program' for all persons dealing with critical information infrastructure and cyber security in Pakistan;

Re-delegation of the '.pk domain' to the Government of Pakistan, with its full control maintained by NCSA;

Development of qualified cyber security workforce; security of public cloud services; incentives for vendors to promote the local security industry; and enhancement of law enforcement capabilities for cybercrime prevention and prosecution, among others.

Draft National Broadband Policy, 2021

According to ITU, "The development of a national broadband plan increases mobile investment by 15%, network coverage by 14%, price reduction by 8%, and mobile penetration by close to 3% after two years." Under the Telecom Policy 2015, MoITT released the draft National Broadband Policy, 2021, for consultation with stakeholders. Being the key stakeholder in implementation of the policy, PTA assessed and analyzed the draft policy within the purview of the Telecom Policy 2015 and Digital Pakistan Policy 2018, and provided a comprehensive gap analysis.

Some critical issues on which PTA's input was shared in detail included 'Basic Access Service' as a new license category, Content Delivery Networks (CDNs) in terms of Internet Exchange Points (IXP) management, Administrative Incentive Price (AIP), telecom and national disaster management, and environmental obligations. In addition, PTA gave input on the 'Open Skies Policy' with respect to satellite telecom services, Right of Way (RoW), and competition rules. The draft National Broadband Policy will shortly be finalized and notified by the government.

Draft Cloud First Policy

In view of the expected benefits of cloud computing for the public sector in Pakistan, MoITT initiated a consultation process to obtain reviews and feedback from all stakeholders on the draft Pakistan Cloud First Policy. This policy aims to guide public sector entities in their transition to cloud computing. It is also expected to encourage cloud adoption beyond the public sector, and across a variety of markets and industries. The policy will foster growth of the local ICT industry by enabling access to cloud-enabled technologies. This allows the

indigenous industry to benefit from global data sets by identifying actionable intelligence and vulnerabilities to make impactful decisions. The policy is an important element for achievement of the objectives set forth in the Digital Pakistan Policy, such as improving the effectiveness of services to citizens.

□ Draft Data Protection Bill, 2021

The MoITT released a draft bill on Personal Data Protection Act, 2020, for consultation and deliberation with stakeholders. Being the key stakeholder, PTA assessed and analyzed the draft bill within the purview of PECA 2016, Pakistan Telecom (Re-organization) Act, 1996, other relevant legislations and sector specific regulations, and provided a comprehensive gap analysis. Some critical issues on which PTA's input was shared in detail included "improvement in structure and arrangement to address inconsistencies, ambiguities, and overlapping sections; improvement in the expression of definitions; addressing of multiple sector-specific issues e.g., collection of data under a license regime, processing of data with legal mandate and under enforcement and monitoring powers; processing with respect to court orders; processing for regulating telecom sector functioning, and other similar issues."

In addition, PTA also gave input on harmonizing the role of regulatory bodies established under other statutes to avoid overlapping and functional conflicts. The Draft Bill 2020, after incorporating stakeholders' input, was revised by MoITT in 2021 and published on its website in August 2021 for the second consultative round. The bill is presently in the re-consultation stage, and upon finalization, will be processed for the government's review and approval.

□ Draft Internet of Things Framework

The draft framework for regulating IoT in Pakistan was developed during the reported period. To seek the industry's views on the regulatory mechanism, a consultation on the framework was convened. The identification of frequency bands by the government is an important milestone for implementation of Low Power Wide Area Network (LPWAN) IoTs. In this regard, FAB has approved frequency bands for long range IoTs and Short Range Devices (SRDs). The draft framework has gone through extensive industry consultation and finally submitted to the MOIT for comments. The framework will be finalized accordingly in early 2022.

□ Policy Recommendations on WLL Regime

The WLL regime was introduced in 2004, pursuant to promulgation of the Deregulation Policy, 2003. WLL was

expected to augment telecom service availability in remote areas of the country as a replacement of FLL service, and as an easy-to-deploy, cost-effective last mile access solution. WLL was supposed to provide coverage with limited mobility in unserved and thinly populated areas to improve teledensity. In many countries, the concept of a separate licensing regime for Fixed Wireless Access (FWA) and mobile services remained in place for a while till the maturity of technologies, identification of spectrum bands for International Mobile Telecommunication (IMT) purposes by ITU, and introduction of NGMS.

In Pakistan, 450 MHz, 479 MHz, 1900 MHz, and 3.5 GHz bands were allocated for WLL services. Right from the assignment of 3.5 GHz band till this point in time, the spectrum is not being efficiently utilized, with only two operators namely, PTCL and LinkDotNet (LDN), offering noteworthy services in this band. The 3.5 GHz band has now been identified by ITU for IMT as a core band for 5G services now being deployed in many countries through auction process. The GoP, vide its policy directive issued on October 16, 2017, for 'Test and Development of Future Technologies Particularly for Fifth Generation (5G) Wireless Networks in Pakistan,' has also identified it as a potential band for IMT deployment in Pakistan. Moreover, a Rolling Spectrum Strategy for radio frequency was issued by the government on November 23, 2020. This strategy provides a future roadmap for spectrum allocation as well as spectrum-related policy reviews that are anticipated to take place from 2020 to 2023. The government has foreseen 3.5 GHz band (3300 MHz-3600 MHz) to be allocated to its highest value in terms of social and economic benefits for the user, by allowing more players to bid for the spectrum when the existing assignments to WLL operators expire in 2024.

□ Establishment of PTA's Regional Offices

PTA is a statutory body established under the Pakistan Telecommunication (Re-organization) Act, 1996 with a mandate to regulate the establishment, operation, and maintenance of telecommunication systems and provision of telecommunication services in Pakistan. To perform its functions in an efficient manner, PTA has established eight offices across Pakistan including AJ&K and GB. However, due to rapid growth of the telecommunication sector, its existing offices became insufficient, leading to the establishment of four new offices in Gwadar, Sukkur, Faisalabad, and Abbottabad. This expansion has eased implementation of PTA's regulatory functions, improved consumer access to ICT services, and promoted efficient monitoring and implementation of regulatory functions.

02 

CONSUMER PROTECTION



Consumer Protection

PTA is committed to protecting the interests of consumers by ensuring provision of high-quality telecommunication services, smooth operations, and appropriate maintenance of telecommunication systems. The Authority receives complaints from a variety of channels including email and post, as well as from the Consumer Support Center (CSC) and the online Complaint Management System (CMS). PTA also processes and redresses consumer complaints received from Pakistan Citizen Portal (PCP). Prompt redress and effective relief is made possible through constant coordination with telecom operators; PTA also analyses the complaints in the light of applicable laws and regulations on the subject.

Consumer Protection Quality Policy



Process and redress telecom-related consumer complaints in a timely manner.



Coordinate with telecom operators to ensure provision of high-quality ICT services to their respective customers.



Comply with regulatory requirements and enhance the effectiveness of the Quality Management System, the Quality Policy, and the Consumer Protection Division.



Ensure that all employees and stakeholders are aware of the requirements of the complaint handling mechanism according to the Pakistan Telecommunication (Re-Organization) Act, 1996, as well as other rules, regulations, and SOPs, and are compliant with the government's transparency policy.



Lodge, register, analyse, and redress complaints, gauge the pulse of telecom consumers, and identify areas requiring regulatory work in the larger interest of consumers.



Comply with the requirements of ISO 9001:2015.

Certification for Consumer Protection Division

The Consumer Protection Division (CPD) of PTA has acquired ISO 9001:2015 quality management system certification, following an audit conducted by the British Assessment Bureau.

This certification demonstrates PTA's commitment to deliver high-quality telecom solutions to end-users in Pakistan through the state-of-the-art CMS operated by CPD. PTA is determined to provide uninterrupted services for complaint handling, and to address all issues related to telecom services for continuous improvement, user satisfaction, and engagement.



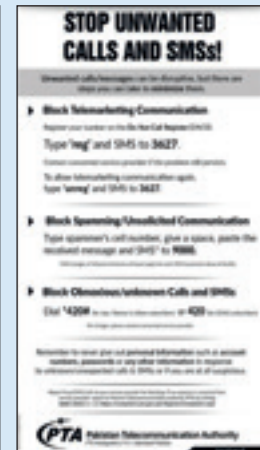
Consumer Awareness



PTA is a strong proponent of consumer engagement. Creating awareness about the telecom rights of subscribers and disseminating information about relevant contacts and procedures to lodge complaints and grievances, constitutes the mainstay of its consumer interaction.

Fake text messages and phone calls from unknown callers preying upon subscribers, and packaged with offers of lucrative prizes, lotteries, plots, or lucky draws is a common scam enticing gullible people, who end up being deprived of their hard-earned money.

Frequent calls and marketing messages from unwanted numbers are also a nuisance for telecom users; they are tantamount to breach of privacy. To address these issues, PTA reached out to subscribers with public awareness messages disseminated through the print and electronic media. These messages offered tips on how to block telemarketing communication, spamming and unsolicited communication, and obnoxious calls and SMSs. PTA regularly carries out nationwide campaigns through SMS broadcasts, newspapers, and FM Radio to raise public awareness. It has also issued a billing advisory for general awareness of telecom consumers on billing issues, and on availing mobile broadband services at affordable rates.



Consumer Support Center

PTA launched the CSC (toll-free number 0800-55055) in February 2020 to facilitate telecom consumers. The Center provides information and registers complaints related to:

Telecom services (Cellular Mobile Telephony Operators, ISPs, fixed/wireless telephony, etc.)

DIRBS

Web content reporting (blasphemy, pornography, etc.)

Mobile blocking and unblocking through LSDS

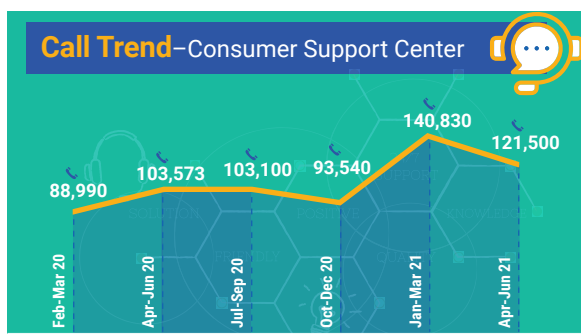
The toll-free number is accessible throughout the week, including Saturdays and Sundays, from 9 a.m. to 9 p.m.

During FY 2020-21, CSC received 38,200 calls per month (1200-1300 calls per day) on the average. The facility is a testimony to PTA's commitment to provide innovative international quality services to address consumer needs. The accompanying graph reflects the overall monthly trend of calls received by CSC.

Complaint Management System

PTA received 165,944 complaints against Cellular Mobile Telephony, ISPs, Basic Telephony (Fixed Line) and Wireless Telephony (WLL) during the year 2020-21, with 98% of the complaints being addressed. Approximately 49% of the consumer complaints against CMOs were related to restoration of suspended SMS facility blocked due to SPAM filters.

The accompanying Table provides details of complaints received against each service type. Since a vast majority of the population is using mobile services, around 95.6% of the total complaints received by PTA were against



them. PTA further categorized these complaints and resolved them in accordance with available legal tools in cooperation with respective operators.

Consumer Complaints Received by PTA 2020-21

	No. of Complaints	Total Addressed Complaints	Redressal/ Disposal (Percentage)
Cellular Mobile Telephony	158,750	155,925	98.22%
Internet Services	5,244	5,110	97.44%
Basic Telephony	1,799	1,714	95.27%
Wireless Telephony	151	145	96.03%
Total	165,944	162,894	98.16%

Redressal of Complaints on PM's Portal

PTA received 49,601 complaints on the Pakistan Citizen Portal (PCP) during the period between November 12, 2018, to June 30, 2021. Of these, 47,704 complaints were promptly resolved. Commonly referred to as the PM's Portal, this online public complaint redressal system is directly overseen by Prime Minister Imran Khan's office to ensure redress of complaints by concerned government departments and offices within strict timelines. PTA has a dedicated section handling complaints from concerned telecom operators and licensee, on priority.

Complaints received on PCP 2018-2021

Complaint Received	49,601
Complaints Resolved	47,704
Redressal/ Disposal (Percentage)	96.1% (as on June 30, 2021)
Positive Feedback/ Satisfaction (Percentage)	58.7%

Lost Stolen Device System

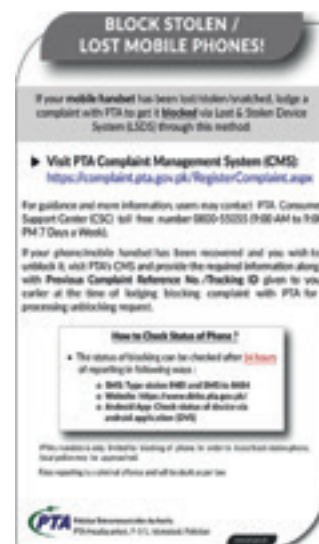
In April 2021, PTA launched an automated Lost Stolen Device System (LSDS) for blocking of lost, stolen, and snatched mobile phones within 24 hours of reporting, after necessary verification.

The system, which features automated blocking, is integrated with DIRBS. It facilitates users wanting to get their mobile phones blocked in case of theft, snatching, or loss. Complainants can file a request with PTA for blocking the IMEIs of such handsets to prevent potential misuse.

A blocking request can be lodged through CMS (accessible at www.pta.gov.pk). Further information can be obtained by calling on CSC's toll-free number (0800-55055) between 9 a.m. to 9 p.m., seven days a week.

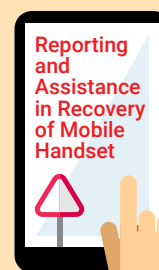
A complaint reference number is issued to the complainant upon successful registration of the blocking request. If the mobile phone is recovered, the complainant is required to follow the same procedure for unblocking through CMS, mentioning the complaint reference number, along with other mandatory details that were previously provided for blocking. Thereafter, the user receives an SMS on the registered number once the mobile phone has been unblocked.

PTA also carried out a media campaign for public awareness on LSDS during the year under review. Ever since the introduction of this system in April 2021, PTA has thus far received 9,963 requests on LSDS, leading to blocking of 9,409 IMEIs and unblocking of 554 IMEIs by LSDS, only after compliance of necessary procedural processes.






The complainant can also report the lost/stolen/theft mobile handset complaint with the concerned police station or the Citizen Police Liaison Committee (CPLC), Karachi.

HELP LINES:
+92-(21) 35682222,
+92-(21) 35662222, 1102
Email: Info@cplc.org.pk





IMEI Blocking and Unblocking		
2021		
	Requests Received on LSDS	9,963
	IMEIs Blocked	9,409
	IMEIs Unblocked	554

Mobile App to Facilitate Telecom Consumers

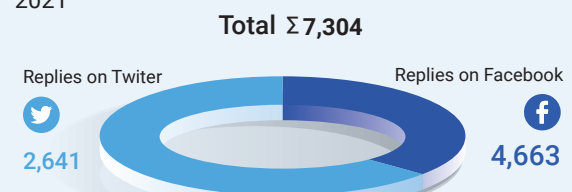
In an effort to facilitate telecom consumers even further, PTA has launched a user-friendly CMS mobile application. This app is available on Android (Google Play) and iOS (Apple App store). Consumers can register their complaints related to telecom services, mobile registration, DIRBS, web content reporting, and stolen handset blocking, etc. The app allows users to track their complaints and provide feedback on complaint resolution. It also includes

Frequently Asked Questions (FAQs) on different issues to promote consumer awareness and understanding.

Social Media Presence

PTA is effectively utilizing its social media space to not only inform consumers about various telecom policies and developments, but also to seek feedback on regulatory decisions. It has also leveraged the social media in its campaigns to raise public awareness on fraud SMSs and calls, reporting of unlawful online content, prohibition on import, sale, and use of GSM boosters, amplifiers, and repeaters, and the illegality of providing Internet services without license, among other issues.

Social Media Presence 2021



Way Forward

PTA strongly believes in creating awareness among telecom consumers by keeping them abreast with latest information about procedures and systems for lodging complaints, and apprising them of its latest policies on issues of public interest. Awareness campaigns are, therefore, carried out throughout the year via SMS broadcasts, as well as the print and electronic media and SM handles. The performance and processes of CMS are being closely monitored and modifications incorporated to cater for integration of various modules such as the web analysis module, which will be integrated with CMS. Other areas being considered for integration to ensure a seamless consumer experience include the nature of complaints, reporting requirements, creation and deletion of user and telcos' accounts in CMS, and consumer facilitation for lodging complaints over CMS.



03

TELECOM DEVELOPMENT IN AZAD JAMMU & KASHMIR AND GILGIT-BALTISTAN



Telecom Development in Azad Jammu & Kashmir and Gilgit-Baltistan

The area constituting Azad Jammu and Kashmir (AJ&K) and Gilgit-Baltistan (GB) is spread over 86,268 square kilometers (AJ&K: 13,297 sq kms; GB: 72,971 sq kms) and has a population of 5.9 million (AJ&K: 4.3 million; GB: 1.7 million). Being an integral part of Pakistan, both the regions have come a long way and continue to evolve constitutionally and economically. Alongside this progress, services and other sectors of AJ&K's economy are also steadily progressing.

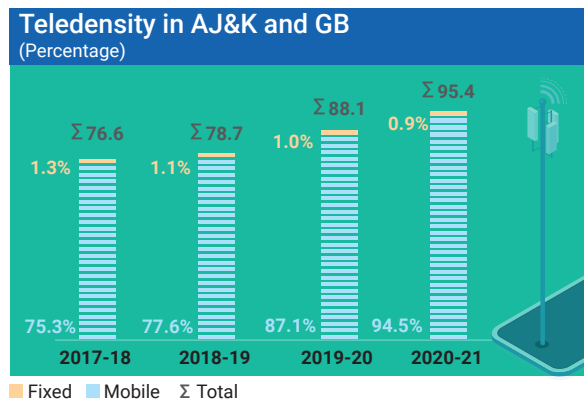
The region is a naturally rough terrain; coupled with that, sparse population and low economic activity makes it a less lucrative business market for investors. The development and growth of telecommunication services, however, remained interchangeably dependent on the performance of the AJ&K administration and the focus of GoP. Since 1976, GoP has been providing telecom services to the region through SCO. In 2006, private sector service providers also joined the market in view of fast-increasing demand, coupled with technological advancements. Today, there are 45 licensed operators providing different telecom services in these two regions.

Cellular mobile licenses issued to Jazz, Telenor, and Ufone in 2006 were renewed in June 2021 against a renewal fee of US\$ 40.5 million whereas Zong's license will be renewed in 2022 against a fee of US\$ 13.5 million. Similarly, additional spectrum has also been auctioned in the region for enhanced broadband services in the wake of increased data demand. Ufone, Zong, and Telenor have acquired the spectrum in this auction against a total amount of US\$ 30 million.

Under GoP's vision to develop the Gwadar-Kashgar corridor, the strategic importance of the region vis-à-vis telecom services, has increased manifold. As such, special attention is being accorded to support development activities along the Gwadar-Kashgar corridor. Details of network growth in AJ&K and GB are shared below.

Teledensity

The aggregate teledensity of AJ&K and GB stands at 95.4%, which is higher than that of Pakistan. This includes 94.5% cellular penetration and 0.9% fixed line penetration. During FY 2021, teledensity showed an upward trend, increasing by approximately 8.3%.



Amidst high demand, the arrival of Telenor, Jazz, Ufone, and Zong made it easier for the local population to access mobile services; to have a wider choice of operators; and to avail services at competitive rates. Today, there are over 5.6 million mobile subscribers across a region inhabiting over 6 million people.

Although the subscriber growth rate indicates a fluctuating trend over the last five years, the average annual growth rate hovered at 12%. Telenor and SCO are the preferred choice of the population because of their relatively larger footprint in the region, compared to the other three operators. Telenor has over 2.3 million subscribers, while Zong too has penetrated well with a subscriber base of 1.0 million, just behind SCO with 1.5 million subscribers. During the period under review, Telenor grabbed 42% of the market share, becoming a dominant player in the region. However, its share in the local market decreased by 1.7%, compared to last year.

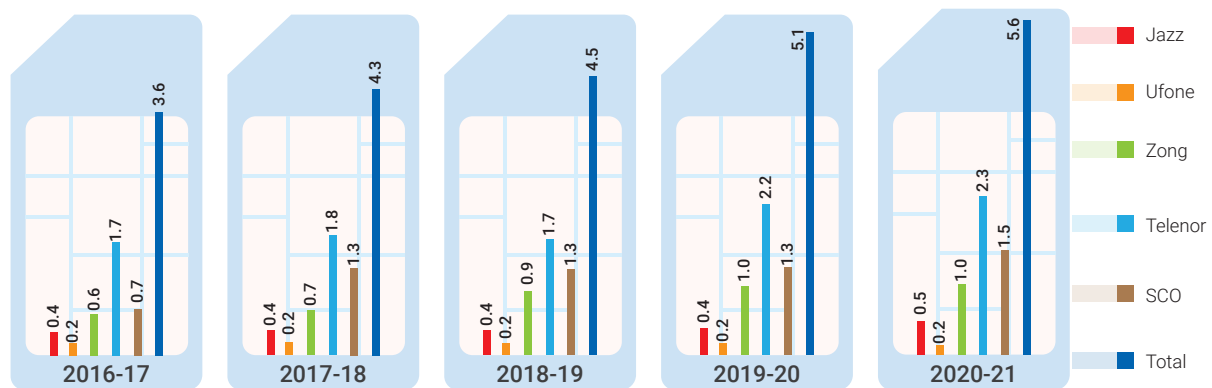
Cellular Mobile Services

The presence of leading CMOs in AJ&K and GB has led to an exponential increase in the number of subscribers.

The market share of SCO and Jazz increased by 2.4% and 0.6% respectively, during the period under review. Ufone was unable to maintain its position in the market as its share dropped by 0.4%.

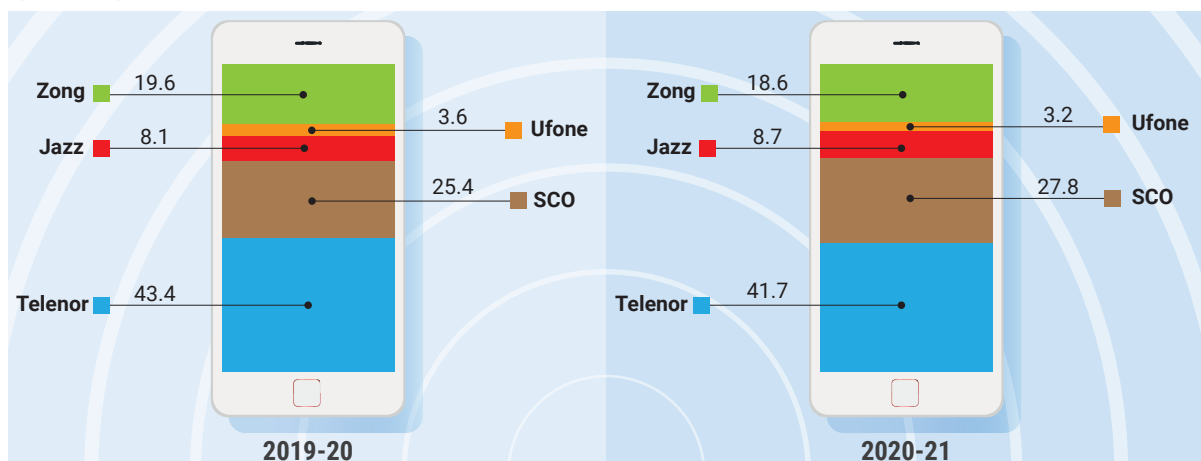
Cellular Mobile Subscribers in AJ&K and GB, by Operator

(Million)



Share of Cellular Mobile Subscribers in AJ&K and GB

(Percentage)



Broadband Services

Broadband services were introduced in AJ&K and GB after 2015. The global trend of slow growth in fixed broadband penetration was evident in AJ&K and GB as both experienced staggered growth.

Today, there are 26,730 DSL subscribers, which translates into less than 1% penetration of fixed broadband in the region. SCO—the largest FBB services provider in the region—has initiated triple-play FBB services using Gigabit Passive Optical Network (GPON) technology to offer super-fast broadband speeds to its customers.

The commercial launch of GPON FTTH triple-play services has been initiated in Gilgit, Karimabad, Skardu, Muzaffarabad, and Mirpur. The region, however, saw substantial adoption of mobile broadband services after SCO, Telenor, and Zong offered services to their subscribers.

Today, there are 2,388,788 mobile broadband subscribers (1,743,445 in AJ&K and 645,343 in GB). Both 3G and 4G services are available, with 3G currently leading. The total broadband penetration in the region is 40%. Telenor has maximum subscribers in the region while SCO is consistently working to increase its footprint vis-à-vis NGMS services and deployment of NGMS Phase 3. Similarly, the recent spectrum auction in AJ&K and GB will also help to enhance broadband penetration in the region.

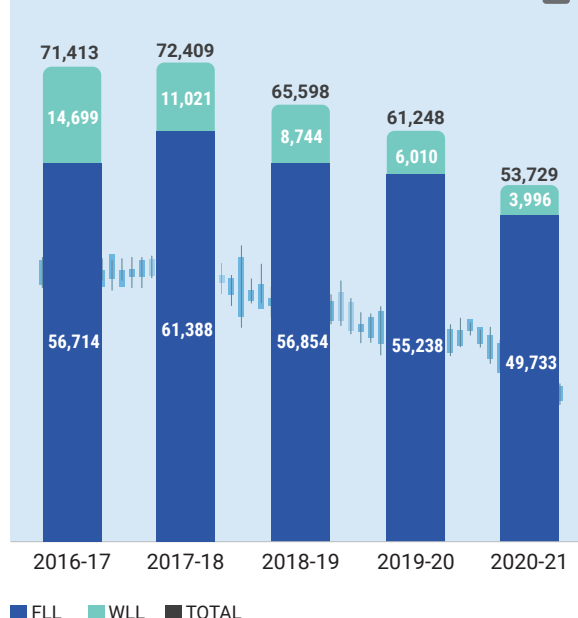
Broadband Subscribers in AJ&K and GB (2020-21)

Operator	Region	NGMS	Total
Telenor	AJK	698,025	801,319
	GB	103,294	
Zong	AJK	488,919	509,118
	GB	20,199	
SCO	AJK	556,501	1,078,351
	GB	521,850	
Total	AJK	1,743,445	2,388,788
	GB	645,343	

Fixed Line Services

Even though almost all communication has now morphed into wireless, the importance of fixed line cannot be underestimated—especially in AJ&K and GB, where complete wireless coverage is a daunting task to accomplish in view of the difficult terrain. There are currently three service providers in the market—SCO, PTCL, and Wateen. Both SCO and PTCL are currently the major fixed line service providers in the region. Fixed line subscribers in AJ&K and GB stood at 53,729, compared to the previous year's 61,248, depicting a decline of approximately 12% during the year under review. In GB, the subscriber count stood at 17,213 in 2021, compared to the previous year's 17,494. The negative trend is expected to improve after deployment of the GPON project Phase-I and Phase-II by SCO in 45 major cities and towns of AJ&K and GB.

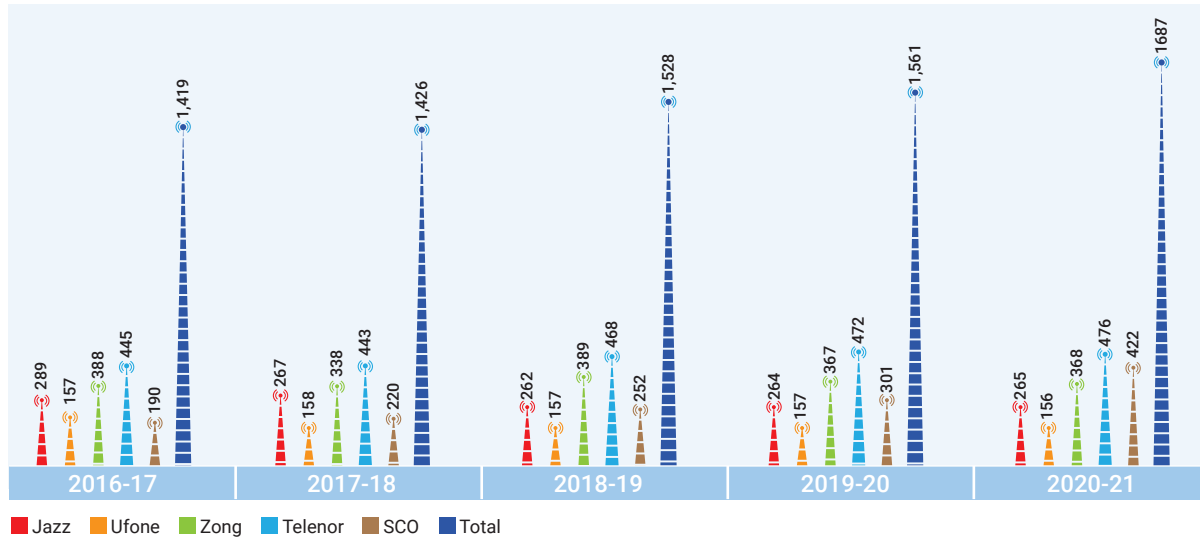
PSTN Subscribers in AJ&K and GB



Telecom Infrastructure

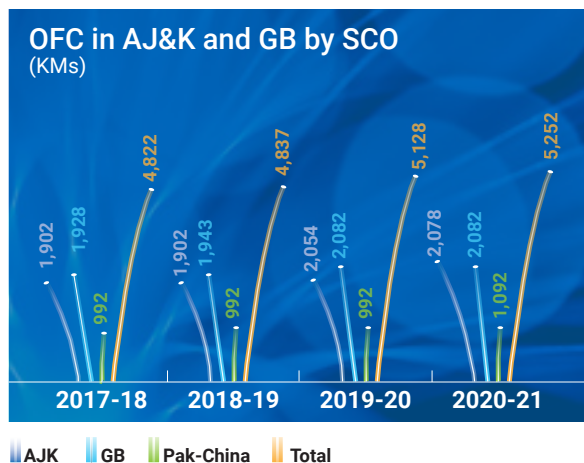
The provision of telecom services has always been a challenge in AJ&K and GB, given the naturally dangerous and tough terrains. Right from 1976 onwards, SCO has enjoyed the distinction of connecting the population of this hard-to-access region with the rest of the world by installing essential telecom infrastructure. However, since 2006, other companies have also jumped in with similar activities. Today, there are 1,687 cell sites across the region. Telenor, being the largest service provider, has 476 cell sites, followed by SCO (422) and Zong (368). Recently, SCO upgraded 199 BTS sites (including 81 2G sites) to 4G. The total cell sites registered a positive growth of 8.1% during FY 2021 as against over 3% in the preceding year.

Cell Sites in AJ&K and GB



Optical Fiber Cable in AJ&K and GB

SCO has connected AJ&K and GB with Optical Fiber Cable (OFC), not only with the rest of the country but also with China. The Pakistan-China OFC project has recently been completed under the China-Pakistan Economic Corridor (CPEC) program. Under this project, SCO has deployed approximately 1,092 kilometers of OFC from Rawalpindi to Khunjerab, and Karimabad to Khunjerab to establish the first-ever land-based connection with China. The total length of OFC laid across AJ&K and GB, inclusive of the Pak-China OFC, is 5,252 kilometers. SCO is consistently increasing its OFC, which grew by 2.4% during FY 2021.



Pakistan-China OFC Project

SCO initiated the Pak-China OFC project in 2018. This is the first-ever land-based telecommunication connection between China and Pakistan. The project has multi-dimensional avenues for future ICT developments in CPEC trade corridor in Pakistan. It has strategic security

dimensions in addition to meeting end-to-end connectivity requirements (Khunjerab-Rawalpindi-Karachi/Gwadar-international destinations).

Under Phase-I, SCO has deployed 992 kilometers of OFC from Rawalpindi to Khunjerab and has established the first-ever direct telecom connectivity with China. The link is operational and currently carrying traffic from China to Europe, courtesy the SCO-PTCL consortium, and from China to Pakistan for CMI- Zong connectivity. In the meanwhile, negotiations are underway with Chinese operators for higher volumes of traffic for different international destinations in the Middle East, Africa, and Europe.

Phase-II of the project encompasses the planned extension of OFC network from Rawalpindi to Karachi and Gwadar. The Prime Minister of Pakistan performed soft launch of the project in Gilgit on April 30, 2021. This phase will also see SCO deploying OFC from Rawalpindi to Gwadar and Karachi along CPEC routes, along with establishing a landing station at Gwadar. The project will cost US\$ 236.9 million (PKR 37.9 billion), of which 15% has been appropriated for local component and 85% for foreign exchange component (FEC).

Spread over a network length of 7,990 kilometers, the project will create a national ICT infrastructure, thereby reducing reliance on foreign infrastructure. It will additionally provide regional connectivity between China and neighboring Afghanistan and Iran, thereby making Pakistan the hub of regional connectivity. Moreover, the project forges broad strategic and socio-economic dimensions in addition to the synergy created by meeting the ICT requirements of Pakistan Railways and the National Highway Authority (NHA) through unified networks.

□ CPEC Initiative by Zong

The 'One Belt One Road' project (now known as the 'Belt and Road Initiative') under CPEC requires connectivity backbone as it intends to promote connectivity across Pakistan through a network of highways, railways, and pipelines in addition to energy, industrial, and other infrastructure development projects.

Zong 4G is playing the role of the primary connectivity provider in CPEC projects with its unrivalled network footprint and high-speed data products and services that have accelerated digital penetration in the country with 18 dedicated solutions deployed for CPEC alone in FY 2020-21.

Thar Coal is one of CPEC's key projects, which is located in the desert with no network coverage. Zong 4G took the initiative of network construction around Thar Coal project. With active cooperation from the project's side, Zong 4G's network personnel worked day and night and finally set up a 4G network. Moreover, as a digital enabler, Zong 4G is currently providing ICT services including GSM, MBB, FBB, and VPBX services to Karakorum Highway (KKH) Phase II, Karot Hydro Project, Suki Kinari Hydro Project, Dawood Wind Power, Port Qasim, HUBCO Coal Power Plant, Sahiwal Coal Power Plant, and Zonergy Solar Projects, to name a few.

Socio-Economic Uplift Through Digital Services

GoP—through SCO—has ensured that most parts of the region enjoy voice and data facilities. Digital facilities are now available to 700 educational institutions, 330 hospitals and healthcare facilities, 170 financial institutions and banks (for online banking and ATM services), 120 tourist locations, border crossing points in AJ&K, and the Sust dry port in GB. Mobile services are available at the K2 Base Camp (Concordia) and Fairy Meadows. Multinational companies are working on road and energy projects like Neelum–Jhelum Hydel project in AJ&K, and the KKH expansion project in GB, among other initiatives that have significantly contributed to socio-economic uplift of the people.

Special ICT Initiatives

SCO and Karakorum International University (KIU) have established GB's first Software Technology Park. This facility is operational at Konodas, Gilgit, since October 2020 and is playing a pivotal role in creating a conducive environment for research and innovation in the field of IT by honing and harnessing skillsets of the region's brilliant youth.

04

• **STRENGTHENING CYBER SECURITY IN DIGITAL SPACE**



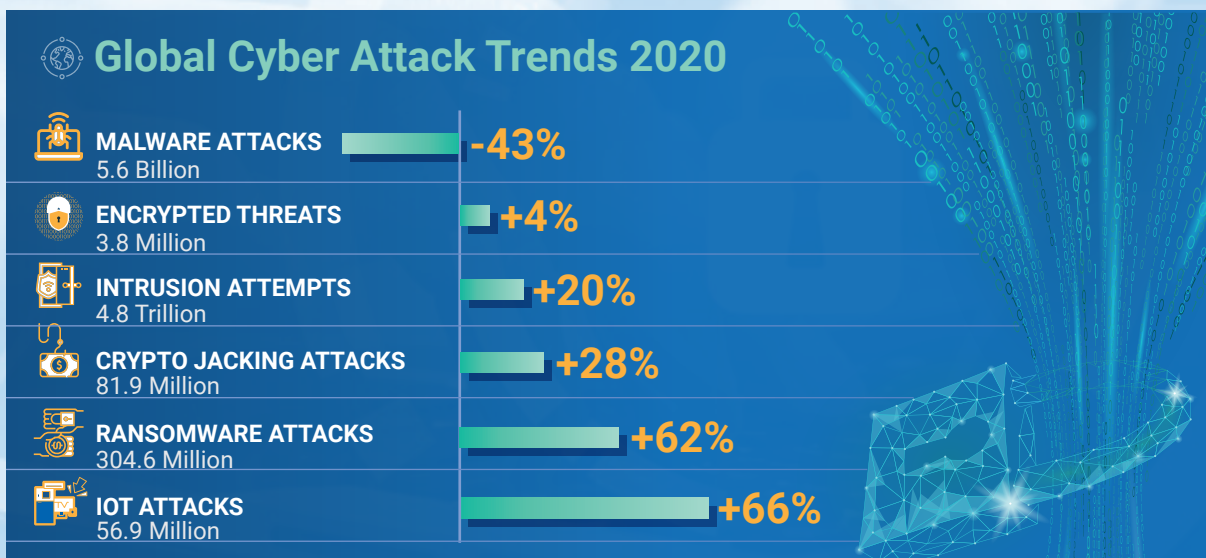


Strengthening Cyber Security in Digital Space

Grappling with COVID-19 has strengthened Pakistan's digital vision by forging the ICT imperative for every business and sector to survive and thrive. The new-normal is all about transformation—a paradigm shift towards remote working, online collaboration, and instant communication while building new processes, modifying standard practices, and supporting novel ways of operating. This change has brought in its wake, new security challenges as well as opportunities for hackers and cybercrimes.

In 2020, the digital shift raised the bar of cyber-threats exponentially, leaving most businesses vulnerable to hacking. Taking advantage of the situation, cyber criminals and cross-border espionage actors started preying upon all sectors and regions. Many state and local public sector agencies were ravaged by ransomware attacks. In some cases, entire local governments were forced to declare a state of emergency due to massive leaks of sensitive data and loss of services. The rise in attacks involving malicious use of ICTs is posing security and financial risks to the entire spectrum of users including individuals, businesses, sectors, and states. In tandem, it is a wakeup call for the 5th dimensional war; as nation states embrace the cyber espionage approach, threat groups too have teamed up to achieve their malicious designs.

To strengthen cyber security and to address cyberspace challenges, the government and its various stakeholders are prioritizing their security and compliance efforts for users, businesses, and the state. However, security and compliance need to be seen and implemented as an enabler rather than a disabler of innovation and growth. Most of the available security solutions are yet to provide a silver bullet for protection. Similarly, considerable cyber security investments cannot prevent cyberattacks, or for that matter, automatically provide a robust security firewall for applications and infrastructure. For now, and in the near future, security will require continuous efforts, and the experiences gained thereby will reshape security policies for years to come.



Source: Global Cyber Attack Trends, Cyber Threat Report 2021, Sonic Wall.

Legal Frameworks for Cyber Security in Pakistan

The federal and provincial bodies, as well as sectoral regulators, are already taking various initiatives for the online safety of Pakistani citizens and the security of digital systems. These initiatives fall within the purview of enactments such as the Electronic Transaction Ordinance, 2002 (covering only electronic financial transactions and records), Investigation for Fair Trial Act (IFTA), 2013, Pakistan Telecommunication (Re-Organization) Act, 1996, and PECA, 2016; these regulations cover some, but not all aspects of information and cyber security. More recently, the government has also issued the first National Cyber Security Policy 2021.

With regard to setups responsible for cyber security, only selective Cyber Security Incident Response Teams (CSIRTs) are operational at the organizational level in the public, private, and defense sectors. At the sector level, PTA has notified CERT for the telecom industry. However, this is only partially functional and will become fully operational after the formation of National CERT in the coming years.

Existing legislative and institutional frameworks, structures, processes, and functioning are constantly monitored, assessed, and improved by the government and its stakeholders in the context of future cyber security demands.

Ensuring Cyber Security

Telecommunication is oftentimes a gateway to multiple businesses. Of late, with the advancement and development of technology and changes in the threat landscape, cyber-attacks—particularly against the telecom industry—are on the rise. Telecom operators are now transforming themselves from network companies to cloud service companies aimed to a) improve efficiencies in business operations, b) achieve perpetual speed and processing, c) rollout new services and applications, and d) store and distribute online content.

Given that telecoms own a vast majority of complex and critical national infrastructure, the ramifications of a successful attack will not only be massive, but also have far-reaching ripple effects. Telecom companies with large customer bases are comparatively more susceptible to unlawful breaches by 'malicious actors.' Cyberattacks can either be targeted towards a specific telecom company, its third-party providers, or its subscribers. Such attacks could be foreign state-sponsored, financially motivated, or driven by hacktivism, terrorism, denial of service, third-



party risks, insider threats, and IoT for endless connectivity. Mobile devices, home routers, and unsecure mobile apps also comprise a huge area of vulnerability. Against this backdrop, the privacy and protection of fundamental rights in the online and mobile space is becoming critically important to consumers.

Propelled by the resolve to control the security situation, adhere to the rapidly evolving compliance landscape, and strike a balance between data protection and Pakistan's digital ambition, PTA is constantly working to improve the cyber security posture, strengthen cyber resilience, and identify, mitigate, and respond to potential cyber threats against subscribers. PTA oversees cyber security activities, both at the organizational as well as sector levels. Its core function areas in this domain include compliance and reporting on legal, statutory, regulatory, and contractual cyber security and national security requirements. PTA is also actively involved in efforts to:

- Govern, comply, educate, and manage cyber security risks;
- Monitor, hunt, detect, and advise on cyber threats;
- Investigate and respond to security data breaches, incidents, frauds, and offences against the confidentiality, integrity, availability, privacy, and protection of critical telecom data, information systems, and network;
- Provide industry coordination, cooperation, support, and capacity building on cyber security matters;
- Establish contact with relevant authorities, and national and international bodies for cooperation;
- Create awareness on cyber threats and internet governance;
- Manage and coordinate other projects (such as establishing IXPs in Pakistan, transition from IPv4 to IPv6, etc.); and
- Perform and execute functions, including those related to policy matters, as and when assigned by the federal government.

Complying with the National Cyber Security Policy 2021, and ensuring effective industry operational security compliance and information exchange, PTA has established an institutional structure i.e., Telecom Sector CERT, which functions as the central point of contact for industry coordination, reporting, and compliance on cyber threat intelligence and incident management. CERT also functions on behalf of the government and/or law enforcement agencies for industry coordination and information-sharing on security vulnerabilities and threat advisories.

Audit, Assurance, and Compliance of Critical Telecom Data and Infrastructure

PTA established the 'Critical Telecom Data and Infrastructure Security Regulations' (CTDISR), which were gazette notified in 2020. Based on international best practices, these regulations require that all licensees ensure security compliance of their critical telecom data and infrastructure with the specified requirements. The regulations are comprehensive and contain approximately 100 measures to be implemented in the following areas for critical telecom data and infrastructure protection:

- Cybersecurity Framework
- Physical and Environmental Security
- Monitoring
- Malware Protection
- Data Protection
- Critical Telecom Infrastructure
- Data Backup
- Cybersecurity Incident Management
- Service and Cybersecurity Continuity Management
- Cybersecurity Reviews
- Consumer Education and Awareness

During the year under review, PTA took the following initiatives to accelerate compliance of regulations and to promote cooperation:

- Conducted joint sessions with telecom operators on implementation of CTDIS Regulations, 2020, thereby promoting meaningful engagement with the sector

on the subject. While PTA ensures compliance of CTDSIR, the operators are anticipated to comply with the industry practice to ensure and strengthen cyber security.

- Directed all licensees to conduct initial audit, followed by regular interim internal audits, for compliance. All licensees are required to get third-party independent audits from security-cleared local cyber security firms. The objectives of this process are to earn the trust and security assurance of third-party firms, to streamline and harmonize independent auditing of the telecom industry, and to promote and build confidence in local firms.
- Pursued seamless coordination with local security vendors to provide cost-effective security solutions for medium to small sized telecom operators in a bid to meet their compliance requirements.
- Ordained to issue category-wise awards for best performers in the category of compliance and assurance with a view to incentivize and build confidence in the industry.

Preventing Illegal Sale of Telecom Subscribers' Data

PTA carries out periodic security investigations related to fraud and illegal sale of telecom subscribers' data. As a sequel to rigorous efforts, sources involved in the criminal activity of selling subscribers' data in the open market without their consent, were identified. A report on the subject was prepared in collaboration with telecom licensees, with their recommendations included therein; it was later submitted to the Ministry of Interior (MoI) for appropriate action.

Moreover, PTA identified fraudulent apps being used for illegal sale of telecom subscribers' data and resultantly blocked approximately 13 apps. Similarly, a significant number of social media and instant messaging platforms were also found involved in the criminal activity. More than 100 such illegal sales and advertising channels comprising Facebook pages and WhatsApp accounts were identified, reported, re-verified, and eventually blocked.

In view of the rising incidence of such illegal activities, PTA—in collaboration with telecom operators, the police force, and law enforcement agencies—is in the process of devising mechanisms for secure information sharing and prevention of leakage of subscribers' data. Towards this end, PTA has collaborated with the Islamabad Police to serve as a role model.

Measures for GSM and SS7 Security

Introduced and adopted in the mid-70s, Signaling System No. 7 (SS7), which is the nervous system of a telephone network, serves as the basis for a signaling infrastructure in local, national, international, and wireless networks. However, vulnerabilities in SS7-based networks have emerged in the wake of technological advancement, allowing an intruder with basic skills to inflict dangerous cyberattacks that may lead to leakage of a subscribers' confidential data or disruption of communication services.

Owing to the importance of SS7 security, PTA took the following steps to minimize risks:

- Conducted capacity building workshop on SS7 security for the industry;
- Framed recommendations on adoption of ITU and GSMA best practices as mitigating strategies; and
- Issued compliance notices to the industry to counter SS7 attacks by implementing security controls (i.e., SS7 firewall). Mobile operators are taking steps in this regard; while half of the CMOs have shown compliance, the remaining are expected to meet compliance by the fourth quarter of 2021.

National Telecom Computer Emergency Readiness and Response Team (nTCERT)



In its role as a regulator, PTA has been mandated to establish sector-level cyber security capabilities i.e., the National Telecom Security Operations Center and the National Telecom Computer Emergency Response Team Threat Intelligence Center (nTSOC/nTCERT) to safeguard critical telecom infrastructure and to contribute to combatting cyber security threats at the national level. In line with its legal, regulatory, and official mandate, PTA established sector-specific nTCERT in 2020 for coordination with the industry on cyber security and threat intelligence. To automate the CERT processes, a web portal was established in early 2021 for two-way coordination with the industry. The licensee can utilize this portal to share security information, threat intelligence information, and incident/data breach related information, etc. The following steps have been taken as part of nTCERT functioning so far:

PTA Internal nTCERT Advisories					
Year	Q1	Q2	Q3	Q4	Total
2018-19	9	11	9	10	39
2019-20	11	9	10	10	40
2020-21	11	14	12	11	48
Total	31	34	31	31	127

- As part of local advisory services of Telecom CERT, PTA's cyber security team issued approximately 127 security advisories and more than 100 security alerts to telecom operators on latest cyber threats and vulnerabilities.
- The portal's secure access was shared with all licensees. Many telecom operators are currently using the portal for threat intelligence information exchange, security readiness, and compliance.



Chairman PTA, Maj General Amir Azeem Bajwa (R), with Member Finance, Mr. Muhammad Naveed, and Member Enforcement and Compliance, Dr. Khawar Siddique Khokhar, launching the Computer Emergency Readiness Team (CERT) Portal on April 5, 2021.

National Telecom Security Operations and Threat Intelligence Center (nTSOC)

PTA is in the process of establishing the National Telecom Security Operations and Threat Intelligence Center (nTSOC). After its establishment, both nTSOC and nTCERT will jointly function to provide integrated security awareness and advanced threat intelligence, and to monitor the telecom cyber threat landscape 24/7 to effectively detect cyberattacks targeting the telecom sector. This will also facilitate real time coordination with the industry for proactive and timely countermeasures on important security alerts, remediation for incidents, and continual improvement of the overall cyber security posture.

Thus far, PTA has taken the following steps in this direction:

- ❑ Conducted consultations and fostered close coordination with local vendors on acquiring indigenous and homegrown nTSOC solution. The solution primarily includes sector-specific unified Security Information and Event Management (SIEM), Security Orchestration, Automation, and Response (SOAR), incident management, case management, and unified cyber threat intelligence.
- ❑ Conducted consultations with an international stakeholder (APNIC).
- ❑ Formulated a concept paper on nTSOC for stakeholders' consultation.

In addition, the finalization of the tendering process on establishing nTSOC as per PEPPA rules is also underway.

Public Awareness on Cyber Threats

PTA takes active interest in organizing public awareness campaigns on internet governance, cyber security, and related global and local developments. Its website is an authentic source of information for public awareness vis-à-vis secure internet and mobile usage. In 2020, PTA also published various awareness messages containing threat and safety tips related to remote working and video conferencing security, VPN security, social media security, and ongoing scams to help people safeguard themselves from cyber threats.

PTA is among the founding organizations of the Pakistan School on Internet Governance (pkSIG) since its inception in 2015; it is currently managing its Secretariat along with the Islamabad Chapter of the Internet Society of Pakistan. The 6th class of pkSIG was held in Quetta in August 2020, with a comprehensive four-day program that featured lectures and discussions on political, legal, economic, socio-cultural, technological, and other dimensions of internet governance, internet infrastructure, cyber security, cybercrime and legal aspects, digital economy, and social media related topics.

Public Awareness Messages from PTA



Internet Exchange Point

After successful deployment of IXPs at the premises of HEC in Islamabad and Karachi, PTA is in the process of establishing the third IXP at the datacenter of PITB, in consultation with stakeholders in Lahore. In this connection, the Asia Pacific Network Information Center (APNIC) has provided logistics and technical support, including capacity building of the local community. The following steps have been taken so far:

- IXP configuration is in its final stages, wherein APNIC as an international partner, Nexlinx as community lead,

and PITB as hosting site, are leading the process in consultation with PTA. All stakeholders are extending full support for establishment of the Lahore IXP.

- Seven operators have deployed fiber at the PITB Data Center where the traffic testing phase is underway, while some operators are in the process of terminating fiber.
- FlexOptix Germany has arranged SFP transceiver for the Lahore IXP.
- After completion of IXP deployment and configuration, interconnection of all licensees with IXPs will be ensured.



Way Forward

Cognizant of the strategic importance of cyber security, the government has issued the first National Cyber Security Policy 2021 in conformity with the national cyber vision. The policy document will serve as the foundation for construction of a holistic digital ecosystem with corresponding frameworks and components essential for the delivery of secure, reliable, and standardized digital services, digital payments, applications, and digital infrastructure. Enabling and promoting public-private partnerships and strengthening the local industry in Pakistan will also constitute a key focus area.

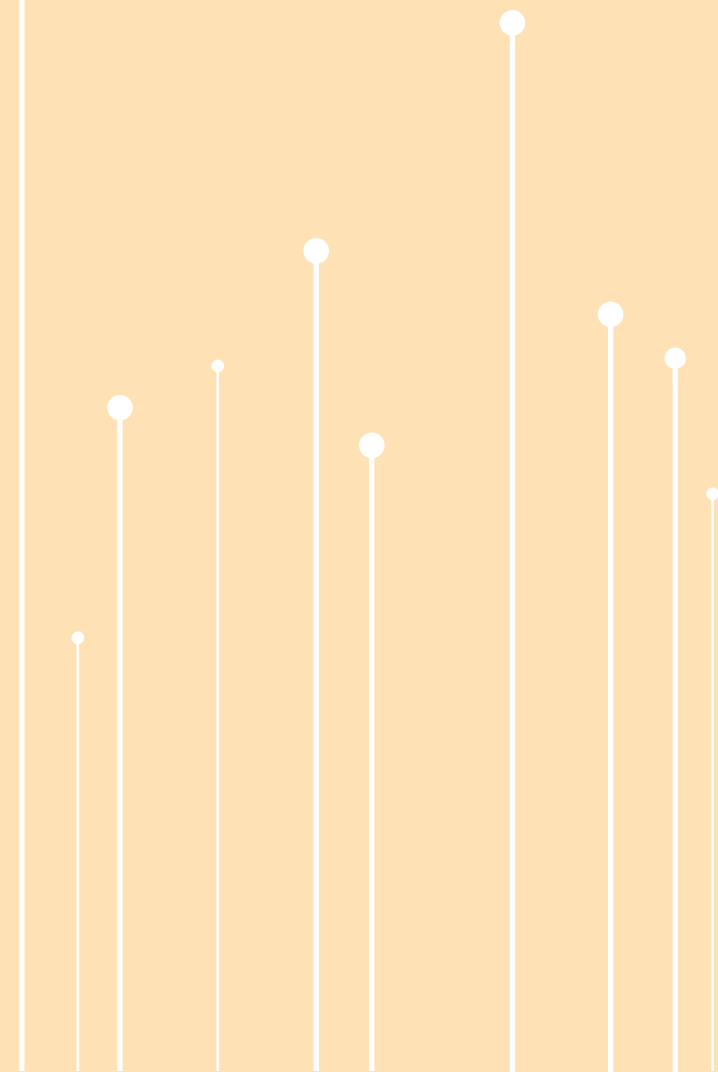
To mitigate cyber threats and to improve the national cyber security outlook, the GoP, MoITT, and key stakeholders including PTA, will identify and process legislative and regulatory actions under their respective mandates as assigned in the policy. The actions will primarily focus on:

- » Strengthening of national cyber security capabilities through the development of essential and well-coordinated security mechanisms;
- » Establishment of national and sector institutional setups and frameworks for well-coordinated cyber incident response;
- » Risk management and establishment of safeguards for protection and information sharing mechanisms across all tiers of cyber threat; incident management of national critical information and infrastructures;
- » Implementation of security standards and regulations under a policy and legislative framework;
- » Protection and privacy of citizens in the digital space;
- » Development of skilled cybersecurity workforce through capacity building and skills development;
- » Indigenization and development of homegrown cyber security solutions to minimize international supply chain dependency;
- » Assurance and compliance mechanisms for accountability and continual improvement; and
- » Frameworks for national-global cooperation and collaboration on cyber security.

Defending against national cyber threats and achieving national cyber security objectives requires exhaustive communication, cooperation, and a coordinated response across all tiers, in addition to effective enforcement of statutes, clear mandates, aligned policies and efforts, investments, and adequate resources for continual security improvement.

05

• **DIGITAL FINANCIAL INCLUSION**





Digital Financial Inclusion

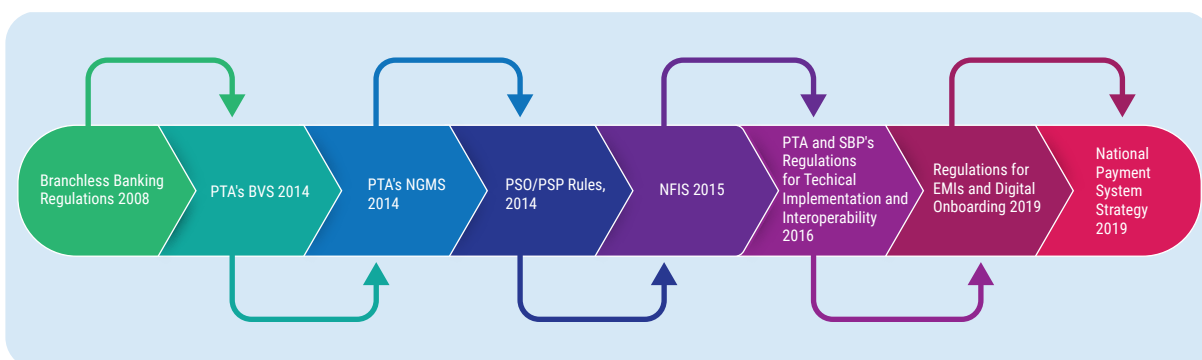
The creation of a regulatory framework for branchless/mobile banking in 2008, followed by revolutionary initiatives led by regulators and active participation of CMOs and Fintech companies alongside financial institutions, has enabled Pakistan to lay a fairly strong foundation for the provision of digital financial services. This landscape has connected the nodes for various economic activities, including e-commerce and other digital services. The country now needs to rise to the next level of financial inclusion by ensuring that the digital financial network is effectively used and pay-offs to the society are enhanced. This can happen if the right balance of incentives, encouragement, and trust is provided to users and service providers—the goal should be to attain a business environment where individuals prefer to use digital means instead of cash. Recent progress and status of digital financial services and e-commerce in Pakistan is discussed below.

Evolving Regulatory Framework

Under the patronage of GoP, the State Bank of Pakistan (SBP) has spearheaded the reform process for promotion of digital transactions in the country in collaboration with PTA. In 2008, SBP enabled Fintech companies and CMOs to contribute to the digital landscape by issuing Branchless Banking Regulations, 2008, thereby allowing CMOs to join hands with financial institutions. The initiative led to successful models like Easypaisa and Omni, which earned international recognition. For electronic transactions, SBP simultaneously established Pakistan's first Real Time Gross Settlement (RTGS) system and further expanded the touch points/Points of Sale (POS) in the country.

To further strengthen the digital ecosystem for payments and financial inclusion, the government initiated a target-oriented National Financial Inclusion Strategy, 2015. Under

this strategy, PTA and SBP teamed up to provide a regulatory framework for mobile banking interoperability in 2016, and delivered a platform to enable the banking industry to pursue remote onboarding and service provisioning to all mobile subscribers. SBP also brought the Payment Service Operator (PSO)/Payment System Provider (PSP) Rules, 2014, to enable Fintech companies to recommend innovative solutions for payment systems and e-commerce. PTA and SBP also worked with relevant stakeholders including banks, operators, and Pakistan Mobile Number Portability Database (PMD) to provide CNIC-mobile pairing verification to facilitate remote digital onboarding of customers by banks. More than 10 banks have already integrated their systems for this service. PTA and SBP are working with banks and operators for integration of all banks so that they can avail CNIC-mobile pairing verification and initiate digital on-boarding of customers.



□ Digital Payment Strategy

ICT infrastructures are critical enablers for payment systems and provision of payment services in general; they are also important for access to and usage of transaction accounts. In November 2019, SBP launched a National Payment Systems Strategy to make access to financial services easier for people and to help improve financial inclusion in the country. This strategy offers a roadmap and action plan for Pakistan to have a modern and robust digital payment network. Migration to efficient electronic payments stimulates consumption and trade, thereby benefiting the entire economy. By migrating to electronic means, the strategy intends to boost Pakistan's Gross Domestic Product (GDP) by 7%, creating 4 million jobs, resulting in \$263 billion in new deposits, and representing a potential market of \$36 billion by 2025.²

Initiatives to Control Financial Frauds

The digitization of payments and banking services has led to an increase in frauds involving the use of digital channels. Fraud trends include:

- Social engineering frauds, wherein confidential information, card details, passwords, and OTP, etc., of banking customers are obtained by unknown callers impersonating as someone from their banks, SBP, the armed forces, etc.
- Call spoofing, wherein fraudsters spoof the official helplines of banks to obtain confidential data of customers.
- Unauthorized registration of the mobile apps of financial institutions.
- SIM swapping.

PTA has established close liaison with SBP and Law Enforcement Agencies (LEAs) to assist in the control of financial frauds. Recently, the two organizations constituted a joint committee of their respective officers to:

- Review social engineering frauds in banking services using telecom/mobile service channels including emerging fraudulent vectors such as SIM swapping, and suggest high-level security governance and possible controls;
- Assess and recommend data security controls for protection of customers' data including financial data;
- Develop a mechanism for regular coordination between SBP, financial institutions, telecom companies, PTA, and LEAs for dealing with digital banking frauds; and
- Collaborate with the telecom and banking industries to develop educational and awareness campaigns to protect users from digital frauds.



During the year under review, PTA carried out campaigns to raise awareness among telecom users regarding financial frauds and complaint registrations. Additionally, as evident in the accompanying pictorial depiction, PTA and SBP have integrated their respective complaint management systems for speedy redress of complaints related to financial frauds by concerned authorities.

Report Financial Fraud

People are being deprived of their money through fake text messages and phone calls from unknown numbers/ unauthorized number. Sometimes account information and personal data is also asked from consumer through email, social media and other online methods. **Please do not share your personal information like account details, password, account pin code, pin code received on your phone, and transfer any cash or phone credit in response to such calls and SMSs**, failing which the consumer will be responsible for any loss resulting from such frauds as it does not fall under the regulatory ambit of PTA except blocking of number.

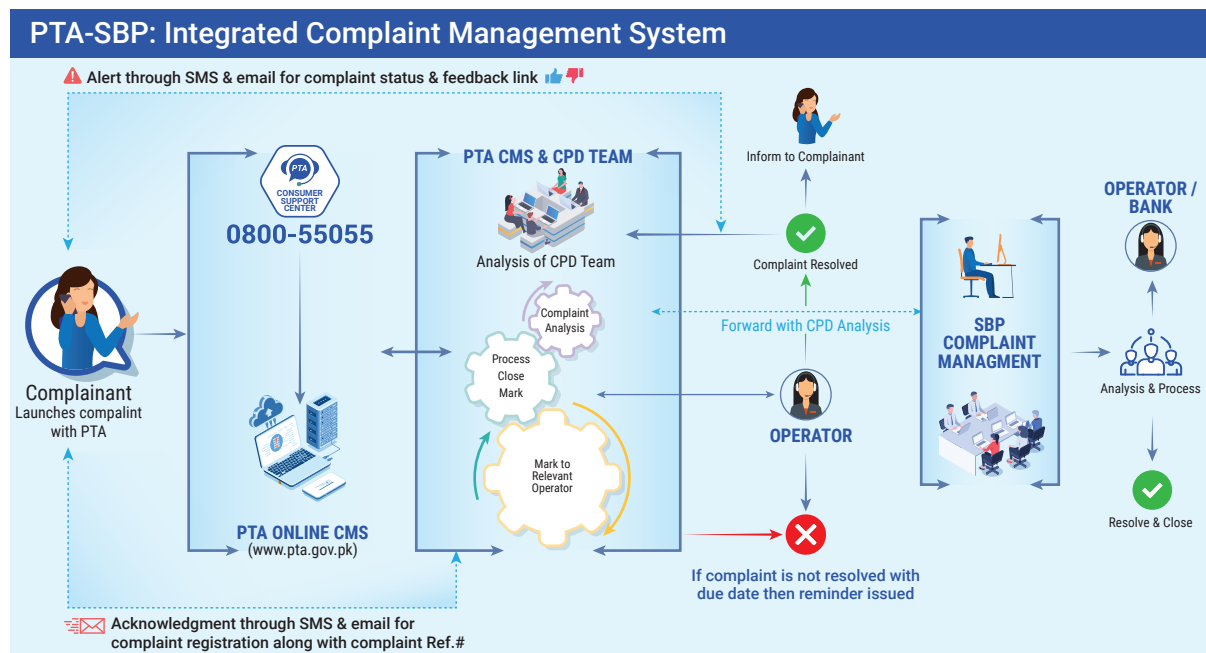
- Register your complaint at the helpline of your telecom operator for blocking of fraudulent number.
- Register complaint at PTA website (through online complaint form) or at toll free number 0800-55055 for blocking of fraudster number.
- Report all type of frauds at National Response Centre for Cyber Crime (NR3C)-FIA helpline: 9911, 051-9106384 or visit www.nr3c.gov.pk
- Report financial/ mobile banking frauds at State Bank of Pakistan's email: cpd_helpdesk@sbp.org.pk
- Report Benazir Income Support Program (BISP) fake messages at BISP helpline: 080026477.
- If fraudster uses name of Pakistan Army, report to ISPR Helpline: 1125 & 1135.

For more details regarding 'Consumer Support', please visit www.pta.gov.pk

**Pakistan
Telecommunication
Authority**

www.pta.gov.pk

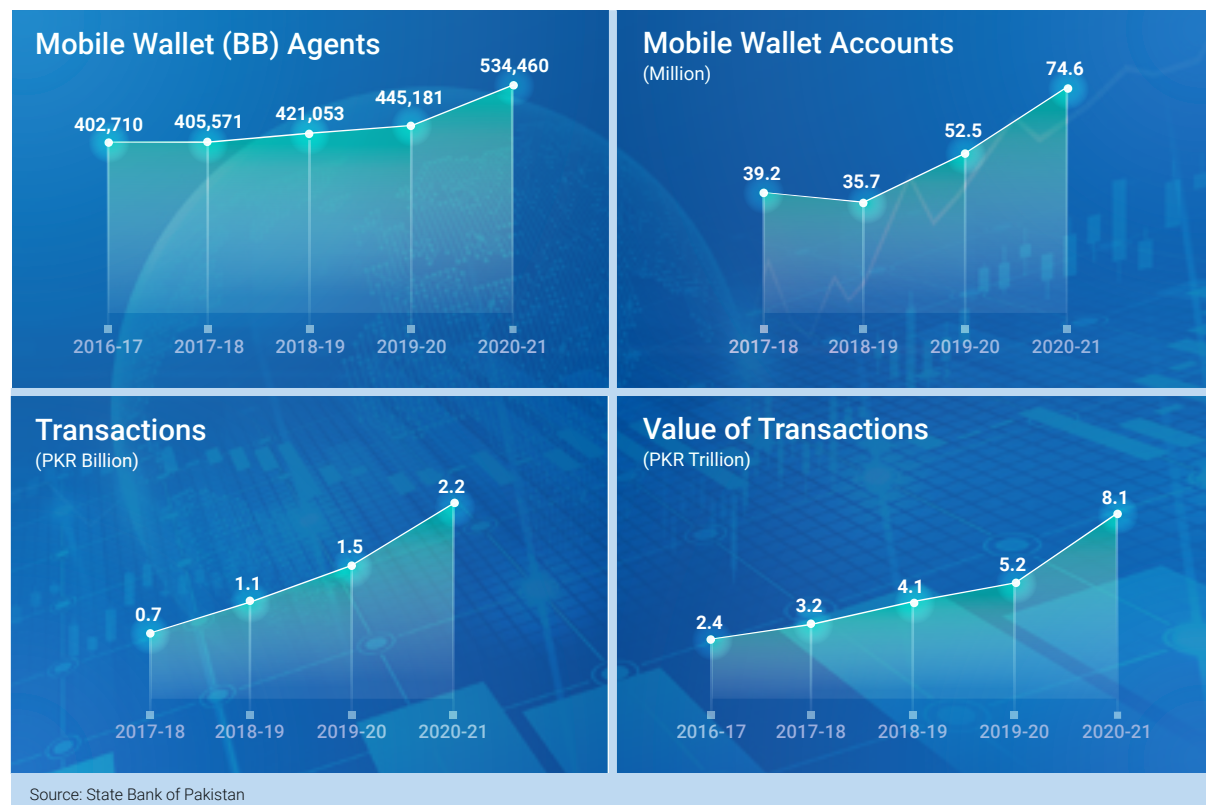
² <https://www.sbp.org.pk/ps/PDF/NPSS.pdf>

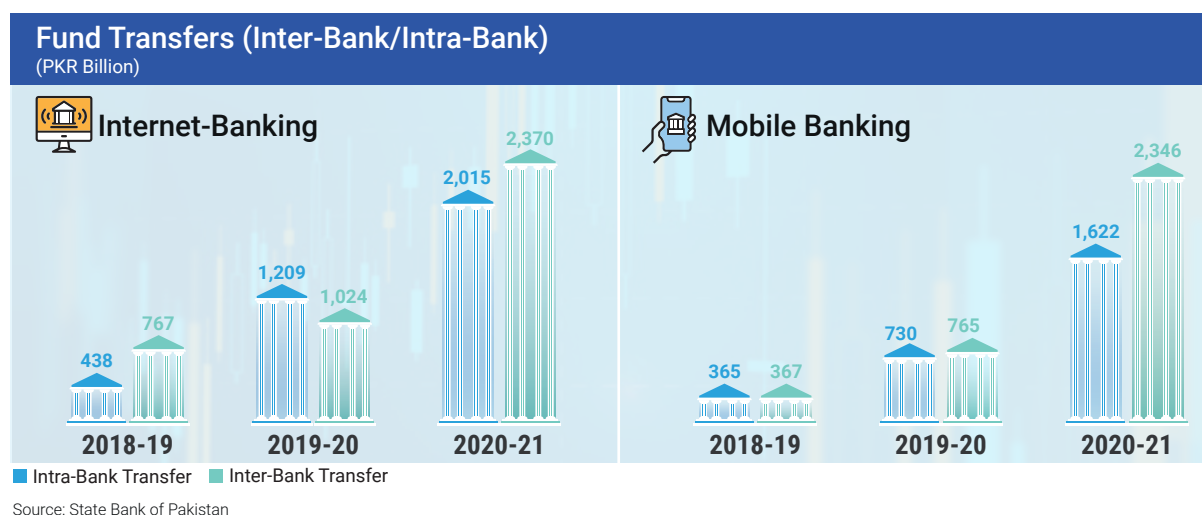


Status of Digital Financial Services in Pakistan

Over the years, branchless/mobile banking has shown tremendous growth based on the telco-banks-Fintech nexus, contributing significantly to financial inclusion. The m-banking network has expanded to over 534,460 m-banking agents and 74.6 million m-wallet accounts.

This network has enabled more than 2.2 billion annual transactions worth over PKR 8 trillion in 2021. Despite these developments, cash still dominates economic activities and there is scant use of electronic payments, especially by micro and small retailers. Cash is the predominant payment method in Pakistan as it is considered 'safe' by almost all retailers and suppliers. Most wages and salaries are paid through cash. Cheques are widely used to make





commercial and government payments. According to SBP, women branchless banking accounts stand at 18.8 million as against 55.7 million accounts held by men; there are a total of 74.6 million branchless banking accounts in Pakistan.

The importance and usage of electronic banking and alternative delivery channels increased during the post-COVID-19 period. Realizing this, SBP further incentivized the use of digital financial channels by instructing banks to waive all interbank and intra-bank charges on digital transactions. This resulted in a substantial annual increase of 206% in inter-bank transfers and 122% in intra-bank transfers through internet banking. For mobile banking, the impact was even higher, with a three-fold increase in mobile banking inter-bank transfers from Rs. 765 billion in FY 2020 to Rs. 2,346 billion in FY 2021. On the aggregate, internet and mobile banking transactions are on the rise, as more and more consumers are using smartphone apps to transfer funds, pay utility bills, or carry out other payments, such as those involving retail purchases/e-commerce.

DFS Ecosystem

With 188 million biometrically verified SIMs and 107 million mobile broadband subscribers, the telecom infrastructure provides an authenticated base for digital/remote on-boarding and provision of digital services. The accompanying graphs depict the high-level structure and components of the DFS ecosystem.

E-commerce Trend

The e-commerce market in Pakistan has shown impressive growth over the past few years due to increased digitization in nearly every public and private sector of the country. According to SBP, the e-commerce market in 2020 is estimated to have expanded to PKR 235 billion, up by 55.5% from the previous year. The number of e-commerce merchants registered with banks also increased by 45.76% in 2020. According to the Ministry of Commerce, Pakistan's e-commerce market size posted a growth of over 35% in the first quarter of FY 2021. E-commerce Index by Daraz—a



Source: Pakistan Telecommunication Authority/ State Bank of Pakistan



local e-commerce company—shows that Punjab has the highest contribution to e-commerce order shares at 55%, followed by Sindh at 36%. Balochistan, KPK, and AJ&K and GB cumulatively contribute the remaining 9%.

There are various estimates for e-commerce market in Pakistan. Global business data platform, Statista, has projected Pakistan's e-commerce market to reach US\$ 5,883 million in 2021, and expects e-commerce revenues to show a Compound Annual Growth Rate (CAGR) 2021-2025 of 7.49% in dollar terms, resulting in a projected market volume of US\$ 7,856 million by 2025; the number of e-commerce users is expected to reach 65.1 million by 2025.

In Pakistan, most of the key e-commerce players are either online marketplaces for goods such as Shophive and Daraz (for consumer electronics and apparel, etc.), and FoodPanda (for food delivery), or online marketplaces for services via immediate delivery such as the ride-hailing platforms, Careem, Uber and Bykea. Then there are online information and financial intermediaries—or infomediaries, as they are often called—like PakWheels (for automobile sale and purchase), OLX (Free classifieds for sales), Rozee (for job/head hunting and recruitment), and Zameen (for real estate business). These few channels serve to fill information gaps and mostly earn profits through advertisements, contract making, and commission fees, etc.

As per SBP, the overall usage of e-banking channels, as measured by transactions via Real Time Online Banking (RTOB), ATMs, POS, Internet and mobile phone banking, call

center banking, and e-commerce, is on the rise. E-commerce in Pakistan is consistently increasing; however, a sizable portion of the transactions (an estimated 60% in value) are via Cash-on-Delivery (COD). Encouragingly, m-wallets are also being used for payment of e-commerce sales as well as loan disbursements.



Source: State Bank of Pakistan

E-commerce Initiative

The government has worked on necessary legislation to increase the pace of e-commerce and to attract international e-commerce players in the national market. In this regard, the E-commerce Policy 2019 aims to create an enabling environment for holistic growth of e-commerce across

all sectors of the country while protecting the interests of consumers and sellers alike, and focusing on the development and promotion of Small and Medium-sized Enterprises (SMEs), thereby making Pakistan a significant player in the regional and global digital economy.

The objective of the policy is to provide a conducive environment for the growth of e-commerce by promptly addressing key challenges faced in areas such as the e-commerce regulatory and facilitation environment; digitization through payment infrastructure development; SMEs and youth empowerment through e-commerce; consumer protection in the digital environment; taxation on e-commerce activities; ICT sector and telecom services; logistics for e-commerce platforms; data protection and investment; and global connectivity and multilateral negotiations.

Under the policy, the government has taken several initiatives to promote e-commerce. These measures include public-private partnerships to create awareness and foster innovation; Cross Border B2C E-commerce Regulatory Framework 2020; export to end-customers (e.g., sell on Amazon); Web-based One Customs (WeBOC) e-commerce module; automated clearance facility to registered E-commerce traders; registration portal of the Securities and Exchange Commission of Pakistan (SECP); separate classification

of E-commerce companies, and reduction of e-commerce company registration time to four hours.

According to the e-commerce policy framework of Pakistan, MoITT is in the process of formulating Pakistan's first-ever cloud policy, while the draft Data Protection Act is currently at an advanced stage of consultations. The draft addresses issues concerning data protection in e-commerce.

By virtue of GoP's enabling policies, international e-commerce players have started penetrating in Pakistan. Amazon—the global e-commerce giant—has entered Pakistan, enabling local sellers to sell their products across the globe through this platform, rather than third parties. Amazon has also registered a local office in Pakistan for provision of Amazon web services. Earlier in 2018, Alibaba entered Pakistan's e-commerce platform 'Daraz.pk' and acquired 45% shares of Telenor Micro Finance Bank. These developments will specifically benefit small and medium sized enterprises in expanding their businesses and outreach to the international markets.

Despite various regulatory reforms and market efforts, approximately 60% of e-commerce transactions in Pakistan are carried out through COD and the remaining 40% through digital channels—credit/debit cards, Interbank Funds Transfer (IBFT), prepaid cards, and mobile wallets.



Way Forward

To reap optimum benefit, the DFS and e-commerce ecosystem need to evolve to a state where consumers and businesses feel comfortable to leave their funds in digital form rather than cash, and prefer to make transaction payments through electronic means rather than cash or COD. Matching the global norms, bulk payments including G2P and B2P should be done through mobile wallet accounts/digital accounts. Payments through such accounts must be acceptable and as convenient as cash transactions at the merchants' outlets. Moreover, payments across different channels should be ubiquitous and interoperable for consumers so that anyone is able to transfer funds/payments to any intended recipient through any legal channel. Delivery of additional services such as savings, insurance, investment, and loaning should be available through digital wallets. The road to success lies in development of consumers' trust in digital technologies through provision of essential incentives and enabling platforms.



06



INTERNATIONAL AND LOCAL ENGAGEMENTS



INTERNATIONAL AND LOCAL ENGAGEMENTS

Regular interactions with international telecom and research organizations, including standardization bodies, paves the way for adoption of cutting-edge technology and promotion of knowledge exchange. In keeping with this principle, PTA and other telecom sector stakeholders in Pakistan maintain international visibility in the global telecom arena by proactively participating in all important events to accelerate digital transformation compliant with global standards. Conversely, Pakistan's strong presence at international forums is also important to highlight achievements of the local telecom sector, and to draw attention of foreign investors and service providers. Successful events lead to collaborative initiatives and partnerships that assist acceleration of digital initiatives. Moreover, participation in international conferences, training sessions, workshops, and working group meetings exposes employees to new experiences and ideas, thereby building capacities in their respective areas of expertise.

Canvassing for 'Digital Pakistan'

Although the COVID-19 pandemic has shifted the focus from in-person events to virtual spaces, PTA has seized every international opportunity in the new-normal environment since 2020 for canvassing Pakistan's image and presence as a digital nation and building the capacity of its workforce. Key activities and engagements with foreign entities in the telecom/ICT arena during the year under review are summarized below.

□ GSMA Ministerial Programme and Mobile World Congress

The GSMA Mobile World Congress (MWC) was convened in Barcelona, Spain, from June 28 to July 1, 2021. It was one of the first major in-person technology conferences since COVID-19 pandemic that took place in Europe, attracting policymakers, investors, operators, and research and telecom organizations from around the world to exchange views on digital inclusion, network resilience,

and maximization of the potential of telecom—especially 5G—against the pandemic backdrop.

Representing Pakistan at MWC 2021, Chairman PTA, Maj Gen Amir Azeem Bajwa (R), highlighted the achievements of the country's telecom sector and recent collaborative initiatives taken by the government and PTA for realization of the 'Digital Pakistan' vision and advancement of the ICT sector. His keynote address at the 'Realizing Digital Pakistan Milestone Roundtable' focused on the digital



Chairman PTA, Maj Gen Amir Azeem Bajwa (R), along with executives of GSMA, Etisalat, and USF, at the GSMA Mobile World Congress held in Barcelona during June-July 2021.



Chairman PTA, Maj Gen Amir Azeem Bajwa (R), Executive Director A4AI, Ms. Sonia Jorge, and CEO of USF, Mr. Haaris Mehmood Chaudhry, after an interaction held on the sidelines of the 'Realizing Digital Pakistan Milestone Roundtable.'

landscape of Pakistan, steps taken to address industry challenges, and the market potential for further investment by operators. On the sidelines of the roundtable, he also met the Director of the Development Bureau of ITU; the Minister of Communications and Information Technology, Government of Afghanistan; the President of Huawei, Middle East; and the Executive Director of A4AI to discuss areas of mutual assistance and collaboration.

□ ITU Global Symposium for Regulators 2020, 2021

Since 2000, ITU has annually been holding its flagship regulatory event titled 'ITU Global Symposium for Regulators' (GSR). This platform affords an opportunity for heads of various national telecom and ICT regulatory authorities worldwide to share their views and experiences on pressing regulatory issues.

The Chairman PTA was invited for multiple virtual engagements during GSR-20 and GSR-21. Moderating GSR-20 on 'Competition in the Digital Era: a Collaborative and Cooperative Approach,' he shed light on the development of telecommunication, with a focus on the inter-technology competition that has laid the foundation of modern digital infrastructure. The session was attended by leading regulators and representatives of private organizations from France, Mexico, the United States, the Kingdom of Saudi Arabia, Italy, and the Netherlands.

At the Heads of Regulators Executive Roundtable of GSR-21 held online on June 21, 2021, the Chairman PTA spoke on the importance of 'Collaborative Regulation for Digital Transformation.' He shared examples of PTA's cross-sectoral regulatory collaborations with SBP, FBR, the National Command and Operation Centre (NCOC), and other organizations for digital transformation and COVID-19 relief efforts. He also participated as a panelist at the closed Executive Roundtable with heads of National Regulatory Authorities (NRAs) of the Asia Pacific region. This roundtable was held as part of a series of events leading to GSR-21. In his opening statement, the Chairman PTA briefed the audience about the significance of co-deployment, infrastructure sharing, and emerging technology and policy-cum-regulatory initiatives and their development status in Pakistan.

□ World Summit on Information Society Ministerial Roundtable

On May 19, 2021, the Chairman PTA participated as a panelist in ITU's World Summit on Information Society (WSIS) 2021 virtual Ministerial Roundtable, where he shared Pakistan's experience of addressing connectivity challenges on the one hand, and its achievements in

implementing cross-sectoral strategies during COVID-19, on the other. He recommended the adoption of whole-of-government approach during disaster situations while elucidating PTA's role in mitigating risks associated with the ongoing pandemic.

□ SAMENA Leaders' Summit 2021

The SAMENA Telecommunications Council Leaders' Summit is an annual congregation comprising public and private sector leaders from South Asia, the Middle East, North Africa, Asia, Europe, and beyond. Delivering the keynote speech online at the opening ceremony on April 8, 2021, the Chairman PTA spoke on 'Championing Digital Economic Growth: from Policy to Reality.' He apprised the audience of PTA's reconciliatory approach towards industry regulation and the impact of its progressive interventions on the sector's growth.

□ 21st SATRC Meeting

The Chairman PTA delivered a high-level statement on 'Sub-regional Digital Cooperation' online at the 21st meeting of the South Asian Telecommunication Regulators' Council (SATRC-21) held virtually on October 27-28, 2020. Dr. Khawar Siddique Khokhar, Member—Compliance and Enforcement at PTA—also shared his thoughts on 'Connected Digital Future' at the Heads of Regulators Roundtable' while Amer Shahzad, Director General Licensing, attended the regulator-industry dialogue on '5G Deployment in South Asia.' The SATRC meeting is held annually to coordinate regulatory and other telecom/ICT related issues common to regulators of SATRC members.

□ GSMA APAC Thrive 2020

Under the GSMA APAC Thrive 2020, a roundtable on 'Accelerating Digital Pakistan' was held on October 28, 2020, where the Chairman PTA delivered the keynote speech on 'Accelerating Pakistan's Digital Future.' The event was also attended by Dr. Khawar Siddique Khokhar, Member—Compliance and Enforcement at PTA.



Member Compliance and Enforcement PTA, Dr. Khawar Siddique Khokhar, alongwith Federal Minister of IT&T, Syed Amin ul Haque, and Secretary Ministry of IT&T, Shoaib Ahmed Siddiqui, at the round table on 'Accelerating Digital Pakistan,' organised by GSMA on October 21, 2020.

SAMENA Telecom Council Policy Roundtable

On November 19, 2020, the Chairman PTA addressed the opening ceremony of SAMENA policy roundtable on 'Building Fiber Optic Connectivity Corridors for Digital Economy.' He articulated Pakistan's digital aspirations vis-à-vis fiber deployment to meet national sustainability goals.

Google's 'Cloud Seekho'

The Chairman PTA was the chief guest at Google's virtual graduation event 'Cloud Seekho,' held on August 27, 2020. 'Cloud Seekho' is an initiative regarding self-study online lab i.e., the 'QwikLabs' platform, through which student developers in Pakistan can learn cloud skills and technologies on Google Cloud platform. Addressing the participants, the Chairman appreciated the Google team for taking interest in the digital revolution, which will transform the way we live, work, and socialize. He also assured that PTA would continue to strengthen the foundation of digital transformation.

Collaborations and Partnerships

PTA-GSMA Action Plan for Digital Transformation in Pakistan

At MWC 2021 held in Barcelona on June 29, 2021, PTA and GSM Association (GSMA) signed a cooperation agreement for collaboration in the areas of knowledge exchange, regulatory modernization, joint projects for digital inclusion, harmonization of data sharing, digital skills program, and research on the ICT sector in Pakistan. GSMA will also project Pakistan's achievements and promote the 'Digital Pakistan' vision at various regional and global forums. Under the agreement, PTA and GSMA have developed an action plan to accelerate digital transformation and ICT adoption in Pakistan. The plan will be implemented over the next two years.

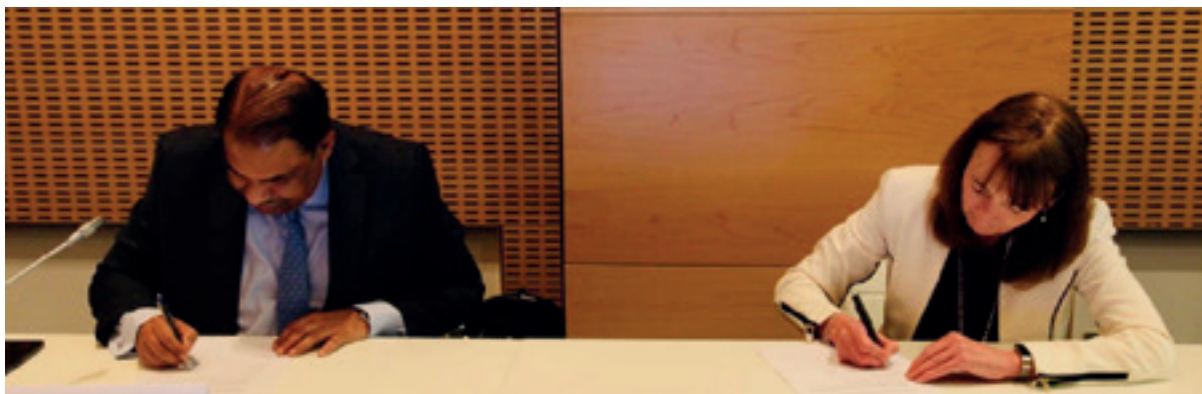
ITU Assistance for PTA's Transition to 5G Regulator

The ITU has agreed to provide technical assistance to PTA in its endeavors to achieve the highest level of regulatory maturity as defined by its Global ICT Regulatory Tracker. Currently, PTA is a 4th Generation telecom/ICT regulator. The understanding was reached during a meeting between the Chairman PTA and Director of ITU's Development Bureau, Doreen Bogdan-Martin. The Chairman briefed the ITU Director about the digital profile of Pakistan including market potential, spectrum roadmap, recent achievements, and efforts to bridge the digital divide.

The ITU Director appreciated PTA's efforts and assured that ITU would fully cooperate towards efforts aimed at modernization of PTA's regulatory outlook through dedicated actions and assistance measures. PTA has already constituted a senior committee to work with ITU in this important area of regulatory advancement. The first meeting in this regard was held between PTA and ITU on September 7, 2021 where PTA's approach and concrete steps to achieve the G5 level were discussed. It was decided that follow-up meetings would be arranged to align PTA's responses with ITU requirements for the regulatory tracker surveys.

Working with A4AI

PTA and A4AI have joined hands to bridge the digital divide and gender gap in the use of ICTs. This was agreed during a meeting between the Chairman PTA and Executive Director of the Alliance, Sonia Jorge, at MWC 2021. Under this partnership, A4AI will develop a policy brief on Pakistan featuring connectivity assessment, identification of gaps, and the way forward. The action items also include workshops on rural broadband policy framework developed by A4AI, and gender mainstreaming in Pakistan.



Chairman PTA, Maj Gen Amir Azeem Bajwa (R), and Head of Public Policy GSMA-Asia Pacific, Ms Jeanette Whyte, signing a cooperation agreement for mutual collaboration.

Bilateral Assistance to Regional Regulators

The Telecommunication Regulatory Authority of Oman (TRA-Oman) requested PTA's assistance to understand the design principles, implementation, and impact of DIRBS to be able to deal with issues pertaining to counterfeit and illegal devices by undertaking similar initiatives in Oman. In an online meeting between senior officers of PTA and TRA-Oman on January 6, 2021, Director (Type Approval) briefed the TRA-Oman officials about the background, objectives, development, implementation, and impact of DIRBS. This was followed by a briefing on policy and regulatory frameworks and short demonstration of major system functionalities. TRA-Oman thanked the Chairman PTA for enabling improved understanding of DIRBS.

The Telecommunication Regulatory Commission (TRC) of Sri Lanka requested PTA for technical assistance on Mobile Number Portability (MNP). During virtual meetings held between PTA and TRC on December 1, 2020, and April 1, 2021, PTA's technical consultant screened a presentation on the concept, design principles, and implementation procedures of MNP. The Director General of TRC thanked the Chairman PTA for the support and the insightful presentation by the PTA team.

Virtual IT Delegation's Meeting with Australian Business Community

The Pakistan High Commission in Australia organized Virtual IT Delegation Meetings (VITDMs) as part of tech diplomacy to project the ICT achievements of Pakistan at the international level. Senior PTA officers participated in VITDMs held on emerging ICT development topics in Pakistan such as cyber security (March 10, 2021), digital financial services (July 14, 2021) and cloud services (August 24, 2021). During these meetings, investment opportunities and associated solutions were shared with the business community in Australia.

PTA-Ericsson Technology Update Sessions

PTA and Ericsson agreed to conduct a series of technology update workshops with a focus on expert insights into latest developments taking place in the telecom/ICT sector. The first session in this context was conducted virtually on 'Low Earth Orbit (LEO) Satellite Solutions—Case of SpaceX's Starlink Project' on June 24, 2021. Sven Hellsten, Business Development Director for Fixed Wireless Access and Satellite Communications at Ericsson, conducted the session on this innovative connectivity solution. Senior MoITT and PTA officers attended the event.

Capacity Building

During the year under review, PTA officers participated in 68 online training sessions, webinars, meetings, and events. Details of some capacity building activities organized by PTA, in partnership with other international bodies, are summarized below.

Training on Mobile Sector Taxation

PTA partnered with GSMA to organize a virtual training program on 'Mobile Sector Taxation' on May 25, 2021. The course was accredited by the United Kingdom Telecommunications Academy, an internationally recognized Center of Excellence in the provision of academic, technical, and vocational education in telecommunications. Organized under the 'GSMA Capacity Building Centre of Excellence Programme', the half-day activity was designed for government and regulatory professionals from South and Central Asian region via GSMA's free virtual training platform.

Training on 'Bridging the Mobile Gender Gap'

PTA, in collaboration with GSMA, organized an online capacity building training course on 'Bridging the Mobile Gender Gap' from August 27, 2020, to October 22, 2020. The course was attended by representatives from MoITT, Cabinet Division, PTA, Pakistan Electronic Media Regulatory Authority (PEMRA), Universal Service Fund (USF), and Ignite. The course focused on expanding mobile coverage in rural areas, and the role of the government and industry in bridging the mobile broadband gender gap.

Webinar on Digital Financial Services

PTA, in collaboration with the Commercial Law Development Program (CLDP) of the United States' Department of Commerce, jointly organized a webinar on 'Digital Financial Services' on October 22, 2020. The interactive webinar focused on the state of digital financial services and legal frameworks in Pakistan, along with international best practices and lessons from the US Trade Office and business sector. Dr. Khawar Siddique Khokhar, Member—Compliance and Enforcement at PTA—attended the seminar alongside PTA officers. Speaking on the occasion, Dr. Khokhar underlined the need for digital financial services in the modern world and transition to a digital economy. Referring to PTA's commitment to digital transformation of Pakistan, he said, this commitment cannot truly be realized in the absence of a prospering digital economy based on robust digital financial solutions.



07 

GENDER MAINSTREAMING IN ICTs



GENDER MAINSTREAMING IN ICTs

SUSTAINABLE DEVELOPMENT GOALS



The digital gender divide is a major impediment to the development and growth of digital societies worldwide. There are an estimated 2.9 billion (Dec 2021) unconnected people across the world, their predominant majority comprising women and girls. To close the digital divide and to reduce the gender gap, women need to be empowered through digital technologies. Access to the Internet and improved digital skills can pave the way for women to start new businesses, sell products to new markets, find market-competitive jobs, and access education, health, and financial services while actively participating in public life and improving information exchange. In contrast to the developed world, which represents insignificant gender gaps in the use of ICTs, the developing countries are not showing any significant decline in the gap.

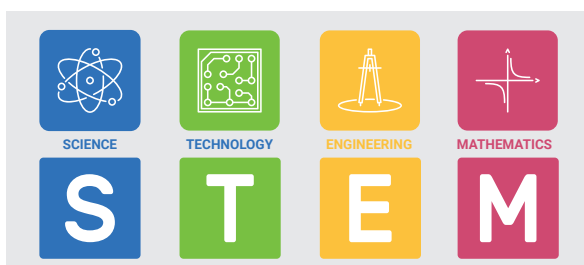
Out of the 17 Sustainable Development Goals (SDGs), gender inclusion has been addressed mainly in SDG 5 and 9. According to SDG 5 (achieve gender equality and empower all women and girls), gender equality is a necessary right to achieve a peaceful, prosperous, and sustainable world. More specifically, SDG 5.b (enhance the use of enabling technology, in particular ICT, to promote the empowerment of women), and SDG 9 (build resilient infrastructure, promote sustainable industrialization and foster innovation) promote subject areas that stimulate other goals. Under the SDGs, UN member states must ensure and promote digital inclusiveness and technology use, which is a cross-cutting theme of almost all SDGs.

International Telecommunication Union and Gender Mainstreaming Initiatives

The ITU classifies the global gender divide into four categories namely, gap in access and use of the Internet, gap in digital skills and use of digital tools, gap in participation in Science, Technology, Engineering, and Math (STEM), and gap in tech sector leadership and entrepreneurship.

ITU has taken numerous initiatives to close this gap, the foremost being collection, sharing, and disseminating of

national, regional, and global age-disaggregated data on gender to help measure, evaluate, and shape policies that can resolve gender issues. Similarly, the joint ITU-UNESCO Broadband Commission for Sustainable Development has formulated a dedicated goal to achieve gender equality across all its targets including Internet access and use, digital skills, digital financial services, and Micro-, Small- and Medium-sized Enterprises (MSMEs) by 2025.



Under its STEM programs, ITU supports women to pursue careers in STEM fields. It is also working to raise awareness and promote participation of girls and young women in ICTs and other STEM-related careers, among other digital skills, to fulfil the demand for future jobs on an equal basis. The ITU-led International Girls in ICT Day is a flagship global effort to raise awareness and empower girls and young women to consider studies and careers in STEM. More than 377,000 girls and young women have taken part in over 11,400 celebrations in 171 countries worldwide.

Another important initiative is the EQUALS Global Partnership, founded in 2016 by ITU, the United Nations University (UNU), UN Women, the International Trade Centre (ITC), and GSMA. This partnership brings together, over 100 global public and private sector actors to ensure women and girls around the world have the access, skills, leadership, and research roles to help shape the digital economy. Similarly, the Enhanced Integrated Framework (EIF), the United Nations Office for Project Services (UNOPS), and ITU run a project to enhance access to digital technologies and build digital skills for women in Least Developed Countries (LDCs). The aim is to improve the policy and regulatory environment, thereby increasing the ability of governments to mainstream gender and ICTs, and to enhance the economic and professional opportunities of working-age women by equipping them with digital skills.

Digital Pakistan Policy: Way Forward for Gender Mainstreaming in ICTs

The Digital Pakistan Policy issued by GoP in 2018 has amply emphasized the role of ICTs in empowering women and girls in Pakistan. Under this policy:



The government will initiate 'ICT for Girls' programs to train girls and women in computer skills—including software coding—in a bid to reduce inequalities, provide decent work, and promote economic growth in line with relevant SDGs;

Software Technology Parks will provide built-in facilities for women;

Stakeholder companies will align their employment policies with provision of equal job opportunities to women and girls in the field of IT; and

The government will design and develop customized programs for the social uplift of girls and women, especially in rural areas.

With reference to the 'ICT for Girls' programs, the policy seeks to:

Promote the use of ICTs to empower women and girls, and to bridge the digital divide;

Initiate 'ICT for Girls' programs across the country to train girls in computing skills (computing, coding, and communication);

Establish computer labs in girls' schools of unserved and underserved mandated areas of the country to train women and girls in computing skills in collaboration with the private sector;

Provide incentives to boost digital services and applications for girls' empowerment (direct-to-mobile strategy), and hence lower barriers to technology adoption; and

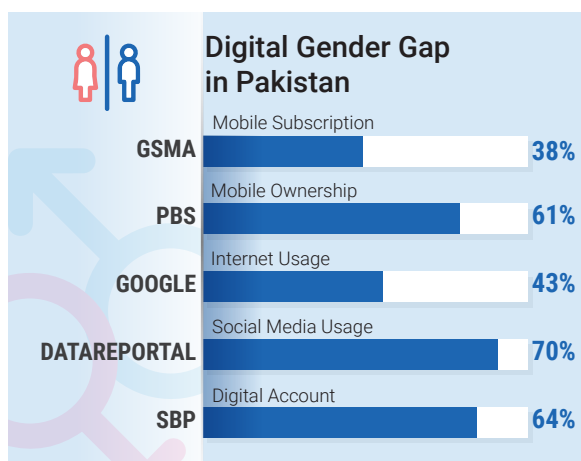
Strengthen international cooperation to promote access to ICTs and active participation of women and girls in the digital society; also provide legal protection to women and girls to encourage online participation.

Digital Gender Gap in Pakistan

Even though mobile and broadband are recognized as being instrumental in the development of any country, the digital gender gap is a phenomenon common to all developing as well as low- and medium-income countries. Given their inherent issues, socio-cultural structure, and economic situation, the developing countries have a long way to go in decreasing the digital gender gap. Pakistan has some of the widest gender gaps identified not only by international organizations but also by the Pakistan Bureau of Statistics (PBS). Efforts are hence being made to improve the situation.

The female uptake of mobile services and related apps and industries is a recent phenomenon in Pakistan. Today, Pakistani women have mobile connections in their name, own mobile phones, and use apps like E-Commerce, digital banking, and the likes of TikTok, in addition to utilizing voice services and WhatsApp.

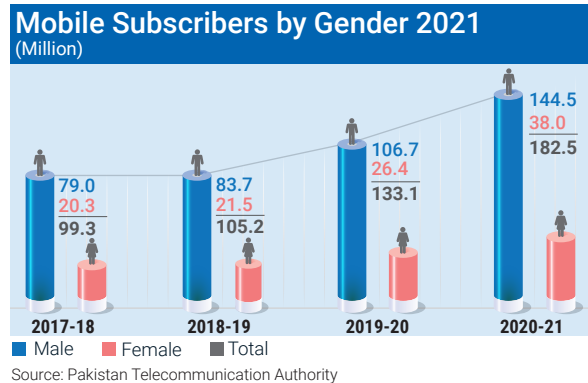
According to an estimate³, Pakistani women living both in rural and urban areas are making 5% more voice/video calls on Skype as compared to men. According to the GSMA Intelligence Consumer Survey 2017-19,⁴ which was carried out in 12 countries, Pakistan has one of the strongest rates of growth in mobile Internet awareness, especially among women. According to the report, the gender gap in Internet awareness declined from 16% to 11% between 2017-2019. In parallel, mobile Internet usage among women doubled from 10% to 19%. The digitally excluded segments of Pakistani women are mainly illiterate, unemployed, disabled, and those over 45 years of age.



Source: GSMA -2019, PBS-2020, Google 2021, DataReportal 2021, SBP, 2021.

Mobile Penetration

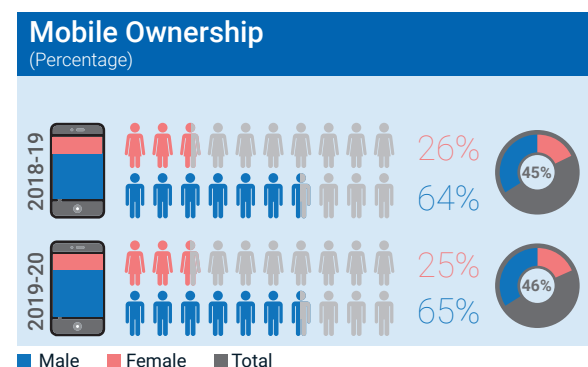
Pakistan faces a peculiar situation when it comes to mobile subscription or penetration, by gender. Since the last couple of years, the percentage of female mobile subscriptions is



only 21% of the total subscriptions. This results in a large number of unaccounted women using mobile connections. Of the 182⁵ million (FY 2021) mobile connections across Pakistan, only 38 million are held by females against their CNICs; the remaining 144 million connections are held by the male population. Mobile penetration in the female population stands at 37%, compared to 130% in the male population. According to the GSM Association's gender report, the gender gap in mobile ownership (SIM ownership) declined from 45% to 38% between 2017 to 2019. In 2019, female mobile ownership in Pakistan was 50%, compared to male ownership of 81%.⁶ However, such low percentage does not reflect the actual situation. Due to security-related issues, as well as social, cultural, and religious reasons, females do not get mobile subscriptions against their own CNICs; instead, they have it in the name of their male family members.

Mobile Ownership

The Pakistan Social and Living Standards Measurement (PSLM) Household Survey 2021 released by PBS reported that 46% of the country's population (25% female and 65% male) owns a mobile phone. In terms of the rural-urban divide, the gap between male-female mobile ownership in the rural areas is much higher, compared to urban areas. Female mobile ownership in Sindh, Punjab, and KPK is almost the same i.e., between 23% to 29%, but is relatively lower i.e., 15% only, in Balochistan.



3- PSLM Household Survey 2020

4- Addressing the Gender Mobile Gap in Pakistan – March 2021.

5- Total mobile subscribers (male and female) does not include SCO subscribers.

6- A mobile ownership is defined as a person who has sole or main use of a SIM card (or a mobile phone that does not require a SIM) and uses it at least once a month.

Internet Users

With 51% in 2020, compared to 67% in 2017, South Asia holds the unfortunate discrepancy of having the world's widest gender gap, with only 18% of the women using the Internet.^{7,8} According to GSMA, the gender gap in Internet usage in Pakistan has declined to 49% in 2019 to 41% in 2020, as reported by PBS.

Although aware of the potential benefits of the Internet, females in Pakistan cannot use it primarily due to low level of female literacy, inadequate ICT skills, and low affordability, being financially dependent members of the family. Moreover, due to the local socio-cultural norms, the families of females do not approve of Internet usage due to a variety of reasons including safety and security.

Due to low literacy rates, the possibility of women using the Internet through platforms offering voice facilities and images, rather than written content, can be tapped.

Mobile broadband is available to 77% of Pakistan's population. There are over 100 million mobile broadband subscribers in FY 2020-21 with broadband penetration of 46%. Of the total, 21 million are female subscribers, and based on female subscribers, penetration stand at 20%. According to GSMA, PBS, and a recent Google survey, 19%, 14%, and 39% women respectively, are using the Internet. PSLM 2020 states that almost 43 million people in the country are using the Internet for purposes including Facebook, Skype, education, research, information seeking, business, watching movies, online shopping, and banking.

Internet Users by Gender (2020-2021)						
	Internet Users		Male		Female	
	Million	Percentage	Million	Percentage	Million	Percentage
PTA	100	46%	79	71%	21	20%
PBS	43	19%	27	24%	15	14%
GSMA	61	28%	41	37%	20	19%
Google	117	54%	77	69%	40	39%

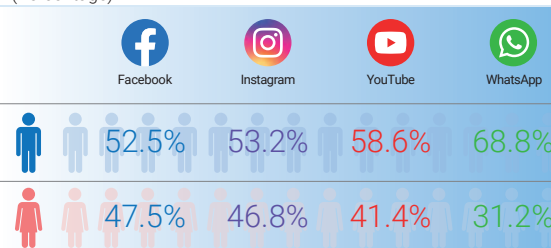
Social Media Usage

There are over 4.1 billion active social media users worldwide, making up about 53% of the world population. However, this usage is not evenly distributed as only 36% of the South Asian population is using social media. Globally, the gender gap in social media usage stands at 18%; however, South Asia has the widest gender gap in the world (63%), with only 27% of the females using social media. Although the number of social media users in South Asia has increased by 30% in the last couple of years, the gender gap persists at the same level.

With Daraz, OLX, Urdu Point, and Dawn being the most visited local websites in Pakistan, the country currently has over 46 million social media users, making around 21% of the total population. Almost 99% of these users access the social media through mobile phones. More specific stats reveal that there are approximately 3.5 times more male Facebook users in Pakistan than female users, indicating a gender gap of 70% in Facebook usage. The accompanying Table presents the percentage traffic being generated by male and female users on different social media platforms.

Share of Traffic on Social Media Platforms 2021, by Gender

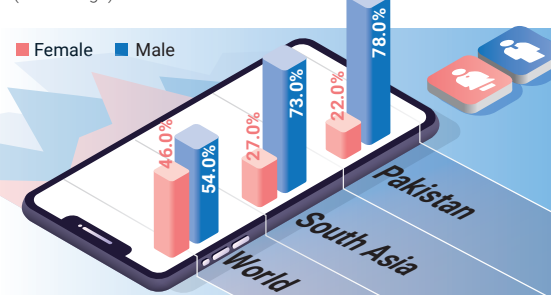
(Percentage)



Source: * datareportal.com

Share of Social Media Users, by Gender

(Percentage)



Source: DataReportal and Pakistan figures of Facebook from Napoleancat

7- <https://webfoundation.org/2020/03/the-gender-gap-in-internet-access-using-a-women-centred-method/>

8- Report on Addressing the Mobile Gender Gap in Pakistan, March 2021.

Digital Financial Services and E-Commerce


In the financial sector, gender parity positively influences the ability to seize available economic opportunities. Pakistan's stats in terms of gender participation in the financial sector are rather dismal. According to SBP, only 29% of the adult women have a bank account. While 25% women own a mobile handset (out of total 46 Million Mobile Owners in Pakistan), 18% correspondingly have a digital banking account. Women's Branchless Banking (BB) accounts stand at 18.8 million, as against 55.7 million accounts held by men. The digital financial gender gap in Pakistan is 64%.


SBP states that by incorporating a gender perspective in existing policies, Pakistan can have an inclusive financial system that equally serves both women and men. To this effect, it has launched a Credit Guarantee and Refinance Scheme, which offers 0% refinance rate and 60% risk coverage for small businesses run by women entrepreneurs. In consultation with other stakeholders, SBP is also working on a path-breaking gender mainstreaming policy called 'Banking on Equality' to engender equality in banking and reduce the gender gap in financial inclusion.

With only 0.7% of the female population having credit card, the use of E-Commerce platforms is impossible unless using COD or other money transfer channels like Jazz Cash, Easy Paisa, etc. Women are making a meagre 3.3% of the total online transactions taking place in Pakistan. However, spending on consumer E-Commerce categories depicts fashion and beauty as being at the top with US\$ 2.75 billion spent, showing a Year-Over-Year growth of 85% in 2020, as reported by Hootsuite.

29% Women have a bank account 

25% Women own a mobile handset 

18.8 million Women have Branchless Banking (BB) accounts 

55.7 million Men have Branchless Banking (BB) accounts 

The financial gender gap in Pakistan is 64%.



Digital Initiatives by Telecom Sector

In implementing the Digital Pakistan Policy 2018, key telecom stakeholders have taken numerous initiatives to increase penetration of digital education, services, and entrepreneurship, with a focus on rural women. Major steps being taken to decrease the gender gap and to bring women on board the digital platform have been highlighted below.

Ignite

Ignite is an R&D organization that works under MoITT and is funded by R&D levy on telecom operators' revenues. Ignite's incubation centers across the country nurture tech

million to the country's IT exports by providing services to the global market. In Khyber Pakhtunkhwa, DigiSkills empowered 3,000 females by organizing courses on graphic design, WordPress, social media marketing, digital productivity tools, blogging, and content writing. The program is currently in progress, and 2,092 participants have successfully completed their training sessions thus far. Another 1,100 females have been enrolled in various cohorts and completed their trainings in FY 2021.

Although Ignite has been supporting women startups throughout, some of its most promising startups have attracted investment as high as PKR 18 million and generated revenue of PKR 36 million—the highest among all female startups. These startups include projects related to education, health, retail, shared economy, aviation,

Women Startups						
#	Startup's Name	Founder's Name	Industry	Jobs Created	Revenue Generated	Investment Committed
1	Plate 101	Noor Saba	Shared Economy	314	12,000,000	1,546,604
2	Beyond the Classroom	Hana Tariq	Education	55	36,000,000	18,000,000
3	Oxbridge	Manzil-e-Maqsood	Education	5	1,500,000	20,000,000
4	International Services Pak	Zillay Mariam	Energy	65	8,150,000	19,000,000
5	Zari Faisal Designs	Zarlasht Faisal	E-Commerce	20	12,000,000	16,400,000
6	Tutors Gateway	Uruba Ali	Education	154	1,341,050	50,460,000
7	APRUS	Hira Irshad	Health Care	10	2,067,000	145,500,000

Source: Ignite

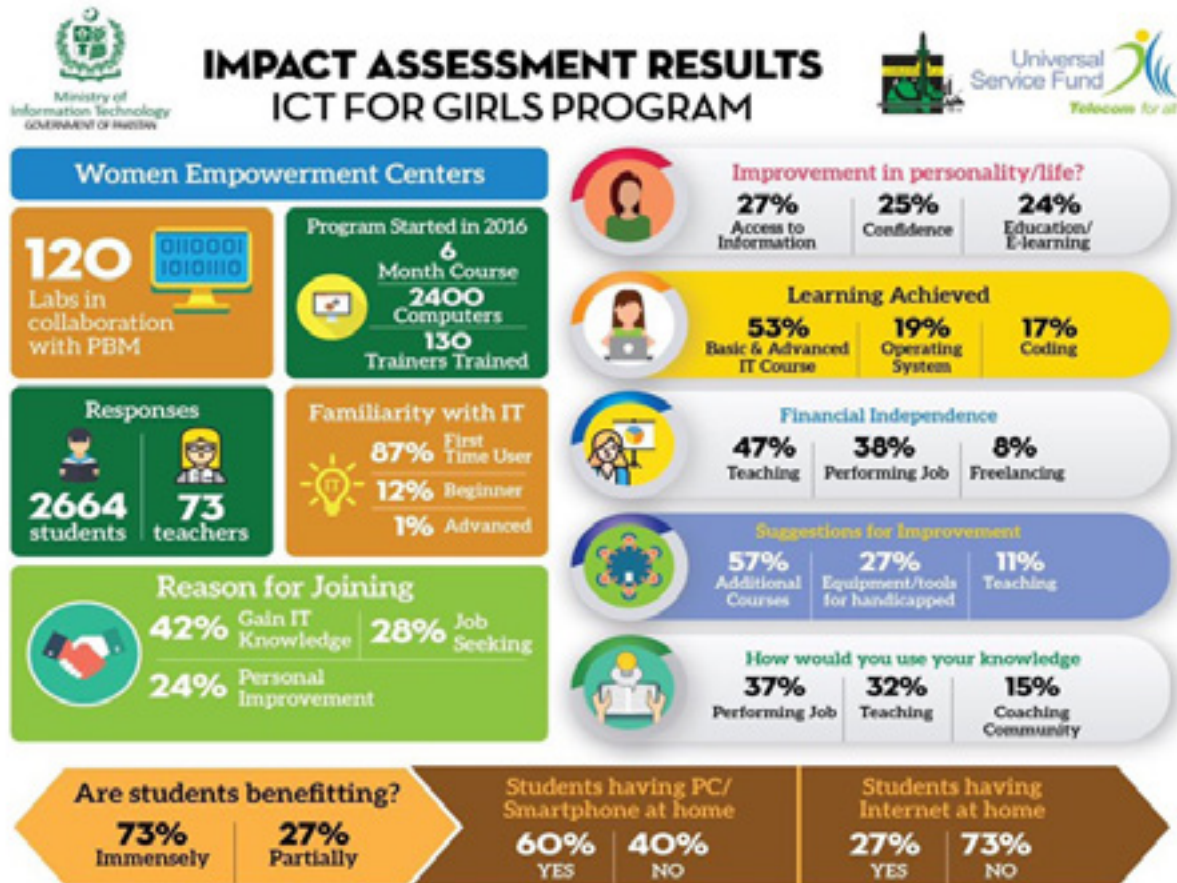
startups and engage them with investors and corporations. It offers tech innovation grants to innovative, deep tech projects and startups in health, education, energy, agriculture, telecom, and finance, among other areas. The federal government provides financial support to Ignite which, in turn, collects the prescribed contributions from relevant PTA licensees including fixed line, mobile cellular, and data service providers. PTA is one of the key stakeholders and a member of the Board of Directors of Ignite.

An assessment of the gender gap in Pakistan's digital landscape propelled Ignite to focus on women's capacity building and training. DigiSkills.pk—an initiative of Ignite—has conducted over 20 million online training sessions since 2018; of these, 25% have been imparted to women. After training, these freelancers have contributed US\$ 202

E-Commerce, and transport. The projects have directly created over 1,100 jobs so far.

ICT for Girls

'ICT for Girls' seeks to spur the socio-economic uplift of this very important segment of the society. The purpose of this endeavor, which has been taken under the Digital Pakistan Policy 2018, is to provide ICT facilities to girls, thereby increasing their employability potential so that they are monetarily enabled. The program aims to provide ICT infrastructure, latest hardware, high-speed Internet, software, and trained human resource. In a joint effort with Microsoft, female educators are also being trained on Super Skills for the 21st century. In addition, training sessions are being conducted on cloud computing,



web designing, coding, introduction to databases, basic computer programming, and basics of software design and development.

Under 'ICT for Girls,' MoITT is running the following two projects through the Universal Service Fund.

Computer Labs in Women Empowerment Centers and Educational Institutions

Under this project, ICT Model Labs have been established in 144 Women Empowerment Centers and educational institutions. Over 15,000 girls will annually be trained in state-of-the-art computer labs under the coaching and training program of Microsoft.

Computer Labs in Government Girls Institutions

Under this project, ICT Model Labs have been established in 226 schools of Islamabad. In addition to equipment, 202 teachers have also been placed in these institutions. These teachers have been trained by Microsoft under the trainer program on '21st Century Super Skills.' The project will make over 110,000 girl students (studying in Islamabad's schools) computer literate.

Punjab IT Board

E-earn

PITB has taken several initiatives at the provincial level to improve women's access to opportunities. For example, e-Earn is developing the largest co-working space network across Punjab. This platform will provide upcoming entrepreneurs and freelancers with a professional work setting laced with amenities like the Internet, uninterrupted power, furniture, etc. The initiative aims to enable around 10,000 freelancers—particularly females—to benefit from the platform.

National Freelance Training Program

PITB has designed the National Freelance Training Program (NFTP) to impart contemporary training to aspiring freelancers across all provinces. In the same vein, the e-Rozgaar program is imparting training in digital skills to youth in Punjab. Freelancers from both these platforms can pitch for projects on international freelancing platforms like Fiverr, Upwork, and People Per Hour to earn handsome income. NFTP seeks to train 21,000-plus individuals over three years, with a focus on achieving sustained economic growth through women's empowerment, reduced inequality, gender balance, and cutting-edge training sessions.

E-Rozgaar

The E-Rozgaar programme encourages female participation by providing a secure and safe learning platform through its 41 training centers across Punjab, of which five are dedicated for females. As of now, 54% of the e-Rozgaar graduates are females. The reported earnings of these female trainees constitute about 50% of the total earnings of the program. Women from metropolises, as well as from marginalized areas, are enthusiastically participating in the project, which empowers them to not only run the house but also contribute to the economy by bringing foreign exchange.

Day Care Center

To facilitate working mothers, PITB has set up a Day Care Center manned by trained staff. The assurance that their children are well-protected just a few feet away enables working women to focus on their careers, with minds at ease.

Kisan Ki Beti

The Punjab Ministry for Women Development has launched 'Kissan Ki Beti' in collaboration with the Community Development Foundation (CDF), Women Economic Development Initiative Punjab (WEDIP), Women Development Directorate (WDD), Dukhtran-i-Pakistan, Shahid Javed Burki Institute of Public Policy (BIPP), Agri Byt, and the Centre for Security and Disaster Management (CSDM). This project will assist 20 districts, targeting 15,000 families and over 30,000 young women (living in rural areas), with measures to improve their living standard, especially through skills training, business competencies, entrepreneurship, education, and support towards protecting their rights. The program will set up a platform for rural women to earn in four ways i.e., through certified vocational courses; by selling their own local brands as entrepreneurs; by getting linked with local markets; and by having access to online selling, especially of agri-based items.



CMOs Initiatives

Girls Learn Women Earn

In Pakistan, women's labor participation rests at 29%, with only 1% women engaged in entrepreneurship. Telenor Create—the design academy at Telenor Pakistan—in collaboration with the World Bank's Girls Learn Women Earn (GLWE) initiative, developed a customized curriculum in 2020 to train and enable aspiring women entrepreneurs on digital skills. Under this program, 1,100 women were trained in digital skills such as solving business problems, and utilizing digital tools to scale their businesses. Of the 1,100 trained females, 770 participants were from different parts of Khyber Pakhtunkhwa including Malakand, Swabi, and Charsadda. Moreover, urban female participants were also equipped with industry knowledge and relevant skills to enhance their employability and enable them to create a more human-centered business.



Khushaal Aangan

The 'Khushaal Aangan' female inclusion initiative by Telenor Pakistan is a digital helpline service that focuses on rural women who not only manage the health and wellness of their household, but also play a significant role in livestock management and core agriculture. With 750,000 subscribers, the service offers advisories on livestock management, health and nutrition, agriculture, wellness, cooking, and mobile Internet literacy. Telenor is also collaborating with GSMA's Connected Women initiative to increase Internet literacy for women in Pakistan.

Safe Internet and School Outreach Program

The Safe Internet and School Outreach Program is a flagship program of Telenor Pakistan that aims to train and build the capacity of students, mainly girls, around safe use of the Internet. It promotes responsible and safe online behavior of girls by building their capacity in online self-protection through interactive awareness training sessions and modules. It helps them to identify and protect themselves from the risks prevalent in the online world. It also enhances the capacity of project staff, teachers,

school management, council members, and students on online protection of girls via workshops and engagements. Initially, training sessions were conducted physically but subsequently, due to closure of schools on account of COVID-19, an online approach was adopted. Under this program, over 400,000 girls (and over 800,000 students in total) in public and private schools across all provinces and territories of Pakistan have so far been trained on safe use of the Internet.

Jazz Smart School

Jazz Smart School is a sustainable initiative launched to increase student learning outcomes and enhance teaching methodologies by deploying technology-driven smart learning solutions across 75 female public sector schools in Islamabad. Employing advanced technological solutions, Jazz Smart Schools has established Digital Learning Centers in 75 schools, benefitting over 38,000 female students so far. Through these centers, teachers have filled their knowledge gaps and structured their classes through improved usage of preloaded digital content, activities, and assessments.

Jazz-The Citizen Foundation Schools Initiative

Jazz has collaborated with The Citizens Foundation (TCF) to digitally transform TCF schools with 12000-plus female teachers, which is expected to positively impact over 266,000 students across Pakistan and AJ&K. Jazz will also assist in replacing aging tablets and mobile phones that run TCF's existing School Management Application, allowing principals to collect data more efficiently. Spanning a period of three years, this collaboration will introduce a blended learning curriculum, result in revamp of computer labs, and create a digital school management system.

Smart Feature Phones by Jazz

Jazz has recently launched Digit 1—a 4G-enabled smart feature phone across Pakistan. The idea was to introduce affordable products and services in a bid to bridge the digital divide. This phone offers six months of free 4G Internet, along with a free data SIM. The device supports famous smartphone applications like Facebook and WhatsApp. Other special features involve a touchscreen, Wi-Fi hotspot, a 2MP camera, and a reliable 2000 mAh battery. Currently, smartphone adoption in Pakistan is low and people are still using legacy 2G phones; they need newer options to convert to latest technologies like 4G. The devices are available at Jazz Experience centers and franchises nationwide for PKR 5,300, along with Digit's one-year official warranty program.

Sehat Kahani



The availability of health services in Pakistan leaves much to be desired. In February 2018, the GSMA Ecosystem Accelerator Program selected 'Sehat Kahani' for an Innovation Fund grant. Sehat Kahani's mobile- and web-based application is a holistic digital health solution that enables women and other marginalized segments to access primary and secondary healthcare services online, without the hassle of having to wait for long hours at a physical healthcare facility. The health portal is providing low-, middle-, and high-income populations with various E-Health solutions, utilizing technology. Jazz has partnered with Sehat Kahani, which has 14 E-Health clinics in three provinces. It currently operates three healthcare verticals including E-Health Hubs, Enabling Outreach—Preventive Health, and Sehat Kahani Mobile Application, impacting over 500,000 lives. The app provides for low-income communities by creating telemedicine E-Hubs that connect users to qualified, online doctors, with nurses acting as intermediaries in various communities. Recently, Zong has entered into a partnership with Sehat Kahani to provide 12,000 free e-consultations to the underprivileged strata of the society.

Establishment of Digital Vocational Centre for Girls Orphanage

Zong 4G has developed a Digital Vocational Center at a girls' orphanage in Islamabad, empowering women to learn technical and digital skills from the comfort of their home in the pandemic.



View from a Digital Vocational Centre housed in an orphanage in Islamabad.

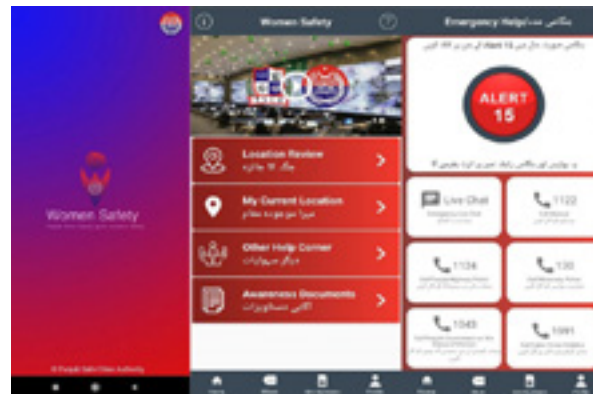
Promoting E-education

With a focus on e-education, Zong 4G has partnered with the Punjab Skills Development Fund (PSDF) to extend support to marginalized students. As part of the project, Zong 4G and PSDF have launched a course on e-lancing for 10,000 youth of Punjab, with almost 50% female students. The objective is to provide digital learning opportunities to youth during the pandemic and equip them to earn through freelancing. The partnership is in line with the vision of the company and the digital agenda of GoP.



Punjab Police Women Safety App

In view of the rising incidents of violence against and harassment of women, the Punjab Police has launched a 'Women Safety App' that enables women to contact the police through a message, rather than making a call. Developed to protect women, the app enables the police to track the location of the complainant through smartphone. A special police squad rushes to the victim's location once a complaint has been lodged. In addition to the Punjab Police, important agencies like Rescue 15, Motorway Police, and Punjab Highway Patrol are also on board the initiative.



Way Forward

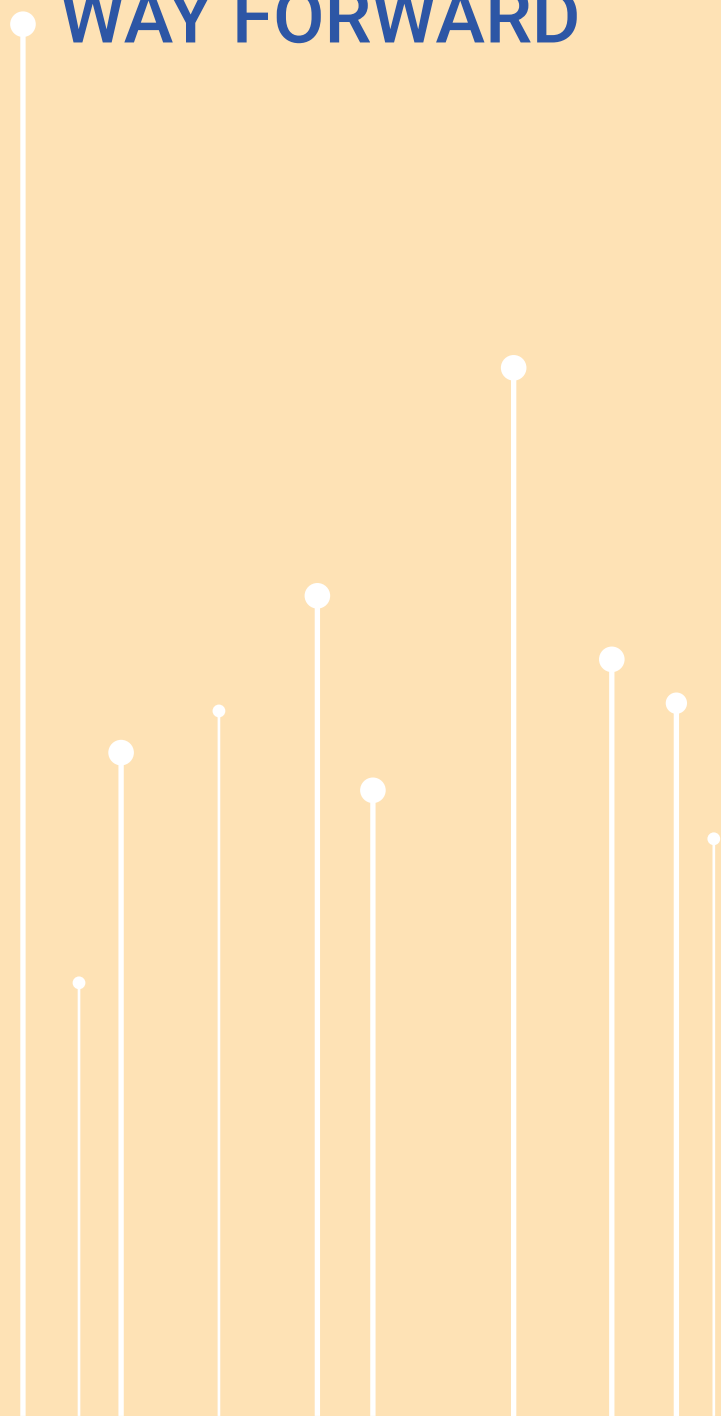
Gender mainstreaming in ICTs has teed off as part of the broader implementation strategy of the Digital Pakistan Policy, which is a testament to the government's commitment to reduce the gender gap. In pursuance of these objectives, various initiatives have been taken by stakeholders in their respective areas. However, Pakistan still has a long way to go as it narrows the gap with an all-inclusive approach harnessing the use of ICTs. The following areas need to be strategically incorporated into existing efforts:

- » Availability of authentic and reliable ICT data on gender;
- » Awareness creation on use and benefits of the Internet, utilizing multiple channels;
- » Prioritization of sub urban and rural areas for all ICT-related initiatives;
- » Initiatives for development of ICT skills;
- » Development of local content and least textual websites and apps;
- » Increase in female mobile phone ownership and SIM connection;
- » Creation of legal frameworks to protect female online security;
- » Data protection and safety;
- » Women-oriented employment policies;
- » Initiation of STEM education initiatives for females; and encouragement of women entrepreneurship in digital startups.

08



• WAY FORWARD





Way Forward

C OVID-19 has gravely impacted every sector around the world, leaving significant imprints on the telecom industry as well. With an increasing number of countries imposing restrictions on movement, people are spending more time on work and leisure, and using exponential volumes of data. Telecommunication companies are focusing on increasing their network resilience and are examining the likely ramifications of COVID-19 and its variants on their planned investment, particularly in 5G. PTA, as a regulator, has focused on providing an enabling environment, not only to existing telecom operators but also to new incumbents, to invest in networks and to improve customer experiences through upgraded and enhanced QoS standards.

A year and a half into the pandemic, the telecom sector has proved to be the bedrock for other industries to recover and thrive. Telecom operators must continue to seize the opportunity to expedite the digitalization process, thereby shaping a new future for businesses and consumers on the strength of advanced wireless technologies. Reaching out to the inaccessible, enhancing the experiences of those who are already connected, ensuring a level-playing field for all stakeholders, making the Internet a secure and safe space, and enhancing Pakistan's manufacturing capacities are a few areas that PTA is working to prioritize.

PTA also realizes that bridging the digital divide is a concentrated effort requiring focus on addressing both the supply side (network coverage) as well as the demand side (affordability, digital literacy, etc). To close the digital divide, PTA is addressing coverage issues by focusing on both mobile and fixed broadband. Cross-sectoral cooperation, coupled with legal frameworks and international collaboration, will accelerate Pakistan's digital agenda. Steps in the right direction will bring further stability to the telecom sector, with investments registering growth, players contributing their best, and consumers ending up satisfied. Key areas of PTA's focus in the coming year are elaborated below.

Quality of Service and Coverage

The existing fixed broadband services are being provided mostly through legacy copper-based networks. PTA implemented new mandatory conditions in all new/renewed licenses to gradually switchover legacy networks to FTTH connections. This transition will be monitored through active measures. Affordable and high-speed broadband is the key to a knowledge-based economy. As such, the broadband speed on fixed-line Next Generation Access Network (NGAN) infrastructure is currently set as >8 Mbps, with the intent to further increase the speed in the coming years.

Reasonable and prudent measures have been taken to enhance mobile data throughput from the average download data rate of 512 Kbps to 1 Mbps (for 3G) and average download data rate of 2 Mbps to 4 Mbps (for 4G), with equal yearly increase. Beside this, a minimum outdoor signal strength of -100 dBm must be achieved. For mobile broadband, network rollout obligations have been incorporated in licenses whereby each operator has to achieve 3 percent additional population coverage each year in each province. The objective is to cover 90% of the population with high-quality broadband services. PTA's initiative to improve QoS standards for 3G and 4G services and to enhance coverage obligations in cellular

licenses to reach maximum population, will enrich the overall user experience and outreach of broadband services across the country.

Through continuous monitoring and enforcement, PTA will ensure that the enhanced QoS standards and coverage obligations envisaged in the recent cellular mobile license renewals and NGMS spectrum auctions are available to the people of Pakistan, AJ&K and GB. To this effect, PTA has chalked out extensive survey plans covering the requirements laid down in agreements signed with Prime Minister's Office. For this purpose, the procurement of additional QoS monitoring tools is already underway. Moreover, PTA is also in the process of engaging a third-party consultant on QoS for an independent viewpoint. Furthermore, PTA has expanded its footprints in Gwadar, Abbottabad, Faisalabad, Multan, and Sukkur. Should the need arise, it will further expand its outreach to ensure provision of quality ICT services throughout the country.

Provision of Additional Spectrum

PTA has successfully conducted spectrum auction for release of additional spectrum in existing bands being used by CMOs both in Pakistan and in AJ&K and GB in 2021. The same will meet the objectives of improving mobile broadband in the country. Active engagement is being pursued with all stakeholders to release additional spectrum, as and when demanded by the market through policy directives of GoP. The same will not only provide an opportunity for CMOs to improve the QoS standards but also facilitate consumer access to digital services.

5G Network Roll Out

GoP is aware of the 4th industrial revolution and 5G technology deployment, and is in the process of refining modalities for launch of 5G in the country. The broad objectives are socio-economic development, broadband proliferation, enhancement of digital inclusion and E-governance, and promotion of effective utilization of spectrum. In addition enhanced consumer welfare, innovative entrepreneurship, and startups in ICT sector are also expected as well as economic growth in the ICT sector. MoITT, PTA and FAB are working together for successful launch of 5G in Pakistan in collaboration with relevant stakeholders.

Fiberization

Accelerated evolution of next generation technologies, coupled with improvements in broadband penetration, makes fiber optic network an essential component of

the digital infrastructure. Fiber optic should be adopted as the preferred medium of transmission for providing uninterrupted high-speed Internet connectivity to users. The GoP and industry players have realized the need for a high-speed data transport medium catering for future technologies and applications.

A transition is underway to OFC connectivity linking telecom regions and telecom towers. This includes mandatory deployment of OFC for long distance and international licensees along with LL licensees in specific telecom regions, and deployment of OFC networks in far-flung areas to provide higher speed broadband and backhaul connectivity in collaboration with USF.

Telecom infrastructure sharing is envisioned as a suitable model for reduction in operational costs by avoiding duplicate infrastructure and would lead to optimization of the backhaul infrastructure of multiple telecom service providers.

The optical network and transmission system, however, bears with challenges such as installation difficulty, initial installation cost, fiber cable cuts, and difficulty in tracing faults, etc. The GoP is focusing on addressing issues and challenges related to facilitation of telecom infrastructure deployment, which includes removing roadblocks in procedures related to grant of RoW in order to facilitate both fiber deployment and telecom tower installations.

Right of Way

PTA has been making efforts to improve national and international connectivity by providing regulatory facilitation to its licensees as per its role, functions, and powers mandated under the Pakistan Telecommunication (Re-Organization) Act. However, telecom access and expansion is hampered by persistent RoW issues, use of utility infrastructure, and procedural delays in the approval process at the government and private levels.

Telecom is a federal subject while public RoW falls under the purview of the provincial as well as federal governments in the post-18th Amendment milieu. Public sectors such as NHA, Pakistan Railways, DISCOs etc., are treating RoW of telecom infrastructure deployment according to their own mandates.

In December 2020, the MoITT issued a policy directive on RoW, which provides a basic framework to reduce the administrative roadblocks for telecom licensees. However, its implementation is proving to be a challenge, given that the policy directive is non-binding in nature. The applicable existing legal framework, Section 27-A of the Telecom Act

on RoW, is not comprehensive and is silent on key areas related to role of the federal and provincial governments; hence, the implementation and enforcement of any policy issued by GoP on RoW remains limited. As such, there is a need to re-address, align, and harmonize the legal framework of RoW at the appropriate level. An all-inclusive and holistic legislation addressing all challenges and streamlining RoW facilitation of telecom infrastructure deployment at the national level is direly required.

GoP has recently issued a strategic road map for the launch of 5G services in Pakistan. One of the building blocks of 5G launch is dense fiberization, and in that respect, MoITT may review the RoW Policy in consultation with stakeholders to facilitate telecom network deployment. PTA and MoITT are further evaluating the processes being followed for establishment of telecom infrastructure by operators. Any further facilitation required to enhance the network infrastructure will be taken care of through future policy directives and the National Broadband Policy.

Rationalization of Taxes

Pakistan's telecom sector has witnessed the levying of higher taxes, both in comparison to regional countries as well as in contrast to taxes imposed on other sectors within the country. These taxes are not only a burden on telecom users but are also an obstacle in achieving the 'Digital Pakistan' vision of Prime Minister Imran Khan. PTA's longstanding persuasion of GoP to rationalize taxes on the telecom sector resulted in tax relief being extended to the telecom sector and consumers in the Federal Budget 2021. Incentives such as relief in FED/GST, withholding tax, and SIM tax, coupled with the award of industry status to the telecom sector, have only started to bear fruit. As a regulator, PTA believes that the 'Digital Pakistan' vision requires a boost in broadband proliferation and telecom access. The achievement of this goal demands availability of cheap handsets and affordable telecom services, which is not possible sans reduction in prevalent taxes. As such, PTA will continue to persuade GoP for continuation of the said tax relief and further rationalization of telecom taxes.

Industry Profitability

Pakistan's thriving telecom sector has attracted international telecom players such as China Mobile, Telenor, Etisalat, and VEON owing to expansion of telecom market opportunities and provision of a conducive regulatory environment. In recent years, profitability of major telecom operators including CMOs and PTCL has improved due to the ever-increasing demand for telecom services amid COVID-19; the sector reported highest-ever revenues of PKR 644 billion in FY 2020-21. The profitability of telecom operators is key to

meeting the growing requirement of investment of billions of dollars in the telecom infrastructure. Cognizant of this fact, PTA is collaborating with the operators to expand telecom services and to ensure reasonable return on telecom investments. PTA will continue its efforts for sustainable growth and profitability of this sector, and adequate rollout of telecom infrastructure to meet the demand for high-speed data connectivity.

Unlawful Content Moderation

SM platforms have connected people of all ages, irrespective of their geographical location. The GoP's continued support to tech companies for sustainable growth through enabling environment and launching of user-friendly SM applications has created a corps of over 60 million active social media users in Pakistan. To ensure safe and clean SM platforms containing informative, productive, and legitimate content for users, it is important to manage online content in accordance with local laws. To this end, PTA has implemented the SM Strategy under the umbrella of PECA through Removal and Blocking of Unlawful Online Content (Procedure, Oversight and Safeguards) Rules 2021. PTA's consistent support to tech companies has resulted in tremendous growth of SM users.

For effective removal of unlawful content, PTA has established dedicated liaison channels with major SM platforms including Facebook, YouTube, TikTok, Twitter, etc. SM companies have also nominated dedicated focal persons besides providing separate escalation channels for quick removal of sensitive reported content, wherever required. Frequent engagements occur between PTA and these SM platforms to remove gaps and improve understanding, especially with respect to content that is against the local laws and societal norms of the country. Resultantly, major SM companies are hiring for their moderation teams, such human resource that possesses an understanding of local laws and norms.

In view of the enormous volume of content being uploaded on digital media, a multi-pronged strategy needs to be devised to minimize uploading of unlawful content on various platforms. The following actions are intended to be taken in this regard:

- Registration of major SM platforms in line with Rule 7(6) of Removal and Blocking of Unlawful Online Content (Procedure, Oversight and Safeguards) Rules, 2021.
- Holding of special sessions with moderation teams of SM platforms, especially with regard to sensitive (sacrilegious/sectarian) content which can lead to real world harm.

- Creating short videos (15 to 30 seconds) about safe, responsible, legitimate, and productive use of the Internet/SM. The videos will be disseminated through the electronic and social media for public awareness.
- Conducting seminars and training sessions in universities and judicial academies to educate students and the judicial fraternity regarding the challenges posed by SM.

Collaborative Regulations

The IT and telecom sector is the backbone of the digital economy. Fostering this economy requires extensive cross-sectoral collaboration—a fundamental shift in the way regulation is executed and the kind of stakeholders that it brings together. Being a progressive regulator, PTA will continue to facilitate digital transformation in Pakistan by working in a collaborative and consultative mode. PTA will continue to work with different sectoral regulators and ministries because new innovations have a larger spread across sectors such as banking, education, commerce, health, and agriculture, to name a few.

PTA's recent successful engagements with FBR, SBP, Ministry of Industries and Production, and other government agencies for digital inclusion, DIRBS implementation, and local manufacturing of mobile handsets will further be expanded for greater economic benefit. Similarly, collaborations in the agriculture and services sector will smoothen penetration of IoT in the local setups. PTA will also focus on working with the Ministry of Commerce and CCP so that a contemporary and competitive online marketplace can be formed. Going forward, the commercial launch of 5G technologies demands an even higher level of cross-sectoral engagement to develop the required ecosystem, and to use cases for deployment of such cutting-edge technologies in the country. Receptive to changing global trends, PTA will continue to strive for ITU's G5 regulator status by focusing on collaborative and cross-sector regulations that leverage digital transformation for the benefit of the people of Pakistan under the 'Digital Pakistan' vision.

Level Playing Field for Telecom Operators

Pakistan's telecom market is undergoing rapid transformation, with the demand for broadband access and mobile applications perpetually on the rise. The situation has triggered active competition amongst telecom players in the market. PTA will ensure that a level-playing field is available to all telecom operators so that they can earn a reasonable return on their investments and contemplate further expansion of services. Operators will be encouraged

to use best marketing and promotion practices to create an environment featuring healthy competition and enabling provision of competitive services. Burdensome wholesale interconnect costs will further be reduced to ensure that the benefit of cost-effective solutions reaches the end-users. Through continuous reforms in the areas of regulation and licensing of telecom services in Pakistan and AJ&K and GB, new and existing operators will be encouraged to invest in the direly needed ICT infrastructures with enhanced rollout obligations such as optic fiber. A conducive framework and spectrum availability will also be provided for innovative ICT services such as IoT.

Cyber Security

With the National Cyber Security Policy 2021 in place, Pakistan is focused on establishing a secure digital ecosystem to enable delivery of safe, reliable, standardized, and resilient digital services to its citizens. The policy objectives include implementation of various security requirements such as the establishment of national cyber capabilities, corresponding frameworks, and institutional structures; development of necessary standards, rules, processes, procedures, and mechanisms for coordinated national security management; and a proactive response to cyber threats in a bid to improve the country's cyber security outlook.

To safeguard national critical infrastructures and to protect citizens' privacy and personal information, GoP, MoITT, and key stakeholders from all sectors including PTA, are identifying and implementing legislative and regulatory reforms in accordance with their respective security mandates defined under the policy.

Furthermore, GoP and its stakeholders will also focus on public-private partnerships, promoting local industry through indigenization and development of homegrown cyber security solutions to minimize international supply chain dependency. Other areas of focus include professional capacity building of the cyber security workforce through training sessions and skills development, and fostering global cyber security cooperation.

Digital Literacy

Technological advancement and its practical application results in value additions that help steer towards a knowledge-based society. Digital literacy is crucial for use of technology and communication networks. PTA will collaborate with telecommunication service providers to devise and initiate Corporate Digital Responsibility (CDR) future-oriented programs in public schools for teachers and students to learn basic and advanced digital skills.

Digital Gender Divide

Although Pakistan, along with other South Asian countries, is facing the largest gender gap in the use of ICTs, the fact that the issue has been recognized at the right time, offers hope. The focus of international telecom organizations on the digital gender divide has sensitized, not only governments but other actors as well.

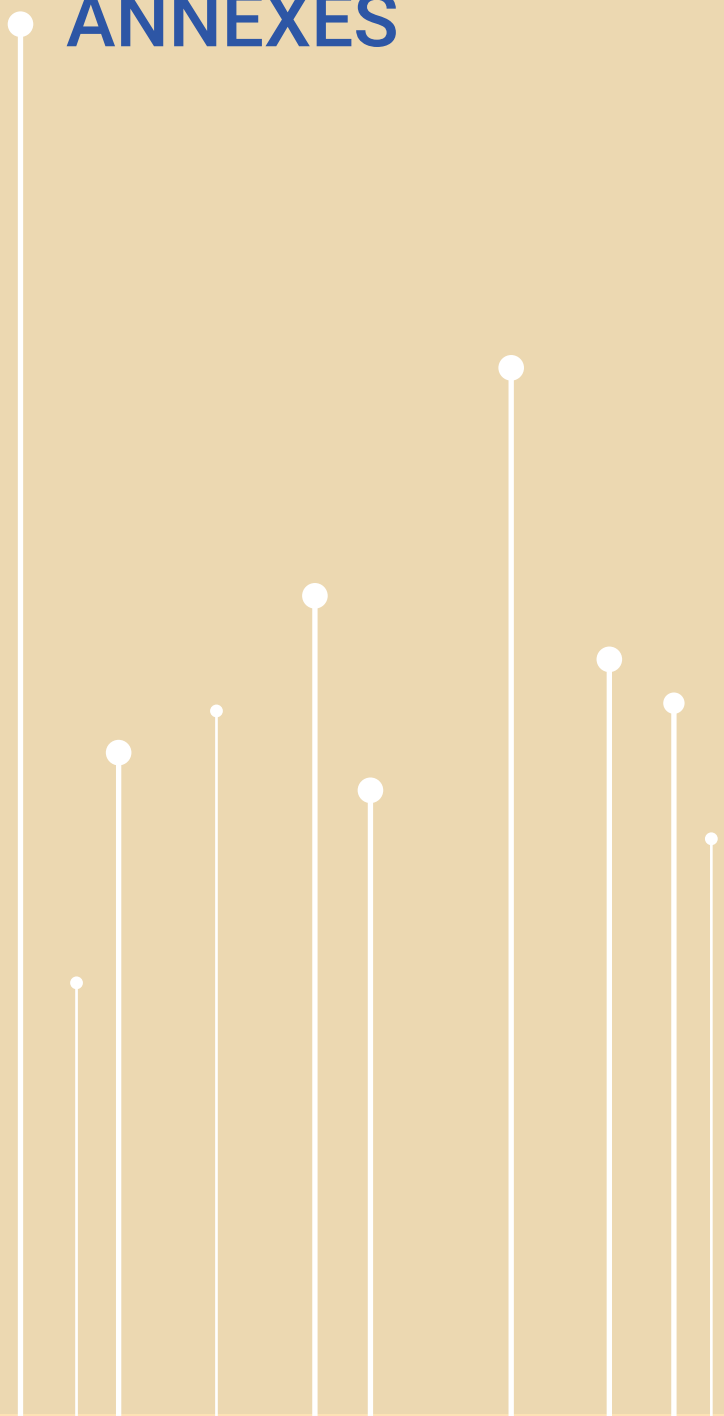
PTA is cognizant of the issue of gender gap in Pakistan and is working to overcome it. However, an all-inclusive approach is required across all segments to be able to harness the potential of ICTs for gender mainstreaming. A well-devised strategy based on authentic and reliable ICT data on gender may be developed. Addressing the issue at the grassroots level calls for utilizing multiple channels to raise awareness on the use and benefits of the Internet.

The sub-urban and rural areas need to be prioritized for all ICT-related initiatives and skills development. Development of local content and least textual websites and apps, along with increased female ownership of mobile phones and SIMs, can help overcome the existing divide.

One of the most instrumental steps is ensuring female online security, data protection, and safety. In this regard, a committee has been constituted in PTA to identify issues and challenges related to gender gap in the ICT eco-system, and to develop a concrete plan for gender mainstreaming in ICTs. Further, PTA has initiated a partnership with A4AI—a global coalition working to bridge the gender divide in least developed countries through policy and regulatory reforms. Similarly, the GSM Association is also assisting PTA in bridging the digital divide.

09 

● ANNEXES



Contingencies and commitments 10

The annexed notes 1 to 29 form an integral part of these financial statements.

CHAIRMAN

MEMBER (FINANCE)

PAKISTAN TELECOMMUNICATION AUTHORITY
INCOME AND EXPENDITURE STATEMENT
FOR THE YEAR ENDED JUNE 30, 2021

	Note	2021 Rupees	2020 Rupees
Revenue	21	36,935,757,942	134,854,507,274
Expenditure			
General and administrative expenses	22	2,063,933,220	1,800,084,723
Provision for doubtful fee receivable	16.3	140,040,910	101,754,141
Financial charges	23	4,849,882	5,035,792
		(2,208,824,012)	(1,906,874,656)
		34,726,933,930	132,947,632,618
Other income	24	3,619,178,021	7,261,549,541
Surplus for the year before taxation		38,346,111,951	140,209,182,159
Less: Provision for taxation	25	245,750,981	(989,771,697)
Net surplus for the year		38,591,862,932	139,219,410,462

CHAIRMAN

MEMBER (FINANCE)

PAKISTAN TELECOMMUNICATION AUTHORITY
STATEMENT OF CASH FLOWS
FOR THE YEAR ENDED JUNE 30, 2021

	Note	2021 Rupees	2020 Rupees
CASH FLOWS FROM OPERATING ACTIVITIES			
Surplus for the year before taxation		38,346,111,951	140,209,182,159
Adjustments for:			
Depreciation	11	79,768,149	60,423,129
Amortization of intangible asset		1,082,385	146,914
Depreciation on right of use asset		15,592,671	11,050,579
Finance cost on lease liabilities		4,829,293	5,030,877
Provision for			
- accumulating compensated absences		1,449,744	1,449,744
- employee's gratuity scheme obligation		157,557,589	125,916,751
- pension obligation		87,637,588	85,695,342
- post retirement medical benefit		63,516,755	59,987,178
- doubtful fee receivable	16.3	140,040,910	101,754,141
Profit on bank deposits	24	(166,492,404)	(883,462,842)
Markup on NGMS license	24	(222,286,963)	(708,418,220)
Mark-up on license renewal	24	(3,179,077,759)	(5,648,388,903)
Gain on sale of property and equipment	24	(22,986,188)	(241,828)
		35,306,743,721	133,420,125,021
Changes in working capital			
Decrease/(increase) in current assets			
Fees receivable		(134,239,195)	(111,756,639)
Advances, deposits, prepayments and other receivable		(9,190,880)	6,300,928
Increase/(decrease) in current liabilities			
Unearned revenue		(3,486,151,250)	-
Accrued and other liabilities		24,120,718	165,114,611
Payable to AJK & GB Council		2,388,796,418	233,703,728
		(1,216,664,189)	293,362,628
Cash generated from operations		34,090,079,532	133,713,487,649
Contributory provident fund payable		58,689,210	48,318,590
Receivable from operators on behalf of AJK and GB Council - net		(197,646)	(655,043)
Loans and advances		(21,537,870)	(90,790,789)
Income taxes paid		(100,377,291)	(691,985,433)
Pension paid		(1,449,744)	(1,449,744)
Gratuity, accumulating compensated absences and post retirement medical benefits paid		(76,501,117)	(78,568,077)
Net cash generated from operating activities		33,948,705,074	132,898,357,153
CASH FLOWS FROM INVESTING ACTIVITIES			
Purchases of property and equipment		(210,503,252)	(85,194,260)
Purchases of Intangibles		(1,316,000)	(35,000)
Profit on bank deposits received		254,717,669	808,058,180
Markup on ISF of NGMS License received		688,635,572	1,106,812,498
Mark-up on license renewal received		3,977,640,806	3,992,624,185
Proceeds from sale of property and equipment		22,988,331	252,688
Net cash generated from investing activities		4,732,163,126	5,822,518,291
CASH FLOWS FROM FINANCING ACTIVITIES			
Contribution to Federal Consolidated Fund (FCF):			
- Payment made to Frequency Allocation Board		(830,554,594)	(804,071,647)
- Transfers made to FCF		(35,642,514,568)	(132,278,336,310)
- Federal excise duty paid / adjusted during the year		-	(6,200,000,000)
Lease liabilities paid		(19,597,944)	(14,818,704)
Net cash used in financing activities		(36,492,667,106)	(139,297,226,661)
Net (decrease)/ increase in bank balances		2,188,201,094	(576,351,217)
Bank balances at beginning of the year		3,532,654,616	4,109,005,833
Bank balances at end of the year	20	5,720,855,710	3,532,654,616

The annexed notes 1 to 29 form an integral part of these financial statements.

CHAIRMAN

MEMBER (FINANCE)

Annex-2: Telecom Contribution to National Exchequer (PKR Billion)

Period	GST	PTA Deposits	Others*	Total
2016-17	43.81	39.68	77.43	160.91
2017-18	57.85	22.26	88.92	169.03
2018-19 (R)	26.27	25.97	62.78	115.02
2019-20 (R)	47.79	141.23	101.10	290.12
2020-21 (E)	67.4	44.84	116.23	225.80

Others include: WHT, income taxes, custom duty and other taxes

Annex-3: GST by Telecom Industry (PKR Million)

	2016-17	2017-18	2018-19	2019-20	2020-21
Cellular	33,486	42,274	9,707	28,398	44,530
LL & CVAS	7,792	10,145	9,135	12,194	13,178
LDI	1,167	844	1,433	1,928	1,614
TTP/TIP	1,364	4,585	5,993	5,273	3,408
Total	43,810	57,848	26,267	47,794	62,730

Annex-4: Other Taxes by Telecom Industry (PKR Million)

	2016-17	2017-18	2018-19	2019-20	2020-21
Cellular	65,877	66,968	44,34	85,497	97,666
LL & CVAS	7,356	8,285	11,094	7,514	7,920
LDI	2,807	3,636	2,825	3,290	3,710
TTP&TIP	1,387	10,032	4,519	4,797	4,597
Total	77,427	88,922	62,78	101,098	113,894

Annex-5: FDI in Telecom (US\$ Million)

		FDI in Telecom	Total FDI	Telecom Share in Total FDI (%)
2017-18	Inflow	288.49	3,494.51	7.60
	Outflow	188.40	714.23	26.81
	Net FDI	100.09	2,780.29	3.24
2018-19	Inflow	235.5	2,785.2	8.45
	Outflow	313.1	1,422.8	22.01
	Net FDI	- 77.6	1,362.4	-5.70
2019-20	Inflow	763.3	3,285.8	23.23
	Outflow	140.8	724.6	19.44
	Net FDI	622.5	2,561.2	24.30
2020-21	Inflow	202.34	3,010.5	6.72
	Outflow	167.5	1,163.1	14.40
	Net FDI	34.8	1,847.4	1.88

Source: State Bank of Pakistan

Annex-6 : Investment by Telecom Industry (US\$ Million)

	CMO	FLL/CVAS	LDI	TTP/TIP	Total
2016-17	809.7	153.4	16.6	153.6	1,133.3
2017-18	562.4	130.0	24.8	143.6	860.8
2018-19	362.9	167.2	30.6	117.1	677.8
2019-20	568.7	231.8	74.6	253.7	1,128.7
2020-21	677.7	245.5	31.3	139.4	1,093.9

Note : Investment figures updated and include CVAS, TIP and TTP

Annex-7: Telecom Industry Revenues (PKR Million)

	CMO	CVAS	FLL	WLL	LDI	TTP/TIP	Total
2016-17	404,764	76,697	6,837	1,893	23,471	15,071	528,733
2017-18	383,646	76,253	8,998	4,003	34,002	32,928	539,829
2018-19	447,311	66,126	11,741	5,879	39,287	33,934	604,278
2019-20	425,961	76,086	11,385	5,052	37,061	36,188	591,734
2020-21	461,668	78,742	13,410	5,318	45,104	39,867	644,109

Annex-8: Cellular Mobile Operators Revenues (PKR Million)

	Jazz	Ufone	Zong	Telenor	SCO	Warid	Total
2016-17	154,811	52,733	70,111	109,211	1,068	16,830	404,764
2017-18	147,031	53,230	72,409	109,744	1,232	–	383,646
2018-19	180,407	62,280	100,740	102,226	1,657	–	447,311
2019-20	174,821	53,632	95,414	100,425	1,669	–	425,961
2020-21	194,961	55,040	105,293	103,737	2,637	–	461,668

Annex-9: Mobile ARPU/Subscriber/Month (PKR)

	2016-17	2017-18	2018-19	2019-20	2020-21
Mobilink	226.9	226.8	262.7	239.7	240.7
Ufone	234.9	230.6	240.2	194.5	198.9
Zong	191.2	200.7	256.5	220.9	224.0
Telenor	230.8	218.4	194.0	183.9	179.8
Total	203.5	219.1	238.3	213.9	215.2

Annex-10: Mobile Subscribers

	Jazz	Ufone	Zong	Telenor	SCO	Total
2016-17	52,470,638	18,397,981	28,084,677	40,804,820	720,439	140,478,555
2017-18	55,469,118	20,314,686	30,890,633	43,564,216	1,281,160	151,519,813
2018-19	59,470,721	22,616,449	34,713,311	44,221,147	1,256,780	162,278,408
2019-20	62,808,245	22,323,713	36,712,560	45,424,353	1,290,944	168,559,815
2020-21	69,792,924	23,118,277	40,498,899	49,279,306	1,560,493	184,249,899

Annex-11: Fixed Line Subscriber (FLL & WLL) (Million)

	FLL & WLL
2016-17	3.01
2017-18	2.90
2018-19	2.65
2019-20	2.49
2020-21	2.54

Annex-12: Mobile Broadband Subscriber

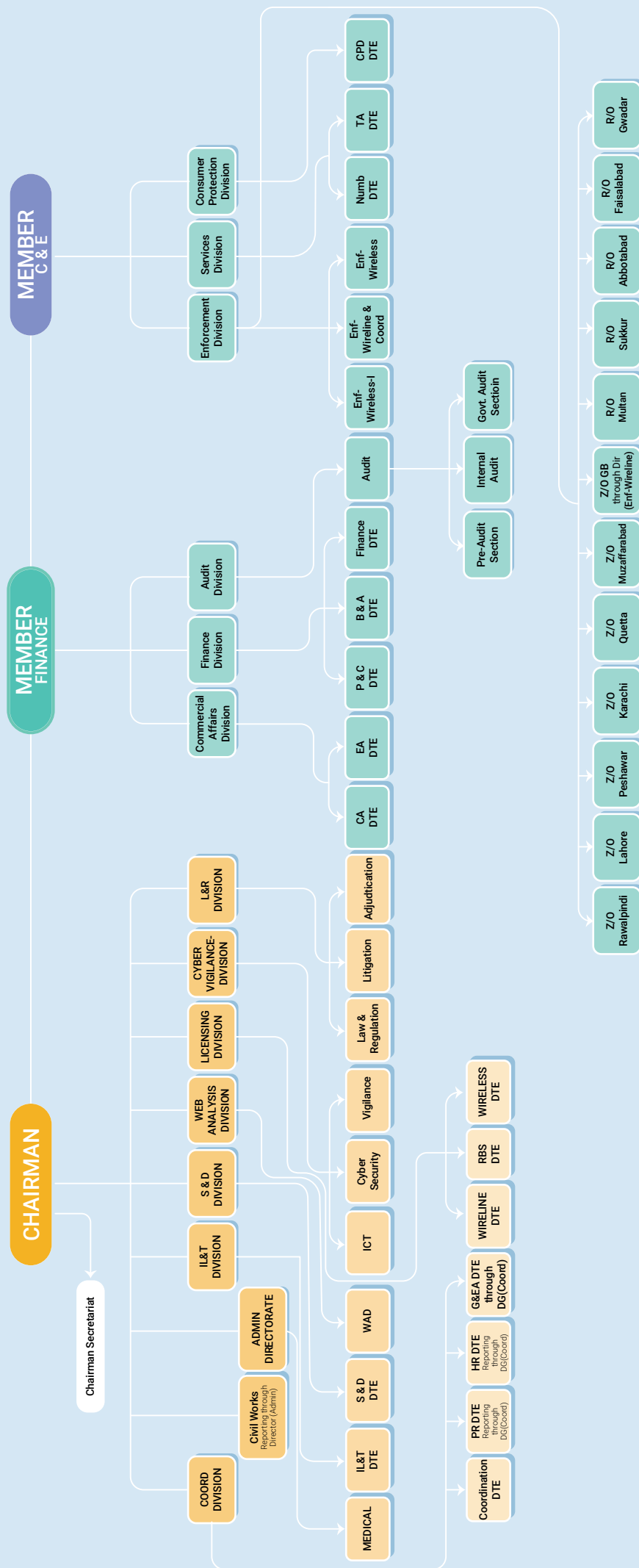
	Jazz	Ufone	Zong	Telenor	SCO	Total
2016-17	13,380,547	4,960,486	12,682,099	11,060,898	–	42,084,030
2017-18	19,206,445	6,630,766	16,620,516	13,626,893	379,120	56,463,740
2018-19	24,222,714	8,901,792	21,171,595	14,636,038	498,483	69,430,622
2019-20	29,880,315	9,351,854	24,043,012	17,868,772	560,960	81,704,913
2020-21	38,458,078	10,534,021	27,518,921	22,263,536	1,078,351	99,852,907

Annex-13: Digital Financial Indicators

Indicators	2016-17	2017-18	2018-19	2019-20	2020-21
No. Of Mobile Wallet (BB) Agents	402,710	405,571	421,053	445,181	534,460
No. of active BB Agents	185,297	–	174,609	182,189	246,280
No. of mobile wallet accounts	27,312,964	39,246,468	35,730,704	52,522,222	74,620,637
Deposits as on Quarter End (PKR Million)	15,423	15,345	25,664	36,660	55,259
No. Of Transactions (Thousands)	551,544	748,639	1,116,267	1,489,665	2,233,117
Value of Transactions (PKR Million)	2,427,823	3,183,571	4,128,868	5,151,391	8,086,149
Average size of Transactions (PKR)	4,417	2,197	1,724	3,463	3,653
Average Daily Transactions	1,532,064	2,079,554	3,100,738	4,137,956	6,203,103
Average Deposit In Accounts	497	227	547	663	783
Active Accounts	13,158,310	21,815,840	22,044,942	26,694,588	45,887,496

Source: State Bank of Pakistan

Organogram





Pakistan
Telecommunication
Authority

Headquarters, F-5/1, Islamabad
www.pta.gov.pk

Point Contact

Mr. Muhammad Arif Sargana

Director General - Commercial Affairs - PTA

Email: arif@pta.gov.pk