



**PAKISTAN TELECOMMUNICATION
AUTHORITY**

Information Memorandum 2012

**Auction of frequency spectrum in 1.9
GHz and 3.5 GHz for existing Fixed Local
Loop (FLL), Wireless Local Loop (WLL)
and Class Value Added Services (CVAS)
Licensees.**

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PART I – PREFACE

1. INTRODUCTION:

1.1 The Government of Pakistan (GoP) is endeavoring to improve telecommunication sector with the broader objective of increasing investment and competition. Pakistan Telecommunication Authority (hereinafter referred to as “PTA”) will award available 1.9 GHz and 3.5 GHz spectrum to existing Fixed Local Loop (FLL), Wireless Local Loop (WLL) and Class Value Added Services (CVAS) licensees through telecom region-wise auction process. The purpose of this document is to provide information to existing FLL, WLL & CVAS licensees wishing to participate in the auction of frequency spectrum in 1.9 GHz and 3.5GHz bands. FLL, WLL and CVAS licensees will be limited to provide services authorized under their existing licenses, on the auctioned spectrum, within the licensed telecom region(s). The liberalization policies are described in the following documents also available through the Ministry of Information Technology (MoIT).

- a.) Deregulation Policy for the Telecommunication Sector 2003 Annex-A
- b.) Mobile Cellular Policy 2004 Annex-B
- c.) MoIT Policy for auction of Mobile Cellular license 2011 Annex- C
- d.) MoIT Policy for Spectrum Auction in 1.9 GHz and Annex-D
3.5 GHz band 2011
- e.) Broadband Policy 2004 Annex- E

1.2 All the existing FLL, WLL and CVAS licensees (as of the date of publication of this IM) can participate in the Auction Process.

1.2.1 In case of winning of spectrum by FLL and WLL licensees, an addendum (**Annex- G1 of this IM**) will be annexed to their existing licenses for remaining duration. FLL & WLL licensees can bid for their respective regions as mentioned in their licenses. All existing operators shall be required to have their FLL/WLL licenses modified accordingly.

1.2.2 CVAS licenses will be modified as per addendum (**Annex-G2 of this IM**) which includes license obligations related to limited mobility, national security, monitoring, network roll out obligations, QoS KPIs, R&D and USF contributions, infrastructure sharing and other terms of the license. The modified licenses shall be valid for the remaining period of

respective existing CVAS licenses. The spectrum, however, will be issued for a period of 15 years from the date of allocation of the spectrum (**Annex-G3**). For CVAS licensees willing to participate in the auction, following shall apply.

1.2.2.1 A Nation-wide license holder can bid separately for spectrum in all the 14 telecom regions or less.

1.2.2.2 A provincial license holder can bid for all telecom regions falling within the licensed province or less.

Note:

- a) In all of the above cases, the total spectrum auction price shall be based on the applicable years for which the spectrum is being issued and calculated proportionally and linearly with respect to “per MHz per year” spectrum auction price of the band.
- b) The right to use the spectrum for provision of licensed services exists only against valid respective license.
- c) Operators holding multiple bands shall continue to hold all bands of spectrum unless otherwise as desired by GoP, or a decision by PTA based on violation of the spectrum obligations by the licensee(s), or if surrendered by the licensee(s) on terms and conditions agreed by the Authority.

1.4 Spectrum Details with Fee

1.4.1 The details of the spectrum to be auctioned by PTA are mentioned in the Table-1 & Table-2 below:-

1.4.1.1 **1.9 GHz Frequency Band**

Sr.No.	Licensed Region	Frequency Band MHz (Uplink/Downlink)	Bandwidth (MHz)	Annual Spectrum Fee/ Block/ Region
1	CTR	(1900-1905/1980-1985)	5	Area-1 : US\$ 75,000/- Area-2 : US\$ 25,000/-
2	FTR	(1900-1905/1980-1985)	5	
3	GTR	(1900-1905/1980-1985)	5	
4	HTR	(1900-1905/1980-1985)	5	
5	ITR	(1900-1905/1980-1985)	5	
6	KTR	(1900-1905/1980-1985)	5	
7	LTR	(1900-1905/1980-1985)	5	
8	MTR	(1900-1905/1980-1985)	5	
9	NTR-I	(1900-1905/1980-1985)	5	
10	NTR-II	(1900-1905/1980-1985)	5	

11	RTR	(1900-1905/1980-1985)	5	
12	STR-I	(1900-1905/1980-1985)	5	
13	STR-V	(1900-1905/1980-1985)	5	
14	WTR	(1900-1905/1980-1985)	5	

Table-1: 1.9 GHz Frequency Band

Area-1: ITR, KTR, LTR

Area-2: CTR, FTR, GTR, HTR, MTR, NTR-I, NTR-II, RTR, STR-I, STR-V, WTR

1.4.1.2 **3.5 GHz Frequency Band**

Sr.No	Licensed Region	Frequency Band MHz	Bandwidth (MHz)	Annual Spectrum Fee/Block/ Region
1	CTR	3541.25 – 3563.25	22	Area-1 : US\$ 25,000/- Area-2 : US\$ 10,000/-
		3563.25–3585.25	22	
		3415.25 – 3436.25	21	
		3478.25 – 3499.25	21	
2	FTR	3562.25–3585.25	23	
3	GTR	3499.25 – 3520.25	23	
		3583.25 – 3585.25		
4	HTR	3541.25 – 3563.25	22	
		3563.25 – 3585.25	22	
5	ITR	3562.25 – 3585.25	23	
6	KTR	3562.25 – 3585.25	23	
7	LTR	3562.25 – 3585.25	23	
8	MTR	3541.25 – 3563.25	22	
		3563.25 – 3585.25	22	
9	NTR-I	3541.25 – 3563.25	22	
		3563.25 – 3585.25	22	
10	NTR-II	3541.25 – 3563.25	22	
		3563.25 – 3585.25	22	
11	RTR	3562.25 – 3585.25	23	
12	STR-I	3541.25 – 3563.25	22	
		3563.25 – 3585.25	22	
13	STR-V	3541.25 – 3563.25	22	
		3563.25 – 3585.25	22	
14	WTR	3541.25 – 3563.25	22	
		3563.25–3585.25	22	

Table-2: 3.5 GHz Frequency Band

Area-1: ITR, KTR, LTR

Area-2: CTR, FTR, GTR, HTR, MTR, NTR-I, NTR-II, RTR, STR-I, STR-V,
WTR

- 1.5 Recipients of the Information Memorandum (hereinafter referred to as “IM”) who intend to submit application for the auction should note that the information contained in this IM does not necessarily mean that it is complete or final. Any representation or warranty, express or implied, including the accuracy or completeness of the information contained in this IM or any other written or oral information made available to any interested party and any liability in respect of any such information or any inaccuracy in this IM or omission from this IM is expressly disclaimed. This IM is not intended to form any part of the basis to make any investment decision or other evaluation or any other decision to participate in the auction. Recipients must undertake their own detailed investigations and independent assessment of the issues raised in the IM and any other issues they consider relevant in order to determine whether to participate in the auction. This IM does not constitute an offer or invitation to participate in the auction, nor does it constitute the basis of any contract which may be concluded in relation to the auction or in respect of any award of the Spectrum.

PTA reserves the right not to qualify any applicant without giving any reason whatsoever.

- 1.6 The purpose of IM is to provide the following information:-
- a) Overview of the Pakistan Telecommunications Sector,
 - b) Telecommunication Sector Regulation in Pakistan,
 - c) Bidding Procedure and Auction Process,
 - d) Application Checklist attached as Annex-F,
 - e) Appendix for existing FLL/WLL license attached as Annex-G-1,
 - f) Modified CVAS license attached as Annex-G-2 and its Annex- G-3,
 - g) Bid Form for outcry attached as Annex-H,
 - h) Radio Frequency Spectrum Request Form attached as Annex-I,
 - i) SMRA Procedure (Example) as Annex-J,

2. SCHEDULE OF EVENTS

2.1 Schedule to be observed till award of spectrum is as follows:

	EVENT	TENTATIVE DATE (2012)
A	Publication of IM	14 th Feb
B	Begin date for submission of Expression of Interest (EoI)/ Application	15 th Feb
C	Pre-Bid Conference	22 nd Mar
D	Closure of queries	26 th Mar
E	End Date for submission of EoI/ Application	30 th Mar
F	Response of queries from PTA	2 nd Apr
G	Qualification of bidders before auction	11 th Apr
H	Receipt of Bid Earnest Money in PTA's Bank account	19 th Apr
I	Auction	3 rd May

2.2 PTA reserves the right to determine the overall timetable of the Auction or to amend this schedule from time to time, as circumstances require.

2.3 **Address for Correspondence:** All correspondence relating to this IM, Investors Conference, submission of Application documents, Auction procedure and issuance of Spectrum/Addendum duly marked "**Auction of Spectrum in 1.9 & 3.5 GHz**" should be addressed to:

Director General (Licensing)
Pakistan Telecommunication Authority
H/Qs F-5/1, Islamabad 44000
Pakistan,
Telephone: + 92 51 2878128
Fax: + 92 51 2878129
E-mail: 1900_3500@pta.gov.pk

PART II – INFORMATION ON PAKISTAN TELECOMMUNICATION SECTOR

3. ECONOMY OF PAKISTAN

- 3.1 Pakistan is the 6th most populous countries in the World, with an estimated population of 177.1 million in (2010-2011) as per Economic Survey of Pakistan 2010-2011. The annual population growth rate during the recent years (2005 to 2010) has been around 2.0 %.
- 3.2 Pakistan is a democratic country consisting of two houses of the Parliament, the National Assembly and the Senate. The head of the State is the President, and the head of the Government is the Prime Minister. The Supreme Court heads the Judiciary. Administratively, Pakistan is divided into four provinces: Punjab (Capital is Lahore), Sindh (Capital is Karachi), Khyber Pakhtun Khwa (Capital is Peshawar), and Balochistan (Capital is Quetta).
- 3.3 Pakistan has extraordinarily important strategic endowments and great development potential. Pakistan occupies a strategic location at the crossroads of South Asia, Central Asia, China and the Middle East. It is at the fulcrum of a huge market with a vast population, enormous and diverse resources and huge untapped potential for trade and a huge potential source of demand and growth for Pakistan. Pakistan has a large population; the sixth most populous country in the world and the most urbanized in South Asia.
- 3.4 Approximately 36% of the Pakistani population resides in urban areas. The largest urban centers are Karachi (estimated population of 15.3 million), Lahore (estimated population of 8.5 million), Faisalabad (estimated population of 5.8 million) and Rawalpindi/ Islamabad (estimated population of 6.2 million). Islamabad is the capital city of Pakistan with an estimated population of 1.7 million.
- 3.5 The current per capita income of Pakistan is approximately US \$ 1,207.
- 3.6 Pakistan economy grew at 6.4% on average per annum during last decade though recently it went to a dip because of some adverse shock like devastating floods, global financial fallout and instable oil & commodity markets. In the year 2010-11, the economy registered growth of about 2.4%. With some reprieve and continued efforts by the Government of Pakistan, we hope that it would revert to its potential growth trajectory. Pakistani Diasporas is an asset who remitted

US\$ 9.1 billion during July-April 2010-11 as against the US\$ 7.3 billion in the same period of last year.

- 3.7 Agriculture is an important sector of the economy as it employs over 45% of the total population and provides essential input for agro-based industries including textile and sugar. Agriculture income has therefore created demand for industrial goods as well as services. Agriculture also accounts for a significant share of foreign exchange earnings. Pakistan is the world's fourth largest producer of cotton and the economy depends primarily on cotton and textile exports as a major source of foreign exchange and employment. Cotton textile production is the single most important industry, accounting for about 46% of overall manufacturing activity in the country. Other important industries are cement, vegetable oil, fertilizer, sugar, steel, machinery, tobacco, paper and paperboard, chemicals, and food processing.
- 3.8 For the year 2010-11, the Agriculture sector grew an estimated 1.2%, against a target of 3.8%, and previous year's growth rate was 0.6%. While the Crops sub-sector declined 4% over the previous year, Livestock posted a healthy rise of 3.7%. Industrial output expanded by 4.9%, with Large Scale Manufacturing (LSM) posting a 1.71% rate of growth. The Services sector grew 4.1%, as compared to 2.9% in 2009-10.
- 3.9 Pakistan emerged from four years of stringent macro-economic adjustments. The government tackled some difficult economic issues, including Pakistan's significant debt payments. Pricing was broadly deregulated, including in the energy sector, import tariffs were rationalized and reduced significantly. Pakistan's Central Bank was granted unprecedented autonomy and capital market prudential oversight was strengthened. These measures were taken to improve the general investment climate in the country.
- 3.10 A central element of Pakistan's economic reform process has been the effort to reduce persistent government budget deficits. The overall fiscal deficit which averaged almost 7.0% of GDP during the 1990s has been gradually reduced over the years and remained 4.3% during Jul-Mar 2011 despite pressures on public finances due to intensification of war on terror and slow economic growth. There has been a 14.3% increase in tax revenue during FY2010-11. Total revenue relative to the GDP increased from 13.4% in FY2000-01 to 14.2% in FY2010-11 whereas total expenditures as percent of GDP remained 20.5% in FY2010-11. The government's efforts to introduce wide ranging tax reforms and promote fiscal transparency were also the contributory factors to deficit reduction. As a result,

public debt, as a percent of GDP, declined from 78.9% in FY2000-01 to 60.2% in FY2010-11.

- 3.11 During the last six years (FY2005-06 to FY2010-11), Pakistan has received a Foreign Direct Investment (FDI) of US\$ 21.5 billion. A significant portion (32%) of this FDI inflow was in the telecommunication sector due to privatization, deregulation and new telecom operators. Historically, the United States, United Kingdom, United Arab Emirates and Saudi Arabia have been Pakistan's major sources of FDI investment. Principal sectors attracting such investment are financial services, oil and gas exploration, power, trade, transport, storage and communications, chemicals, pharmaceuticals, fertilizers, and textiles.
- 3.12 Financial reforms introduced in 1990s have liberalized Pakistan's banking sector, which had long been dominated by state-owned banks. Private Banks are gradually playing a more significant role. Pakistan's financial system has grown in recent years. Still there is an enormous potential for growth. The system remains relatively small in relation to the economy, when compared with other emerging countries in Asia and around the world. Private banks are gradually playing a more significant role. As on December 2010, total number of branches of banks stood at 9,339 as compared to 9,146 on 30 June 2009. Assets of all banks showed a net expansion of Rs 4,353 billion during the last five years (2006 to 2010) and stood at Rs 7,138 billion. Hence the asset base of the banking system increased by 64% during this period.
- 3.13 Additional information on the state of the economy in Pakistan is available in Pakistan Economic Survey 2010-11 published by the Ministry of Finance. The Survey is available at the website of the Ministry of Finance: <http://www.finance.gov.pk>.
- 3.14 Pakistan is a member of the main international and regional organizations, including the United Nations, the Organization of the Islamic Conference (OIC), the Economic Cooperation Organization ("ECO"), the World Trade Organization ("WTO"), the South Asian Association for Regional Cooperation ("SAARC"), the International Telecommunication Union ("ITU") and the Asia Pacific Telecommunity (APT). The ECO, whose founding members are Pakistan, Turkey, and Iran, grants a 10 % tariff preference on statutory rates for some goods. In 1993, ECO membership was expanded and Afghanistan, Azerbaijan, and the five formerly Soviet Central Asian republics were admitted to this organization. The SAARC comprises India, Pakistan, Bangladesh, Sri Lanka, Nepal, Bhutan and Maldives. SAARC proposed a South Asian Preferential Trading Agreement, which became

operational after ratification by the member states in November 1994. The SAARC Governments have signed an agreement on South Asian Free Trade Area (SAFTA) on 6 January 2004. The agreement will enter into force on 01 January 2006 upon completion of formalities including ratification by all contracting states. This agreement shall supersede the SAARC Preferential Trading Agreement (SAPTA). Pakistan is also a member (along with India and Nepal) of the Asian Clearing Union, which was founded in 1976 and aims at facilitating multilateral payments through the use of currencies of participating countries in regional transactions in order to expand intra-regional trade and save convertible foreign exchange.

- 3.15 Pakistan has negotiated Bilateral Investment Treaties with several countries, including Australia, Azerbaijan, Bangladesh, Belarus, Luxemburg, Economic Union, Bosnia, Bulgaria, Cambodia, China, Czech Republic, Denmark, Egypt, France, Germany, Indonesia, Iran, Italy, Japan, Kazakhstan, Kuwait, Kyrgyz Republic, Lebanon, Laos, Malaysia, Mauritius, Morocco, Netherlands, Oman, Philippines, Portugal, Qatar, Romania, Singapore, South Korea, Spain, Sri Lanka, Sweden, Switzerland, Syria, Tajikistan, Tunisia, Turkey, Turkmenistan, U.A.E., United Kingdom, Uzbekistan, and Yemen. Negotiations are also underway with 19 other countries, for bilateral investment treaties. Also, at multilateral level, Pakistan is actively pursuing with the ECO and SAARC. These treaties generally include dispute settlement provisions. If a dispute cannot be settled through mutual consultation, investors can generally take cases to arbitration under rules of the UN Commission on International Trade Law or to the World Bank's International Center for Settlement of Investment Disputes or to the Court of Arbitration of the International Chamber of Commerce. Pakistan is a member of the Multilateral Investment Guarantee Agency, an arm of the World Bank.
- 3.16 The Protection of Economic Reforms Act, 1992, safeguards local and foreign investments in Pakistan. This statute, inter-alia, guarantees the right to bring, hold, sell, transfer and take foreign exchange within or outside Pakistan; protects fiscal incentives provided by the government; and protects investors against expropriation of assets.
- 3.17 Companies doing business in Pakistan are subject to the Companies Ordinance, 1984, as amended. This statute sets out the legal regime applicable to the incorporation, operation and termination of companies in Pakistan. The Securities & Exchange Commission of Pakistan (SECP) is responsible for registration of companies under Companies Ordinance 1984. Applicants should consult their own professional advisors for further information on company law requirements.

- 3.18 The Income Tax Ordinance, 2002 is applicable to the companies conducting business in Pakistan. To obtain more information on Pakistan's taxation regime, visit the website of the Federal Board of Revenue: <http://www.fbr.gov.pk> Applicants should also consult their own professional taxation advisors for more complete information on Pakistan's tax requirements.
- 3.19 Pakistan has one of the most liberal foreign investment regimes in South Asia. 100% foreign equity is permitted in the manufacturing and infrastructure sectors. On-going reform of Pakistan's trade regime is reducing tariff barriers. Duty on capital goods, plant and machinery not manufactured locally is now just 5%, having earlier been in a range of 5 to 25%.
- 3.20 Pakistan has bilateral and/or double taxation treaties or agreements with more than 50 countries, including Austria, Azerbaijan, Bangladesh, Belarus, Belgium, Canada, China, Denmark, Finland, France, Germany, Greece, Hungary, India, Indonesia, Iran, Ireland, Italy, Japan, Jordan, Kazakhstan, Kenya, Republic of Korea, Kuwait, Lebanon, Libyan Arab Republic, Malaysia, Malta, Mauritius, Netherlands, Nigeria, Norway, Oman, Philippines, Poland, Qatar, Romania, Saudi Arabia, Singapore, South Africa, Sri Lanka, Sweden, Switzerland, Syria, Thailand, Tunisia, Turkey, Turkmenistan, U.A.E, U.K, U.S.A and Uzbekistan.

4. OVERVIEW OF TELECOMMUNICATIONS SECTOR

- 4.1 The telecommunication sector in Pakistan has grown rapidly in the past seven years and offers significant opportunities in every segment of the telecommunications market. The Federal Government has granted high priority to developing telecommunications in the country to achieve sustainable growth in all sectors of the economy. Pakistan possesses a very healthy competition in telecom market with some of the world's most successful investors in emerging markets including Orascom, Telenor, Etisalat, China Mobile, SingTel, Abu Dhabi Group Qtel and Omantel.
- 4.2 Pakistan has international connectivity with other countries through undersea cables, satellite links and terrestrial cables. Pakistan is linked to Southeast Asia, the Middle East and Western Europe by the SEA-ME-WE-III submarine fiber optic cables. An older submarine cable also links Pakistan with UAE.
- 4.3 Pakistan has established submarine cable connectivity (SEA-ME-WE-IV) and IMEWE for the international link and improving through IMEWE and SEAMEWE-V. In addition, Transworld Associates have established Pakistan's first ever private sector undersea fibre optic cable system (TW-1) which connects

Pakistan with rest of the world. Transworld is a joint venture between Orascom Telecom of Egypt, the Saif Group of Pakistan and the Omzaest Group of Oman. With the start of above international links, Pakistan has now established sufficient backbone for international connectivity. The country is also in process of connecting with Iran, India, Afghanistan and China with terrestrial optical fibre for improving the redundant connectivity and providing the hub for international connectivity to central Asian states.

- 4.4 In addition to the international connectivity Optical Fibre connectivity inside the Country have also improved over the years connecting most of the cities and town all across the country. Many companies have established optical fibre networks accumulating to a total 20,500 km of fibre network. The following table summarizes the domestic optical fibre network:

Fiber Optical Back Haul		
1	PTCL	5,500 Km
2	Wateen	5,500 Km
3	Multinet	4,500 Km
4	Link Direct	5,000 Km
Total		20,500 Km

- 4.5 To promote development of telecommunication services in un-served and under-served rural areas of Pakistan Universal Service Fund (USF) have been working successfully over the past years since its establishment, because of the same USF Pakistan is one the most successful universal service access story all around the world. So far a total of 4,063 Kms of optical fiber has been laid by USF in un-served areas and laying of 2,460 Kms is in progress. Most of the tehsil headquarters of the country are now connected with optical fiber.
- 4.6 The telecommunications sector in Pakistan has shown significant growth in the recent years. However, it still lags behind many of its comparable economies in terms of fixed line density (number of fixed phones per 100 inhabitants), mobile penetration (number of mobile subscribers per 100 inhabitants) and internet usage. Due to the fact that there is a substantial population that is devoid of telecommunication services, there exists an enormous potential for growth of telecommunications in the country.

4.7 The following figure shows Pakistan’s total teledensity over the last six years:

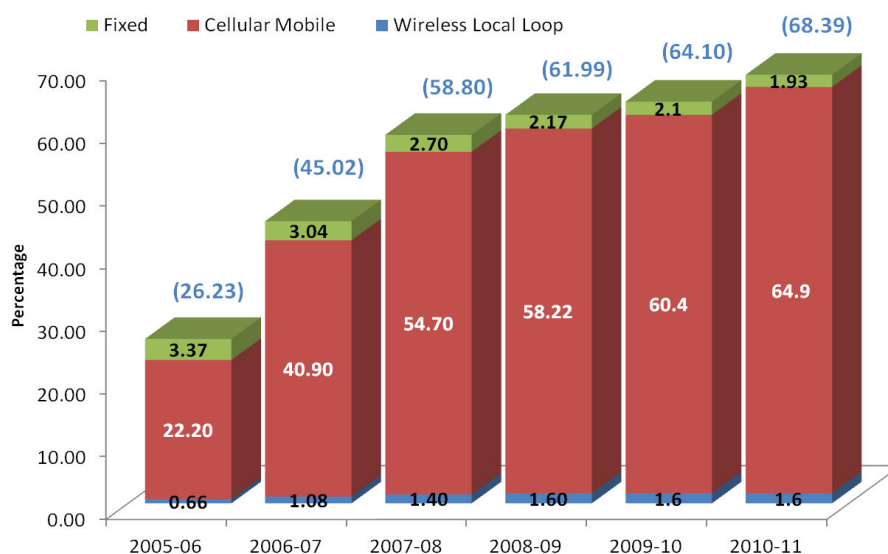


Figure:- Total Teledensity of Pakistan

4.8 In line with the global trends, the mobile cellular sector of Pakistan has shown stronger growth than the fixed line telephony. Pakistan currently has over 111 million cellular subscribers. The number of subscribers has increased more than fifteen times in the past seven years but there still exists high demand for mobile cellular communication services in the country. The start of operations by U-fone in 2001, and Telenor and Warid in 2005 facilitated growth in number of subscribers as shown below:

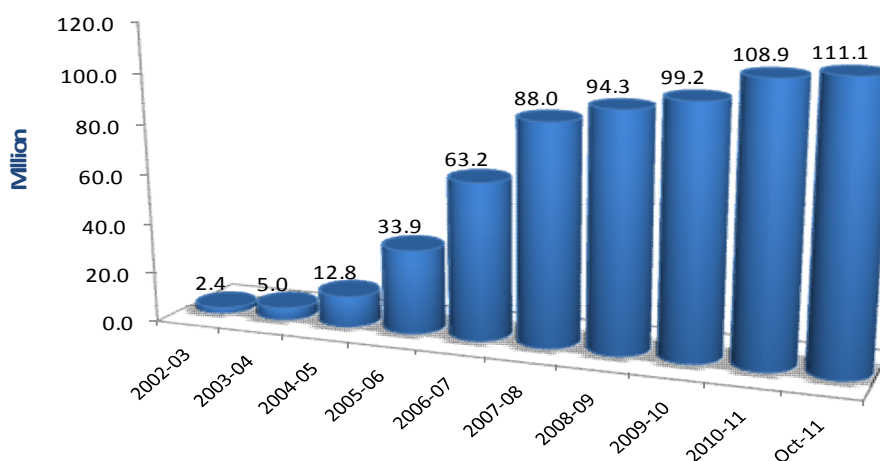


Figure:- Cellular Mobile Subscribers Growth

- 4.9 The market share of five mobile operators in Pakistan mobile market is indicated in the figure given below. Mobilink being the market leader has 32.20% market share, Telenor 24.9%, Ufone 18.7%, Warid 13.9% and CMPak 12.1%.

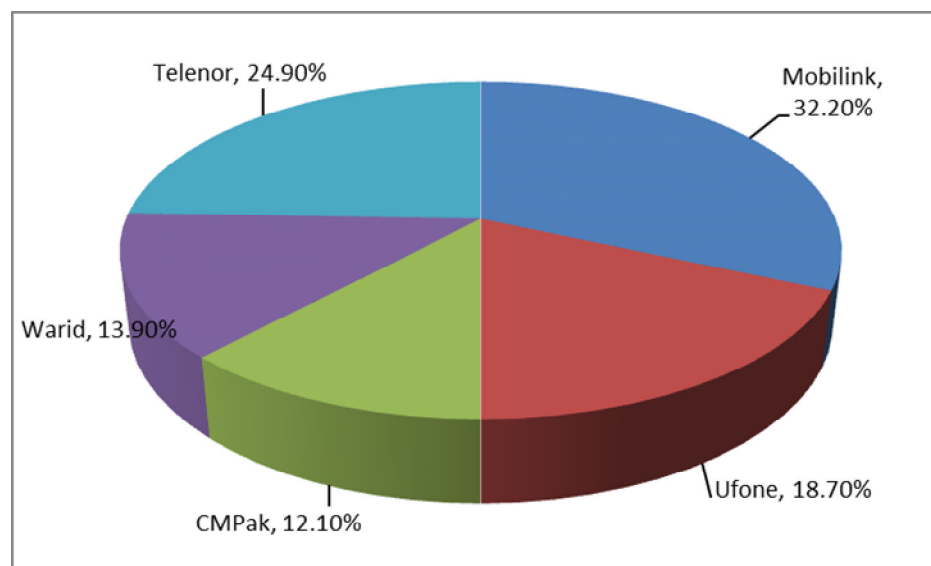


Figure:- Cellular Market Share(2G) (2010-11)

5. LICENSED TELECOMMUNICATION SERVICE PROVIDERS

5.1 MOBILE CELLULAR SERVICE PROVIDERS

The following paragraphs give brief description of the five existing Mobile Cellular Operators.

5.1.1 Pakistan Mobile Communication Limited -PMCL (MOBILINK)

PMCL launched its GSM network in 1994. In June 2003, the company became the largest mobile operator in Pakistan. The company has cell sites covering over 1,400 cities, towns and villages. PMCL operates under the consumer brand 'Mobilink'. In 2010-11, PMCL had a subscriber base of 33.9 Million with 32.2% share of the whole mobile market.

5.1.2 Telenor

Telenor acquired the license for providing GSM services in Pakistan in April 2004, and launched its services commercially in Islamabad, Rawalpindi and Karachi on March 15, 2005. The license terms stipulates

that by year 4 Telenor will cover 70% of Pakistan's 297 administrative Tehsil headquarters. Telenor have fulfilled the license requirements and provide superior quality coverage. Currently, the company has over 28 million subscribers with 24.9% market share. Telenor is providing mobile services in over 750 cities/towns/villages and highways across Pakistan.

5.1.3 **Pakistan Telecommunication Mobile Limited-PTML (UFONE)**

PTML is Pakistan's fourth mobile operator and second GSM operator. It launched services in January 2001 under the Ufone brand. Till the end of year 2010-11, it has over 21 million subscribers and a market share of 18.7%. Pak Telecom Mobile Ltd. is a wholly owned subsidiary of PTCL controlled by Etisalat. The Operator is offering innovative value added services to its consumers.

5.1.4 **Warid Telecom**

Warid Telecom Ltd, is a group company of Abu Dhabi Group, one of the largest groups in the Middle East. It launched its services on 23rd May 2005 in 28 cities across Pakistan in the 1st phase. In 2010-11, its total number of subscribers reached 15.6 million. Currently, the company is providing its services in cities and towns all over Pakistan with market share of 13.9%. Warid Telecom has mainly targeted the population residing in urban areas offering superior quality services in these areas.

5.1.5 **CMPak Ltd (ZONG)**

CMPak Limited, previously known as Paktel was founded in 1990 and claims coverage, network quality, customer services and value added services. It presently offers cellular services all across the country. CMPak is owned and controlled by China Mobile the biggest cellular mobile operator in China. Presently they have over 13.5 Million Subscriber base and having 12.1 % of the total market share.

5.2 **LOCAL LOOP SERVICES**

5.2.1 Pakistan has been divided into 14 telecom regions, a local loop operator have to operate within the telecom region for which the license is awarded. Local Loop operators include both fixed line and Wireless operators and are operating all over the country. So far there are 16 Fixed Local Loop operators who are operating in different areas of the country along with 13 Wireless Local Loop operators in all 14 telecom regions.

5.2.2 In 2010-11 local loop subscribers' base was 5.72 Million which included both fixed and wireless local loop operators. The figure below shows the growth trend and comparison between fixed and wireless local loop subscriber base.

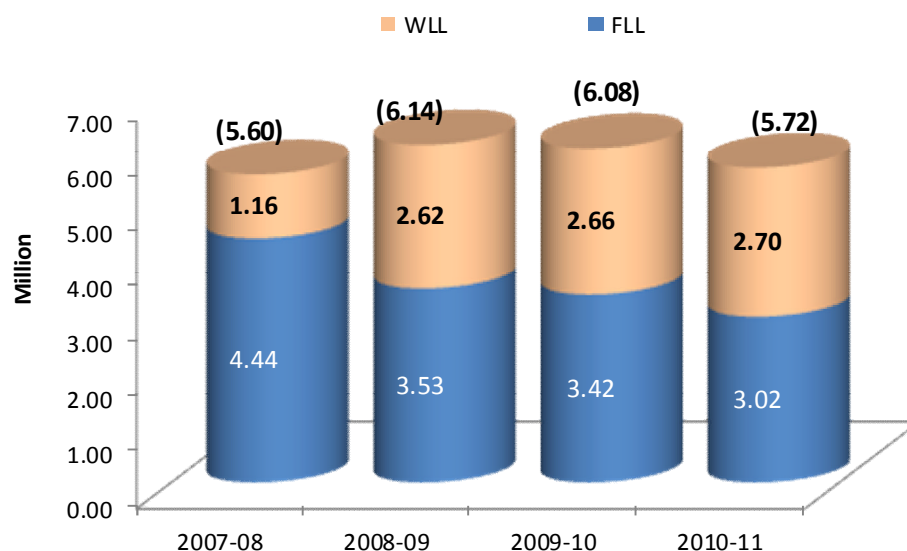


Figure:- Local Loop Subscribers

5.2.3 Currently the 1.9 GHz spectrum is allocated to three 3 WLL Operators (PTCL, Telecard and World Call) which is summarized as below:

Sr. No	Telecom Region	Spectrum in MHz	Spectrum FDD(MHz) / Allocated to No. of operators
1	CTR	1880-1885, 1895-1900/ 1960-1965, 1975-1980	10 MHz/2
2	FTR	1880-1885, 1890-1900/ 1960-1965, 1970-1980	15 MHz/3
3	GTR	1880-1885, 1890-1900/ 1960-1965, 1970-1980	15 MHz/3
4	HTR	-	-
5	ITR	1880-1885, 1890-1900/ 1960-1965, 1970-1980	15 MHz/3
6	KTR	1890-1900/1970-1980	10 MHz/2
7	LTR	1880-1885, 1895-1900/ 1960-1965, 1975-1980	10 MHz/2
8	MTR	1880-1885, 1890-1900/ 1960-1965, 1970-1980	15 MHz/2
9	NTR-I	1880-1885, 1895-1900/ 1960-1965, 1975-1980	10 MHz/2
10	NTR-II	1895-1900/1975-1980	5 MHz/1
11	RTR	1880-1885, 1895-1900/ 1960-1965, 1975-1980	10 MHz/2

12	STR-I	1880-1885, 1890-1900/ 1960-1965, 1970-1980	15 MHz/3
13	STR-V	1880-1885, 1890-1900/ 1960-1965, 1970-1980	15 MHz/3
14	WTR	1890-1900/1970-1980	10 MHz/2

5.2.4 Current allocations of 3.5 GHz spectrum to eleven 11 WLL Operators (PTCL, World Call, Wi-Tribe, Wateen, Sharp, Link Direct, Cybernet, Super Dialogue, Metrotel, DHA and Mytel) which are summarized as under:

Sr. No	Telecom Region	Spectrum in MHz	21 MHz slots in TDD band / Allocated to No. of operators
1	CTR	3436.25 - 3478.25, 3499.25 - 3520.25	84 MHz/4
2	FTR	3415.25 - 3562.25	147 MHz/7
3	GTR	3415.25 - 3499.25, 3520.25 - 3583.25	147 MHz/7
4	HTR	3415.25 - 3541.25	126 MHz/ 6
5	ITR	3415.25 - 3562.25	147 MHz/7
6	KTR	3415.25 - 3562.25	147 MHz/7
7	LTR	3415.25 - 3562.25	147 MHz/7
8	MTR	3415.25 - 3541.25	126 MHz/ 6
9	NTR-I	3415.25 - 3541.25	126 MHz/ 6
10	NTR-II	3415.25 - 3541.25	126 MHz/ 6
11	RTR	3415.25 - 3562.25	147 MHz/7
12	STR-I	3415.25 - 3541.25	126 MHz/ 6
13	STR-V	3415.25 - 3541.25	126 MHz/ 6
14	WTR	3415.25 - 3541.25	126 MHz/ 6

5.3 LONG DISTANCE AND INTERNATIONAL SERVICES

5.3.1 Long Distance & International services companies are an integral part of the telecom sector which are responsible for carrying international traffic from Pakistan to abroad and terminating international traffic in Pakistan. At the time of de-regulation in 2004, a total of 14 LDI licenses were

awarded to various companies, besides PTCL, the incumbent operator. Major players include Link Direct, Wateen, World Call and Telecard. Almost all of the LDI operators are providing LDI services using state-of-the-art networks.

5.4 CLASS VALUE ADDED SERVICES

5.4.1 Class value added service licensing started in 2005-06 which comprises three broad categories for licensing. i.e. Data CVAS, Voice CVAS and CVAS Registration for provision of different services such as Vehicle Tracking System, Payphone Services, Premium Rate Services, Video Conferencing etc. So far, a total of 353 CVAS licenses have been issued to various companies which are operating in different areas across Pakistan.

5.5 INTERNET AND BROADBAND SERVICES

5.5.1 In line with the Federal Government policy of expanding Internet access throughout the country, there is direct digital Internet connectivity in more than 2,389 cities and towns. Customers are able to access internet through legacy dial-up connections as well as DSL services in both fixed and wireless media.

5.5.2 To promote broadband Internet services in Pakistan, PTA directed PTCL to enter into agreements with ISPs for the provision of Digital Subscriber Line (DSL) services. Currently there are seven major players providing broadband facilities in the country both fixed and wireless including PTCL, Micronet, Link Dot Net, WorldCall, Wi-tribe, Qubee and Wateen.

5.5.3 Pakistan's Broadband market has a lot of growth potential as so far the broadband penetration rate is quite low i.e. only 1% but on the other side the growth rate of broadband penetration has been 150% consistently for the last few years which clearly depicts the potential, the market has got. **According to "Point Topics Global Broadband Report for the 4th Quarter 2009" Pakistan stands among the top 10 countries in terms of annual broadband subscription growth.**

5.5.4 The below figure shows the positive growth trend of the broadband subscribers base in Pakistan.

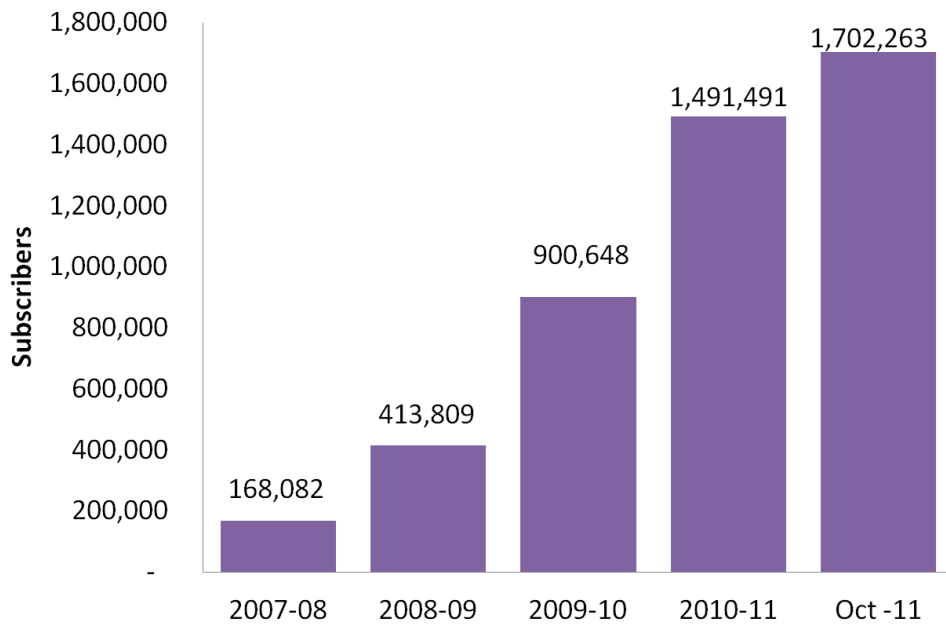


Figure: Broadband Subscribers Growth

PART III – BIDDING PROCEDURE AND AUCTION PROCESS

6. QUALIFICATION PROCESS

- 6.1 Applicants may raise questions and queries in writing through letter, fax or email to PTA concerning this IM following the date of publication of this IM. PTA may not respond to questions and queries received after end date of submission as mentioned in Para 2 of this IM.
- 6.2 Applicants may apply for available block(s) in 1.9 GHz and in 3.5 GHz for those telecom regions for which they hold FLL/WLL/CVAS licenses. If a CVAS licensee applies for a block in more than one designated band(s) in a telecom region, the applicant must submit business plan, financial plan, technical plan and rollout information in respect of each such band. Every applicant must also indicate the bands it is applying for by completing a Radio Frequency Spectrum Request Form given at **Annex I**, and enclose it with its application.
- 6.3 Prospective bidders must submit an EoI/ Application before the last date for submission of EoI/ Application. Prospective bidders are required to submit all documents (as applicable) contained in the Checklist of materials to be submitted with the application at **Annex-F**. PTA will notify the “Qualified Applicants” by courier, letter, fax, or e-mail that the applicant is entitled to participate in the bidding process, subject to the submission of Bid Earnest Money.
- 6.4 The bidding procedure and auction process shall be as follows:
 - 6.4.1 The Bid Earnest Money per block shall be equivalent to 15% of Base Price for respective block in each region and will be deposited by the qualified applicants in PTA’s bank account by the date as mentioned in Para 2 of this IM.. The Bid Earnest Money shall be deposited in equivalent Pak Rupees to be converted at the TT selling rate of National Bank of Pakistan on the day preceding the date of the payment. If the payment of the earnest money to PTA is being remitted from abroad, it should be remitted through SWIFT Telegraphic Transfer in PTA’s collection account number NIDA-11-1 being maintained at National Bank of Pakistan, Jinnah Avenue Branch Code 1628, Blue Area, Islamabad, Pakistan (Swift code NBPAPKKA02I Routing No. 026004721 of National Bank of Pakistan, New York favouring NBP Head Office Karachi A/C No. 005640-4607) under intimation to PTA. If the payment of earnest money is being made from sources in Pakistan, it should be made only

through a Pay Order or Demand Draft or by way of credit in PTA’s collection account No. NIDA-11-1, under intimation to PTA.

6.4.2 PTA after verification of Bid Earnest Money from the National Bank of Pakistan will inform the Qualified Applicants of the acceptance of the same but not later than 48 hours before the Auction Day.

6.4.3 The Bid Earnest Money of the successful bidder(s) will be adjusted towards the Auction Winning Price, while the Bid Earnest Money of the unsuccessful bidders will be returned within thirty (30) working days¹ of the Auction date without bearing any liability towards interest, indexation, inflation or deflation etc.

Note:- Any delays in transfer of funds should be taken up by the applicants and enough margin should be kept to ensure that all amounts are received in PTA’s bank account by the given date.

6.4.4 Only three authorized representatives from each Applicant shall be allowed to participate in the Bidding process.

7. **BASE PRICE**

7.1 The Base Price of each block in a given region for 1.9 GHz and 3.5 GHz spectrum is mentioned below in Table-3 and Table-4 respectively:

7.2 **1.9 GHz Frequency Band**

Sr. No.	Licensed Region	Frequency Band MHz (Uplink/Downlink)	Bandwidth (MHz)	Base Price (Million USD)
1	CTR	As per Table-1	5	2.7596
2	FTR		5	9.6930
3	GTR		5	6.7281
4	HTR		5	2.3035
5	ITR		5	6.6140
6	KTR		5	27.4596
7	LTR		5	8.0509
8	MTR		5	6.5228
9	NTR-I		5	3.6856
10	NTR-II		5	1.5144
11	RTR		5	4.5386
12	STR-I		5	3.0561
13	STR-V		5	1.8018

¹ “Working Days” means Monday to Friday, excluding public holidays.

14	WTR		5	1.3684
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Table-3 1.9 GHz Spectrum with Base Price

7.3 **3.5 GHz Frequency Band**

Sr. No	Licensed Region	Frequency Band MHz (Uplink/Downlink)	Bandwidth (MHz)	Base Price (Million USD)
1	CTR	As per Table-2	22	0.25
			22	0.25
			21	0.24
			21	0.24
2	FTR		23	1.75
3	GTR		23	0.25
4	HTR		22	0.25
			22	0.25
5	ITR		23	3
6	KTR		23	16
7	LTR		23	4
8	MTR		22	0.25
			22	0.25
9	NTR-I		22	1.25
		22	1.25	
10	NTR-II	22	0.2	
		22	0.2	
11	RTR	23	0.25	
12	STR-I	22	0.25	
		22	0.25	
13	STR-V	22	0.25	
		22	0.25	
14	WTR	22	0.25	
		22	0.25	

Table-4 3.5 GHz Spectrum with Base Price

7.4 The bidding for each frequency block will be made above the Base Price in line with Para 8.1.5 below.

7.5 In case the number of qualified bidders, who appears on the Auction Date, is equal to the number of frequency blocks offered for bidding in a given region, the matter will be decided by the Bidding Committee accordingly.

8. SIMULTANEOUS MULTIPLE ROUNDS AUCTION (SMRA)-OPEN OUT-CRY

- 8.1 The following procedure shall be followed for bidding:
- 8.1.1 Each bidder will be issued a card to identify himself.
 - 8.1.2 The auction shall be based on SMRA through open outcry on the date, venue and the time as announced by Bidding Committee.
 - 8.1.3 The bidder shall cry-out his bid and write it on the prescribed form duly signed by the Authorized Representative and hand it over to the Bidding Committee. The bid form is placed at **Annex 'H'** to this IM. The Authorized Representative of a Bidder shall not be allowed to participate in any activity on behalf of any other Bidder during the Auction process.
 - 8.1.4 Bidding Committee will be announced prior to start of the auction and shall continue the auction until there are no further Bids for all frequency blocks in all regions. The time duration for each round will be 30 minutes. Each bidder shall be granted a time out of ten minutes each on request only twice during the entire auction process.
 - 8.1.5 The bidding amount will be quoted on per annum basis. Each successive bid(s) shall have to be more than the already quoted bid. Each subsequent bid increment shall be in multiple of US\$ 5,000(US Dollars Five Thousand only) with a minimum bid limit of US\$ 5,000 and maximum bid limit of US\$ 30,000.
 - 8.1.6 Bidders can bid for any/all block(s) in any/all telecom region(s) simultaneously as summarized in **Annex 'J'**, against which they have submitted the Bid Earnest Money. A Bidder will not be allowed to bid twice for the same block in a given region in any one round. After each round, bid amount will be announced and the highest bidder's details will be recorded (Manually/Electronically) before the next round. The next round will start after five minutes of displaying the highest bid amounts.
 - 8.1.7 The Bidding Committee shall continue the simultaneous open outcry auction for 1.9 GHz spectrum and 3.5 GHz in 14 telecom regions in multiple rounds, until a round in which there is no further Bid for 10 minutes, excluding time out, for all frequency blocks in all regions. The bidders are encouraged to actively participate during the auction process, however a Bidder can submit his bid till the last round, when the auction

process ends, even if he has not submitted a single bid in any of the earlier rounds.

- 8.1.8 When there are no further Bids, the Bidding Committee shall announce the Auction Winning Price, the name of the successful bidder and the spectrum along with telecom region with the fall of hammer as well as the order of all other bidders. After the announcement of the successful bidder, no further offers to obtain the spectrum shall be entertained.
- 8.1.9 Successful Bidder shall deposit in PTA designated bank account, 50% of the Auction Winning Price after adjustment of the Bid Earnest Money within thirty (30) working days from the date of the issuance of written request to Successful Bidder by PTA, failing which the Bid Earnest Money of defaulting bidder shall stand forfeited. The remaining 50% of the Auction Winning Price shall be deposited in ten equal instalments over the next ten years. In case of WLL/FLL licensee, the charges of FLL & WLL will be adjusted as per the remaining period. The Successful Bidder shall deliver to PTA an irrevocable and continuing Bank Guarantee acceptable to PTA, from AAA rated bank, for an amount of 50% of Auction Winning Price in US Dollars as a continuing guarantee for payment of annual instalments before allocation of spectrum.
- 8.1.10 If the Successful Bidder fails to make the payments as referred above within the stipulated time, the next highest bidder(s) in order of their bid(s) will be offered the Spectrum on the same Auction Winning Price and on the same terms and conditions subject to submission of written undertaking and Bid Earnest Money. If no Bidder is found ready to match the Auction Winning Price, the Bidding session will be closed without awarding that Spectrum.
- 8.1.11 PTA shall forfeit the Bid Earnest Money and all other amounts received from the defaulting bidder(s), as provided above.
- 8.1.12 The license/spectrum shall only be issued after payment of 50% of the Auction Winning Price within 30 working days from the Auction Date.

9. DISQUALIFICATION

- 9.1 Without prejudice to any other remedy that may be available to it, PTA reserves the right, on the recommendation of the Bidding Committee, to disqualify any Bidder and forfeit its money for any of the reasons set out below:

- 9.1.1 If a Successful Bidder abandons the bid or fails to pay 50 % of the Auction Winning Price within thirty (30) working days.
- 9.1.2 Inaccuracy or misrepresentation of any facts in any part of the EoI.
- 9.1.3 Illegal conduct, disruption during the auction, or indulgence in improper attempts to influence the outcome, or delay the process.
- 9.1.4 Any “corrupt practice” meaning the offering, giving, receiving or soliciting of anything of value to influence a public official in relation to auction process.
- 9.1.5 Any fraudulent practice or misrepresentation of facts in order to influence the results of the auction process established by the IM.

10. INFORMATION PROVIDED BY THE AUTHORITY

- 10.1 The information contained in this IM and any other information provided to Applicants during the Application process, in writing, is intended to assist Bidders in preparation of their Bids and shall be binding on them in the course of bidding.
- 10.2 PTA has made, and will continue to make, reasonable efforts to include accurate and current information in the IM and in any other documents provided to Applicants. However, neither PTA nor any of its agencies, employees, representatives, advisors or consultants shall have any liability whatsoever to any Applicant or any of its shareholders or members or any other person resulting from use of or reliance on any of the information so provided. Applicants are advised to undertake their own verification of any information supplied by PTA prior to use of or reliance on that information.

11. OTHER COMMUNICATIONS

- 11.1 All deliveries, notices or other communications made to Applicants in connection with the Application process shall be sent by designated fax or email or letter (courier) to the contact office of the bidder(s)/Applicant(s), as specified by the Applicant to PTA in his EOI.
- 11.2 All deliveries, notices or other communications made by Applicants to PTA in connection with the Application process shall be sent by fax, E-mail or letter (courier) to the officer mentioned in Para 2.3 of the IM.

12. CONFIDENTIALITY OF APPLICATIONS

12.1 PTA shall make all reasonable efforts to ensure confidentiality of the information provided by the Applicants. However, neither PTA nor any of its agencies, employees, representatives, advisors or consultants shall be liable in any respect whatsoever to any Applicant or any of its members or representatives for damages or harm resulting from a failure to maintain such confidentiality.

13. COSTS ASSOCIATED WITH BID AND BIDDING

13.1 The Bidders shall bear all their costs associated with the preparation and submission of their Bids and PTA shall in no case be responsible for these or any other costs, regardless of the conduct or outcome of the application process.

14. RESERVATION OF RIGHTS

14.1 PTA reserves the right, in its sole discretion, to take any action, including amendment in this IM, which it considers necessary to ensure that the Auction process is carried out in a fair, open and transparent manner, in accordance with law and to discourage collusion and predatory bidding that may block the entry of potential bidders into the bidding process.

14.2 PTA further reserves the right to modify or terminate the Auction process at any time in its sole discretion. In such an event Bid Earnest Money would be returned to the Bidder within thirty (30) working days without bearing any liability.

15. OWNERSHIP DISCLOSURE REQUIREMENT

15.1 All bidders must disclose their ownership information in a separate sheet. No two bidders shall have any common directorship on their respective boards.

16. CHANGES IN COMPOSITION OF BIDDERS

16.1 Any change in the composition of a bidder is not allowed following submission of Application and Expression of Interest and at least up to the date that the Spectrum is awarded. New members are also not allowed to join bidder after the date of Application.

17. CONFIDENTIAL INFORMATION

17.1 The bidders are not allowed to provide in any way confidential information

relevant to their bids to another bidder. In case of such evidence, PTA reserves the right to exclude such bidders from the Auction process.

18. COLLUSION

18.1 All bidders are warned not to indulge in collusion. In case there is any evidence of collusion, PTA reserves the right to disqualify that bidder from the Auction process.

19. MISCELLANEOUS

19.1 This IM and any Spectrum issued pursuant to the Auction process announced herein shall be exclusively subject to, and interpreted in accordance with provisions of the Pakistan Telecommunication (Re-Organization) Act, 1996, and the Rules and Regulations issued there under.

19.2 Any dispute, controversy or claim arising out of, or in connection with, this IM, or the breach, termination or invalidity thereof, shall be settled by PTA and its decision shall be final and binding.

19.3 The Auction process, the accompanying documents, and all correspondence relating to the Auction process announced in this IM shall be submitted in English language.

19.4 PTA at all times shall reserve the right to change, alter, modify, amend, supplement or replace any or all of the Auction process before the Auction Date and such change, alteration, modification, amendment, supplemental or replacement shall be communicated to the Bidders and become an integral part of the Auction process.

19.5 No suit, prosecution or any other legal proceedings shall lie against PTA or any member or employee of PTA in respect of anything done or intended to be done by PTA in good faith in connection with this IM.

20. DISCLAIMER

20.1 Questions or requests for clarification on the contents of this IM may be raised. PTA reserves the right not to reply to questions. However, to the extent that it does, it will publish/reply the question and the answer in written or at the PTA website www.pta.gov.pk, unless confidentiality has been requested. The identity of those asking the questions will not be published without the questioner's permission.



De-Regulation Policy for the Telecommunication Sector

July 2003

**Ministry of Information Technology
IT & Telecommunication Division
Government of Pakistan
www.moitt.gov.pk**

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Telecommunication De-Regulation Policy

1. Economic Landscape:

- 1.1 Located in South Asia, Pakistan is one of the major regional economies and among the 10 most populous countries in the world with a population base of 146 million. The country is nearly four times the size of United Kingdom, and has India, Afghanistan, Iran and China as its neighbours. The economy of Pakistan is primarily driven by agriculture, which accounts for the largest share of GDP, contributing about 25% to the economy. Pakistan is one of the world's largest producers of raw cotton, which serves as the input to drive the textile industry - the mainstay of industrial activity in Pakistan. Pakistan's per capita income per annum is about US \$ 492.
- 1.2 The Government is committed to revitalizing the economy and to demonstrate its commitment to business friendliness through internationally acknowledged fiscal policies, good governance and transparency in managing Government affairs.
- 1.3 Telecommunication de-regulation policy ("Policy") has been prepared in line with Government's objective to de-regulate and liberalize various sectors of the economy. The Policy applies to opening up of the fixed-line telecommunication sector. The exclusive rights of Pakistan Telecommunication Company Limited ("PTCL") to provide basic telephone services (local, long distance, international and leased line services), which it enjoyed under The Pakistan Telecommunication (Re-Organization) Act 1996 ("Telecom Act 1996"), have expired since 31st December 2002.

2. Telecommunication Sector of Pakistan in 2003

Pakistan has made steady progress in expanding telecommunication networks and services in recent years. Key features of the present telecommunication infrastructure in Pakistan are:

2.1 Pakistan Telecommunication Company Limited ("PTCL")

- 2.1.1 PTCL is the incumbent service provider for provision of fixed line telecommunications. Established as public limited company in 1996, PTCL is 88% owned by the Government of Pakistan. It has shown impressive growth in the past 5 years and manages a well-developed domestic telecommunication infrastructure of 4.85 million access lines (June 2003), nationwide fibre-optic backbone and international communication through sub-marine cable (SMW3) and satellite links.

-
- 2.1.2 PTCL has installed more than 1.5 million new telephone lines since June 1997. As a result, teledensity (defined as the number of operational telephone lines as a percentage of population), at about 2.7%, has increased by 6% per year.
 - 2.1.3 The telecommunication network is almost entirely digital.
 - 2.1.4 As a result of tariff rebalancing program initiated by the Government in 1997, the prices of long distance and international calls have been significantly reduced in recent years.

2.2 National Telecommunication Corporation (“NTC”)

- 2.2.1 National Telecommunication Corporation was formed in 1996 in order to meet telecommunication requirements of Government and Defence Forces. It has nationwide presence with a network of 72,000 customer access lines and nationwide fibre-optic backbone infrastructure.

2.3 Special Communications Organization (“SCO”)

- 2.3.1 The Government created SCO in 1976 and gave it the task of installing and maintaining telecommunication facilities in the entire Azad Jammu and Kashmir and Northern Areas. SCO operates a network of 60,000 lines in its territory.

2.4 Cellular Mobile Telephony

- 2.4.1 Cellular usage is growing strongly after the introduction of Calling Party Pays (“CPP”) regime in the year 2000. Currently, four operators (2 GSM, 1 D-AMPS, 1 AMPS) provide service to over 2.2 million cellular subscribers all over the country. The number of subscribers has more than tripled in the past two years.

2.5 Internet Services

- 2.5.1 More than 70 active Internet service providers provide Internet access, which is accessible in more than 1400 cities and towns. Low Internet access charges have encouraged Internet usage and acceptance by the Pakistani public. Internet services are accessible at a cost of unit local call without discrimination of distance, in most parts of the country. Low-priced data communication services are available to companies in the information and communications technology sector in order to encourage these companies to establish and grow in Pakistan.

2.6 Role of Other Private Sector Operators

2.6.1 Private sector operators have played a very important role in developing the value added services market in Pakistan. Their key achievement is installation of over one hundred and twenty thousand pay phones and public call offices in addition to operations of value added services, premium rate calling systems and so forth. Some private sector service providers have deployed fibre optic infrastructure in main cities to provide Cable TV and Internet services. In addition, PTCL has entered into O&M contracts with private sector partners to offer services such as Wireless Local Loop (WLL) pay phones, DSL based Internet access, pre-paid calling cards, International voice termination using VoIP technology. Companies in the Information Technology business can set up satellite based direct international connectivity for call centers / IT services under franchise agreement with PTCL.

2.7 Regulatory Perspective

2.7.1 Efforts to develop a fully competitive market in telecom sector were initiated in the early 90's. The Pakistan Telecommunication (Re-organization) Act was promulgated in 1996. Pakistan Telecommunication Authority ("PTA") – the industry regulator, was established to regulate the telecom industry. PTA is a fully functional organization and has played a key role in developing private sector's role in telecommunication services.

2.7.2 Frequency Allocation Board ("FAB") is an independent organization entrusted with the responsibility of allocating and assigning frequency spectrum to Government, telecom system / service providers, broadcasting operators and private users of wireless systems. It operates within the provisions of Telecom Act of 1996 and the guidelines / recommendations laid down by International Telecom Union (ITU).

3. Policy Objectives

The policy is designed to achieve the following objectives:

- a. Increase service choice for customers of telecommunication services at competitive and affordable rates
- b. Promote infrastructure development, especially infrastructure that will increase teledensity and the spread of telecommunication services in all market segments (including voice, data and cellular etc)
- c. Increase private investment in the telecommunication sector and encourage local telecom manufacturing / service industry
- d. Recognizing the challenge to incumbent, minimize exposure to the Government's revenue base in the short term

-
- e. Accelerate expansion of telecommunication infrastructure to extend telecommunication services to un-served and under-served areas
 - f. Liberalize the telecommunication sector by encouraging fair competition amongst service providers
 - g. Maintain an effective and well defined regulatory regime that is consistent with international best practices, and;
 - h. Maintain consistency with Pakistan's IT and Internet promotion policy of low prices for bandwidth to make Internet access affordable.
 - i. Safeguard Pakistan's national and security interests

4. Number and Type of Fixed Line Telecommunication Service Licenses

1. It is proposed that there will be two types of licenses for fixed line operators:
 - Local loop ("LL") fixed line telecommunication within a PTCL region
 - Long-distance and international ("LDI") fixed line telecommunication

2. Local Loop Licensing:

Entry to Local Loop market will be unrestricted and open. Any person who requests for a license, and meets the licensing requirements, will be eligible to get a license on payment of the prescribed fee which will be set at the Pak rupee equivalent of **US\$ 10,000** for a LL license.

3. LDI Licensing:

Entry to LDI market will be unrestricted and open. Any person who requests for a license, and meets the licensing requirements, will be eligible for a license on payment of prescribed fee, which will be set at the Pak Rupee equivalent of **US\$ 500,000**. In order to ensure that only serious players enter the market under this regime, stringent requirements of technical and financial capabilities, experience and rollout will be incorporated in the licensing documents. The decision of award of license will be preceded by an open, public hearing process.

4. A company can hold both (LL / LDI) types of licenses.
5. Existing licensees of telecommunication services in Pakistan would be permitted to retain their current licenses or O&M agreements with PTCL. They may compete for a new Long Distance International or seek a Local Loop license.
6. Tariffs of both types of licensees (LL / LDI) will not be regulated by PTA until they attain SMP status. However, PTA has the right to regulate tariffs in case of evidence of unfair and burdensome pricing to consumers.

4.1 Rights of the Licensees

- 4.1.1 Licensees will have the right to contract for the “Right of Way” (RoW) they need to construct their networks, subject to conditions laid down by the concerned agencies.
- 4.1.2 Entities (for example, those in the power, gas, water and rail transport sectors) besides PTCL, with suitable land holdings, will be encouraged to provide access to Rights of Way, subject to availability, on non-exclusive basis.
- 4.1.3 LDI licensees will have the right to non-geographic numbering ranges, and will also be allocated short codes for operator services. They will also be issued a four digit Access Code of the type “XXXX”, to allow Indirect Access (call-by-call carrier selection) by incumbent’s customers.
- 4.1.4 LDI licensees will have the right to sub-lease half-circuit capacity on the SEA-ME-WE-3 submarine cable system on non-discriminatory prices under commercial arrangements. In the event of capacity shortage on the system, PTCL shall allocate a minimum proportion of the total capacity employed for voice circuits to new entrants.
- 4.1.5 LDI licensees will have the right to participate in, and obtain IRUs (Indefeasible Rights of Use) from submarine cable consortia and the right to install earth stations. They will have the right to co-locate in PTCL’s international exchange buildings, and backhaul to and from them using their own fibre and / or own radio spectrum, where practicable. Licensees will have the right to participate in future landing points for new submarine cables. Access by licensees to PTCL’s satellite earth stations will be on commercially negotiated terms between PTCL and the licensees, subject to PTA monitoring.
- 4.1.6 LL licensees will have the right to geographic and non-geographic numbers, as well as short codes (for example, for operator services). PTA will be the number issuing authority. PTA will organise and manage numbering in order to ensure contiguous numbering for new entrants, wherever practicable. PTA will set a nominal charge for numbering to discourage misuse, and a procedure for taking back numbering ranges not used within a reasonable period of time.
- 4.1.7 LL licensees will have the right and, be exempted from the requirement to offer Indirect Access (carrier selection) to their subscribers, until such time as they enjoy Significant Market Power (SMP) as determined by PTA.

-
- 4.1.8 Both types of licensees will have the right to co-locate in PTCL local and transit exchange buildings, and to connect their own fibre and own radio links to PTCL buildings.
 - 4.1.9 There will be no obligation on licensees to open ducts, poles or other such facilities to competitors until they enjoy Significant Market Power.
 - 4.1.10 LL licensees who opt for wireless solutions may provide limited mobility within a cell, but not beyond local call charging radius. No inter-cell handovers and roaming to other networks will be allowed.

4.2 Obligations of the New Licensees for Fixed Line Telecommunications

4.2.1 LDI Licensees

LDI licensees will have the following key obligations:

- a. Start roll-out by building at least one Point of Interconnect in five of PTCL regions within one year of award of license and in all thirteen PTCL regions within 3 years.
- b. The licensees will be permitted to lease infrastructure from PTCL or any other infrastructure owner on mutually agreed commercial terms, non-discriminatory to other licensees seeking the same facility. The licensee must own a proportion of the transmission system and cables comprising its network. The proportion will be 10% in year 1, rising to 30% in year 2 and 50% in year 3 measured in 2 Mbit/s x km. A long-term lease of 5 years or more will be acceptable in lieu of ownership. The licensee will provide a performance bond of **US \$ 10 million** in respect of infrastructure and roll-out targets in the form and substance acceptable to the Government and provide incoming and outgoing interconnection services, both for voice and data traffic, to all who may request it.

4.2.2 LL Licensees

LL licensees will have the following key obligations:

- a) Start operations with building and operating one Point of Interconnect within the prescribed period and in each licensed PTCL Region where they operate (*“Points of Interconnect” are premises at which other licensed operators can send to or receive from the LL licensee voice or data traffic originated by or destined for the LL licensee’s customers*) at acceptable technical and quality standards.

-
- b) In the event that another licensee considers that an LL licensee's termination prices are inappropriate, PTA has the power to resolve the dispute and impose cost-based prices.
 - c) Provide free of cost directory assistance services to its own customers, access to emergency services, operator assistance and any other similar support services as required by PTA.
 - d) LL licensees will not be permitted to carry voice calls between PTCL Regions (other than metro regions) or long distance / international traffic. They may carry voice calls between municipalities, but only within a single region.

4.2.3 Both Licensees

- 4.2.3.1 Both types of licensees will be required to provide regular reports to PTA on quality and network implementation. These will include, but will not be limited to, the number of voice lines and revenues from line rentals. They will also provide details of revenues and minutes from local, long-distance and outgoing / incoming international calls separately. LL licensees will file separate reports for each PTCL region in which they operate.
- 4.2.3.2 Both types of licensees will be penalised for failing to (a) meet license obligations, (b) make use of allocated radio spectrum. If no roll-out is made within eighteen months of grant of license, it may result in cancellation of license and / or withdrawal of allocated radio spectrum. In addition, the licensees may be obliged to provide all services as may be mandated to achieve defined policy objectives.
- 4.2.3.3 Both licensees shall meet the requirements of authorized security agencies for interception of calls and messages as detailed in the Telecom Act 1996. Further, the Government of Pakistan would have the right to cancel any license to safeguard national security interests.
- 4.2.3.4 Licensees will pay to PTA a fixed annual fee, approved by the Government, to reasonably cover the cost of regulation. The annual fee shall not exceed 0.5% of last year's gross revenue minus inter-operator and related PTA / FAB mandated payments.
- 4.2.3.5 Licensees will devote 1% of gross revenue minus inter-operator and related PTA / FAB mandated payments to Research and Development Fund.

4.2.3.6 The Government believes that the success of market liberalization depends on the development of a fair competitive environment for all licensees. In this regard, PTCL and other SMP licensees that may emerge, shall be prohibited from abusing their dominant positions through anti-competitive conduct. At present, PTCL's license contains prohibitions against anti-competitive conduct. These prohibitions shall be updated, incorporated in the Rules and made applicable to all such licensees that are determined by the PTA to possess SMP.

4.2.3.7 PTA shall have the responsibility of promptly investigating allegations of anti-competitive conduct and taking remedial measures against such conduct.

4.3 Access Promotion Contribution

4.3.1 At present, net incoming international traffic generates a financial premium over the cost of conveying and terminating the traffic into Pakistan. Although historically this premium has been large, it has been steadily reducing, in-line with global trends.

4.3.2 As long as the premium continues to exist, a reasonable portion of the premium is proposed to be used to promote infrastructure expansion. The portion of the premium applied to promoting infrastructure expansion is referred to as the "Access Promotion Contribution" ("APC").

4.3.3 The design and implementation of APC program will be guided by the following principles:

- a) The APC shall be used to foster new infrastructure development to increase teledensity.
- b) The distribution of funds between LDI and LL licensees shall be done in a transparent and non-discriminatory manner.
- c) The APC program shall be under the regulatory supervision of PTA, which shall also regulate international traffic agreements.
- d) For the period leading upto policy review, the LDI licensees would be permitted to retain a fixed share (upto 6 US cents per minute) of termination charge paid by international carriers for termination of international incoming calls. The remaining amount called "Access Promotion Contribution" (APC) will be passed on to local loop licensees

to encourage them to foster new infrastructure development and increase tele-density. In case of windfall profits (profits not in-line with telecom industry profitability trends) accruing to LDI licensees for factors not attributable to their efficient performance, PTA would have the right to intervene, in public interest, following a fair, transparent and open public process. After the policy review period, the sharing of revenues from incoming international calls, between LDI / LL licensees would be determined through a formula to be specified by PTA. The APC derived from the formula would be reviewed and notified atleast once every six months. Long Run Incremental Cost (“LRIC”) based transmission / termination charges would form the basis of such formula.

- 4.3.4 The APC shall not be available to cellular operators. Premium of APC on current cellular termination rates would be mopped up and diverted to Universal Service Fund, with effect from a future date to be notified by the Government.
- 4.3.5 No LL licensee may claim APC payments without first actually delivering the telephone calls to the customer premises in respect of which it is claiming APC payment.
- 4.3.6 In order to secure the effective collection of APC, negotiations of bilateral accounting rates will be supervised by PTA, although it is expected that PTCL will lead the consortium of LDIs who would undertake negotiations on bilateral accounting rates with foreign carriers. The principle of “one country one rate” will be implemented. It will also be ensured that symmetry between incoming and outgoing international termination rates between carriers is maintained. All licensees will be obliged to file reports on the volumes, sources and destinations of international incoming minutes, and allow PTA to audit their call detail records and billing systems with the objective of detecting and eliminating fraud. The LDI licensees will also be obliged to provide real time, on-line traffic information for monitoring and mirroring of international traffic data, for PTA.

4.4 Radio Spectrum

- 4.4.1 Radio spectrum is a valuable public resource belonging to the State and must be used in the public interest. The FAB is responsible for properly managing radio spectrum.
- 4.4.2 Wherever possible and consistent with good spectrum management practices, licensees shall be required to share spectrum with other licensees.
- 4.4.3 Licensees shall relinquish rights to spectrum that is no longer needed for their operations, and allow sharing of the bands they currently occupy where such

sharing is technically feasible, and subject to management by FAB of frequency re-use in the band in accordance with best international practices. Un-used spectrum allocated for operations of LL / LDI licensees may be withdrawn if the licensees fail to begin operations within eighteen months of award of radio spectrum. The Licensees may not assign, lease or sell the rights of use of spectrum allocated to them in the first place.

- 4.4.4 All entities using spectrum shall be charged a fee for spectrum. The fee will be approved by the Government of Pakistan and recovered by Frequency Allocation Board from users of frequency spectrum. The factors to be considered in setting fees shall include but not limited to coverage, scarcity and value of the spectrum. The spectrum will be allocated for a definite time.
- 4.4.5 Where demand exceeds available frequency spectrum, it shall be allocated by auction or other transparent, non-discriminatory, open and competitive process.
- 4.4.6 Pakistan plans to follow ITU specified radio frequency bands specific for the purpose of operations of WLL, point to point microwave and backbone / transmission services.
- 4.4.7 Information about available radio spectrum for telecommunication services would be placed in the public domain for the prospective users to apply for allocation on nation-wide or regional basis.
- 4.4.8 The FAB shall deal with the requests for radio spectrum, within the framework of Telecom Act 1996 and Rules thereunder, and process applications within a target of 30 days. FAB will streamline and proactively coordinate the process of site clearance for licensees who have been allocated frequency spectrum, to expedite rollout of wireless based networks.
- 4.4.9 LDI licensees will be entitled to radio spectrum (where available) for point-to-point / and backbone links, within the parameters of their licenses, on payment of spectrum charges.
- 4.4.10 LL licensees will be entitled to radio spectrum for WLL systems, and also spectrum for point-to-point links, where available, and on payment of spectrum charges.
- 4.4.11 LL and LDI licensees that receive spectrum shall meet defined usage milestones, failing which they must relinquish their rights to use the assigned spectrum.

4.5 Interconnection

-
- 4.5.1 Both types of licensees will have the right to interconnection, leased lines and co-location facilities from the incumbents. Pricing of the incumbent services will be determined in accordance with the notified Rules, and subject to monitoring by PTA.
 - 4.5.2 Pending the development by PTCL of unbundled cost accounts of services that are approved by PTA, incumbent's interconnection prices shall be based on international benchmarks.
 - 4.5.3 The initial interconnection prices will be notified by PTA by October 2003. Lead times for provision of interconnect facilities to new-entrants by PTCL (inter-alia) shall be set out in a "Reference Interconnect Offer" to be made available by PTA, and will be in accordance with international benchmarks.

4.6 Obligations on PTCL

- 4.6.1 In order to facilitate market liberalization, PTCL, within a stipulated time frame, is obliged to:
 - a) Prepare all transit and tandem switches for interconnection. Implement within six months after policy approval, all needed upgrades in the transit switches to the capacity orders submitted by new entrants. PTCL shall not be required to implement upgrades in respect of orders not accompanied by pre-payment of 3 months port cost. PTCL shall pay needed penalties in case of delay in providing ordered PoIs, to be determined by PTA.
 - b) Prepare 50% (measured by lines in service) of local Main Switching Units ("MSU") for interconnection within one year. The remainder to be done in two equal stages within the subsequent two years.
 - c) Enable subscriber lines on all digital local switches to perform Indirect Access (call-by-call carrier selection) for 22 digit numbers within one year.
 - d) Enable all subscriber lines to perform Indirect Access
 - e) Enable all subscriber lines to perform carrier pre-selection
- 4.6.2 PTCL shall upgrade all local switch software to allow automatic insertion of Access Code before the numbers dialed by customers of LDI licensees (carrier pre-selection).

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- 4.6.3 PTCL shall publish cost-based price for restoration, in the event of fault on the non-self-healing cable, to the same availability standards as it currently enjoys.
- 4.6.4 Unbundling of service and cost accounting information should be done based on the principles of transparency, orientation, and allocation based on activities and related cost drivers. They shall be sufficiently detailed to allow clear identification of (a) activities related to interconnection - covering both interconnection services provided internally and interconnection services provided to others; and (b) other activities, so as to identify all elements of costs and revenues. Details of the basis of their calculations and the allocation methods used shall be provided, including an itemized breakdown of fixed assets and structural costs. Sufficient records must be kept to allow independent audit of these cost accounts.
- 4.6.5 PTA will issue a “Reference Interconnection Offer” (RIO) to be used as the default interconnection offer for interconnection with PTCL pending determination of LRIC based pricing. PTCL can implement amendments to the interim RIO, subject to the prior approval of PTA.
- 4.6.6 PTCL shall continue to be obliged, until end 2008, to install exchanges and lines in rural / under-served areas at the same annual average rate as it achieved during the exclusivity period, and in any case no fewer than 83,000 new lines per annum. PTA will verify this on year-by-year basis.
- 4.6.7 Wherever PTCL faces competition and when the competitors price their services below the PTCL regulated rate, PTCL will be at liberty to offer discount in the region / area concerned to meet the challenges of competition.

4.7 Pricing Regime

- 4.7.1 PTA will continue to regulate PTCL’s rates and services in the public interest, as per the notified Rules. As the market for particular services become effectively competitive, PTA shall reduce the regulatory burden on PTCL in respect of such services, while maintaining appropriate anti-competitive safeguards.
- 4.7.2 PTA will prepare detailed pricing framework for new fixed-line telephony licensees. PTA will also have the power to determine as to which of the licensees hold Significant Market Power (SMP). Licensees who are not SMPs will not be subjected to any tariff regulations. It may be noted that competitive telecom market may result in differential regional prices as against current uniform rates for various fixed-line services across the country.

4.7.3 Further, as already stated, under the APC regime, a significant portion of settlement rates for international traffic will be transferred to Local Loop licensees.

5. Universal Service

- 5.1 The Government has designed the market liberalization policy to maximize the commercial availability and coverage of telecommunication networks and services in Pakistan. The Government recognizes, however, that even with market liberalization, and under strict commercial considerations, there may exist certain populations or geographic areas that would remain un-served or relatively underserved. The Government's Universal Service policy is designed to ensure that these designated populations and geographic areas receive adequate service in a sustainable manner as resources permit.
- 5.2 The PTA is required under section 4(e) of the Telecom Act 1996 to "promote the availability of wide range of high quality, efficient, effective and competitive telecommunication services throughout Pakistan". In furtherance of the policy objective, the Government intends to amend the Telecom Act 1996 and Rules, as appropriate, to establish a Universal Service Fund ("USF").
- 5.3 The main financing mechanism to promote Universal Service in Pakistan will be the USF. The precise form and working of USF including USF rules will be determined by PTA with the approval of the Government.
- 5.4 The USF policy framework will be prepared and approved by the Federal Government. Once approved, it will be administered by PTA/Government. It shall include collection of the funds, within specified policy framework, from the licensees and disbursement within approved USF framework. The amounts and usage of the USF will be made public, and shall be subject to independent audit.
- 5.5 The USF will be used to finance the expansion of basic services (including access to the Internet), both on individual and community basis. Under USF rules, there will be a determination about the level and types of services to be financed by the USF, the designated populations or geographic areas eligible to receive subsidized services from the USF, and the level of available financing and actual subsidies.
- 5.6 Disbursement of USF funds shall be made through a transparent, non-discriminatory and competitive process.
- 5.7 The USF will be predominantly financed by revenues collected from all telecommunication licensees through a Universal Service Fund charge (the "USF Charge"). Premium of APC on current cellular termination rates would be mopped up

and diverted to USF with effect from a future date to be notified by the Government. The USF may also receive contributions from the Government, and also funding from international or bilateral development agencies.

- 5.8 The USF Charge shall be paid by all licensees, licensed to provide basic telecommunication services, except those subject to roll-out obligations in lieu thereof. USF charge will be levied on new basic telecommunication services licensees after completion of first full year of operations and audit of operational results.
- 5.9 The USF Charge will be limited to a maximum of 1.5% of gross revenue minus inter-operator and related PTA / FAB mandated payments as determined by the Government.

6. Grant of Licenses

- 6.1 PTA shall prepare the requisite applications, license templates, information package and other necessary measures with the approval of Government to facilitate the licensing process. Issuance of licenses will commence as soon as possible after the approval of this Policy.

7. Cellular Mobile Operators

- 7.1 The Government recognizes that mobile cellular operators have an important role to play in sector development and improving access to telecommunication networks in Pakistan. There is evidence that some customers in Pakistan already rely on mobile cellular phones as an alternative to fixed line telephones. Moreover, the experiences in other developing countries show that mobile cellular technology can be cost effectively employed as an access solution.
- 7.2 The cellular mobile sector is already operating in a competitive scenario with four licensees providing cellular mobile services. At the time of award of existing cellular licenses, a liberal policy regime was followed and licenses were given to these operators to develop the market. Since the sector has matured over time, policy framework for additional licensing and enhancing competition in the cellular sector is under review. For the future, a uniform framework for existing and new cellular licensees addressing issues such as spectrum allocation and pricing, roll-out obligations, Quality of Service standards, license terms & conditions and performance benchmarks will be separately announced. Under the proposed new policy framework, in order to ensure that fixed line telephony licensees are not placed in a position of disadvantage, the cellular licensees would also be required to contribute towards R&D and USF funds in the same manner as fixed line licensees. The number of new licenses may be restricted due to limited availability of frequency resource. The present policy of nation-wide cellular mobile service licenses will continue.

8. Existing Organizations

- 8.1 Special Communications Organization (“SCO”) will continue to operate exclusively in its territory as now.
- 8.2 SCO and NTC will have the right to continue with the existing revenue sharing agreements they have with PTCL and cellular operators. They are encouraged however, to migrate these revenue sharing agreements to interconnection agreements in accordance with this policy at the earliest practical time.
- 8.3 This policy will be without prejudice to the purpose specific licenses given to Government / Semi-Government and Autonomous organizations, but which will not allow them to become commercial operators without obtaining either an LL or LDI or both licenses from PTA under the approved framework.

9. Continuity of IT Policy

- 9.1 PTCL will be obliged to continue offering ‘131’ Internet access as at present, and to continue to extend the service to PTCL exchanges not currently served, at the same average annual rate (measured in exchanges) as achieved during the exclusivity period.
- 9.2 New entrants will also be required to offer ‘131’ Internet access services at standard ‘131’ prices applicable to incumbents.
- 9.3 The Internet bandwidth prices will not be allowed to be increased from the current levels.

10. Policy Tenure

- 10.1 The Policy would be valid for five years from date of implementation and will be subject to review after this period. The licenses awarded to LL / LDI operators will be valid for 20 years.

11. Regulatory Changes

- 11.1 Appropriate changes in the regulatory framework would be made expeditiously to support the policy.

12. Technology Neutral Licensing

- 12.1 The policy and licensing regime are proposed to be technology neutral.

-
- 12.2 LL / LDI licensees may employ any technology such as IP, VoIP, DWDM, CDMA and so forth within flexibility of license.

13. Miscellaneous

- 13.1 Class licensing regime is proposed to be enforced based on templates to be approved as part of policy process.
- 13.2 Corporations that wish to establish intra-corporate networks will be facilitated. New operators and PTCL will be obliged to provide infrastructure and services for corporate networks at cost oriented prices.
- 13.3 Open regime will be enforced for companies desirous of providing value added services such as Broadband, pre-paid calling cards, premium rate services and the new value added services that become available.

14. De-Regulation Facilitation Unit

- 14.1 In order to facilitate the implementation of the de-regulation policy, a deregulation facilitation unit will be set up in the Ministry of Information Technology comprising of senior professionals. This unit would ensure that all actions in pursuance of the policy are being undertaken by agencies concerned and entrepreneurs are facilitated.



Mobile Cellular Policy



January 28, 2004

IT and Telecommunication Division
Ministry of Information Technology
Government of Pakistan



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1 Introduction

This document presents the policy of the Ministry of Information Technology (MoIT) for the Mobile Industry. The Mobile Policy presented is consistent with the De-Regulation Policy for the Telecommunication Sector approved by the cabinet on January 10, 2004.

This Mobile Policy is set out in the following sections:

- Section 2 – Mobile Policy Objectives
- Section 3 – Mobile Sector of Pakistan
- Section 4 – Radio Spectrum
- Section 5 – Mobile Sector Roadmap
- Section 6 – License Conditions
- Section 7 – Obligations of PTCL
- Section 8 – Universal Service
- Section 9 – Investment incentives
- Section 10 – Regulatory Reform
- Section 11- Policy Review

2 Mobile Policy Objectives

In addition to the broad Telecom sector objectives, as outlined in the Telecom Deregulation policy, the following objectives specific to mobile cellular sector are expected to be achieved through this policy:

- i. Promotion of efficient use of radio spectrum;
- ii. Increased choice for customers of Cellular mobile services at competitive and affordable price;
- iii. Private investment in the cellular mobile sector;
- iv. Recognition of the rights and obligations of mobile cellular operators;
- v. Fair competition amongst mobile and fixed line operators;
- vi. An effective and well defined regulatory regime that is consistent with international best practices;

3 Mobile Cellular Sector of Pakistan

3.1 Mobile Licensees

Currently, four operators (2 GSM, 1 D-AMPS, 1 AMPS (migrating to GSM) are providing services to just under 3 million cellular subscribers all over the country. The



number of customers has more than tripled in the past two years. The table below provides an overview of the current subscriber base of the operators.

	Mobilink	Ufone	Paktel	Instaphone
Technology	GSM	GSM	AMPS, migrating to GSM	D-AMPS
No of Active mobiles Nov. 2003	1,675,000	552,000	255,000	478,261

Source: Figures stated by Operators as of Nov 2003

3.2 Market

The Pakistani economy throughout 2003 has continued to post strong results with inflation under control at approximately 3% per annum and GDP growth at 5%. All the macro economic indicators have shown very healthy trends in the last four years. Forecasts suggest that the economy will continue to develop at even higher rates for the next few years.

The cellular industry in Pakistan registered significant growth when the tariff mechanism changed from Mobile Party Pays to Calling Party Pays regime in year 2000. At approximately the same time Ufone, a subsidiary of the state owned PTCL, launched its commercial service.

Pakistan has experienced sizable population growth over the last few decades. Its current population of around 150 million is expected to grow to 190 million by 2018 according to UN forecasts.

The province of Punjab accounts for 26% of the land mass and accommodates 56% of the population creating a population density of 402 people per square kilometre. This compares to Balochistan which covers almost 50% of the country's geography but has a small population, around 5% of the total, where the population density is only 19 people per square kilometre.

Current coverage is a constraining factor in the growth of mobile penetration. Since the existing operators have essentially built their networks in the cities and towns, current policy aims to accelerate coverage for rural areas by putting coverage obligations and by creating a Universal Service Fund.

Assuming that future cellular coverage reaches 95% of all urban population and 30% of rural population and taking into account the relative geography and population density of each Province, there is a potential demand of approximately 25 million cellular subscriptions by 2018.

4 Radio Spectrum

Crucial to the development of the mobile cellular market is the availability of spectrum and its most optimal and efficient use for which a basic frame work was defined in the Telecom Deregulation policy as below:



4.1 Telecom De-Regulation Policy

With regards to radio spectrum, Telecom Deregulation Policy states at Section 4.4:

- 4.4.1 Radio spectrum is a valuable public resource belonging to the State and must be used in the public interest. The Frequency Allocation Board (FAB) is responsible for properly managing radio spectrum.
- 4.4.2 Wherever possible and consistent with good spectrum management practices, licensees shall be required to share spectrum with other licensees.
- 4.4.3 Licensees shall relinquish rights to spectrum that is no longer needed for their operations, and allow sharing of the bands they currently occupy where such sharing is technically feasible, and subject to management by FAB of frequency re-use in the band in accordance with best international practices. Unused spectrum allocated for operations of Local Loop (LL) & Long Distant International (LDI) licensees may be withdrawn if the licensees fail to begin operations within eighteen months of award of radio spectrum. The Licensees may not assign, lease or sell the rights of use of spectrum allocated to them in the first place.
- 4.4.4 All entities using spectrum shall be charged a fee for spectrum. The fee will be approved by the Government of Pakistan and recovered by Frequency Allocation Board from users of frequency spectrum. The factors to be considered in setting fees shall include but not limited to coverage, scarcity and value of the spectrum. The spectrum will be allocated for a definite time.
- 4.4.5 Where demand exceeds available frequency spectrum, it shall be allocated by auction or other transparent, non-discriminatory, open and competitive process.
- 4.4.6 Pakistan plans to follow ITU-R specified radio frequency bands¹ specific for the purpose of operations of Wireless in the Local Loop (WLL), point-to-point microwave and backbone / transmission services.
- 4.4.7 Information about available radio spectrum for telecommunication services would be placed in the public domain for the prospective users to apply for allocation on nation-wide or regional basis.
- 4.4.8 The FAB shall deal with the requests for radio spectrum, within the framework of Telecom Act 1996 and Rules thereunder, and process applications within a target of 30 days. FAB will streamline and proactively coordinate the process of site clearance for licensees who have been allocated frequency spectrum, to expedite rollout of wireless based networks.
- 4.4.9 LDI licensees will be entitled to radio spectrum (where available) for point-to-point / and backbone links, within the parameters of their licenses, on payment of spectrum charges.
- 4.4.10 LL licensees will be entitled to radio spectrum for WLL systems, and also spectrum for point-to-point links, where available, and on payment of spectrum charges.
- 4.4.11 LL and LDI licensees that receive spectrum shall meet defined usage milestones, failing which they must relinquish their rights to use the assigned spectrum.”

4.2 Current assignment of Mobile cellular spectrum

Currently assigned mobile cellular spectrum and deployed technologies in Pakistan are shown in Appendix A, together with the international allocation of particular bands to different mobile cellular technologies.

4.3 Available spectrum for mobile cellular

Based on the foregoing assignments, the availability of spectrum in Pakistan in internationally designated mobile cellular bands is shown in the Table below:

¹ The ITU defines Wireless Access as "end user radio connection(s) to core networks". Bands used for FWA include 3.4 - 3.6 GHz, 3.6 - 3.8 GHz, 10.15 - 10.3 & 10.5 - 10.65 GHz. Bands between 24.5 and 29.5 GHz are also used. In addition there are the license exempt bands where Radio Local Area Networks (RLANs) have been implemented using 802.11 or HIPERLAN technology the former and its derivatives in the 2.5 and 5.8 GHz ISM bands and Hiperlan in the range 5 - 5.7 GHz. DECT 1880-1900 MHz and cdmaOne frequency bands e.g. 850 and 1900 MHz.



Band (MHz)	Uplink (MHz)	Downlink (MHz)	Total Available	Recognised Standards	Notes
800	835 – 845	(none)	(10 + 0) MHz	GSM 850 CDMA 800 AMPS/DAMPS 800	Corresponding band not available
900	890 – 895	935 – 940	5 + 5 MHz	GSM 900	Additional 5 MHz is likely to be available, exact details will be mentioned in IM document.
1800	1710 – 1740	1805 – 1835	30 + 30 MHz	GSM 1800	Potentially more. Under re-farming.
1900	1900--1910	1980-1990	10 + 10 MHz	GSM 1900 CDMA 1900 (IMT 2000)	Small encroachment on lower IMT 2000 guard band. Under re-farming.
2100	Currently fixed links (PTCL, SSGC)			IMT 2000	Under re-farming

Table A- Available mobile cellular bands and spectrum

In summary it can be concluded that:

- i. In the **800 MHz** band, Paktel AMPS uplink assignment will eventually be returned to FAB for re-use. However there is no available downlink due to its utilisation by Paktel for GSM uplink channels.
- ii. In the **900 MHz** band there is only 2x5 MHz remaining from the total international band assignment of 2x35 MHz.(Additional 5 MHz is likely to be available in near future)
- iii. In the **1800 MHz** band there is currently 2x30 MHz available, with the potential for more being freed in future under current re-farming initiatives by FAB.
- iv. In the **1900 MHz** band there are currently 2 lots of 5 MHz available, one or two of these lots will be available for WLL services depending on the outcome of the auction for mobile cellular spectrum.
- v. The **2100 MHz** band is currently under re-farming. FAB is scheduled to complete this by the end of 2005.

4.4 Spectrum Pricing

The GoP wishes to encourage efficient use of the radio spectrum. As such the frequency usage charge will be set at such a price so as to encourage effective use.

For Mobile Cellular Licenses, where the assignment of spectrum is linked to a set of license conditions, the associated fees will consist of two parts:

Cellular Spectrum Price.

The Spectrum price for national mobile cellular licenses will be determined through auction.



The Spectrum Price resulting from the auction will also be used as benchmark to determine price per MHz per annum for the existing operators, once they come under the purview of this policy.

Spectrum Administrative fees

Administrative fees for radio spectrum will be set to recover the cost of administration of that spectrum. The total income generated from administrative fees for the whole spectrum should recover the reasonable operational costs of FAB incurred whilst managing, licensing and policing that spectrum.

Interim fees for the mobile licensees for first year of operation on the assumption of no change in allocated spectrum for existing operators are detailed in Appendix B. The fees may be adjusted in case the existing operators exchange some of their 900 MHz frequency with 1800 MHz band. Spectrum price for line of site links will be limited to the Administrative fees

The mobile licensees will pay the Pakistan Telecommunication Authority (PTA) – the regulator, in addition to the Spectrum Administration fee and the Spectrum Price, an annual license Administration fee (Regulatory fee), to reasonably cover the cost of regulation. The annual Regulatory fee shall not exceed 0.5% of last year's gross revenue minus inter-operator and related PTA / FAB mandated payments.

4.5 Management of fixed link spectrum

Assignment of spectrum to all fixed links will preferably be on a link-by-link basis.

The current practice of making nationwide fixed link assignments is inefficient and may result in the appearance of scarcity of spectrum when in reality this is not the case. FAB shall assign spectrum based on optimal utilisation of scarce resources.

4.6 Use of Spectrum

Unused spectrum allocated to any licensee may be withdrawn if the licensee fails to begin operations within eighteen months of award of radio spectrum. The Licensees may not assign, lease or sell the rights of use of spectrum allocated to them.

To support the promotion of efficient use of spectrum for national benefit it is important that spectrum which has not been used is returned to FAB for reallocation. Frequencies not used by Licensees will be returned to FAB if the Licensee does not make active or effective use of them. The use would be confirmed by monitoring. Licensees shall allow sharing of the bands they currently occupy where such sharing is technically feasible, and subject to management by FAB in accordance with best international practices.



5 Mobile Sector Roadmap

5.1 Number and Tenure of Mobile Cellular Licenses

The PTA will issue new national, technology neutral, Mobile Cellular Licenses for 15 years tenure. Existing mobile cellular licensees will not be permitted to bid for these licenses.

GoP has decided to grant new 15 year technology neutral National Mobile Cellular Licenses. Existing mobile cellular licensees will not be allowed to bid for these licenses. As further spectrum is cleared, frequency bands may be made available to licensed mobile cellular operators and WLL operators.

Pre-qualified bidders will receive the Information Memorandum (IM), which will include the License template and other relevant material. The currently licensed mobile operators and their substantial shareholders (10% or more) will not be eligible to bid for the new mobile cellular licenses. Applicants must also demonstrate that they have no substantial ownership/interest (10 percent or more) in more than one of the bidding companies or consortia.

5.2 Allocation of Mobile Cellular Spectrum

The mobile cellular spectrum will be auctioned in blocks. The size of these blocks will be sufficient to support the creation of commercially viable services.

The spectrum will be auctioned in blocks/packages keeping in mind the most effective use of the spectrum as a whole. At the same time the blocks of spectrum allocated will have sufficient bandwidth to enable economic use. PTA and FAB will define the Blocks in an Information Memorandum (IM) and will set the detailed method for the auction well in advance of the auction date.

The auction rules to be formulated by the PTA shall ensure that the auction process:

- Be fair and transparent;
- Provides a fair basis for competition among the pre-qualified bidders;
- Encourages the maximum number of potential investors;
- Establishes a fee which is economically justified when balanced with the investment required to meet the roll-out obligations specified with the license;
- Be simple to execute;
- Discourages collusion and predatory bidding that may block entry of potential bidders into the auction process.

The standards employed for licensed blocks of Spectrum shall conform to recognized international standards.

The standardization process has resulted in some technologies being associated with specific spectrum. To date GSM and CDMA are two such technologies. In such circumstances the cellular License should be linked to the associated recognised



standard. Where more than one standard could be adopted in any given block of spectrum the licensee shall have the right to choose which standard to employ.

The licensees will also be entitled to bid for additional spectrum in the 2100 MHz (3G) band when it becomes available.

In the context of 2100 MHz band, the GoP recognises its importance to enable mobile licensees to upgrade technology as spectrum becomes available. For this reason it is providing a degree of certainty in respect to the third generation mobile cellular technology.

While auctioning spectrum in 2100 MHz band, the reserve price per MHz per annum will be set by reference to the 2004 auction price

If there is additional spectrum which is not required by licensees and if any other applicant requests its use for non-cellular services, subject to confirmation of spectrum by FAB, PTA may announce an auction within a reasonable time of the formal request.

5.3 Payment Schedule

After an initial payment of 50% of bid price as down payment on acceptance of bid, the Spectrum Price will be paid by the licensee(s) in equal annual instalments over next ten years.

All licensees will make Spectrum Price payments on per MHz basis of the frequency allocated to them.

5.4 Renewal of existing licenses

The Mobile Cellular License under this policy will replace the existing licenses as soon as possible or at latest upon expiry of the current licenses.

The existing operators will be encouraged to come under the purview of Mobile Cellular policy even before the expiry of their existing License. This would mean that all Mobile Cellular Operators would have the same license terms. The licenses would vary only by their terms of coverage obligations, frequency assignments and level of performance bond. The coverage terms will be adjusted to take account of the existing deployed network. Total coverage required of each network will be equivalent after four years.

The advantage to existing mobile operators in changing would be to gain such benefits as:

- Certainty of 15 years renewal on expiry of their current tenure;
- Additional rights to self-build of regional backbone within each of the defined PTCL regions;
- Allocation of additional frequencies in the 1800 MHz band in exchange for a lesser amount of spectrum in the 900 MHz band;



- Rights in respect to bidding for additional 2100 MHz (3G) spectrum as and when available
- Access to Universal Access Fund (USF)

The fees for the renewed licenses will also be paid using the same payment profile and be based upon the same per MHz per annum price as determined in the auction

5.5 LDI and LL Licenses

Mobile Operators will be eligible for LDI and LL Licenses.

Commercial benefit could accrue to mobile operators also holding licenses to provide other types of services. Where an operator does hold a number of licenses the Licensee will have to meet the requirements of the PTA of accounting separation and for setting up separate legal entities for reasons of transparency and non-discrimination.

5.6 International Connectivity

International connectivity currently provides significant revenue to the telecommunications industry. The GoP recognises that high international rates may not be sustainable in the long run. However, as long as the premium continues to exist, a reasonable portion of the call termination premium is proposed to be used to promote infrastructure expansion. The portion of the premium applied to promoting infrastructure expansion is referred to as the "Access Promotion Contribution" ("APC").

If the Mobile Operator does not hold an LDI license then international connectivity will have to be obtained from an LDI operator.

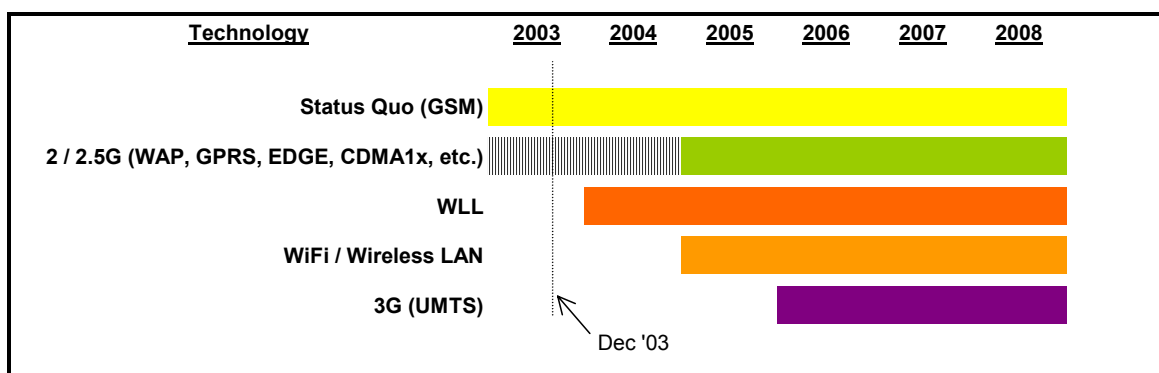
5.7 Technologies

The allocation of spectrum to mobile cellular licenses must take account of international standards and the need to encourage national harmonisation, the adoption of global standards and mass-market technology with associated social benefits.

Further, FAB is working to clear the spectrum in the 2100 MHz bands for IMT-2000 which is scheduled to be completed by the end of 2005.



The figure below indicates an anticipated time line for the introduction of new technologies in Pakistan.



5.8 3G Spectrum

The 3G spectrum will be sold by auction. Both the Licensed mobile cellular operators and the new parties interested in 3 G licenses will be able to participate in the process.

IMT2000² (UMTS) is becoming the de facto migration path from GSM to 3G in many countries. Internationally agreed bands are assigned for 3G implementation based on W-CDMA / UMTS technology.

Since GSM is currently the main cellular technology in use in Pakistan, it is likely that the preferred technology for 3G will be UMTS.

The FAB is clearing the 3G spectrum and will complete this task by the end of 2005. Thereafter, spectrum in the 3G Bands of 2100 MHz will be made available for auction.

The 3G licenses will include a minimum urban coverage requirement and performance bond to ensure the spectrum is utilised in a manner beneficial to the country. The PTA will specify the License conditions.

Frequency in the 3G FDD/TDD bands will be divided into Lots of 5 MHz + 5 MHz with coverage specified in the License. Interested parties will be able to bid for more than one Lot. Failure to launch commercial service within a specified period of time will result in the unused frequency being recovered by FAB (through PTA). If there is 3G spectrum not taken up then as the demand rises further auction dates will be set.

² Covers FDD/TDD frequencies

⁵ Market will be considered sufficiently competitive when PTA determines that the cellular user has a real choice in terms quality of service, pricing and coverage.



5.9 Retail Prices

The retail price cap on mobile Licensees, fixed from time to time, by PTA will continue till such time the market, in the view of PTA, becomes sufficiently competitive⁵.

5.10 Significant Market Power (SMP)

The PTA will regularly undertake a review to determine the relevant markets for the telecom industry and in turn the SMP operators for the relevant markets. PTA should complete the first review within six months from the policy notification.

The Government believes that the success of market liberalization depends on the development of a fair competitive environment for all licensees. In this regard, Mobile and fixed line licensees who emerge with Significant Market Power (SMP) shall be prohibited from abusing their dominant positions through anticompetitive conduct. PTA will incorporate provisions of anti-competitive practices in the licenses for SMP(s).

Operators with SMP will also have to produce a Reference Interconnection Offer (RIO) detailing the services and tariffs they provide to other Licensed operators.

Section 17 of the Pakistan Telecommunications Rules defines Significant Market Power (SMP).

(1) An operator shall be presumed to have significant market power when it has a share of more than twenty-five per cent of a particular telecommunication market. The relevant market for these purposes shall be based on sector revenues.

(2) The Authority may, notwithstanding sub-rule (1), determine that an operator with a market share of less than twenty-five per cent of the relevant market has significant market power. It may also determine that an operator with a market share of more than twenty-five per cent of the relevant market does not have significant market power. In each case, the Authority shall take into account the operator's ability to influence market conditions, its turnover relative to the size of the relevant market, its control of the means of access to customers, its access to financial resources and its experience in providing telecommunication services and products in the relevant market.

6 License Conditions

6.1 Self provision

The mobile licensees will have the right to provide their own infrastructure within a PTCL Region and to also provide their own interconnection circuits to other operators.

The GoP fully recognises that international best practice permits the Mobile operators to have the right to provide their own fixed links between all elements of their network. The key problems are timeliness of delivery and circuit availability for termination at suitable base station sites.



In the event that an LDI operator is unable to provide a circuit within 3 months from request or the Quality of Service (QoS) falls below international standards the mobile operators will have the right to self provide inter regional circuits.

Between Regions the GoP wishes to limit mobile operators to using leased circuits from an LDI operator to assist the development of the competitive LDI market. In the event that there are no LDI operators able to supply interregional leased circuits within 3 months from a formal order to meet the operational requirements of a Mobile Cellular Licensee then self provision will be permitted. It should be noted that the Mobile operators have the opportunity to apply for and hold an LDI license as well. In this case they will be able to self provide intra and inter regional circuits.

Licensees will have the right to contract for the “Right of Way” (RoW) they need to construct their networks, subject to conditions laid down by the concerned agencies.

6.2 Coverage and roll-out requirements

The Mobile Cellular Licenses will include a coverage obligation against which a licensee will be obliged to submit a Performance Bond with the PTA. The performance bond will be linked to the rolling annual capital investment requirements to meet the coverage obligations over a 4 year period.

A major objective of the GoP is to ensure, over a reasonable time, that there are services in the underserved and rural areas. The Mobile Cellular policy includes obligation to roll out coverage to at least 70% of Tehsil headquarters in four years with a minimum of 10% Tehsil coverage in all the provinces. Licensees would be required to deposit a performance bond to be redeemed against achievement of coverage targets. The value of the bond for the first year is set at USD 15 Million for new entrants and the value for existing operators will be set depending on the difference between their current level of coverage and the coverage targets in the license. Specific annual coverage targets will be included in the license.

6.3 Quality of Service

The Licensee will provide a set of reasonable QoS measures against which the performance of licensee will be measured on a regular basis.

The GoP intends to ensure that licensees provide a good quality of service. The following table is indicative of the QoS measures to be included as an Annex to the Mobile Cellular Licenses. The PTA will set the QoS parameters after consultation with the Licensees before final issue of the license.



Indicator	Short Term (first 3 years)	Long Term (3 years on)
Air Interface Blocking	<= 4% in busy hour	<= 2% in busy hour
Call Completion Rate	> 96%	> 98%
Call Connection Time	<= 7 seconds	<= 5 seconds
Call Quality	MOS ³ Score > 3	MOS Score > 3
Network Down-time (averaged across all sites) ⁴	< 2% in any 1 calendar month < 1% over a 1 rolling year period	< 1% over a 1 month period
Cell-site Down-time (for each site) ⁵	Not longer than 48 hours	Not longer than 24 hours

In addition to the above QoS measures a limited number of targets will be set for service covering such areas as:

- Customer service time to answer
- Time to resolve complaints
- Billing accuracy
- Provision of interconnect ports
- Repair of interconnect ports

The PTA will after due consultation prepare a set of criteria which will be attached to the License. The Mobile Cellular licensees will be required to provide regular reports to PTA on quality of service.

6.4 Infrastructure Sharing

All Licensees are encouraged to implement infrastructure sharing in accordance with the guidelines issued by PTA and FAB.

It is important to encourage Infrastructure sharing as a matter of policy and keeping in view environmental issues related with towers and masts. Infrastructure sharing includes a requirement to lease facilities on a non-discriminatory basis, to such other service providers. The facilities provided may include space, electrical power, air conditioning, security, cable ducts, space on antenna masts or towers, rooms etc. Infrastructure sharing, including co-location and facility sharing, shall be provided based on the guidelines established by PTA/FAB on the principles of neutrality, non-discrimination, equal access and commercial arrangements.

³ Bit Error Rate measurements can be used as a proxy

⁴ Outages caused by third parties (such as PTCL) are not included in this figure

⁵ Outages caused by third parties (such as PTCL) are not included in this figure



6.5 National Roaming

Licensees are encouraged to offer National Roaming with other licensees offering reciprocal services in accordance with the guidelines issued by PTA.

In order to implement the policy objectives of the GoP, Licensees are encouraged to offer nationwide service as expeditiously as possible at mutually acceptable terms. It is expected that national Roaming will remain a useful facility in order to promote competition in rural areas where it may well be the case that all operators will not have a presence.

6.6 International Roaming

All mobile operators are encouraged to negotiate International Roaming Agreements with foreign operators.

6.7 Interconnection

The new licensee(s) will have the right to interconnect its network with other licensed mobile and fixed networks in Pakistan.

It is important to enable customers to dial from one mobile network to customers on either another mobile network or customers on a fixed network at reasonable retail rates. To achieve this the mobile operators must be free to decide and make connection to, the most economic point of interconnection with other operators. Mobile operators will have the right to request leased lines from LDI operators.

Interconnection with PTCL will be covered by the Reference Interconnection Offer (RIO) being developed by PTCL under the interconnection guidelines.

Mobile Interconnection termination charges will not exceed the existing level until cost-based rates are available for both fixed and mobile operators. PTA will set rates before the end of 2004 based upon its view of termination costs by existing operators.

Interconnection charges will move to a cost plus normal return basis for all mobile operators on the basis that each operator has a monopoly on termination of calls to customers connected to its own network.

All operators should provide the PTA with evidence of cost for interconnection termination rates within 12 months of beginning their operation.

6.8 Mobile Number Portability

PTA will immediately undertake a consultation process on the implementation of Mobile Number Portability with the aim to implement number portability within two years of policy notification.

A major drawback to switching mobile operators is that, at present, customers need to change their mobile telephone numbers. In order to establish market conditions that



provide maximum choice, consumers should be able to switch operators in order to take advantage of attractive service offerings, lower prices or improved quality.

PTA will determine, in consultation with the industry, the most appropriate method of implementing number portability and establish rules for its implementation. To provide flexibility to consumers, all mobile licensees shall implement number portability, according to the PTA's requirements and guidelines. Although there may be a one-off charge for porting a number, there should be no additional on-going charges related to porting the number.

6.9 Customer Charter

All Licensees are encouraged to publish a Customer Charter, to be approved by the PTA.

The GoP wishes to see a significant improvement in the availability and quality of mobile services. The Customer Charter should provide commitments by the Licensee to Customers in respect of the standard and quality of the Licensed Service.

6.10 Standard Contract

The Mobile Cellular Licensee shall submit a Standard Customer Contract before the commencement of its services to the PTA for approval.

The Licensee shall prepare a standard contract of service for use with its customers. The Licensee shall file the standard contract, and amendments thereto from time to time, with the Authority for its approval.

The standard contract, as approved by the Authority, shall apply to all customers that obtain Mobile communications services from the Licensee.

6.11 Protection of customer from unsolicited fraudulent communications

Operators should put in place mechanisms to prevent abuse of the systems which result in customers receiving unsolicited or fraudulent communications.

The international growth in unsolicited and fraudulent use of the mobile networks enticing customers to make high priced calls ("Scamming") is a matter of concern. PTA after consultation with the industry will establish a code of practice for Mobile Operators to prevent such use. The code of practice will be produced before the end of 2004.

6.12 Mobile Virtual Network Operator (MVNO)

All Operators will be permitted to support MVNO services, a detailed framework for which is to be prepared by PTA within two years of the policy notification.

The concept of MVNO supports and encourages an open and competitive market in telecommunications. All Operators will be permitted to support MVNO services, a detailed framework for which is to be prepared by PTA within two years of the notification of the policy.



6.13 Legal Intercept

Licensees shall meet the requirements of authorized security agencies for legal interception of calls and messages. Further, the Government of Pakistan would have the right to either suspend the service or cancel any license to safeguard national security.

6.14 PTA License Fee

Licensees will pay to PTA a fixed annual fee, to reasonably cover the cost of regulation. The annual fee shall not exceed 0.5% of the previous year's gross revenue minus inter-operator and related PTA / FAB mandated payments.

6.15 R&D Fund

Mobile Licensees will contribute 0.5% of gross revenue minus inter-operator and related PTA / FAB mandated payments to the Research and Development Fund.

Detailed guidelines for the R&D Fund's utilization for IT & Telecom sector development and HRD etc will be proposed separately.

7 Obligations on PTCL

In order to facilitate market liberalization, PTCL, is obliged to:

- a) *Prepare all transit and tandem switches for interconnection and Implement within six months of policy notification, all needed upgrades in the transit switches to the capacity orders submitted by new entrants. PTCL shall not be required to implement upgrades in respect of orders not accompanied by pre-payment of 3 months port cost. PTCL shall pay needed penalties in case of delay in providing ordered Pols, to be determined by PTA.*
- b) *Prepare 50% (measured by lines in service) of local Main Switching Units ("MSU") for interconnection within one year. The remainder to be done in two equal stages within the subsequent two years.*
- c) *Unbundling of service and cost accounting information should be done based on the principles of transparency, orientation, and allocation based on activities and related cost drivers. They shall be sufficiently detailed to allow the clear identification of (a) activities related to interconnection - covering both interconnection services provided internally and interconnection services provided to others; and (b) other activities, so as to identify all elements of costs and revenues. Details of the basis of their calculations and the allocation methods used shall be provided, including an itemized breakdown of fixed assets and structural costs. Sufficient records must be kept to allow independent audit of these cost accounts.*
- d) *PTCL will issue a "Reference Interconnection Offer" (RIO) to be used as the default interconnection offer for interconnection with PTCL pending*



determination of LRIC based pricing. PTCL can implement amendments to the interim RIO, subject to the prior approval of PTA.

8 Universal Service & Access Promotion Contribution

Mobile licensee shall pay a USF Charge limited to 1.5% of gross revenue minus inter-operator and related PTA / FAB mandated payments as determined by the Government.

The importance of funding telecommunication infrastructure in the rural areas cannot be underestimated for the long-term economic benefit and to avoid a 'digital divide' between rural and urban areas. The establishment of the USF and the allocation of funds to operators is an important factor in accelerating the availability of telecommunication services in rural areas. Mobile operators can play an important role in providing coverage to rural areas in particular where there is no fixed line service. The USF will be financed by revenues collected from all telecommunication licensees through a universal service fund charge (the "USF Charge"). The USF may also receive contributions from the Government, and also funding from international or bilateral development agencies.

Mobile operators shall be eligible to apply for money from the USF in order to cover rural and under-served areas as per guidelines for utilisation of USF to be notified separately.

The Government has designed the market liberalization policy to maximize the commercial availability and coverage of telecommunication network and services in Pakistan. The Government recognizes, however, that even with market liberalization, and under strictly commercial considerations, there may exist certain populations or geographic areas that would remain un-served or relatively underserved. The Government's universal service policy is designed to ensure that these designated populations and geographic areas receive adequate service in a sustainable manner as resources permit.

Fees collected by PTA and FAB from telecommunications licensees, which are in excess of administrative costs, shall be deposited into the Universal Service Fund.

The USF policy framework will be prepared and approved by the Federal Government. It shall include collection of the funds from the licensees and its disbursement within approved USF framework. The amounts and usage of the USF will be made public, and shall be subject to independent audit. Disbursement of USF funds shall be made through a transparent, non-discriminatory and competitive process.

The APC shall not be available to cellular operators. Premium of APC on current cellular termination rates would be mopped up and diverted to Universal Service Fund (USF).

Premium of APC on current cellular termination rates would be mopped up and diverted to USF with effect from a future date to be notified by the Government.



9 Incentives for Investors

The Telecom sector, including mobile cellular operations, will be classified as an Industry.

The Mobile operators have to date been classed as a Service and not as an Industry. Reclassification of mobile operators to the Industrial Sector will reduce operational costs.

10 Legal and Regulatory Framework

Appropriate changes in the legal and regulatory framework will be made expeditiously to support the Mobile Cellular Sector Policy. Changes may result in amendments in Telecom Reorganisation Act of 1996 and corresponding rules and regulations. Such changes shall be effected expeditiously after the notification of the policy.

11 Review of Policy

This policy will not be reviewed before five years of notification date.



Appendix A – Currently assigned mobile cellular spectrum

Operator	Technology	Up-Link	Down link	Comments
Instaphone	D-AMPS	825-835 MHz	870-880 MHz	2 x 10MHz
Paktel	AMPS	835-845 MHz	880-890 MHz	2 x 10MHz
Paktel (migration)	GSM 900	880-890 MHz	925-935 MHz	2 x 10MHz: (under implementation)
Mobilink	GSM 900	905-915 MHz	950-960 MHz	2 x 10MHz
Ufone	GSM 900	895-905 MHz	940-950MHz	2 x 10MHz

Table 1 Current mobile cellular spectrum assignments

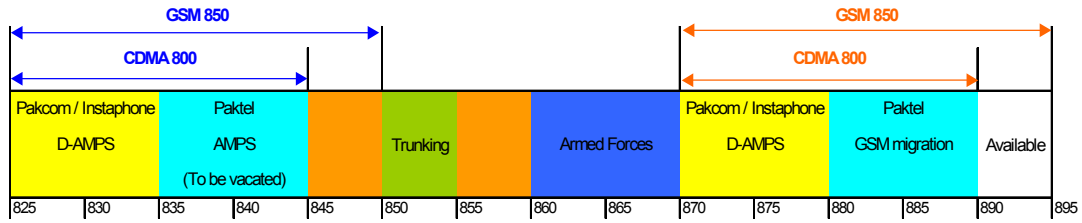
Each operator is currently assigned 2x10MHz, with Paktel in the process of migrating its network from AMPS technology to GSM⁶. This migration is utilising the AMPS downlink assignment for the GSM uplink, with a new assignment having been made for the GSM downlink. On completion of migration, Paktel's AMPS uplink assignment will be released to FAB.

Three operators in Pakistan, Mobilink, Ufone and Paktel (currently migrating customers to GSM from its AMPS service), have implemented GSM technology. Standardised under the auspices of ETSI⁷, GSM is used by over 1.2 billion subscribers on every continent of the world, with 550 operators supplying GSM services in 193 territories.

The international allocation of particular bands to different mobile cellular technologies Table 2 above and also in the 800, 900 and 1800 MHz band plans in Figure 1, Figure 2, and Figure 3 below. The band plans are illustrated in relation to current assignments in Pakistan.

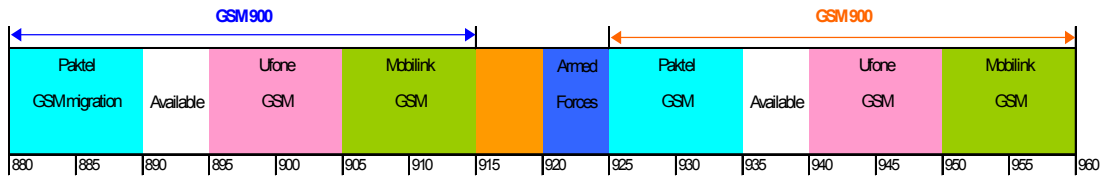
⁶ Global System for Mobile communication

⁷ European Telecommunications Standards Institute



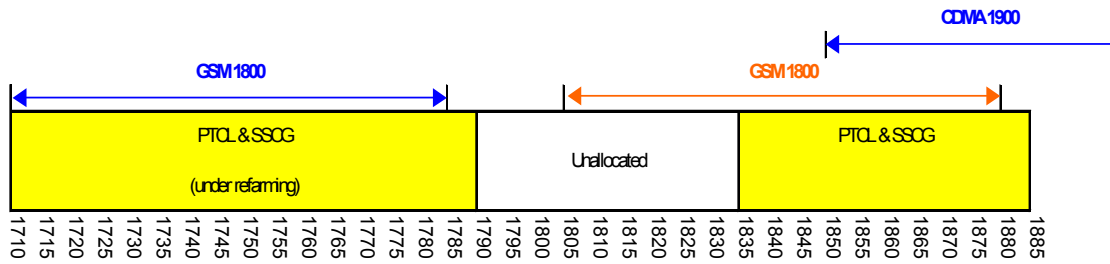
Source: FAB

Figure 1: 800 MHz band plan



Source: FAB

Figure 2: 900 MHz band plan



Source: FAB

Figure 3: 1800 MHz band plan



Appendix B

Spectrum Administrative Fees

Table of Spectrum Administrative Fees for Mobile operators assuming two new National Mobile Licenses.

Operator	Scenario A			Scenario B		
	Spectrum	% of total	Annual fee (Rs)	Spectrum	% of total	Annual fee (Rs)
Mobilink	2 x 10 MHz	15.4%	34.65m	2 x 10 MHz	17.4%	39.15m
Paktel	2 x 10 MHz	15.4%	34.65m	2 x 10 MHz	17.4%	39.15m
Ufone	2 x 10 MHz	15.4%	34.65m	2 x 10 MHz	17.4%	39.15m
Instaphone	2 x 10 MHz	15.4%	34.65m	2 x 10 MHz	17.4%	39.15m
New A	2 x 12.5 MHz	19.2%	43.2m	2 x 12.5 MHz	21.7%	48.83m
New B	2 x 12.5 MHz	19.2%	43.2m	2 x 5 MHz	8.7%	19.57m
Total	2 x 65 MHz	100%	225m	2 x 57.5 MHz	100%	225m

Assumptions made in setting the interim Administrative Fees

- i. For the financial year 2003, the budget for FAB was Rs300 million. This included the funds assigned for the maintenance of the new spectrum monitoring equipment recently acquired by FAB through World Bank funding (the World Bank loan itself is being repaid by the PTA).
- ii. FAB has estimated that around 75% of the resources of FAB are employed in managing the spectrum allocated to the mobile operators.
- iii. As all the mobile licences are national in scope, the issue of determining a geographic component for the spectrum administrative fee does not come into play, as all licences have the same geographic coverage
- iv. How much mobile spectrum is deployed, depends upon which of the proposed Lots is successfully won. Scenario A is that Lots 1&2 are chosen; scenario B is that Lot 1 or 2, together with Lot 3 are chosen. The total spectrum deployed, the proportion of that total used by each operator, and the equivalent annual fee is shown in the table for each of the two scenarios.
- v. Fees include all direct line of site links.

GOVERNMENT OF PAKISTAN
MINISTRY OF INFORMATION TECHNOLOGY
(IT & TELECOM DIVISION)

No. 2-2/2007-Dir (W)

Islamabad, the 19th December 2011

Subject: - POLICY DIRECTIVE UNDER SECTION 8(2) OF THE PAKISTAN TELECOMMUNICATIONS (RE-ORGANIZATION) ACT 1996 FOR INTRODUCTION OF THIRD GENERATION (3G) MOBILE SERVICES IN PAKISTAN

The existing mobile phone services based on the second-generation (2G) technology have been extremely successful for voice and low speed data transmissions but can not support broadband applications like high speed Internet access, interactive multimedia value added or high-resolution video services. The Third Generation (3G) mobile systems have the capability to offer very high data rates and are hence a natural evolution of the 2G systems. Pakistan is currently lagging behind in the proliferation of broadband service primarily due to low penetration and quality of fixed lines. Wireless broadband solutions and especially 3G cellular can fill this gap.

2. The Cellular Mobile Policy 2004 approved by the Cabinet mandated introduction of 3G services in Pakistan by end of 2005 while laying down broad parameters for making requisite frequency spectrum available through open and transparent auction process to both existing 2G operators and new players (Annex I). Later the policy position was modified, by limiting the auction to just existing operators, in the wake of Pakistan Telecommunication Company Limited (PTCL) privatization (Annex-II). The auction, however, could not materialize as the industry requested that market was not ready for introduction of 3G while at the same time requisite frequency was not available as it was being used by other national entities for different purposes. Now the situation has changed on both counts; the industry is almost ready for 3G while at the same time frequency spectrum has been reasonably cleared to allow for 3G service introduction. With this changed scenario, a need has emerged for redefining policy framework and setting guiding principles for the auction of 3G frequency leading to introduction of relevant services.

3. Due to the aforementioned requirements the Federal Cabinet constituted a Committee of Federal Ministers to recommend to the GoP the policy for


3G frequency Auction and Licensing. The Committee, after thorough deliberations with all relevant stakeholders, including MoIT, MoF, PTA and FAB, has made its recommendations to the Prime Minister of Pakistan.

4 In view of the foregoing, keeping in view the importance of introduction of 3G services for the citizens and the Pakistani Telecom market, in line with the recommendations of the Cabinet Committee, the Federal Government, using powers conferred by the Section 8(2) of the Pakistan Telecommunication (Re-organization) Act 1996 (Amended 2006), is pleased to issue the following directives for compliance of the Pakistan Telecommunications Authority.

- (i) Transparent, competitive auction based on the auction principles prescribed in the cellular policy be adopted for the 3G frequency spectrum allocation. The allocation will be technology neutral and usable for any available or upcoming technology.
- (ii) License of defunct Instaphone (PakCom Ltd.) along with the allocated frequencies (Annex III) will be auctioned immediately. All existing operators as well as new players will be eligible to participate in the auction. However, if the final bid price is below a certain amount (as determined by the committee mentioned in sub-clause iv below) this auction would be declared invalid.
- (iii) Within three working days of the advertisement of the above mentioned step:
 - a. *Auction of three blocks of 10 MHz each out of the currently available 3G spectrum (1.9GHz/2.1GHz band Annex IV) shall be announced. All existing operators as well as new players will be eligible to participate in this auction. However, new players would be eligible to participate if they have either bid for the defunct Instaphone license OR are willing to start their operations after the end of March 2013.*
 - b. *Remaining available frequency shall be auctioned simultaneously to all existing and new players. However, this frequency band has to be re-farmed and the winner of this frequency band, would be eligible to start operations in this frequency band after March 2013.*
- (iv) The auction process to be overseen by a joint professional group (Auction Supervisory Committee, ASC) of public sector stakeholders including representatives of Ministry of Finance (MoF), Ministry of Information Technology (MoIT), PTA and FAB.

- (v) The "joint professional group of public sector stakeholders" will be called "3G Auction Supervisory Committee (ASC)" with the following composition and Terms of Reference (ToRs):
- a) Composition of the Auction Supervisory Committee (ASC):
- i. Federal minister for Finance (Chairman)
 - ii. Minister for Water and Power
 - iii. Minister for Petroleum and Natural Resources
 - iv. Minister for Privatization
 - v. Secretary Finance
 - vi. Secretary Information Technology (Convener)
 - vii. Secretary Law & Justice
 - viii. Member Telecom, Ministry of Information Technology
 - ix. Chairman, Pakistan Telecommunication Authority (PTA)
 - x. Executive Director, Frequency Allocation Board (FAB)
 - xi. Director Wireless, Ministry of Information Technology (Secretary of Committee)
- b) Terms of Reference (ToRs):
- i. Base price determination for the 3G auction as well as defunct Instaphone license auction;
 - ii. Methodology of the auction process;
 - iii. Management of the process and any other ancillary matter as deemed necessary.
- c) PTA to immediately carry out the process for appointment of internationally reputed consultant(s) to assist the ASC in fulfilling its assignments
- (vi) Auction to be held by Pakistan Telecommunication Authority (PTA) within 2 to 3 months of this policy decision adopting any suitable auction methodology as agreed by the "Auction Supervisory Committee" fulfilling policy objective of optimal outcome mitigating chances of collusion among bidders.
- (vii) For efficient and optimal rollout of 3G cellular services, sharing of infrastructure will be considered as a matter of first priority by the Cellular operators at the time of rollout.
- (viii) The 3G operators would be required to support the development and growth of mobile handset and telecom equipment manufacturing in Pakistan. Mechanism in this regard to be devised by PTA in consultation with stakeholders.

7. The Prime Minister in his capacity of Minister Incharge for IT has approved the issuance of this policy directive for immediate compliance of the Authority.



Dr. Syed Ismail Shah
Member (Telecom)

Dr. Muhammad Yaseen
Chairman,
Pakistan Telecommunications Authority,
Islamabad

Copy to:

1. Principal Secretary to the Prime Minister, PM Sectt. Islamabad.
2. The Secretary Cabinet, Cabinet Sectt, Islamabad
3. PSO to Secretary IT, Islamabad

**Government of Pakistan
Ministry of Information Technology
(IT & Telecom Division)

No. F-5/1/ 2006 – Dir(W)

Islamabad, 16th December 2011

Subject: POLICY DIRECTIVE FOR SPECTRUM AUCTION OF AVAILABLE FREQUENCY LOTS IN 1.9 GHZ AND 3.5 GHZ BANDS

In pursuance of the Fixed Line Telecom Deregulation Policy, a significant portion of frequency spectrum in the 1.9 GHz and 3.5 GHz bands was auctioned for WLL licensing in 2004. As a result of the spectrum auction latest wireless broadband technologies/systems like WiMAX and CDMA2000 EVDO were deployed in Pakistan. The wireless broadband technologies have played an important role in the growth of broadband services in the country that has been welcomed by all stakeholders.

2. Due to the growth of wireless broadband services, the existing spectrum resources of the operators have become stressed and now they are demanding for additional frequency spectrum to cater for more data speed and capacity in their networks. On the demand of operators, proposals for frequency assignment in the 1.9 GHz and 3.5 GHz were approved in the 35th FAB meeting. A committee constituted by FAB comprising of members from MoIT, FAB, PTA and MoI presented its report in the 37th FAB meeting held on September 23, 2010. The Board considered the report and viewed that approval of spectrum price is prerogative of the Ministry of IT, therefore, it forwarded the committee report/ recommendations to the Ministry of IT for appropriate policy direction to PTA. The report is attached as Annex-I.

3. Foregoing in view, Ministry of IT, hereby, using the powers conferred by Section 8 of the Pakistan Telecommunication (Re-organization) Act, 1996 approves the recommendations of the report and directs PTA to implement the following:

- i. Conduct telecom region wise frequency spectrum auction in 1.9 GHz and 3.5 GHz bands. PTA and FAB will defines the frequency lots in the Information Memorandum (IM).
- ii. To keep the block size for 3.5GHz spectrum as 24/22/23 MHz in the Time Division Duplex (TDD) mode depending on the region wise availability of the spectrum.

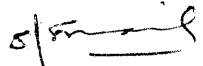
Chairman	<i>[Signature]</i>
Dir Comm	<i>[Signature]</i>
Action By	I G (Lic)
Information	M(Tech), M(Fin), DCC(G&EA)
Diry No.	705 - 19/12/2011

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- ANNEX-D**
- iii. To adopt the block size for 1.9 GHz spectrum as 5 MHz and to include the Frequency Division Duplex (FDD) pairing (1900-1905/ 1980-1985 as depicted in block 4, Annex B) in the Information Memorandum for auction.
 - iv. Adopt Simultaneous Multiple Round Auction (SMRA) methodology for the spectrum auction.
 - v. Allow existing WLL and LL, and CVAS licensees to participate in the spectrum auction. In case of successful auction bid by existing LL or WLL licensee the frequency allocation be done for the rest of the life of the original LL or WLL license and the charges be accordingly adjusted.
 - vi. In case of a successful bid by a CVAS licensee, the CVAS license shall be updated for this purpose to ensure conditions related to limited mobility, national security, monitoring, network rollout obligations, QoS KPIs, R&D and USF contributions, infrastructure sharing and other term of the license.
 - vii. Adopt telecom region wise reserve price for frequency spectrum as proposed in Table 9 and Table 10 of the annexed report (Annex I).
 - viii. Ensure spectrum auction winners to pay 50% of bid price as down payment on acceptance of the bid before assignment of spectrum and remaining 50% of bid price in equal annual installments over the next ten years.
 - ix. FAB to conduct a thorough spectrum audit and to initiate reframing/redeployment exercise for freeing up more commercially viable spectrum for wireless broadband (IMT advanced) and to submit to GoP clear technical recommendations in this regard.

4. This Policy Directive is issued with the approval of the competent authority (Annex II) for implementation with immediate effect.


Dr. Syed Ismail Shah
Member (Telecom)

Dr. Muhammad Yaseen
Chairman Pakistan Telecommunication Authority
PTA Headquarters, F-5/1, Islamabad.

CC:

- i. PSO to Minister for IT
- ii. PSO to Secretary, MoIT.

**EVALUATION REPORT ON BENCHMARKING THE BASE
PRICE FOR 3.5 GHZ & 1.9 GHZ SPECTRUM AUCTION**

Preamble:

In the recent times, the radio spectrum for Broadband Wireless Access (BWA) is becoming key resource for the provision of high speed internet and broadband services. With the rapid technological evolution more innovative wireless broadband technologies are being introduced, creating a challenge for policy makers and regulators to prepare for the availability of the requisite spectrum for existing as well as future needs.

In Pakistan, the major spectrum auction was held in 2004 when along with the mobile cellular spectrum, a significant chunk of BWA spectrum in 3.5GHz range was auctioned. Availability of spectrum on early stages of BWA technology development and reasonable auctioned price has spurred the deployment and growth of wireless broadband and positioned Pakistan among the leading countries of the world to introduce WiMAX services to its users.

With the wide spread deployment of networks and acceptance by the users, the need for WiMAX broadband is increasing day by day. The existing spectrum resources of the operators have become over occupied and now they are demanding for more spectrum. On the demand of operators, a proposal for auctioning the available spectrum in 3.5 GHz & 1.9 GHz range came in the 35th board meeting of Frequency Allocation Board (FAB). The members agreed upon the proposal, however, a committee was constituted to consider and recommend the base price for proposed auction of additional frequency spectrum in 3.5 GHz band. The committee was comprised of:

- i. Member (Telecom) - Convener
- ii. Executive Director FAB - Member
- iii. Director General (Finance)PTA - Member
- iv. Deputy Secretary MoI - Member

The committee in its preliminary meetings deliberated different parameters which were to be considered while benchmarking the base price for the spectrum auctions. The agreed parameters are:

- a. The optimal block size
- b. Scope of the auction? regional or national level
- c. Price Per MHz Per Pop
- d. The eligibility of licensees to participate in auction
- e. Auction Methodology

Six meetings of the committee were convened wherein the members taken into account the above mentioned parameters and deliberated the base price and hereby submit its recommendations to FAB board for consideration. The details of the proceedings are given as under: **ANNEX-D**

a. The Optimal Block Size for the Auction

It was briefed that a band of 21 MHz with a duplex band of 10.5 MHz was allocated to WLL operators for Frequency Division Duplex (FDD) services in 2004. But with the technology development over time, this band got popular for Time Division Duplex (TDD) services as well. Even though the current 21 MHz band is sufficient for data services, but as the operators are planning to launch triple play services, therefore more band is required. Also, there was an issue of the contiguous availability of the band so that operators may take a spectrum chunk contiguous to their existing assignments. The committee determined that the only possibility of the contiguous band availability could be to have the consent of existing holders of the frequency whether they are ready to re-adjust their existing assignments. PTA was asked to coordinate with the operators in this regard. PTA held meeting with the operators but they were not ready to re-shift their current holding of spectrum. It was observed that available band in 3.5 GHz range varies from region to region in the brackets of 21/22/23/44 MHz. A detail of the available band is given at Table 1:

S.No	Region	Available Spectrum
1	CTR	44 MHz 21 MHz 21 MHz
2	FTR	23 MHz
3	GTR	23 MHz
4	HTR	44 MHz
5	ITR	23 MHz
6	KTR	23 MHz
7	LTR	23 MHz
8	MTR	44 MHz
9	NTR-I	44 MHz
10	NTR-II	44 MHz
11	RTR	23 MHz
12	STR-I	44 MHz
13	STR-V	44 MHz
14	WTR	44 MHz

Table 1: Status of the available spectrum region wise

Some members were of the idea that chunks of 10 MHz may be offered for the auction and if an operator wants more spectrum, it may opt for more than one block. However it was agreed to examine the technical feasibility for minimum block size and also to consider international best practices. It was observed that technically, the minimum block size of 21 MHz is required for the optimal

operations. Although the existing operators already hold a part of spectrum in this range, yet there is a possibility of new entrants in the auction, and to give a level playing field, the minimum lot size should be as per their technical needs. A review of international auctions and especially the recent BWA auction in India was made. It was observed that minimum 20 MHz has been kept as a minimum block size in most of the cases in 3.5 GHz range while a lot size of 5 MHz is a frequent benchmark in 1.9 GHz range. Consensus was developed to keep the minimum lot size of 5 MHz in 1.9 GHz range as per the international practice and also in line with the 2004 auction. However, it was observed that in case of 3.5 GHz range, keeping an exact size of 20 MHz may lead to the waste of 2 to 3 MHz spectrum per lot per region as the spectrum availability is to the tune of 23 or 44 MHz. To overcome this limitation, it was agreed to offer the minimum lot size of 21/22/23 MHz depending on the availability of the spectrum in that particular region.

b. Scope of the auction Regional or National Level:

The committee discussed at length about the regional or national level scope of the auction. It was agreed that offering a nation wide lot may not be a suitable proposition as very few existing operators are providing services in all telecom regions, rather different operators are concentrated in different regions. Offering a country wide lot may yield to an irrationalized high base price and the regional players will opt for additional spectrum only within their business telecom region. Therefore, it was decided to offer the lots on region wise basis. To estimate the price region wise, it was proposed to scale it with percentage share of each region in 2004 auction against an across Pakistan lot. The committee adopted the proposal. In addition, it was identified that some regions have negative factors like terrorism, lack of IT education and un-affordability. The committee resolved to apply a negative factor of 20% on the price determination in those regions.

c. Price Determination Per MHz Per PoP

While devising the base price benchmark for the available spectrum, the committee decided to consider following three scenarios:

- i. Base price determination with respect to 2004 auction.
- ii. Base price determination with respect to Indian auction benchmark
- iii. Base price determination with respect to International benchmark

The purpose was to compare different models so that a rationalized base price may be forecasted best suited for Pakistani market and current industry status. Data was available for recent Indian auction and 2004 Pakistani auction, but there was a need to have some consolidated data for international auction practices for BWA spectrum auction. The committee decided to purchase an international consultant report in this regard. It was also decided to compare the

Per MHz per Population cost of all three models. A detail working model is given hereunder: **ANNEX-D**

i). Comparing the 2004 auction

As a first option, the committee compared the auctioned price of same spectrum as collected in 2004 auction amounting to to be taken as the base price (As envisaged in Telecom De-regulation Policy 2003) of future auction. Annual GDP growth @ 5% was also considered in the calculations. The projected reserved price for a Pan Pakistan 21 MHz lot becomes \$ 1.58 M(After adjustment of 20% -ve factor). Region wise break is given in Table 2:

Licensed Region	Winning Price (Pkr Mln)	Winning Price (\$ Mln)	Growth (5% Annual)	Value with -Ve Factor(\$ Mln)
CTR	0.58	0.0102	0.0136	0.0136
FTR	4	0.0702	0.0940	0.0940
GTR	0.58	0.0102	0.0136	0.0136
HTR	0.58	0.0102	0.0136	0.0136
ITR	7	0.1228	0.1646	0.1646
KTR	37	0.6491	0.8699	0.8699
LTR	11	0.1930	0.2586	0.2586
MTR	0.58	0.0102	0.0136	0.0136
NTR-I	4	0.0702	0.094042	0.0752
NTR-II	0.58	0.0102	0.013636	0.0109
RTR	0.58	0.0102	0.0136	0.0136
STR-I	0.58	0.0102	0.0136	0.0136
STR-V	0.58	0.0102	0.0136	0.0136
WTR	0.58	0.0102	0.013636	0.010909
Total				1.5796
	Nil -ve Factor			
	20% -ve Factor			

Table 2: Price benchmarking on the basis of 2004 auction

ii) Comparing the Indian Auction Model

The committee studied the Information Memorandum for indian BWA auction and observed that two blocks of 20 MHz unpaired spectrum were offered in each of 22 service areas in 2.3GHz band. To make a comparison the base price of a Pan India lot of 20 MHz was taken and the Per MHz per Pop computation was made as referred in Table 3.

Available Band	unpaired 40 MHz	Band	2.3 GHz
Block Size	20 MHz	Service Areas	22
Base Price (For Pan India)	USD 372 Million	Base Price per MHz (Pan India)	USD18.6 M
Base Price Per MHz	USD 18.6 M	Base Price Per MHz,, Per PoP¹.	USD 0.0186 M

Table 3: Calculating the PMP price as per Indian IM

Considering the unit PMP price as given in the indian IM, calculations were made for Pakistan while taking into account the 170 M population. Details are as given in table 4 :

Indian Base Price Per MHz, Per PoP.	USD 0.0186	Base Price Per MHz (Pakistan pop. 170 M)	USD 3.16 M
No Negative factor for base line calculations	USD 3.16 M (Pan Pak)	Price for a 21² MHz Pan Pakistan lot	USD 66.4 M

Table 4: Price calculation based on indian PMP unit

The table shows that in this case the base price for a Pan Pakistan lot (covering all telecom regions) will be in tune of USD 66.4 million. Following the agreed region wise percentage sharing formula with respect to 2004 auction, the base price for a 21 MHz lot is computed as:

¹ The population of india is taken as 1 billion for the calculation

² To get the percentage share of each region referring to 2004 auction, unit lot of 21 MHz is taken for base line calculations. All models are compared with a 21 MHz lot and the final recommendations are adjusted on the basis of actual available spectrum.

Licensed Region	% age Share	Adjusted Value(USD Mln)	Value with -Ve Factor(\$ Mln)
CTR	0.85	0.56	0.56
FTR	5.86	3.89	3.89
GTR	0.85	0.56	0.56
HTR	0.85	0.56	0.56
ITR	10.26	6.81	6.81
KTR	54.24	35.99	35.99
LTR	16.12	10.70	10.70
MTR	0.85	0.56	0.56
NTR-I	5.86	3.89	3.11
NTR-II	0.85	0.56	0.45
RTR	0.85	0.56	0.56
STR-I	0.85	0.56	0.56
STR-V	0.35	0.56	0.56
WTR	0.85	0.56	0.45
	Nill -ve Factor		
	20% -ve Factor		

Table 5: Region Wise Base Price Calculation for Pakistan

iii. Comparing the International Benchmark

The next approach was to evaluate the price comparison of BWA auction world wide. Above mentioned International consultant report covers an analysis of 17 markets in which WiMAX license were sold via auction. The committee noticed that the average auction price Per MHz per Pop (PMP) of 17 auctions is US \$ 0.031. It was also observed that normally the auctioned price is 3 to 4 times of the base price, therefore it was agreed to apply a dividing factor of 4 to asses the reserved price in base line calculations. By using the same figure in calculation the base price for a Pan Pakistan 21 MHz lot goes to the tune of US \$ 27.67 M. The same percentage sharing formula was applied to determine the base price on regional level. Detailed working as follows in Table 6:

Licensed Region	%age Share	Adjusted Value(USD Mln)	Value with -Ve Factor(\$ Mln)
CTR	0.85	0.24	0.24
FTR	5.86	1.62	1.62
GTR	0.85	0.24	0.24
HTR	0.85	0.24	0.24
ITR	10.26	2.84	2.84
KTR	54.24	15.01	15.01
LTR	16.12	4.46	4.46
MTR	0.85	0.24	0.24

NTR-I	5.86	1.62	1.30	ANNEX-D
NTR-II	0.85	0.24	0.19	
RTR	0.85	0.24	0.24	
STR-I	0.85	0.24	0.24	
STR-V	0.85	0.24	0.24	
WTR	0.85	0.24	0.19	
		Total	27.24	

Table 6: Base Price evaluation on the basis of 17 markets comparison

By using the above mentioned PMP data a correlation analysis was made. However, committee observed that spectrum costs are affected by multiple factors and bidder behavior is not always predictable. It is no secret that broadband business potential largely dependent on the existing broadband penetration. A market with a low broadband penetration would see a reasonable value PMP price based on international benchmarks. While considering the same factor a price model was projected in the consultant report as:

BB Penetration	PMP Range
< 5%	\$0.04-\$0.05
5%-10%	\$ 0.035 - \$0.04
10% - 25%	\$ 0.01 - \$0.035
> 25%	\$ 0.005 - \$0.01

Table 7: PMP price projection while considering BB penetration

As referred in Table 7, while taking a unit PMP auctioned price of \$ 0.04 and applying a dividing factor of 4 the reserve price for a Pan Pakistan 21 MHz lot goes as \$ 35.7 M. Detailed working are given in Table 8:

Licensed Region	%age Share	Adjusted Value(USD Mln)	Value with -Ve Factor(\$ Mln)
CTR	0.85	0.30	0.30
FTR	5.86	2.09	2.09
GTR	0.85	0.30	0.30
HTR	0.85	0.30	0.30
ITR	10.26	3.66	3.66
KTR	54.24	19.36	19.36
LTR	16.12	5.76	5.76
MTR	0.85	0.30	0.30
NTR-I	5.86	2.09	1.67
NTR-II	0.85	0.30	0.24
RTR	0.85	0.30	0.30
STR-I	0.85	0.30	0.30
STR-V	0.85	0.30	0.30
WTR	0.85	0.30	0.24

Table 8: Reserved price determination while considering BB penetration

The Deliberations:

After the case to case analysis, the committee deliberated that the reserved price calculated on the basis of Indian benchmark may not be rationalized as market dynamics are not comparable to Pakistani market. Indian benchmark suggests too high a price which is even much higher than average price of 17 international markets. Considering the other parameters especially the security situation, such a high price to set as base price may not be prudent. Regarding the price determination based on 2004 auction, the committee was of the view that this price is too small. It was examined that main reason for such a small winning price in 2004 was nascent stage of BWA technologies at that time. WiMAX, WiBRO and other allied technologies were at testing stage and investors could not find economy of scales to deploy wireless broadband system. It is also evident from the fact that the same frequencies were purchased by WLL operators only who had the emphasis on the voice services.

The committee agreed that price determined with regard to international benchmark, is a rationalized approach. Nonetheless, it was agreed that considering the security situation, anticipated 3G auction in this financial year, operating cost including power supply cost, along with the scale and scope of the Pakistani market, simple replication in base price determination may not be possible in Pakistan. The committee agreed to account for the above mentioned factors to the tune of 20% -ve factor on the emerged price. While applying the same 20% negative impact and scaling the lot size as per the actual available spectrum region wise, the final round off figure is calculated as USD 28.2 M for a Pan Pakistan lot covering all telecom regions. Region wise break up is given in Table 9:

License d Region	2004 Auction %age Share	Adjusted Value(USD Mln)	Value with -Ve Factor(\$ Mln)	20% Discount factor	Lot Size (MHz)	Final Base Price(M \$)
CTR	0.85	0.24	0.24	0.192	22 21	0.25 0.24
FTR	5.86	1.62	1.62	1.296	23	1.75
GTR	0.85	0.24	0.24	0.192	23	0.25
HTR	0.85	0.24	0.24	0.192	22	0.25
ITR	10.26	2.84	2.84	2.272	23	3
KTR	54.24	15.01	15.01	12.008	23	16
LTR	16.12	4.46	4.46	3.568	23	4
MTR	0.85	0.24	0.24	0.192	22	0.25
NTR-I	5.86	1.62	1.3	1.04	22	1.25
NTR-II	0.85	0.24	0.19	0.152	22	0.2

RTR	0.85	0.24	0.24	0.192	23	0.25
STR-I	0.85	0.24	0.24	0.192	22	0.25
STR-V	0.85	0.24	0.24	0.192	22	0.25
WTR	0.85	0.24	0.19	0.152	22	0.25
					Total	28.2
	Nill -ve Factor					
	20% -ve Factor					

Table 9: Region Wise Base Price Determined with 20% discount factor (Rounded off)

The committee recommends the FAB board to consider the above mentioned Table 9 for region wise base price for the auction based on the average of 17 international market auctioned price.

d. Base Price Determination for 1.9 GHz Band

While determining the base price for 1.9 GHz band, the committee observed the winning price of the same band in 2004 auction of USD 67.49 M was quite reasonable. The committee agreed that taking the winning price of 2004 auction as a base price for future spectrum auction (As envisaged in Telecom Deregulation Policy 2003) may be a viable proposition. It has been noticed that the GDP growth for last six years is about 5% per year. Adding this growth factor to the winning reference price of 2004, yield an across Pakistan 5 MHz lot to USD 88.75 million. The region wise breakup is shown in the Table 10. The committee agreed that the calculated figures with this formula give a rational base price for the future auction in this band. The committee did not consider viable to apply reduction factor (Except security affected region factor) on the count that only single lot of 5 MHz is available and enough competition exists.

Licensed Region	Winning Price (Pkr Mln)	Winning Price (\$ Mln)	Growth (5% Annual)	Value with -Ve Factor(\$ M)
CTR	121	2.1228	2.7596	2.7596
FTR	425	7.4561	9.6930	9.6930
GTR	295	5.1754	6.7281	6.7281
HTR	101	1.7719	2.3035	2.3035
ITR	290	5.0877	6.6140	6.6140
KTR	1204	21.1228	27.4596	27.4596
LTR	353	6.1930	8.0509	8.0509
MTR	286	5.0175	6.5228	6.5228
NTR-I	202	3.5439	4.6070	3.6856
NTR-II	83	1.4561	1.8930	1.5144
RTR	199	3.4912	4.5386	4.5386
STR-I	134	2.3509	3.0561	3.0561
STR-V	79	1.3860	1.8018	1.8018
WTR	75	1.3158	1.7105	1.3684
			Total	88.75
	Nill -ve Factor			
	20% Factor			

Table 10: Region Wise Base Price Projection for 1.9 GHz Spectrum

e. The Eligibility of the Licensees to Participate in Auction

It was also pointed out that due to the moratorium imposed under PTCL privatization SPA clause regarding the issuance of new licensees, the available spectrum may only be auctioned among the existing licensees. However it was identified that there is no moratorium on CVAS licenses and new players could participate in auction having CVAS license. The committee agreed that it would make an attractive opportunity for new investors and an optimal market growth is expected. Also it will enhance the competition resulting in better auction prices. Therefore committee recommended allowing CVAS licensees to participate in the auction. And if appropriate, PTA may strengthen clauses of CVAS license.

f. Auction Methodology

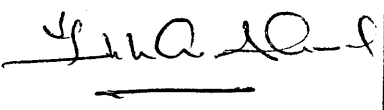
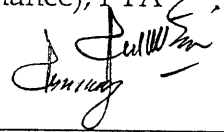

The committee observed that that better auction revenue significantly depends on the auction methodology. Currently, the most popular method of auction is Simultaneous Multiple Round Auction (SMRA) which is also recently adopted in Indian auction. With this method, multiple round of bidding is carried out over several days which results in a more optimal auction outcome. The committee recommended that to ensure maximal revenues and to avoid collusion, SMRA may be adopted in proposed auction. A brief on this auction methodology is given at Annex I.

Recommendations:***The committee recommended:***

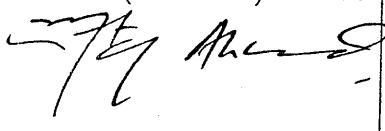
- i. To keep the block size for 3.5GHz spectrum as 21/22/ 23 MHz depending on the availability of the spectrum.*
- ii. To offer the auction lots on Telecom region wise basis*
- iii. To keep the region wise reserve price for 3.5GHz spectrum as proposed in Table 9*
- iv. To adopt the block size for 1.9 GHz spectrum as 5 MHz*
- v. To keep the region wise reserve price for 1.9GHz spectrum as proposed in Table 10*

ANNEX-D

- vi. To allow the CVAS licensees to participate in the auction, so that new investors may be included. CVAS license condition may be appropriately strengthened as admissible.
- vii. To adopt SMRA as the auction methodology.
- viii. The committee also recommends that base price so determined (for frequencies 3.5 and 1.9 GHz) may also be applicable with the approval of FAB on those frequency chunks which may become available before the auction date.

<p>Iftikhar Ahmed Executive Director (FAB)</p> 	<p>Tariq Sultan Director General (Finance), PTA</p> 	<p>Abdul Rahman Deputy Secretary (MoI)</p> 
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Mushtaq Ahmad Bhatti
Member (Telecom)- MoIT



ANNEX ISIMULTANEOUS MULTIPLE ROUND AUCTION

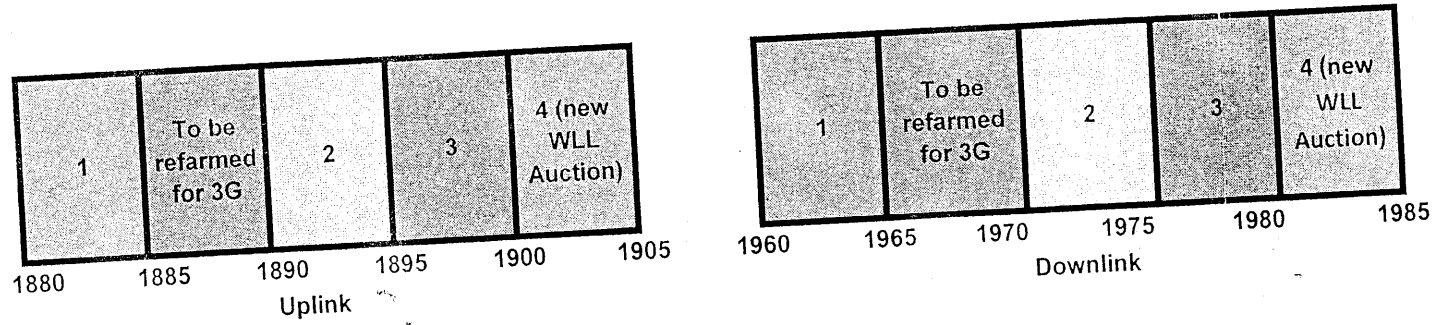
In a simultaneous multiple-round (SMR) auction, all licenses are available for bidding throughout the entire auction, thus the term "simultaneous." Unlike most auctions in which bidding is continuous, SMR auctions have discrete, successive rounds, with the length of each round announced in advance by the Commission.

After each round closes, round results are processed and made public. Only then do bidders learn about the bids placed by other bidders. This provides information about the value of the licenses to all bidders and increases the likelihood that the licenses will be assigned to the bidders who value them the most. The period between auction rounds also allows bidders to take stock of, and perhaps adjust, their bidding strategies.

In an SMR auction, there is no preset number of rounds. Bidding continues, round after round, until a round occurs in which all bidder activity ceases. That round becomes the closing round of the auction.

The Auctions is normally run over the Internet. Bidders are allowed to access the Electronic Auction System ("EAS") to be used for participation in the Auctions using standard web browsing software. Prior to the relevant Auction, pre-qualified Bidders are issued with authentication tokens to allow secure access to the EAS. These tokens consist of (i) a digital certificate (supplied on CDROM that is needed to be installed on any computer used for bidding) and (ii) a number of passwords. Bidders are responsible for ensuring that none of these authentication tokens are released to un-authorized parties. Qualified bidders are provided with a detailed manual explaining how to use the EAS (the "EAS manual"). This documentation and authentication tokens are provided to bidders in advance of conducting a mock auction, which is held at a time specified by the Government.

Pairing for the 1.9 Ghz Spectrum Auction for Wireless Local Loop




Figures in MHz

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PRIME MINISTER'S SECRETARIAT
ISLAMABAD

Subject: 3.5 GHz AND 1.9 GHz FREQUENCY SPECTRUM AUCTION
FOR WIRELESS BROADBAND SERVICES

13. The Prime Minister has been pleased to approve the proposal at para 4 of the summary.


(Khushnood Akhtar Lashari)
Principal Secretary
to the Prime Minister
03.12.2011

Secretary IT & Telecom Division

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Dated: 07-12-11



Broadband Policy

December 22, 2004

Ministry of Information Technology
IT & Telecommunications Division
Government of Pakistan
www.moitt.gov.pk

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1.0 INTRODUCTION:

1.1 Broadband Definition

The definition of ‘Broadband’ varies from country to country, but it is generally accepted as high speed, ‘always on’ Internet connection. Various organizations like the ITU, OECD and international regulators specify the minimum download speed of a broadband connection ranging from 128 Kbps to 2 Mbps or higher. The ‘Always On’ facility as opposed to the ‘dial up’ (10s of KBps) means that the user has access to the net as soon as he switches his internet browser on and does not need to dial the ISP number for a connection. As illustrated in Figure 1, most applications can be adequately supported if the minimum user speed is around 128kbps, accordingly broadband in Pakistan will be defined as “Always on Internet connection with a download speed of at least 128kbps connectivity”. This download speed target will be subject to an increase as the bandwidth prices reduce, local content becomes available and there is a general increase in awareness of broadband.

Speed, kbps	28	128	512	1,024	2,048	4,096	10,000
Transaction Processing	A	A	A	A	A	A	A
Messaging / Text Apps	A	A	A	A	A	A	A
Voice	A	A	A	A	A	A	A
Still Image Transfers	N	A	A	A	A	A	A
Internet / VPN Access	N	A	A	A	A	A	A
Database Access	N	A	A	A	A	A	A
Enhanced Web Surfing	N	A	A	A	A	A	A
Low quality Video	N	A	A	A	A	A	A
Hi - Fi Audio	N	A	A	A	A	A	A
Large File Transfer	P	A	A	A	A	A	A
Moderate Video	P	N	A	A	A	A	A
Interactive Entertainment	P	N	N	A	A	A	A
High Quality Video	P	P	N	N	A	A	A

A = Acceptable
P = Poor Quality
N = Not Acceptable

Figure 1 – Broadband Applications & download speeds

(Source – Broadband Strategy for Egypt 2004-2007)

1.2 Broadband Benefits

Broadband access is widely recognized as a catalyst for the economic and social development of a country. Broadband roll-out has a more powerful impact than the spread of basic telephony. For it not only allows people to communicate, but also to do business more efficiently over longer distances, be better educated, have access to better health services, benefit from better governance, and have enhanced entertainment services. A major part of the expected increase in GDP

and economic uplift due to broadband access will come from the benefits that high speed data networks and internet access will have on corporate efficiency and success. Whether transacting between a business and a consumer, or between two businesses, the success of e-commerce transactions severely decreases with lower speeds. This is driven by the longer time taken to access and act upon information.

A broadband connection can also be used for two way applications that would not be viable with a slow and unreliable ‘dial up’ service such as online classrooms and health clinics where the teacher and student and the Doctor and his patient can see and talk to each other through their computers.

1.3 Broadband Lessons From The World Markets

Countries with high penetration of broadband users such as South Korea, Japan and Canada have all implemented conscious policies for the growth of broadband in their countries. These policies have included growth enablers such as price reductions for the use of infrastructure, unified licensing for service providers, government’s setting of strict annual broadband penetration targets, content and e-commerce development incentives and lowering of the price and tax barriers on the broadband terminal equipment. The resultant growth and high penetration of broadband has contributed significantly to the social and economic standing of these countries. Realising the social and economic benefits of broadband, other countries such as India and Egypt have also recently issued similar strategies for the growth of broadband in their countries.

1.4 Broadband in Pakistan

1.4.1 Global Standing of Pakistan

Even with tremendous growth in the information technology sector over the past five years with the internet reaching almost 2000 towns and villages and the international bandwidth rates dropping by almost 90% (from USD 30,000 in year 2000 to USD 3,950 in 2004), overall ICT usage and penetration in Pakistan is still below international averages and shows a significant room for improvement. (See table 1- Annex B). Although the availability of broadband infrastructure in itself will not necessarily result in the spread of broadband services in Pakistan, the price of broadband access will play a significant role.

1.4.2 Broadband Market Dynamics in Pakistan

According to various market surveys and estimates carried out in Pakistan, Pakistan had approximately 2.5 million Internet users by the end of June 2004. First Broadband connection in Pakistan was given in 2002. By June 2004 there were approximately 29000 (89% cable, 10% DSL and less than 1 % satellite and wireless) broadband subscribers in Pakistan, i.e. a penetration of 1.16 %. All

broadband subscribers are in the three main cities of Karachi, Lahore and Islamabad.

Even though copper access network still dominates the cable / HFC network (less than 100,000 connections compared to over 4.5 million copper connections), broadband, in particular DSL, penetration is low because:

International IP bandwidth cost for a 2 Mbps connectivity, despite significant reductions, is a constraint at \$US 3995 in mid Aug 2004, and as a result the customer is charged a minimum of Rs 3500 for unlimited volume of shared 128 kbps of DSL broadband connectivity per month, plus the installation (Rs 2500) and CPE costs (Rs 3500). These tariffs¹ have kept the demand at a very low level.

Approximately 3000 DSL subscribers (by June 2004) belonged to four private sector companies namely Micronet Broadband Pakistan, Multinet Pakistan, Dancom Pakistan and Habib Rafiq Pakistan, who lease PTCL's access network on an Operation & Maintenance contract basis. These four DSL service providers had very little existing ISP presence/customer base when they started their DSL service. Hence their broadband customer acquisition costs were also high.

1.4.3 Barriers to Broadband Growth in Pakistan:

Price:

–The subscription prices for broadband in Pakistan are 60 times higher than in Korea². However considering the respective purchasing powers of the two economies³, this translates to 1600 times higher prices in Pakistan.

¹ These were the minimum tariffs for unlimited (non volume based), shared 128kbps usage, installation and CPE for broadband DSL in Pakistan in Oct 2004.

² In Oct 2004, the minimum monthly tariff for a 128kbps volume based broadband connection in Pakistan was Rs 1170.

³ In June 2004, the per capita GDP in Korea was US\$ 17,700 as compared to US\$ 652 in Pakistan (source: Ministry of Finance, Pakistan and Ministry of Finance & Economy, ROK)

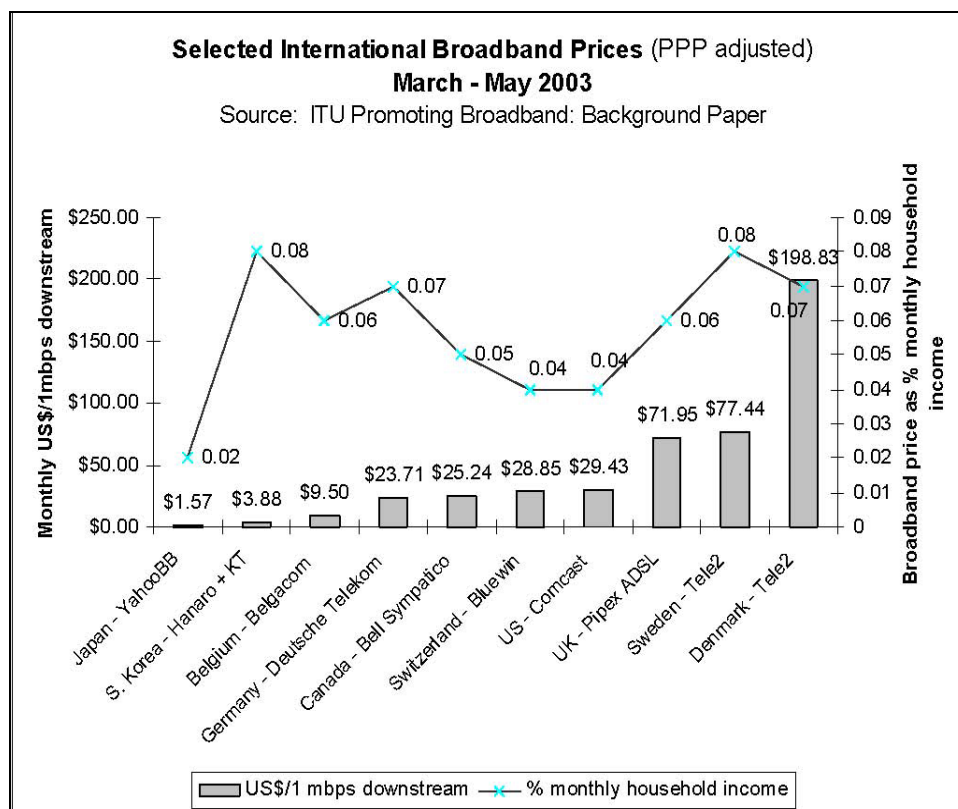


Figure 3- International broadband prices
 (Source- ITU Promoting Broadband: Background Paper)

Last Mile Access

- Low quality and small scaled HFC networks
- Quality issues with the copper beyond 1.5 km from the exchange
- Allocation and availability of frequency bands for BWA according to the ITU standards.

Content:

- Lack of locally located and local language content
- Lack of content and applications e.g. online stock market, online content in local languages, online education, e-government, e-commerce, home shopping, on-line games etc.

1.4.4 Broadband Enabling Steps Required in Pakistan.

While other countries, like Japan and South Korea, are aiming at delivering “universal, affordable access to broadband” for all of their citizens, Pakistan needs to quickly create the environment for stimulating explosive initial growth. Without the right interventions, the current market offerings – dial-up connectivity of 50 hours per month for Rs. 500, or unlimited broadband

connection at more than Rs. 3500 per month⁴, with high installation and CPE costs, and low reliability and quality of service – will continue to prevail with benefits realized by only a few. Steps need to be taken in the Broadband sector in order to escalate the growth of users and in turn the GDP of the country.

In Pakistan the mobile users have already overtaken the fixed line users in Pakistan. However only until the year 2000, this figure stood at less than half a million. The government then introduced CPP (Calling Party Pays) regime in the mobile sector in Pakistan. Within four years the cellular penetration grew by more than a 1000% reaching 6.2 million by September 2004. One policy initiative changed the entire growth of the cellular sector in the country. Today the six mobile operators are each looking to add more than 1 million connections in a year. Similar if not higher growth rates are expected in the fixed line sector after the recent removal of the monopoly in fixed line service provision. The ‘open’ fixed line deregulation policy has resulted in 12 LDI (Long Distance International) operators and 80 Local loop service providers⁵. Open regulatory steps in the policy have resulted in such interest, which no doubt will contribute to a reduction of tariffs and accelerated growth of the fixed line services into the far flung areas of the country.

1.4.5 Way Forward – A Broadband Enabling Policy

In order for the above success to be replicated in the broadband sector of Pakistan, a broadband policy for Pakistan is required- A policy that aims at setting goals for broadband services in the country. This will include investment in urban networks, domestic and international backhaul, content delivery mechanisms, content and application development, and rural build-out. The content and applications would include a full menu of services including education, health, governance, locally located content, local language web content, and new broadband-based entertainment like games and videos. For this magnitude of investment to occur, the appropriate regulatory environment and policies need to be established. Once this happens, only then will there be successful growth and business models in broadband services.

1.5 Broadband Policy Objectives

The Broadband policy is designed to achieve the following objectives:

- 1. Spreading of an affordable, ‘always on,’ broadband high speed internet service in the corporate/commercial and residential sectors across Pakistan.**
- 2. Encourage the entry and growth of new service providers while stimulating the growth of the existing ones at the same time.**

⁴ The non volume based (unlimited) 128kbps broadband connection tariff in Pakistan in June 2004.

⁵ Sept 2004 figures from PTA website.

3. Encourage private sector investment in local content generation and broadband service provision.

The policy proposes the following strategy for the achievement of the above objectives:

- a. Removing the existing technical, commercial, operational and legal barriers to the growth of broadband in Pakistan.
- b. Increasing the choice of broadband technologies (DSL, Cable & FTTx, Wireless, Satellite) available to the consumer at affordable prices.
- c. Encourage the development and hosting of local content so as to reduce reliance on the expensive international bandwidth.
- d. Promoting the sale of terminal equipment (PCs, CPEs).
- e. Obligating a pro-active and facilitating role by the largest infrastructure provider PTCL for the growth of Broadband in Pakistan.

1.6 Broadband Targets:

1.6.1 Broadband in Pakistan will be defined as “Always on Internet connection with a download speed of at least 128kbps connectivity”. This download speed target will be subject to an increase as the bandwidth prices reduce, local content becomes available and there is a general increase in awareness of broadband.

The independent study of the consumer patterns in the Pakistani internet market has shown that a major percentage of internet users will switch to broadband if the average cost of internet usage falls reasonably keeping in mind the improvement in speed and broader choice of applications. However keeping in view the fact that a majority of the internet users are paying less than Rs 500 per month for a dial up connection (and would only switch if broadband tariffs are kept under the same rate as well) and do not pay any fixed costs either such as the costs of CPE and installation associated with broadband connection, it is estimated that with the enablers given in this policy and the resultant monthly tariffs dropping below Rs 1000, at least 5 % of the internet users will be connected to broadband. i.e. 200,000⁶ broadband users in Pakistan within two years of implementing the policy. In line with the continuous reduction in international and domestic Internet and broadband tariffs and the expected availability of local content and broadband awareness facilitated through this policy, it is forecasted that the number of

⁶ Assumes 4 million dial up Internet users by the end of 2005.

broadband users in Pakistan will reach at least half a million within five years, with higher levels of penetrations with further reductions in the tariffs. Although these figures have been estimated the main goal of the policy is to create an environment where broadband proliferates. With the availability of broadband enabling content and applications as well as systematic well spread out and maintained infrastructure the market will take its own path and determine specific growth rates and targets.

Despite all the contributions projected from different parties, we should not expect the broadband services, especially those newly proposed, to turn profitable immediately. Looking at success stories of other developed countries, new services become profitable typically in 3 years. Broadband service providers in Pakistan should take that risk in order to stimulate usage and hence create much higher revenue streams in the future. The penetration levels envisaged in this policy will be achieved and further enhanced when the availability of local content and lucrative e-business models become widespread in Pakistan, when the legal framework fully supports the spread of such business models and when the cost of providing broadband services becomes as low as the levels seen in the broadband rich countries such as Japan, Korea and the US. The policy only aims to facilitate all of the above factors, but the actual growth will depend on the initiatives taken by the other stakeholders too, such as the service and content providers both abroad and in Pakistan to capitalize on these facilitations and help creating and meeting the demand rather than just meeting it.

2.0 Policy Structure:

This policy document aims at separating the broadband value chain into four components and creating growth enablers in each component (Fig 4). The four links of the broadband value chain that will cover all the enabling aspects of the broadband services are

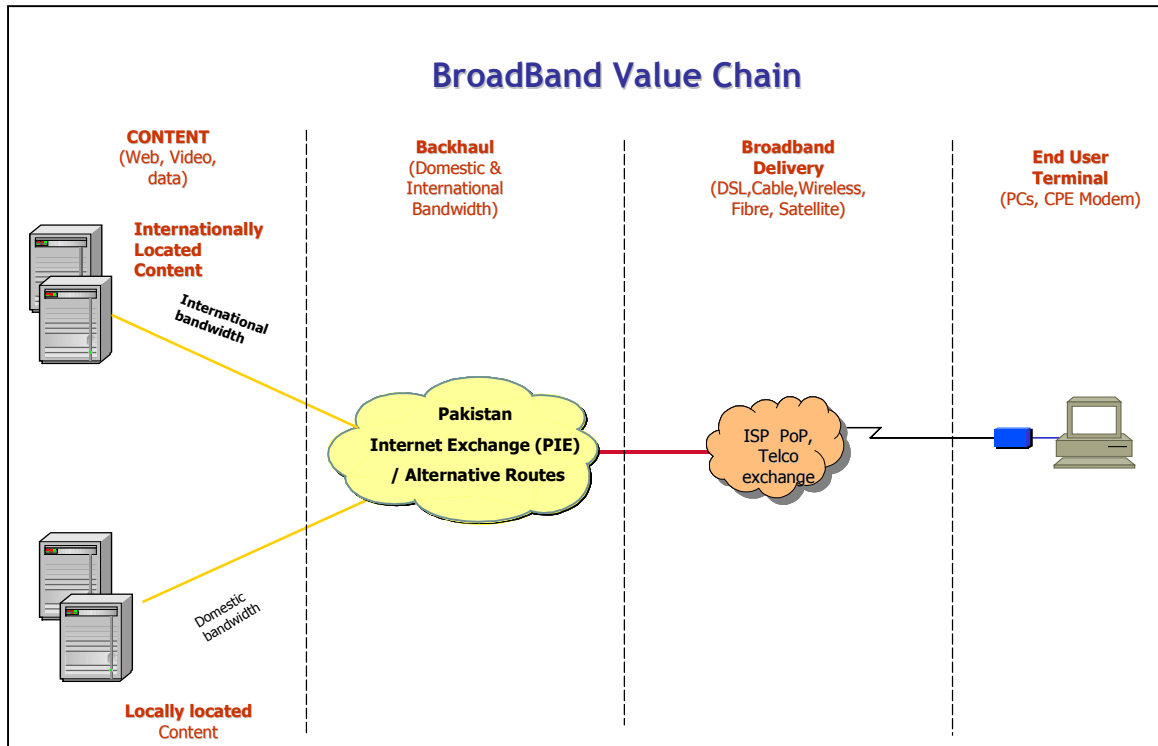


Fig 4- Broadband Value Chain

- 1) Content Facilitation
- 2) Backhaul Facilitation
- 3) Broadband Delivery facilitation
- 4) User Terminal equipment facilitation

3.0 CONTENT FACILITATION

The content available for use over the internet has very important role in enhancing the utility of internet for local population both in the way of local availability and availability in local language(s). The policy aims to enhance both the areas in tandem by ensuring that the content industry will flourish based on the incentives provided on all the platforms where data related services are delivered to the public including data over cellular and over fixed line CPEs apart from the availability on the internet. Policy aims at promoting new breed of Application Service Providers (APs) like Malaysia and other countries where content industry has developed.

3.1 Locally Located Content:

Hosting of websites within a country is one of the main drivers for the promotion of broadband growth. It is therefore important to encourage both domestic and foreign operators to host their websites within Pakistan. This will address one of the key dimensions of accelerating broadband penetration, i.e., local content availability. By providing locally located content, this facility will reduce the reliance on the International IP bandwidth as a high proportion of the internet traffic would remain in Pakistan. To achieve this objective, the following steps will be implemented:

3.1.1 The telecom operators, both fixed and mobile, will be encouraged to provide easy access (such as short access codes) to their networks for “third party content providers” on which PTA will issue guidelines.

Third party content represents a significant chunk of revenues from the non-voice services of mobile and fixed line telecom operators. Since this industry directly impacts both content and broadband areas, the above step will help generate content providers in Pakistan.

New generations of communication CPEs in general, and mobile phones in particular, are supporting increasingly rich and advanced content types. The combination of ‘quality’ and ‘ease of downloading’ content are leading to rapid growth in the development of the content market. The recent past has seen a plethora of non-voice data services in the mobile area (Some VAS are available on Fixed Lines also) such as SMS, MMS and others delivered over different wireless service protocols. Given the popularity of content on mobile phones, encouragement of content providers to hook up to the cellular operators will help to bring in content providers much needed to facilitate broadband in Pakistan. The end user connectivity if provided in the form of short access codes will encourage the entry and growth of content providers in Pakistan, which in-turn will reduce the reliance on the international bandwidth. Several standards for provision of high-speed data services over cellular platforms are emerging. The telecom sector de-regulation policies do not bar the cellular providers from offering these new

services under their existing licenses. The issue of convergent/unified services on these platforms will however be the subject of a future study.

3.1.2 An e-commerce wing will be set up in the Ministry of IT to encourage the growth of broadband services in the country. This wing will propose and implement strategies for e-fraud prevention, verification of company authentication certificates and reliable services such as money back guarantees. The proposals will be based on the collaborative efforts with all the relevant ministries/departments and relevant stake holders e.g. law, commerce etc. for a cohesive view on all these matters.

Availability of useful applications like e-government, electronic tax filing, online stock trading, online gaming etc. have a huge impact on the demand for high speed internet and act as market drivers. The government is proactively working on the introduction of e-government applications. A 'National e-government council' has already been set up under the chairmanship of the Prime Minister of Pakistan. This council will oversee the e-government initiatives aiming at automation and e-communication within all federal ministries and assist all the local governments in automating their records, tax and revenue collection functions to improve decision making, besides ensuring electronic bill payment facility for all major utilities. Availability of these services in conjunction with the local language computing platform as envisaged in the policy will have a major impact on driving up the demand for broadband internet.

3.1.3 In addition to the traditional credit card payment method over the net, all e-commerce content providers would be encouraged to offer payment model where their services are charged from the consumers through the broadband service provider monthly bills.

3.1.4 Facilitation on co-location of space and bandwidth will be given to companies which will set-up hosting facilities of 1 Tera Byte or more in Pakistan. The total storage to be setup at one time and can be in more than one location.

This incentive will help bring in the web content located outside Pakistan thereby reducing the reliance on international bandwidth. This could also include the creation of a local mail service with 100MB storage per user. As of today, hosting websites is an expensive proposition due to the bandwidth and space charges that will be required for large hosting platforms. This financial barrier is one of the main reasons responsible for the low level of website development in Pakistan, whether in English or in Urdu.

Hosting web sites locally will have the following advantages:

- Access to these sites will be faster
- International IP bandwidth dependency will not be required for these sites

- Foreign exchange will be saved

3.2 Local Language Content:

Even if the broadband policy is successful in reducing the international IP bandwidth barrier (reduced prices, peering networks etc), till such time that there is a demand from the consumers for utilization of this bandwidth, the objectives of the policy will not be achievable. Whilst no doubt there is enough material available on the world wide web that can be accessed, given the fact that literacy in English is extremely limited amongst the general population, the vast majority of users will not be able to benefit from the increased bandwidth speeds and cheaper access.

Different government agencies and private sector academic organizations have contributed significantly, with government funding, to the development of an Urdu language Unicode based standard for into website development. Standardization of the Unicode for Urdu has already materialized. This will lead to large software operating system companies to produce standardized software for the language, allowing websites in Urdu to be developed as per normal practice, which allows indexing, searching, sorting and other similar functions to be carried out. The Unicode development will also pave the way for integration of the Urdu language into most popular computing platforms like Microsoft Windows and also prompt the growth of related industry like keyboard manufacturing and Urdu speech-to-text conversion and translation services for the widespread acceptance of the new Unicode for Urdu, the policy envisages:

3.2.1 Holding of a series of training workshops to teach the mechanics of developing Urdu language websites using the Unicode based standard.
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Developing the skills required to be able to develop websites in Urdu is not a complex task, and a short training course will equip the participants with the required skill level. Government will conduct a series of "Train the trainers" workshops. These trainers will then replicate these trainings at selected colleges and institutes throughout the country. This will result in a large pool of individuals who are able and willing to develop websites in Urdu.

It is anticipated that there will be a snowballing effect to this activity, since the more websites that are developed in Urdu, the more will be the usage of the internet within the country, which in turn will fuel the demand for more interesting and varied Urdu and other regional languages websites. This is a trend that has been observed in other countries, when a language has been introduced on the web, and there is no reason to believe that developments in Pakistan will not go down this route.

3.2.2 To spur growth in local content, the government will encourage hosting services for any website developed using the Urdu Unicode standard.

Availability of Urdu language websites hosted locally would combine to raise usage as well as reduce the cost of connectivity, thus driving the usage upwards in turn. This “virtuous” cycle will result in the objectives of the policy being achieved without any major financial burden on the stakeholders.

3.2.3 To promote above concepts on content industry, the policy envisages a sustained and targeted media campaign run in conjunction with both the state as well as the private electronic media channels.

A nation wide competition consisting of different categories of websites and web developers will be organized and attractive prizes will be awarded to the winners. This will stimulate the interest of the target audience and result in high quality websites being developed.

4.0 BACKHAUL FACILITATION

Most of the content (international and domestic websites, .pk domain etc) is located on Internet servers outside Pakistan (Largely in the US and to a smaller extent in Europe). This obligates ISPs and the consumers to pay for the expensive International IP bandwidth to access that content. However the ISPs also need the domestic bandwidth to access and connect their individual PoPs located in various cities in Pakistan. The Content, International bandwidth and the Domestic bandwidth make up three of the most important elements of the back end or 'Backhaul' of the Internet and broadband supply chain. (See figure 4). Facilitation of these three elements will therefore have a major bearing on the ability of the service providers to offer cheap and affordable broadband services.

With lowering of the barriers for the broadband users in Pakistan and the expected switch of Internet users from dial up to broadband, the charges incurred in the PRI equipment specific to dial up users will be reduced so that the ISP can re-deploy his PRI equipment in less lucrative areas. See section 4.2.2.

LDI Licensees will have the option to develop their own backbone networks including National Internet Exchanges (NIEs) to provide competitive connectivity to all existing and new data communication and Broadband service providers. Accordingly, the policy envisages:

4.1 Reduction in International IP Bandwidth Prices

4.1.1 The existing International IP and associated bandwidth prices will be lowered to a level where the annual broadband user targets stated in this policy would be completely achieved by the service providers.

International IP bandwidth price is the biggest factor in an ISP cost. At present prices, it can become a major component (up to 60%) of the operational expense of an ISP. Reducing the International IP bandwidth price will therefore enable ISPs to offer better dial up and broadband services at affordable prices. Bandwidth service provider's price reduction can be achieved by various methods including reduction of costs of international capacities via long-term leasing of high bandwidth capacities and applying volume discounts on higher capacities (STM4). With the increased number of LDI service providers and increased competition in the infrastructure available in Pakistan, it is expected that natural price reductions will follow after the first 'artificial' price reduction offered specially for broadband promotion.

4.2 Reduction in Domestic Bandwidth Prices

4.2.1 The existing domestic bandwidth prices will be lowered to a level where the service providers will be encouraged to use local and national peering services and generate local and nationally hosted content.

A reduction of domestic bandwidth prices by the domestic bandwidth service provider should encourage ISPs to have their own countrywide network and carry their internal traffic on their own network instead of Internet. This will open up cheap new services such as VPNs that ISPs can offer using their national network. ISPs will be able to attract corporate customers and banks for their remote branch connectivity using their national network. It will also encourage companies to develop attractive and e-commerce oriented content that resides in Pakistan, again reducing reliance on the expensive international bandwidth.

4.2.2 To promote IT industry, the PRI charges will be lowered to a level where the gap created in the dial up infrastructure usage by the dial up users switching over to broadband services will not make the operational and capital expenditure in the PRI service a liability for the internet service providers.

PRI (Primary Rate Interface) defines the equipment that is exclusively used to connect the dial up users from their PCs to the ISPs PoP through the telephone exchange. The reduction in charges will ensure that drop in the PRI usage due to users switching to broadband will not hamper the ISPs profitability.

Provision of alternative methods to the current distance based dedicated resource tariffs can be one of the steps that could lead to reduction in broadband prices for the end-user. Facilitation of such steps will introduce options for the broadband service providers and help in lowering the costs for the end-user.

4.2.3 Incumbent will be encouraged to work out alternative products and pricing plans (e.g. Ethernet/ IP ports etc.) complementing the current distance based dedicated resource tariffs, hence increasing the options for the service providers to lower the end-user prices.

4.3 National and Regional Peering

4.3.1 Establishment of National and Regional peering points that connect and switch the domestic traffic between all the ISPs and promote the creation of a national Intranet that provides domestic IP network services, would be encouraged.

This facility will reduce the dependency of ISPs on the costly backhaul IP bandwidth. By exchanging traffic local to ISPs at peering points, their backhaul IP bandwidth will not be used and the customer will experience smaller delays because of shorter span the traffic needs to travel. It will also free up the backhaul IP bandwidth to be used by traffic that needs to go out of Pakistan hence increasing the overall response time.

This facility would again encourage the development of locally located content, such as domestic email and e-commerce services. Once the Peering service is

established, the creation and growth of local content and local e-business will become inevitable. This national intranet will be interconnected with the other intranets in Pakistan such as all the major Universities and Libraries intranet (PERN) and the intranet linking all the government organizations.

The cost of traffic internal within a closed Intranet is significantly lower than traffic on the Public Internet. Development of local intranets such as the already existing PERN network and connectivity between them will again lower the costs of providing broadband services to the residential and corporate users across Pakistan. This facility will also reduce the reliance on the international IP bandwidth.

5.0 BROADBAND DELIVERY FACILITATION

5.1 Broadband Delivery Technologies:

Today there are four primary mechanisms for broadband delivery:

	<u>Common Terminology</u>	<u>Technical Terminology</u>
1)	Copper Telephone lines	- Digital Subscriber Line (DSL)
2)	Hybrid of Coaxial and Fibre cable	- HFC Network
3)	Wireless	- Broadband Wireless Access
4)	Satellite	- VSAT and DTH

5.2 Digital Subscriber Line (DSL) Technology

In DSL, voice and data get transferred simultaneously over the existing copper telephone lines by using different frequency ranges on the same line. Voice is transferred on lower frequency bands and data on higher ones.

The technology to do this resides in the DSL transceiver or modem that's installed both at the subscriber end and at the end of the service provider. A DSL modem on the subscriber end sends data over the telephone line to the telephone exchange or Central Office (CO). At the telephone exchange, a DSL Access Multiplexer (DSLAM) terminates and aggregates incoming DSL lines. It redirects the voice traffic to the public switched telephone network (PSTN) and the data to a high-speed digital line that connects to the Internet as illustrated in Annex B. This results in the simultaneous availability of the telephone and Internet on the same line.

5.2.1 Incumbent's Facilitation for Broadband Growth:

International experience shows that DSL succeeds when the local loop service providers follow the policy of providing the service in an aggressive manner, because the LL service provider typically has ownership of upwards of 90% of the copper local loop.

Since virtually all the local loop telephone lines are owned by the incumbent, giving nondiscriminatory access to this facility for use and investment by other operators also becomes crucial. Thus, the incumbents' role and effort is also the key to spur overall growth in the market.

All the DSL services will fall in one or more of the following categories:

- 1) Local Loop Service provider's retail DSL service.

- 2) Local loop service provider's wholesale DSL service for ISPs and content providers, where the investment in the entire infrastructure is the wholesaler's responsibility. The retailer will be responsible for marketing, customer acquisition and customer services only.
- 3) ISPs and other operators retail DSL service where the DSLAM investment is the ISPs responsibility.
- 4) Bandwidth provision from LDI operator to other service providers for onward delivery of DSL services.

5.2.2 Broadband Business Model and SMEs Growth in Pakistan:

Besides the fast 'time to market' advantage, DSL wholesale will provide the cheapest way for a service provider to offer broadband services. The copper loop owner will be able to offer a wholesale service to any broadband service provider without the service provider having to invest in the infrastructure. This low cost and 'fast time to market' service provision is envisaged to present the SMEs (companies with low capital), with a very lucrative business model, thereby creating new companies and increasing the volume and turnovers of private sector service providers in Pakistan.

The following policy enablers for the above categories of DSL services will promote quick growth and competition in the DSL broadband services:

5.2.3 There will be no restriction on the number of broadband service providers in the market. Any company or entity shall be able to provide broadband services provided that it has met the terms and conditions given under the section 'regulatory framework'

One of the major reasons for the lack of growth in the broadband users in Pakistan is the restriction in the number of operators allowed to offer broadband DSL services. Unrestricted competition will escalate the growth of Broadband users, similar to the growth seen in the dial up Internet sector. Since the incumbent's initiatives are of key importance in the recently deregulated telecom sector, this policy just like the de-regulation policies of the fixed and mobile sector puts some obligations on PTCL to act as stimulus for the smooth entry of new providers into the market.

5.2.4 PTCL will offer the content service provider (ISPs, Multimedia content providers) data stream access to the customer. Rather than a potential content provider having to obtain leased lines from PTCL, pay collocation charges and invest in exchange side broadband related equipment, the PTCL manages the transmission link from the customer to the services providers POP for a flat rate service charge. In order to ensure efficient and fair use of PTCL's resources and space for all service providers, the incumbent will offer wholesale services to retailers in exchanges for which the retail service providers have provided a viable business plan.

This service obligates PTCL to install DSLAMS in its exchanges through which it will provide the ports to its wholesale customers and may also use those DSLAMS to provide retail service to customers. The wholesale service will simplify the broadband service offering by all ISPs and content providers and escalate the spread of the service. Effectively the service providers will be interconnecting at the data stream level rather than the physical copper level.

5.2.5 PTCL will offer non-discriminatory shared access to its last mile copper, i.e. the service providers can install their own exchange side broadband equipment in PTCL's exchanges. The line will be available to other operators for data services only (as the policy's aim is to promote broadband). PTA will monitor the shared access for fair competition.

This will distribute the investment load between the operator and incumbent. And the service provider will be able to deploy its DSLAMS where it makes business sense.

5.2.6 PTCL will have sufficient dedicated staff for the facilitation of the access to its exchanges in order to ensure speedy provisioning of the service to the broadband service providers. PTCL will be required to provide the service within a predetermined time frame.

5.2.7 Service level agreements will be signed between the ISP, the LL/LDI operators and the broadband service provider in case they are all separate entities. Service level agreements will also need to be signed between the wholesale service provider and the retail service provider. In the case of non-availability of desired network infrastructure from any existing LDI/LL licensee, the broadband service provider (either retail or wholesale), can lay down their own purpose specific transport/local loop infrastructure just for providing broadband services, after three months of failure to obtain the network transport desired.

5.2.8 To contribute to the policy subscriber targets, PTCL will reduce the monthly rental charge for the copper loop in order to make it viable for the service provider to offer broadband services at an affordable price level.

5.2.9 Service level agreements stating benchmarks for QoS will have to be signed between customers and broadband service provider.

5.2.10 Regulatory Framework for DSL:

The regulatory approaches on broadband vary from country to country depending on the level of market maturity. Local loop unbundling has occurred in countries such as the UK¹ and the US where teledensity has matured to a saturation level and there is little need to encourage the investor to lay new telephone lines,

whereas in growing teledensity countries such as Egypt and India, the local loop owner has to be paid a rent for using its loop for delivering broadband services. While full local loop unbundling will not occur in Pakistan until such time that teledensity has reached some level of maturity, the steps proposed in this policy aim to ensure that high growth areas such as the DSL have minimum level of barriers in Pakistan. However the reduction of the barriers has to be accompanied by the assurance of quality of service for the broadband users in Pakistan and the protection of stake holder's investments as well. Any entity will be able to offer broadband services in Pakistan provided that they have met the specified terms and conditions:

5.2.10.1 Service level agreements need to be signed with the licensed local loop and LDI operators by the broadband service provider who may also offer value added services such as VPNs, video conferencing and call center connectivity remaining within the scope of class license template as explained in Section 7.

5.3 Fiber / Coaxial Access Network

Broadband services on coaxial networks holds less than 40% of the world broadband market (See Annex B). Its largest location is the US, where cable was deployed as the prime technology for broadband and multimedia services as far back as the 1980's. Before the xDSL and wireless technologies became advanced enough to offer broadband, cable was the medium that offered high bandwidth characteristics. Fiber Optic technology allows for transmission of 10 Gbps which is much higher than DSL technologies. Unlike the DSL service, cost and time constraints would still not allow the fiber to be taken to the customer's premises. However Fiber Optic cables are now being used from the exchange to the more remote feeder points to shorten the length of the copper wire. This may enable high bandwidth services such as broadcast TV and video on demand to be delivered on the DSL. The need for establishing many two way bi directional amplifiers in the network and the need to dig the roads for the laying of fiber and coaxial cable characterizes this technology. Right of Way is the most critical element in the deployment of this technology as far as the broadband policy enablers are concerned.

With the influx of new LL and LDI operators entering the Pakistan market, this might prove to be a major hurdle in rolling out new infrastructure and providing advanced broadband services in a timely manner.

The following policy features will facilitate ROW availability:

5.3.1 The government will encourage local governments and utility companies etc. to offer non-exclusive, non discriminatory and uniform ROWs and space contracts thereof for the concerned market segment, as per the Telecom Deregulation policy section 4.1.

5.3.2 The government would encourage owners/builders of multi-storied buildings and commercial complexes, including local area authorities and operators not to enter into exclusive agreements, which would prevent others from serving potential customers in those areas.

Although local governments, authorities and utility providers do not fall under the jurisdiction of the MoIT, facilitative steps taken for appropriate resolution of these crucial issues at the government level will be helpful for the new market entrants.

5.3.4 Regulatory Frame Work for HFC Network

The fixed nature of the HFC networks means that the regulatory policies for fiber and coaxial broadband networks will be similar to the policies defined for the fixed line copper networks. Regulatory framework clause 5.2.10.1 would also be applicable to the HFC broadband service providers. The broadband service providers desirous of deploying HFC network will have to meet the regulatory requirement of PRMRA if any.

5.4 Broadband Wireless Access

The ITU has allocated multiple frequency bands for fixed wireless deployment. These are

1) IEEE 802 based bands for Short distance broadband	2.4-2.5,5	GHz
2) Fixed Wireless Access bands	3.4-3.7, 10	GHz
2) Multipoint Microwave Distribution System (MMDS)	2.5-2.7	GHz
3) Local Multipoint Distribution System (LMDS)	24-32	GHz

Due to the convergence of broadband, TV and voice, many of the above listed bands are used for offering all services together. Except for the IEEE 802, multimedia convergence equipment is available in all of the above listed bands. Due to the equipment standardization and economies of scale, these bands will offer a potential broadband service provider a very attractive and fast method to deploy mechanism to deliver broadband services in Pakistan. However the recent auction of 3.4-3.7 GHz in Pakistan will give the service provider a fast route to delivering broadband to potential users where fixed lines have either not been installed or their quality is below the standard required for carrying high speed information.

To facilitate the above convergence and international standardization of wireless broadband equipment, the following policy enablers are proposed:

5.4.1 In order to streamline frequency management and allocation plan for Pakistan in accordance with the international standards; a high level technical committee with representations from MoIT, PTA, PEMRA and FAB will be formed. The committee will consider measures with the objectives of making appropriate frequency spectrum available to the broadband service providers in Pakistan. All the licensed and unlicensed frequency bands internationally recommended by ITU for broadband wireless access would be analyzed and offered to promote the service. An inter-ministerial committee will take appropriate decisions based on the recommendations of the technical committee.

The proceedings of the committee meetings will lead to the development of a road map leading to the gradual availability of the unlicensed ITU standardized frequency bands for the broadband deployment. The committee will also examine the scenario of overlap of regulatory authorities of different regulatory bodies like PEMRA, PTA, and FAB etc. and will suggest a framework for the smooth co functioning of the regulators while ensuring the facilitation of the new broadband service providers for the purpose of increase of investment in the sector. The recommendations of this committee would be placed before an inter ministerial body or cabinet committee for final decision.

5.4.2 Service level agreements stating benchmarks for QoS will have to be signed between customers and wireless broadband service provider.

5.4.3 Regulatory Framework for Wireless Broadband Access:

Regulatory policies vary across the world for wireless access broadband. For instance in some countries import duties and licensing exists on WiFi equipment that uses the unlicensed bands, whereas in mature markets like as the US, Korea and Singapore the regulation has allowed unlicensed usage of these bands resulting in the spread of broadband services in the corporate and confined public places. The bands in the IEEE 802 series need to be unlicensed and free for broadband usage in Pakistan in a non-exclusive manner.

5.4.3.1 PTA to provide a regulatory framework for the unlicensed bands users that includes concerns such as setting of the maximum permissible power levels and protection of users against the violators.

Because of the low cost of IEEE 802.11 (WiFi) equipment (off the shelf) and deployment, these technologies are very useful in many situations and make a viable business case for operators to distribute broadband connections to multiple users within a limited distance such as corporate offices (WLAN), airports and shopping malls. Operators using this band within close proximity will need to

restrict the power output to levels that does not interfere with the adjacent operators' service if they are using the same unlicensed band.

5.4.3.2 PEMRA will be required to consult FAB before publicizing and committing any frequency resource bands for broadcast, VoD (Video on Demand) and other Multimedia / TV service.

This would be done in the interest of optimal utilization of valuable frequency resource, which in certain areas falls in shared (broadcast, broadband and converged) services. This will eventually lead towards convergence as per the emerging international practices.

5.4.3.3 PTA and FAB will explore alternative spectrum bands, which are not in the high demand, that could be used for deploying broadband services and develop pricing incentives for their usage.

Because of the international standardization of frequency bands for a particular service, the infrastructure in those bands is manufactured in large volumes and hence sold at low prices. A similar allocation and standardization of frequency bands in Pakistan will give the broadband service provider in Pakistan a low capital expenditure and fast to deploy route to offering the service, thereby contributing to the spread of broadband in the country.

5.5 Satellite Broadband Access

Satellite technology can provide a very 'fast to deliver' last mile alternative to DSL, HFC and wireless. It can make financial sense to deploy Satellite for delivery of services in remote areas where the other technologies become financially unfeasible due to the physical laying of the infrastructure.

5.5.1 Satellite broadband services can be provided by Broadband service providers using VSAT technology provided they meet the class license requirements.

5.5.2 Satellite broadband services can also be provided by the DTH operators provided they have local loop and LDI licenses, keeping in mind the existing limitations of the DTH license issued to them from PEMRA.

5.5.3 The broadband service providers will operate under the class license (including registration with PTA). In case the broadband service provider is proved to be involved in running illegal operations through its service, PTA will take action according to license template and shall also have the right to cancel the registration. In case of violation by PEMRA's licensed service providers, PTA will refer the matter to PEMRA.

5.6 Government Initiatives for Broadband Rollout in Pakistan:

The following policy initiatives by the Government would help stimulate the roll out of all the broadband technologies in Pakistan:

5.6.1 The government would require installation of facilities that enable broadband communications in new buildings built by the state, municipalities and government enterprises.

5.6.2 The government will play a proactive role in development of ICT and broadband services in unserved/underserved areas of Pakistan. The road-map for the USF also includes plans for ICT including broadband in both the areas. This will pave way for proliferation of broadband services in the rural areas of Pakistan.

5.6.3 The Government will encourage the co-existence of all the Broadband delivery technologies in the most efficient manner possible such that no artificial hurdles suppress one technology and maximum competition in the sector is allowed to grow.

For growth in broadband in Pakistan to be accelerated, competition needs to be fostered and made viable in all of the services. The regulatory environment will ensure that each of these access paths co-exist in the most efficient manner possible such that no artificial hurdles suppress one technology. However almost 60% of the world broadband subscribers access the service along the copper telephone lines via the DSL technology. In line with the world trends and despite the need for the availability of all the possible technologies for broadband, the existence of over 5 million fixed telephone lines in Pakistan makes DSL the fastest possible technology to spread the broadband user base in Pakistan. While it is envisaged that the number of Cable Modem broadband users and, in time to come, the wireless broadband users, will grow at a steady pace, due to the existing availability and spread of the copper line infrastructure, majority of the broadband users expected in Pakistan over then next five years will be through the copper line DSL technology.

The Government will however play a proactive part in encouraging the entry and growth of any new and alternative broadband delivery technologies as well. For example, delivery technologies that might become an alternative to the cable and phone companies for delivering Broadband service such as ‘Broadband over Power lines’ or BPL could also fuel the spread of broadband households. Such technologies could offer enormous promise because the power grid is ubiquitous and the costs to the industry to offer the new service would be comparatively small. A technology like BPL would not only offer greater competition in the broadband market, but would also allow consumers to easily create networks in their home through special modems that plug into their electrical outlets.

6.0 END USER TERMINALS FACILITATION

The availability of low cost access devices is a catalyst for broadband penetration. The policy proposes the following initiatives that will stimulate the sale and penetration of end user devices in Pakistan:

6.1 Provisions relating to equipment depreciation and other fiscal incentives provided for in the IT policy will be maintained in the context of this policy.

The advancement of technology often makes IT equipment obsolete in a short span of time. This increased depreciation will help stimulate investment in the equipment sector. This will encourage the large corporations to update their PCs and make cheap second hand PCs available to the lower end of the market, stimulating the use and spread of PCs across Pakistan. This could particularly benefit the schools and colleges in smaller towns and villages across the country.

6.2 Pakistan Government will introduce low interest rate loan facilitation through ‘own a computer initiative’, for the purchase of PCs and broadband customer premises equipment.

Other countries, like Korea, Malaysia and Thailand have taken significant steps with government funding this area for providing low cost and free PC’s to low income families and for all schools. The Korean and Malaysian government provided heavy subsidization and low interest rate loans to help families with children obtain PC and further their ICT education.

7.0 REGULATORY FRAMEWORK AND ROLE OF PTA

The aim of the broadband policy is to simplify the licensing mechanism for the promotion of broadband services in particular and all types of data communication services in general. In pursuance of the already approved deregulation policies (section 13) existing licenses for the Data, ISPs, and EIS are proposed to be phased out after the expiry of their current license tenure or converted into class license. Those who opt to adopt the new class regime will be eligible to the incentives being provided in the Broadband policy. As part of class license the existing Data, ISPs, and EIS and new broadband operators will be free to sign bandwidth and local loop agreements with operators of their choice within policy framework for LDI/LL licensees. The existing data/Internet licensees can opt to continue under their existing license till its expiry within terms and conditions of their license, thereafter they will be governed under class license template. This action will result in simplification of regime with the incentive of lower class license upfront registration charges and elimination of recurring charges etc. The template for class license (registration) of Data, ISPs, and EIS and broadband Service Providers will be made by PTA taking into account conditions specifying requirements of security, violations, voice and illegal termination and penalties thereto. The template will also take care of substantive conditions of contractual obligations to be included in operator and customer agreements. PTA would also specify the necessary requirements for the SLAs and QOS to be incorporated in LL/LDI agreements and in broadband service providers' performance obligations. The idea of registration with PTA is to make sure that all the clauses of the policy are adhered to by the new service providers and for the purpose of national security. While formulating the class license templates, PTA, by incorporating suitable clauses regarding matters pertaining to the use of VSAT by Broadband service providers and VPN and related services, will ensure the protection of the interests of all stake-holders. The overall role of the regulator (PTA) is encompassed in the following text. These regulatory obligations would encompass all the broadband service providers irrespective of their delivery mechanism.

7.1 Class Licensing

7.1.1 Pursuant to section 13 of the Telecom Sector Deregulation Policy existing licenses for the Data, ISPs, and EIS will be phased out after the expiry of their current period of validity and will be converted into class license and they will be eligible to the incentives being provided in the Broadband policy. The broad band service will also fall under the class license regime to ensure uniformity. The existing Data, ISPs, and EIS licensees can opt to continue under their existing license till its expiry within terms and conditions of their license or to be governed under class license template regime.

7.1.2 The existing Data, ISPs, and EIS licensees, who want to provide broadband services, will have to comply with the class license templates for the broadband operators including QoS provisions and service level agreements (SLAs).

7.1.3 PTA will prepare the class license templates and registration terms of Broadband, Data, ISPs, and EIS under the class licensing scheme taking into account conditions specifying requirements of security, violations (including illegal voice origination/termination) and penalties thereto.

7.1.4 The templates will incorporate substantive conditions of obligations to be included in the network transport contracts between broadband operator and the LL/LDI as well as the customer agreements of the broadband operators. The templates will also set time lines for the LDI/LL operators for the availability of their infrastructure for the Broadband operators and the mechanism of the monitoring for the designed SLAs.

7.1.5 PTA will also lay down a comprehensive framework for the required QoS and other performance obligations for the broadband operators. The resulting inter-operator and customer-operator SLAs will reflect these obligations. Detailed SLA and QoS parameters will be published regularly and updated periodically keeping pace with technological developments, by PTA.

7.2. Class License Registration

7.2.1 The terms and conditions of registration (as per the criteria set by PTA) would be made public within three months of issuance of the policy.

7.2.2 Class license registration fee would be kept to a minimum level and would cover the cost of documentation and relevant administrative costs. Exact amount of this fee would be determined by PTA, while protecting licensees' interests and consumer rights. Royalty charges and annual fee would be kept to a minimum level and incorporated in the class license template.

7.3 Code of Conduct

7.3.1 Code of Conduct, covering relevant aspects of policy and after reviewing best international practices in the context of narrow and broadband services would be published. PTA will specify this code for the registered service providers.

7.3.2 The Code would also specify the grounds for violation resulting in potential termination of registration. The record of violation/breach of conduct would be maintained by the Authority. It will be reviewed from time to time and would be applicable after serving of show cause notice.

7.4 Quality of Service (QoS)

7.4.1 PTA, after studying various options/solutions, will specify parameters to ensure quality of service. QoS would cover entire range of services and would aim at protecting consumers' interests. The QoS standards would be reviewed periodically and these would be available on the website after a process of consultation and keeping in view the technological changes, international standards and best practices.

7.5 Rights of Existing Licensees

7.5.1 Rights of existing licensees e.g. Electronic information service, ISP, Data network operators etc would be protected and these operators will be allowed to operate under the original terms and conditions of their licenses till the expiry of the same. In the meantime, these operators will also have the option of adopting the new regulatory regime, while adoption would become mandatory after the expiry of their existing licenses.

7.6 Policy Implementation Plan

7.6.1 Implementation plan and roadmap for the Ministry (MoIT) and its related entities like Pakistan Software Export Board (PSEB) etc., the regulator (PTA), the incumbent (PTCL) have been laid out and appended as Annex D.

All these entities will work together for the smooth implementation of the road map and hence ensuring the ultimate success of this policy.

8.0 BROADBAND PROMOTION AND AWARENESS:

More than 40% of the internet users in Pakistan do not know what broadband DSL technology is and only 0.4% users have knowledge about the number of DSL service providers in Pakistan. Lack of marketing and awareness of broadband benefits also contribute to the slow growth of broadband users in the country. Broadband services and its benefits need to be aggressively marketed to both the corporate and residential users. The stakeholders need to inform the public of the benefits of broadband, its impact on the quality of life and on the society's social and economic standings. This would help raise the level of understanding of the benefits of broadband and promote its usage. The policy envisages the following measure towards broadband awareness:

- | |
|---|
| <p>8.1 The MoIT in collaboration with the industry will carry out countrywide broadband awareness campaigns through series of seminars, workshops, media advertisements and live demos, spreading the importance of high speed internet in critical and attractive applications such as Tele medicine, Stock Trading and e-learning.</p> |
|---|

9.0 PAKISTAN BROADBAND ROADMAP:

This section defines a broadband road map for Pakistan with specific milestones to assess and measure the enablers defined in this policy.

9.1 Increasing the DSL User Base

Due to the removal of restriction on the number of Broadband DSL service providers, the reduction in the local loop and bandwidth charges and the availability of low cost wholesale broadband service for SMEs, the first target for this policy is the growth in the DSL users in Pakistan. The target for the end of the first year after the issuing of the policy is to increase the DSL users to 100,000.

9.2 Spread of Low Cost Unlicensed Wireless Technologies Such as WiFi.

Ensuring the availability of all the ITU classified ‘unlicensed’ frequency bands for the use of the broadband user in Pakistan by the end of the first policy year. Using unlicensed technologies such as WiFi, the Government will have deployed broadband access in hot spots such as Airports, and Universities to set precedence and encourage the deployment and use of low cost unlicensed hot spot technologies such as WiFi technologies.

9.3 Enabling of New Technologies

Broadband technologies such as WiMax and FTTH are still developing and are expected to fully mature by 2006. What is regarded as broadband today will become narrowband in a couple of years. Keeping the objectives of the broadband policy of Pakistan in view, the government will continue to encourage the deployment and spread of new broadband technologies and standards as they develop and mature.

9.4 Policy Review

Keeping in view the fast pace of technology change the GoP may issue addendums and enhancements to the broadband policy if such necessity is warranted.

Annex A

Glossary

APC: (Access Promotion Charge)- A fund that is given to the ‘local loop’ operator to help increase its telephone lines in the area.

ASP: Application Service Providers

Backhaul: Transmission of content from the content source to the ‘local loop’ aggregation point such as the exchange, PoP etc.

BB: Broadband

Broadband: Electronic information access at high speed (> 128kbps)

BWA: (Broadband Wireless Access)- Broadband delivery to the customer via wireless.

BW: Bandwidth

Content: Information in an electronic format eg Websites, TV channels, data, voice etc.

CPE: (Customer Premises Equipment)- A piece of equipment that allows the user to convert the sent electronic information into a format that is acceptable by his display unit such as a PC, TV.

CPP: (Calling Party Pays)- A pricing regime that charges the person that has initiated a communication link such as making a phone call.

‘Dial up’: A method of connecting to the internet where the user has to dial a telephone number over an analogue or ISDN line and wait for the system to give him a communication link.

DTH: (Direct To Home)- A link that allows the receiving of broadcast TV channels over Satellite.

DSLAM: (Digital Subscriber Loop Access Multiplexer)- Piece of equipment that is located in the telephone exchange and connects, combines and digitizes multiple analogue telephone lines into one digital data link that terminates into the internet service provider’s PoP (point of presence) .

DSL: (Digital Subscriber Loop)- A technology that is capable of transforming ordinary phone lines into high speed digital lines capable of supporting applications such as high speed internet and video on demand.

EIS: Electronic Information Services

Exchange: Point of Presence of the telephone operator company that allows connectivity and switching between telephone users locally and internationally.

FAB: (Frequency Allocation Board)- A Pakistan Government organization that manages and allocates the Radio frequency spectrum in Pakistan.

FTTx: (Fiber To The Home/Curb/) - A fiber optic based communication network where 'x' is the physical point where the fiber is terminated.

GDP: (Gross Domestic Product) - A measure of the economic standing of a country.

HFC: (Hybrid of Fibre and Coaxial cable)- A communication network that comprises of primary fibre cable with an extension of a coaxial cable that terminates at the users premises.

ICT: (Information and Communication Technologies)- An international term to represent services and technologies that are driven by computer and Telecommunication networks.

IEEE: (Institution of Electronic and Electrical Engineers)- A US based international body that approves / accredits technologies and standards for ICT across the world.

Intranet: A closed loop and secure communications network as opposed to the public internet that can be accessed by anyone.

Incumbent: The telephone company that owns majority of the telecommunications network in a country (PTCL in context of Pakistan).

IP: (Internet Protocol)- Procedures that allow transmission of communication packets between various internet PoPs.

ISDN: (Integrated Services Digital Network)- A technology that converts the normal analogue telephone lines into higher speed (less than 128kbps) digital lines.

ISP: (Internet Service Provider)- Company that owns internet based infrastructure (Routers, Servers) and provides internet access to users.

ITU: (International Telecommunication Union)- A UN based world body for setting and approving technologies and standards for Telecommunications.

Kbps: (Kilo Bits Per Second)- A measuring unit for electronic data speed in thousands.

LDI: (Long Distance International)- Term that defines communication between domestic cities and international countries.

LL: (Local Loop)- Term that defines communication between the users within a city/town/village.

‘Local Loop’: The physical communication link between the telephone user and the telephone exchange.

Mbps: (Mega Bits Per Second)- A measuring unit for electronic data speed in millions.

Modem: A device that converts analogue signals to digital and vice versa.

MoIT: Ministry of Information Technology, Pakistan

Narrowband: a service or connection that only allows a limited amount of information (< 64kbps) to be conveyed such as basic telephony.

OECD: Organization for Economic Cooperation and Development.

Peering: An interconnected communication network that allows two or more operators to be connected in such an efficient way so as to achieve economies of scale and minimize their intercommunication routes and costs.

PEMRA: (Pakistan Electronic Media Regulatory Authority)- Regulator for electronic media services in Pakistan.

PERN: (Pakistan Education and Research Network)- An intranet that links all the Universities and higher education institutions in Pakistan.

PIE: (Pakistan Internet Exchange)- PTCL’s owned IP based data network that allows the Internet and data traffic to route to locations in and out of Pakistan.

PoP: (Point of Presence)- A physical traffic aggregation/ distribution hub for a telecommunications service provider.

PRI: (Primary Rate Interface)- An ISDN service that specifies a digital pipe with 23 traffic channels and 1 control channel. It can provide full duplex transmission between 23 source and receiving nodes multiplexed into a single path.

PSTN: (Public Switched Telephone Network)- The conventional fixed line telephone network.

PTA: (Pakistan Telecommunications Authority)- The telecommunications regulator in Pakistan.

PTCL: (Pakistan Telecommunications Company Ltd)- The largest telecommunications infrastructure and service provider in Pakistan.

QoS: Quality of Service.

RoW: Right of Way.

SME: Small and Medium Enterprise

SW: Soft Ware

Unicode: A 16-bit character set that assigns unique character codes to characters in a wide range of languages.

USO: (Universal Service Obligation)- A financial obligation on the service providers for contribution to the development of infrastructure in under served areas.

USF: (Universal Service Fund) A fund in lieu of USO to be administered by the GoP.

VPN: (Virtual Private Network)- A secure communication network that links various locations of an organization.

VSAT: (Very Small Aperture Antenna) – An earthbound station used in satellite communications of data, voice and video signals, excluding broadcast television.

WiFi: (Wireless Fidelity) – Technology for low power, indoor wireless data communication.

WiMax: (Worldwide Interoperability of Microwave Access) - a standards-based technology enabling the delivery of last mile wireless broadband access over long distances.

Annex B

Illustrations

1) Copper telephone lines based Digital Subscriber Loop Technology

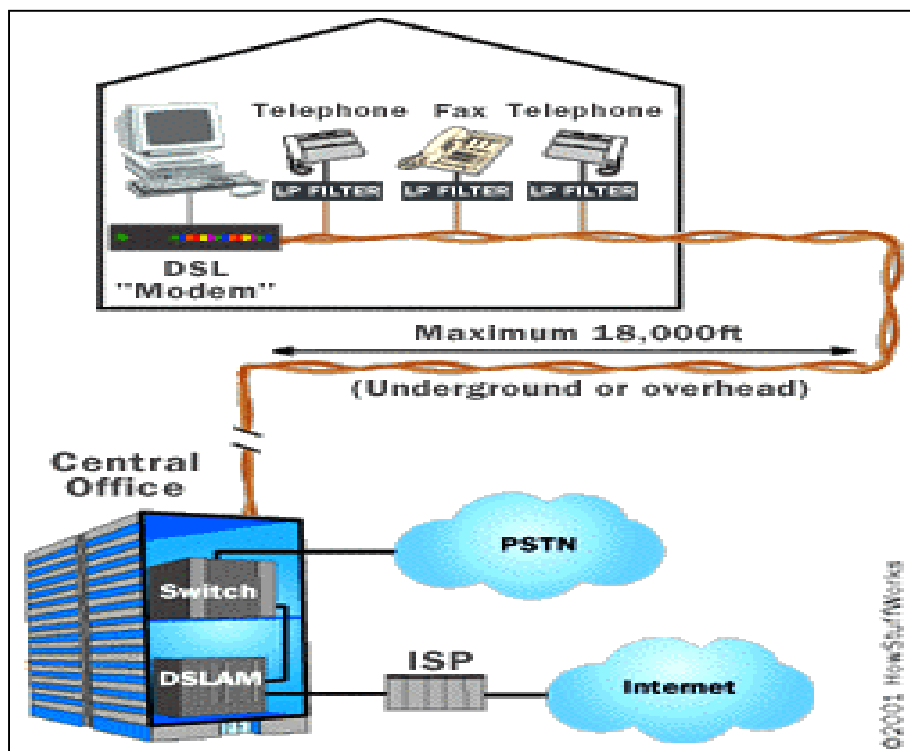


Figure 6 - DSL Architecture

Source – Presentation paper on ADSL by Animation Factory, April 2003.

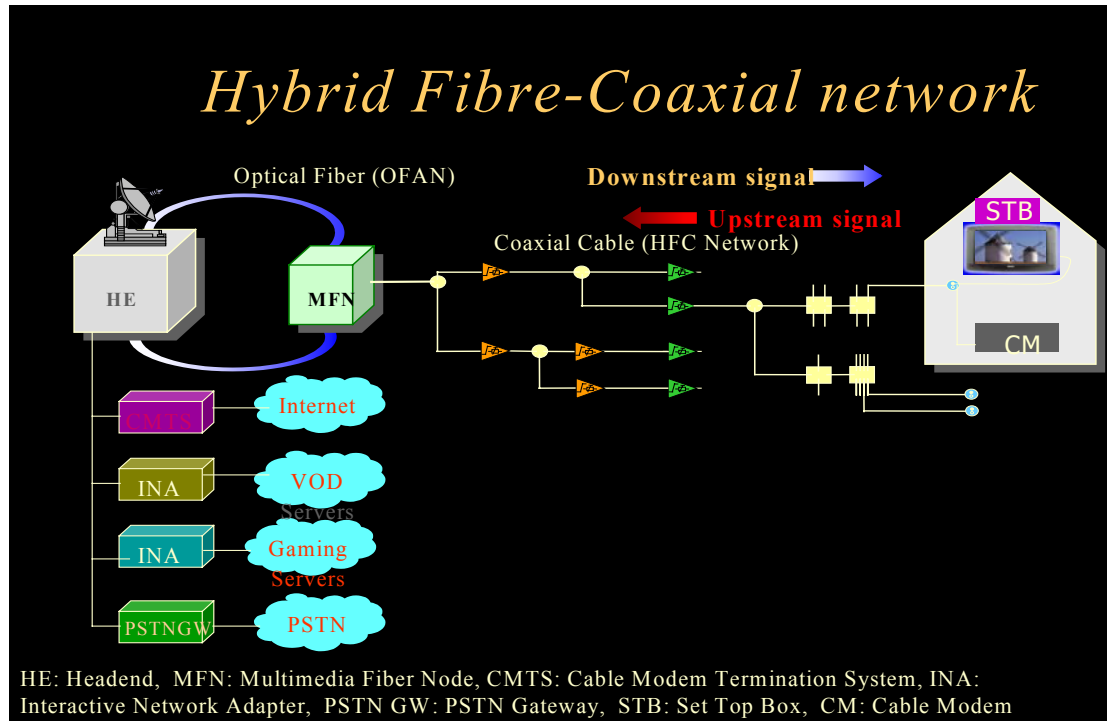
2) Hybrid Fibre and Coaxial network Architecture

Figure 7 – HFC Architecture

Wireless Broadband Access Architecture

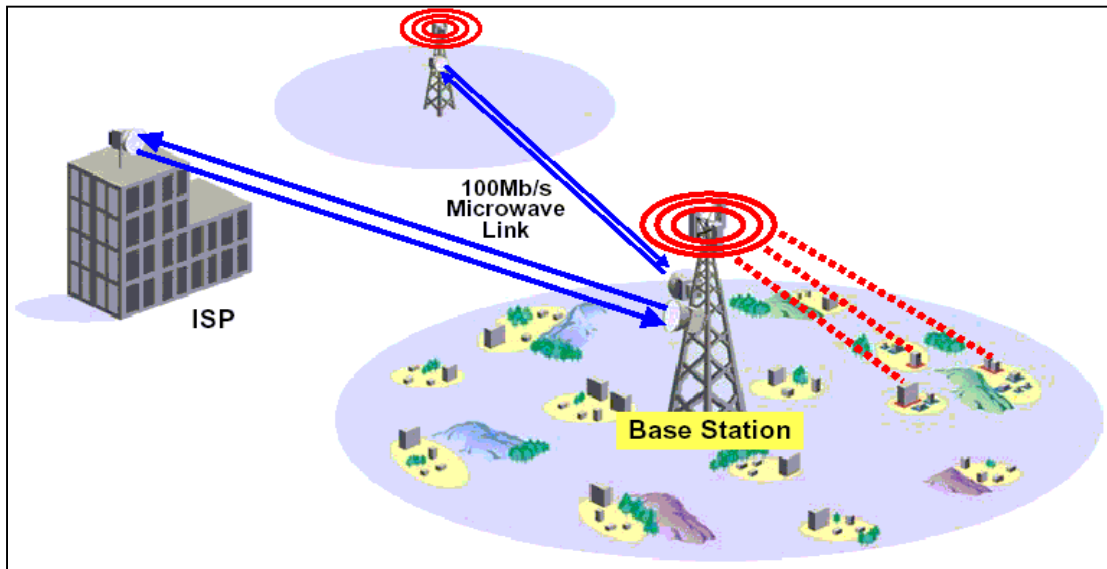


Figure 8 – Broadband Wireless Access Architecture

Global Distribution of Broadband Technologies

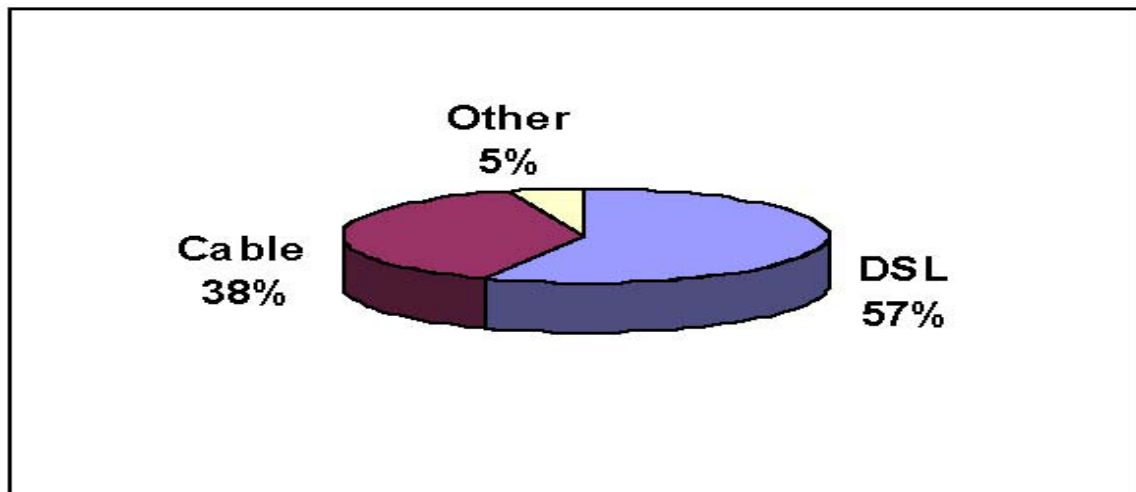


Figure 9 - World market share of broadband technologies
(Source – See Reference i)

Table –1: Comparative Internet and Broadband Indicators (Mid-2003)

	Parameters	Korea	Malaysia	China	India	Pakistan
Access &Infrastructure	No. of PCs per 100	78.6	15	2.8	0.8	1.85
	No. of cable TVs per 100 persons	43	0	9	6	4.28
	No. of fixed telephone lines per 100 persons	49	18.5	16.7	4.5	2.8
	No. of mobile phones per 100 persons	68	39.6	16.1	2.4	1.43
	Cost of PC (USD)	[500]	1,100		600	347
	Cost of cable/DSL modem (USD)	60			100	90
Internet Usage	GDP (USD Per capita)	10,000	4,000	965	465	480
	No. of internet connections per 100 persons	58	11	2	0.4	0.2
	No. of users per 100 Persons	59.4	33	5	1	1.4
	Average revenue per user from an Internet customer per month (20 hrs, USD)	N/A	10		9	4.5
Broadband	No. of broadband connections per 100 persons	57.5	0.21	1	0.02	0.01
	Charges for broadband per month (USD)	30	29	16	20	-
	Charges per 100 Kbps per month (USD)	0.25	7.61	3.07	15.63	-

Figure 10- World Internet and Broadband comparisons
(Source – See reference ii)

Annex-F

CHECKLIST OF MATERIALS TO BE SUBMITTED WITH THE APPLICATION

Sr.No	Document	Attached (Tick if document attached)	No. of Pages	Remarks (if any)
1	Letter of Application			
2	Application Processing Fees: US \$ 1000 or equivalent Pak Rupees to be credited in the designated bank account of PTA with intimation to PTA.			
3	Company Information (Certified true copies to be provided by CVAS licensee)			
	A Certificate of Incorporation/registration			
	B True copy of Memorandum and Articles of Association			
	C List of Directors with details of their shareholdings, and relation to other Operators and applicants for a License			
	D Shareholders with details of equity ownership			
	E List of Shareholder Affiliates that are Operators or applicants for a License, and description of relation to Applicant			
	F Copies of National Identity Card (for Pakistan National)/ Passport (for foreign nationals) and other antecedents of the Directors and authorized representatives of the company			
4	Provide undertaking for the following			
	A That the Company or its Directors have never been declared insolvent by a court of law or government organization.			
	b That the Directors of the company have never been convicted by a court of law for major offences or unethical/ immoral turpitude (other than minor offences)			

	C	That neither the applicant Company nor its group /consortium members are defaulter (s) of PTA and to other PTA licenses/transact ions.			
	D	National Income Tax Number (if any)			
5		Certificate on original letterhead from the Group /Joint venture/Consortium members that they are the participants for Spectrum Auction in (1.9 & 3.5)GHz in Pakistan through the applicant company. (F-1)			
6		Certificate of good standing with the fiscal administration. (FBR in case of Pakistan).			
7		Resolution of the Board of Directors of the Applicant authorizing the person who submits and signs the Letter of Application			
8		Special Power of Attorney granted to the person who submits and signs the Letter of Application			
9		Brief Description of Telecommunications Qualifications and Experience of the Applicant, its key management personnel and its shareholders			
10		Capital Cost of service/ project for the first year and the sources of finance in the form of equity and long term debt.			
11		Brief Description of the project in the form of forecast balance sheet and profit loss account/ income statement for the first 5 years of operation.			
12		Brief description of committed financial resources to meet Capex of the project for the 1st year in the form of bank statement of company account duly signed and stamped by bank manager and letter of intent / MOU signed bank and CFO/ Authorized officer of the company for any long term debt.			
13		Technical Plan			
14		Affidavit (F-2)			
15		Frequency Request Form (Annex-I)			

ANNEX F-1

[Letterhead of the Company]

I, _____, Company Secretary of [*HERE GIVE FULL NAME AND ADDRESS OF THE APPLICANT ENTITY*] (the "Company"), do hereby certify that the following is a true and correct copy of a resolution duly adopted at a meeting of the Board of Directors of the Company duly convened and held on _____, and that such resolution has not been modified, rescinded or revoked, and is at present in full force and effect:

RESOLVED THAT the Company be and is hereby authorized to apply for the grant of [*here describe the Spectrum being applied for*], and to comply with all requirements of its application process and the terms of the License, if any, granted as a consequence;

FURTHER RESOLVED THAT Mr. _____ resident of _____ [*here give designation of the appointee*] be and is hereby appointed as an attorney of the Company (the "Attorney"), for and on its behalf, to execute all documents and take all actions as may be required, necessary or incidental in connection with submission and grant of the application of the Spectrum, including submission of the Affidavit in the form and manner prescribed at Annex F-2 of the Information Memorandum issued by the Pakistan Telecommunication Authority for which all necessary instructions and information has been provided to him;

FURTHER RESOLVED THAT Mr. _____, director/secretary of the Company be and is hereby authorized on behalf of the Company to execute a Power of Attorney in favour of the Attorney on such terms as may be deemed expedient and in the form prescribed by the Pakistan Telecommunication Authority.

Certified to be a true copy:
Company Secretary

POWER OF ATTORNEY

[To be submitted on a stamp paper]

KNOW ALL MEN BY THESE PRESENTS THAT We

having its registered office at _____ (herein after called the

"Applicant') do hereby nominate, constitute and appoint [*here give name, parentage and address of the Special Attorney*] to be and to act as our lawful attorney, for us, in our name and on our behalf to exercise any and all of the powers herein contained, that is to say:

1. to sign, execute or authenticate all applications or other documents required to be submitted to the Pakistan Telecommunication Authority (herein after the "Authority') and to act for and on our behalf in all matters relating to grant of the license for provision of [*here give the nature of the telecommunication services for which the license is applied*];
2. to fulfill all the requirements and formalities as may be required to be fulfilled for the grant of the license applied for on behalf of the Applicant.
3. to attend all hearings before the Authority and to provide all necessary documents and material information or assistance as may be required by the Authority for its satisfaction to issue the license applied for by the Applicant;
4. to sign all applications, correspondence, statements or other documents submitted to the Authority on behalf of the Applicant relating to issuance of the license applied for by the Applicant;

5. to execute all such documents and undertake all such acts as may be necessary in order to comply with the directions, decisions and orders of the Authority relating to issuance of license applied for by the Applicant;
6. and generally to do all such acts as may be necessary or incidental for the grant of the license applied for by the Applicant.

We hereby agree and undertake to confirm and ratify all acts, deeds and things which the said Attorney shall lawfully do or cause to be done in purported exercise of any of the powers contained herein.

This Power of Attorney shall not be revoked without prior notice to the Authority and such revocation shall not invalidate any action taken by the Attorney in exercise of the powers vested hereby. In witness where of we have signed this power of attorney at this day of , 2012

EXECUTANT
Seal of the Company

WITNESSES:

1. -----

NIC NO. - -----

2. _____

NIC NO _____

PAKISTAN TELECOMMUNICATION AUTHORITY PTA Headquarters

Building, F-5/1 Islamabad, Pakistan

www.pta.gov.pk

Draft WLL Spectrum (Licensee name) (1.9 & 3.5) GHz

Dated:-

APPENDIX TO EXISTING LL/WLL LICENSE**RADIO FREQUENCY SPECTRUM ASSIGNMENT, TERMS AND CONDITIONS****1.1 RADIO FREQUENCY SPECTRUM ASSIGNED TO LICENSEE:**

1.1.1. The Licensee is assigned the following radio frequency spectrum from Effective Date for use in providing the Licensed Services in their respective region in Pakistan excluding AJK and Gilgit Baltistan (GB) already identified in the License. The Effective Date for this Addendum shall be the date of the Effective date of the existing License subject to the terms and conditions of existing LL/WLL Licence. Licensee is assigned radio frequency spectrum for use in providing the Licensed Services in the Licensed Region(s):

[Spectrum Details]

1.1.2 The Radio spectrum cannot be sold, transferred, splitted to any entity and will be valid for the duration of existing LL/WLL license. The renewal will be subject to the satisfactory performance including but not limited to clearance of outstanding dues, implementation of National security requirements, Quality of Services and proper utilization of spectrum. The existing License will be renewed against the following Spectrums:-

[Will be written after Auction]

1.1.3 Unused frequency spectrum assigned to the Licensee may be withdrawn, if the Licensee fails to commence its services within eighteen months of the award of spectrum.

1.1.4 The Licensee shall operate radio communication apparatus and devices in compliance with all requirements of the Authority and the Board pertaining to emissions, frequencies of operation, technical characteristics, power, aerial characteristics and site clearance. The Licensee shall ensure that the Licensed System and the Licensed Services do not cause any damage to, or interference with, any Telecommunication System or Telecommunications Services of any other Operator.

1.1.5 The licensee shall strictly follow the Limited Mobility as per PTA guidelines/instructions, determination and Policy in true letter and spirit.

1.2 NATIONAL SECURITY:

- 1.2.1 It shall be open to the Authority to restrict the Licensee from operating in any sensitive area defined by the Federal Government from the national security point of view.
- 1.2.2 The Licensee shall not transfer the following to any person/place outside Pakistan including AJ&K and Gilgit Baltistan:
- a) any accounting information relating to subscriber (except for roaming/billing); and
 - b) user information (except pertaining to foreign subscribers on operator's network while roaming);
- 1.2.3 No local/long distance traffic (Wireless and fixed line) shall be hauled outside Pakistan.
- 1.2.4 No remote access shall be provided to any person/place outside Pakistan for any maintenance/repairs/databases/facility unless approved by the Authority or concerned quarters.
- 1.2.5 The BTSs shall be installed in such a way that signal strength fades away within 2 KM along the international border, or as specified, and no communication takes place across the international border. No BTS shall be installed without prior approval of the Authority.
- 1.2.6 No ciphering, equipment or software, shall be used by the service provider or user without prior approval of the Authority.
- 1.2.7 The Licensee shall ensure to implement Equipment Identity Register (EIR) or related module in the network or as directed by the Authority.
- 1.2.8 All communication with CPE shall be through a specific subscriber identity number.
- 1.2.9 System must be LI (Lawful Interception) complaint and ready to be extended as desired by the Authority.
- 1.2.10 The Licensee shall activate a SIM/RUIM/Terminal of a subscriber after proper verification of his/her antecedents from NADRA through real-time processing or as proposed by the Authority. The verification recordings shall be kept online for nine (09) months and older recordings shall be archived for lifetime.
- 1.2.11 In addition to maintaining complete call records, the licensee shall also record/store data session logs/info along with IP address for one year for scrutiny by or as directed by the Authority or required by security agencies under the law.
- 1.2.12 The Licensee shall provide, at its own cost, suitable equipment at premises designated by the Authority, in order to monitor the communications for the purpose of national security; measure and record traffic; call detail records; curbing of grey international

telephony services and quality of service in a manner specified by the Authority. The Licensee shall provide the Authority and the concerned law enforcement agencies with access to such equipment, and the information generated by such equipment.

1.3 RADIO FREQUENCY SPECTRUM PERFORMANCE REQUIREMENTS:

- 1.3.1. Prior to 18 (eighteen) months from the allocation, and at all times thereafter, the Licensee shall establish, maintain and operate in the Telecom region as identified in section 1.1.1 of this Appendix , as part of its Telecommunication System, at least the following number of radio base stations that operate on the radio frequency spectrum assigned to Licensee and described in this Appendix , where the radio base stations are being used on a continuous basis to provide Services on a commercial basis to its customers:
- a) Number of radio base stations: at least three (3);
 - b) Number of Customers: at least twenty (20).
- 1.3.2 The Authority reserves the right to suggest operator for extension of services to their respective Telecom regions of Pakistan where technically and commercially viable, with or without assistance of USF, after negotiation.
- 1.3.3 If the Radio spectrum is not utilized as identified in 1.1.1 and 1.1.2 then the same may be withdrawn.

1.4 FEES RELATED TO RADIO FREQUENCY SPECTRUM:

- 1.4.1 In addition to any other fees payable by the Licensee under the Licence, the Licensee shall pay one-time fee to the Authority in the amount of:
- a) 50% of USD _____ or equivalent Pak rupees at the time of assignment of the spectrum as identified in clause 1.1.1 of this appendix;
 - b) Remaining 50% of USD _____ or equivalent Pak rupees in equal annual installments over the next XX years from the date of assignment;
 - c) The successful bidder shall deliver to PTA an irrevocable and continuing Bank Guarantee acceptable to PTA, from AAA rated bank, for amount of 50% of Auction Winning Price in US Dollars as a continuing guarantee for payment of annual instalments before allocation of spectrum;
- 1.4.2 In addition to any other fees payable by the licensee under the license, the licensee shall pay an annual fee to the Authority in the amount of:
- a) USD _____ or equivalent Pak Rupees (with respect to Frequency spectrum/ band in Telecom region identified in clause 1.1.1 of this appendix or as per recent reserve price.

- 1.4.3 The annual fees in clause 1.4.2 of this Appendix are subject to revision at any time and from time to time in accordance with the provisions of rules or regulations that may come into effect concerning fees and other charges for radio frequency spectrum.
- 1.4.4 Licensee shall pay all related fees within 120 days of the close of Financial Year to the Authority otherwise 2% “Late Payment Additional Fee” will be imposed per month or part thereof from the due date until-paid. The License may be suspended, in case the Licensee fails to make payment of initial License fee/annual License fees within due date for the payment.
- 1.4.5 This Addendum/License may be suspended, in case the Licensee fails to make the payment of outstanding dues i.e. Initial Spectrum/License Fee, annual fees, contributions, charges, Late Payment Additional Fee, Penalties etc. on due dates.
- 1.4.6 As a continuing guarantee for payment of Annual Fees, the licensee shall deliver to the Authority an irrevocable and continuing Bank Guarantee acceptable to the Authority, from an AAA rated bank, for the amount of US \$100,000 (One Hundred Thousand US Dollars) or its equivalent in Pakistan Rupees of the value prior to Effective Date. If payment of any fee is not made by the licensee by the due date, the Authority shall have the right to encash the Bank Guarantee at any time, to the extent of the amount unpaid by the licensee. In the event of encashment of the Bank Guarantee by the Authority, the licensee shall be obliged to submit a revised Bank Guarantee of US \$100,000 (One Hundred Thousand US Dollars) within one month of the encashment of old Bank Guarantee.
- 1.4.7 Where the Licensee is required under the Licence to make a payment of fees to the Authority that is denominated in a currency other than Pakistan Rupees, the Licensee may make such payment in the equivalent amount of Pakistan Rupees. The rate of exchange for determining the equivalent amount of Pakistan Rupees shall be the TT selling rate of National Bank of Pakistan for the business day preceding the rate of payment.

1.5 MISCELLANEOUS:

- 1.5.1 The Licensee shall not provide any Licensed Services to customers, or accept any payment from customers in respect of Licensed Services to be provided by the Licensee, until the Licensee has obtained from the Authority a service commencement certificate evidencing that the Authority is satisfied that the Licensee has established the Licensed System, and is able to provide the Licensed Services including Mandatory Services as per the QoS KPI's set by the Authority, in accordance with the Licence.
- 1.5.2 The Licensee shall follow the direction of the Authority in blocking any website/web content or as issued from time to time.
- 1.5.3 All terms and conditions in the main License, and not mentioned in this addendum, shall also be applicable to this addendum also.

QUALITY OF SERVICE STANDARDS

- 1.1 The Licensee shall take reasonable and prudent measures to ensure that the Licensed System and Licensed Services are available and operate properly at all times.
- 1.2 Any fault in any component of the Licensed System or Licensed Service shall be repaired as early as possible.
- 1.3 Licensee shall meet or exceed the following quality of service standards (except for causes attributable to another Operator or a service provider that provides telecommunications services outside Pakistan beside interconnect and mutual service level agreement).

<u>KPI</u>		<u>Minimum Target</u>
Network Availability		100%
Service Accessibility	On-Net Calls	97%
	Nationwide/Long-Distance Call	95%
	International Outgoing Call	95%
CALL SETUP TIME DELAY		< = 8 seconds
SERVICE RETAIN-ABILITY		> = 95%
MOS GRADE		> = 3
AVERAGE DATA RATE (for Average Download Speeds of 128kbps, 56kbps and 33.6kbps)		> = 80%
MEAN TIME TO RESTORE (MTTR)		95% in < = 24hrs 100% in < = 48hrs
AUTOMATED OUTAGE NOTIFICATION		> = 90%
BILLING COMPLAINTS		< = 0.2%
CUSTOMER SATISFACTION		< = 0.2%

Note: IN ADDITION TO ABOVE MENTIONED QUALITY STANDARDS, ANY QoS KPI'S DEvised IN FUTURE AND REGULATIONS MADE THERE TO BY THE AUTHORITY SHALL BE STRICTLY FOLLOWED. THE LICENSEE SHALL BE SOLELY RESPONSIBLE FOR MEETING ALL REGULATORY OBLIGATIONS AND RELEVANT INTERNATIONAL STANDARDIZATION FORUMS SUCH AS ETSI, ANSI, ITU, 3GPP/2, IEC ETC.

PAKISTAN TELECOMMUNICATION AUTHORITY
PTA Headquarters Building, F-5/1 Islamabad, Pakistan
(*www.pta.gov.pk*)

Draft Addendum to CVAS Licensee (Licensee name) (1.9 & 3.5) GHz

Dated:-

1.1.1 This Addendum does not authorize the following:

- (a) the provision of Telecommunication Services outside a Licensed Region,
- (b) the interconnection of the Telecommunication System of the Licensee to the Telecommunication System of a service provider that provides telecommunication services outside Pakistan,
- (c) distribution of radio or television programming by means of a cable television transmission system,
- (d) broadcasting of radio or television programming,
- (e) Mobile Communication Service, other than Limited Mobility Communication Service or as directed by PTA,
- (f) Telecommunication Service by means of a space station transmission facility orbiting the earth, or VSAT/Microwave Services except through access providers for communication exclusively within the Licensed Region,
- (g) the establishment, maintenance or operation of a Telecommunications System to provide any Telecommunication Service that is not authorized in this Addendum,
- (h) such other activities or Telecommunication Services as the Authority may, by Regulation, prohibit.

1.1.2 The Licensee shall not provide any Telecommunication Service that is not authorized in this Addendum, except pursuant to a separate Addendum or other proper authorization from the Authority.

1.1.3 For greater certainty, in providing a Limited Mobility Communication Service using the Telecommunication System, the Licensee shall comply with the following:

- (a) a customer shall only be enabled and permitted to access a designated single radio base station,
- (b) the designated radio base station shall only be changed with the consent of the customer,

- (c) the Licensee shall not change a customer's designated radio base station until at least 5 days after the agreement to such a change is made with the customer,
- (d) the Licensee shall not subsequently change the designated radio base station until at least 5 days after implementation of a prior change in the designated radio base station,
- (e) the Licensee shall not authorize or facilitate a customer of its Limited Mobility Communication Service to authenticate or use Terminal Equipment with the Mobile Communication Service of another Operator,
- (f) the Licensee shall not permit the use with its Limited Mobility Communication Service of Terminal Equipment that is authenticated for, or permitted to be used with, the Mobile Communication Service of another Operator,
- (h) the Licensee shall not enter into any agreement or arrangement to jointly bill a customer for the Licensee's Limited Mobility Communication Service and another Operator's Mobile Communication Service provided to that customer, and
- (i) the Licensee shall ensure that operating range of each radio base station does not extend beyond the limits of the Local Calling Area in which the radio base station is situated, except with the prior approval of the Authority.

1.1.4 The Licensee shall obtain prior approval of the Authority at the time the Licensee begins to offer a new category of Licensed Services, other than Services in their existing License, not previously offered by the Licensee. In its notice, the Licensee shall describe the new category of Licensed Services and the expected date that they will begin to be offered commercially by the Licensee.

1.1.5 Upon being informed by the Authority that an Operator's License from the Authority to provide a Telecommunication Service or to establish, maintain and operate a Telecommunication System, is suspended or terminated, the Licensee shall as promptly as practical in the circumstances, disconnect its Telecommunication System from the Telecommunication System of that Operator, and discontinue using the Telecommunication Service of that Operator, until such time as the Authority informs the Licensee that the Operator's License from the Authority is restored or renewed.

1.1.6 All terms and conditions in the main License, and not mentioned in this addendum, shall also be applicable to this addendum also.

1.2 TERM OF THE ADDENDUM

1.2.1 This Addendum shall come into force and shall be valid for a term of the duration of the

existing CVAS License.

1.3 SELF PROVISIONING

1.3.1 The licensee will have the right to provide its own infrastructure:

- (a) within a Telecommunication Region limited to their allocated spectrum identified in Annex without their own terrestrial/satellite network,
- (b) between Regions in the event that all LDI operators are unable to provide a circuit and the same is intimated to PTA for direction, or
- (c) in the event of quality of service falls below international standards for inter-regional circuits as determined by the Authority.

1.4 RIGHT OF WAY

1.4.1 The licensee will have the right to contract for the “right of way” (row) to construct its network subject to conditions laid down by concerned agencies”.

1.5 INFRASTRUCTURE SHARING

1.5.1 The Licensee is encouraged to share infrastructure with other telecom service providers on the principles of neutrality, non-discrimination, equal access and commercial arrangements. The sharing includes collocation and facility sharing. Infrastructure sharing includes leasing facilities for space, electrical power, air conditioning, security, cable ducts, space on antenna masts or towers, rooms etc. Licensee shall follow the guidelines issued on the subject by the Authority, from time to time.

1.6 COMPLIANCE WITH LAW

1.6.1 This Addendum is subject to the terms and conditions contained herein and to the Act, Rules and Regulations respectively. In the event of any conflict or inconsistency between the provisions of this Addendum, and the provisions of the Act, Rules or Regulations, the provisions of the Act, Rules and Regulations shall prevail.

1.6.2 The Licensee shall establish and operate its Telecommunication System to provide the Licensed Services, in compliance with the laws of Pakistan.

1.6.3 The Licensee shall at all times co-operate with the Authority and its authorized representatives in the exercise of the powers, functions and responsibilities assigned to the Authority under the Act. The Licensee shall comply with all orders, determinations, directions and decisions of the Authority.

1.6.4 The licensee will get the security clearance of all its foreign directors/managers.

1.7 NETWORK ROLL-OUT

1.7.1 The Licensee shall provide services in each Licensed Region within 18 (eighteen) months from the date of allocation of Spectrum through access providers or infrastructure obtained from Infrastructure Licensee under service level agreement approved by the Authority.

1.8 RESEARCH AND DEVELOPMENT FUND CONTRIBUTION

1.8.1 In any Financial Year of the Licensee, the Licensee shall make a contribution to the Research and Development Fund established by the Federal Government in the amount calculated on the basis of 0.5% of the Licensee's annual gross revenue from Licensed Services for the most recently completed Financial Year of the Licensee minus inter-operator payments and related PTA/FAB mandated payments. However initial license fee and initial spectrum fee shall not be deducted from the gross revenue.

1.9 UNIVERSAL SERVICE FUND CONTRIBUTION

1.9.1. In addition to the contribution under 1.8.1, the Licensee shall contribute to the Universal Service Fund in an amount calculated on the basis of 1.5% (or such lesser amount as determined by the Rules) of the Licensee's annual gross revenue from Licensed Services for the most recently completed Financial Year of the Licensee minus inter-operator payments and related PTA/FAB mandated payments. However, initial license fee and initial spectrum fee shall not be deducted from the gross revenue.

1.10 ACCESS TO EMERGENCY SERVICES

1.10.1 The Licensee shall provide its customers with access to emergency services, including direct operator assistance or automatic routing to local police, fire and ambulance assistance with operator standby assistance available in case of automated systems failure. The Licensee shall comply with other requirements imposed by the Authority in relation to emergency services.

1.11 ALTERATION OF NETWORK

1.11.1 The Licensee shall, within such reasonable time and in such manner as may be directed by the Authority, and at its own expense, alter the course, depth, position or mode of attachment of any apparatus forming part of its Telecommunication System.

1.12 PAYMENT OF FEES

1.12.1 The Licensee shall pay the following fees to the Authority prior to due date:

- (a) Annual spectrum fees, the amount specified in the Annex.

1.12.2 The Licensee shall pay the following annual regulatory fees to the Authority:

- (a) Calculated on the basis of 0.5% (or such lesser amount as the Authority may, by Regulations, determine) of the Licensee's annual gross revenue from Licensed Services for the most recently completed Financial Year of the Licensee minus inter-operator payments and related PTA/FAB mandated payments. However initial spectrum fee shall not be deducted from the gross revenue,

- (b) The amount of the annual fees referred to in annex annexed hereto.

1.12.3 In addition to the fees payable hereunder, the Licensee shall pay to the Authority all fees required to be paid under the Act, Rules and Regulations.

1.12.4 Where the Licensee is required under the Addendum to make a payment of fees to the Authority that is denominated in a currency other than Pakistan Rupees, the Licensee may make such payment in the equivalent amount of Pakistan Rupees. The rate of exchange for determining the equivalent amount of Pakistan Rupees shall be the TT selling rate of National Bank of Pakistan for the business day preceding the rate of payment.

1.13 GENERAL CONDITIONS CONCERNING FEES

1.13.1 The Licensee shall pay all annual fees to the Authority and make contributions referred to in section 1.8.1 and 1.9.1 within 120 days of the end of the Financial Year to which such fees relate.

1.13.2 The Licensee shall make all contributions referred to in sections 1.8.1 and 1.9.1 within 120 days of the end of the Financial Year to which such contributions relate.

1.13.3 In addition to any other remedies available to the Authority, late payment of fees shall incur an additional fee calculated at the rate of 2% per month on the outstanding amount, for each month or part thereof from the due date until paid.

1.13.4 The Licensee shall annually submit to the Authority audited financial statements in support of its calculations of annual fees and contributions payable pursuant to this addendum. The Authority shall have the right to audit such statements at any time.

1.13.5 As a continuing guarantee for payment of Annual Fees, the licensee shall deliver to the

Authority an irrevocable and continuing Bank Guarantee acceptable to the Authority, from an AAA rated bank, for the amount of US \$100,000 (One Hundred Thousand US Dollars) or its equivalent in Pakistan Rupees of the value prior to Assignment Date. If payment of any fee is not made by the licensee by the due date, the Authority shall have the right to encash the Bank Guarantee at any time, to the extent of the amount unpaid by the licensee. In the event of encashment of the Bank Guarantee by the Authority, the licensee shall be obliged to submit a revised Bank Guarantee of US \$100,000 (One Hundred Thousand US Dollars) within one month of the encashment of old Bank Guarantee.

- 1.13.6 This Addendum/License may be suspended, in case the Licensee fails to make the payment of outstanding dues i.e. Initial Spectrum/License Fee, annual fees, contributions, charges, Late Payment Additional Fee, Penalties etc. on due dates.

1.14 RADIO FREQUENCY SPECTRUM ASSIGNED TO THE LICENSEE

- 1.14.1 The radio frequency spectrum described in Annex is assigned to the Licensee. In relation to the radio frequency spectrum so assigned to the Licensee, the Licensee shall comply with the terms and conditions of this Addendum, and any technical parameters, terms and conditions appearing in Annex.

- 1.14.2 Upon termination of the assignment to the Licensee of radio frequency spectrum, the Licensee shall cease using any apparatus or device that emits or receives any radio communication in the band of that radio frequency spectrum, and shall cause its customers to discontinue using any such apparatus or device.

1.15 USE OF SPECTRUM

- 1.15.1 The Licensee shall comply with the following terms and conditions relating to radio frequency spectrum assigned to the Licensee:

- (a) The Licensee shall report to the Board such information as the Board may require concerning the assigned radio frequency spectrum and its use,
- (b) The Licensee shall only use the assigned radio frequency spectrum in its own operations, and it shall not lease, sub-Addendum, allocate, assign or otherwise make available the use of the assigned radio frequency spectrum to another Operator,
- (c) If, in the opinion of the Board, the Licensee is not efficiently using the full capacity of the assigned radio frequency spectrum, the Licensee shall, upon request of the Board, share use of assigned radio frequency spectrum with one or more other Operators designated by the Board on terms and conditions as

the Board may designate. Where the assignment of radio frequency spectrum to the Licensee has occurred pursuant to an auction in which the Licensee paid in respect of initial fees hereunder and referred to in Annex, more than the minimum reserved amount for the right to the assignment of the radio frequency spectrum, the Licensee will not be required to comply with the foregoing provision of this clause (c) during an initial term of **XX years** after the assignment of the radio frequency spectrum to Licensee,

- (d) The Board shall have the right, exercisable at any time, to terminate the assignment to the Licensee of the radio frequency spectrum described in Annex if the Board determines that the Licensee is not complying with the requirements applicable to such radio frequency spectrum and which are set forth in Annex. Upon such termination by the Board, any rights granted to the Licensee hereunder to use the radio frequency spectrum shall also terminate,
- (e) The Licensee shall operate radio communication apparatus and devices in compliance with all requirements of the Authority and the Board pertaining to emissions, frequencies of operation, technical characteristics, power, aerial characteristics and site clearance. The Licensee shall ensure that the Licensed System and the Licensed Services do not cause any damage to, or interference with, any Telecommunication System or Telecommunications Services of any other Operator,
- (f) At all times, the Licensee shall implement all commercially reasonable measures to optimize the efficiency and effectiveness of its use of the radio frequency spectrum assigned to it.

1.16 REASSIGNMENT OF FREQUENCIES

1.16.1 The Board may, in order to comply with international radio frequency spectrum coordination requirements, ITU assignments or reassignments, or generally in the course of regulating the radio frequency spectrum in the best interests of Pakistan, reassign radio frequency spectrum assigned to the Licensee or require the Licensee to surrender the assignment of radio frequency spectrum assigned to it and which is not reasonably required for the continued operation of the Licensed Services. In such cases, the Licensee shall be entitled to consult with the Board before any such action is taken and the Licensee shall be entitled to reasonable time and, where applicable, the assignment of appropriate alternative radio frequency spectrum, to permit the Licensee to carry on its business without unreasonable costs or disruptions.

1.16.2 If, pursuant to section 1.16.1, the Board requires that the Licensee change the radio frequency spectrum assigned to it, or surrender its rights in respect of radio frequency

spectrum assigned to it, and the Board re-assigns the radio frequency spectrum to another Operator within three years after the date established by the Board as the last date that the Licensee may use any apparatus or device that emits or receives any radiocommunication in the band of the radio frequency spectrum, the Board shall require the other Operator to compensate the Licensee for:

- (a) its reasonable costs incurred as a result of such change or surrender, as determined by the Board, and
- (b) for radio frequency spectrum referred to in Annex, the fraction of the initial fees referred to in Annex in respect of the re-assigned radio frequency spectrum, where the fraction is calculated by the following formula: $(XX- TT)$ divided by XX , where TT is the period of time, expressed in years, between the Assignment Date and the date established by the Authority as the last date on which the Licensee may use any apparatus or device that emits or receives any radiocommunication in the band of the radio frequency spectrum.

1.16.3 At such time as the Licensee changes or surrenders radio frequency spectrum, or is required by the Board to do so, pursuant to this section 1.16, the assignment by the Board of the radio frequency spectrum to the Licensee shall terminate. Upon such termination by the Board, any rights granted to the Licensee hereunder to use the radio frequency spectrum shall also terminate.

1.17 RADIO APPARATUS

1.17.1 The Licensee shall operate radiocommunication apparatus and devices in compliance with all requirements of the Board pertaining to emissions, frequencies of operation, site clearance, technical characteristics, power and aerial characteristics.

1.18 OPERATION OF LICENSED SERVICES

1.18.1 The Licensee shall ensure that its Telecommunication System and the Licensed Services do not cause any damage to, or interference with, any Telecommunication System or Telecommunications Services of any other Operator.

1.18.2 The Licensee shall conduct its operations and shall establish its Telecommunication System in a manner so that it is not a safety hazard and is not in contravention of any law, rule or regulation.

1.19 DISCONTINUATION OF SERVICES

1.19.1 The Licensee shall not discontinue providing the Licensed Services or a category of Licensed Services unless (a) the Licensee gives the Authority and affected customers at

least 90 days prior written notice of such discontinuation, and (b) Authority's prior written approval to such discontinuation is obtained.

1.20 MONITORING

1.20.1 The Licensee shall provide, at its own cost, suitable equipment at premises designated by the Authority, in order to monitor the communications for the purpose of national security; measure and record traffic; call detail records; Grey traffic and quality of service in a manner specified by the Authority. The Licensee shall provide the Authority/ concerned agencies with access to such equipment, and the information generated by such equipment

1.21 INFORMATION

1.21.1 The Licensee shall furnish to the Authority such information as the Authority may request regarding the Licensee's network plan, network and terminal standards, links utilized, financial information, costs and accounts or any such other information as the Authority may from time to time require in connection with its functions, powers and responsibilities.

1.21.2 The Licensee shall maintain such books and records as the Authority may require. The Authority shall give the Licensee a reasonable period of time, not to exceed 120 days, to implement appropriate routines and systems to comply with any such requirement imposed by the Authority. Upon request by the Authority, the Licensee shall make its books and records available for inspection by the Authority.

1.21.3 The Licensee shall maintain financial records and books of accounts in accordance with the laws of Pakistan. The Licensee shall submit audited financial statements, including at a minimum statements of profit and loss and assets and liabilities, to the Authority within 120 days of the closing date of Financial Year of the Licensee.

1.21.4 The Authority shall take reasonable steps to maintain the confidentiality of information in writing that is disclosed to it by the Licensee and which is clearly indicated as confidential, except that the Authority may disclose information where the Authority determines that the public interest in disclosure outweighs the Licensee's interest in maintaining the confidentiality of such information.

1.22 QUALITY OF SERVICE

1.22.1 The Licensee shall at all times meet or exceed the quality of service standards described in Appendix and such other quality of service standards as the Authority

may, by Regulation, require. The Licensee shall maintain records of its performance in meeting these quality of service standards, and shall submit them to the Authority on a quarterly basis in such format as the Authority may require. The Licensee shall maintain supporting records for inspection and technical audit as and when required by the Authority. The Licensee shall maintain all such records for a period of three years.

1.22.2 The Authority may carry out tests on the quality of the Licensed Services and the Licensee's Telecommunication System and the Licensee shall extend full co-operation and assistance for the purpose including provision of test instruments, equipments, etc.

1.23 INSPECTION

1.23.1 The Licensee shall allow inspection of any premises by an authorized representative of the Authority or the Board at any time and furnish to the representative such information as may be required by such representative.

1.24 NATIONAL SECURITY

1.24.1 The Licensee shall comply with the national security and other requirements of section 54 of the Act and any other national security requirements under the law.

1.24.2 It shall be open to the Authority to restrict the Licensee from operating in any sensitive area defined by the Federal Government from the national security point of view.

1.24.3 The Licensee shall not transfer the following to any person/place outside Pakistan including AJ&K and Gilgit Baltistan:

- (a) any accounting information relating to subscriber (except for roaming/billing), and
- (b) user information (except pertaining to foreign subscribers on operator's network while roaming).

1.24.4 No local/long distance traffic (mobile and fixed line) shall be hauled outside Pakistan.

1.24.5 No remote access shall be provided to any person/place outside Pakistan for any maintenance/repairs/databases/facility unless approved by the Authority or concerned quarters.

1.24.6 The BTSs shall be installed in such a way that signal strength fades away within 2 KM along the international border, or as specified, and no communication takes place across the international border. No BTS shall be installed without prior approval of the Authority.

- 1.24.7 No ciphering, equipment or software, shall be used by the service provider or user without prior approval of the Authority.
- 1.24.8 The Licensee shall ensure to implement Equipment Identity Register (EIR) or related module in the network or as directed by the Authority.
- 1.24.9 All communication with CPE shall be through a specific identity number. Each CPE or its user replaceable subparts should have a unique fool proof equipment identity of each user.
- 1.24.10 System must be LI (Lawful Interception) complaint and ready to be extended as desired by the Authority.
- 1.24.11 The Licensee shall activate CPE of a subscriber after proper verification of his/her antecedents from NADRA through real-time processing or as proposed by the Authority. The verification recordings shall be kept online for nine (09) months and older recordings shall be archived for lifetime.
- 1.24.12 The Licensee shall follow the direction of the Authority in blocking any website/web content and any other services.

1.25 DATA RECORDS

- 1.25.1 The Licensee shall record/store data session logs/info along with IP address, date, duration and time, Terminal identification and Cell Site location with regard to the communications made on its Telecommunication System for a period of at least one year for scrutiny by or as directed by the Authority or required by security agencies under law.

1.26 NETWORK STANDARDS

- 1.26.1 The Licensee shall use any type of network equipment, including a circuit and/or packet switch that meets the relevant ITU or other telecommunication standards recognized by the Authority.
- 1.26.2 The Licensee shall ensure that its network is at all times interoperable and interconnectable with the networks of other Operators. If the Licensee implements any new equipment or protocols in its network, the Licensee shall bear the cost of any modifications to its network to maintain such interoperability and interconnectability with the networks of other Operators.

1.27 TYPE APPROVAL OF TERMINAL EQUIPMENT

- 1.27.1 The Licensee shall not install or connect, or permit the installation or connection of,

any Terminal Equipment unless the Terminal Equipment is (a) type approved, or otherwise permitted by the Authority, (b) type approved by a recognized telecommunication equipment type approval agency or a recognized telecommunication equipment testing laboratory in a member country of the Organization of Economic Cooperation and Development (OECD). The Licensee shall not install or connect, or permit the installation or connection of, any Terminal Equipment or type of Terminal Equipment prohibited by the Authority.

1.28 COMMENCEMENT CERTIFICATE

- 1.28.1 The Licensee shall not provide any Licensed Services to customers, or accept any payment from customers in respect of Licensed Services to be provided by the Licensee, until the Licensee has obtained from the Authority a commencement certificate evidencing that the Authority is satisfied that the Licensee has established its Telecommunication System, Quality of services as per KPIs and is able to provide the Licensed Services, in accordance with the description in the Licensee's application for this Addendum previously submitted to the Authority and at a level of quality and reliability that is consistent with international industry best practices.
- 1.28.2 The Licensee shall give 30 days prior written notice to the Authority of the date on which the Licensee intends to commence Services to customers. The Licensee shall cooperate with the Authority in its investigation of its Telecommunication System and the Licensed Services in connection with the issuance by the Authority of a commencement certificate.

1.29 STANDARD CONTRACT OF SERVICE

- 1.29.1 The Licensee shall prepare a standard contract of service for use with individual customers. The Licensee shall file the standard contract, and amendments thereto from time to time, with the Authority for its approval. The Authority shall approve the standard contract if it contains the terms and conditions described in section 1.30.1, and it contains terms and conditions that are not unduly burdensome.
- 1.29.2 The standard contract, as approved by the Authority, shall apply to all individual customers that obtain Services from the Licensee.
- 1.29.3 Prior to providing service to individual customers, the Licensee shall enter into a contract with such individual customers in accordance with the standard form contract approved by the Authority.
- 1.29.3 Upon application by the Licensee, the Authority may waive compliance by the Licensee with the provisions of section 1.29.3 herein subject to such terms and conditions as the Authority may impose.

1.29.4 The Licensee may enter into agreements with corporate customers for the provision of Licensed Services on terms that are negotiated between the Licensee and such customers.

1.30 CONTENTS OF THE STANDARD CONTRACT OF SERVICE

1.30.1 The standard contract shall include, at a minimum, the following terms and conditions:

- (a) Deposits and alternative methods of providing security for payment where reasonably required, provided that in no circumstances may such deposits or security exceed the charges reasonably anticipated to be incurred by the customer within a three (3) month period,
- (b) Pricing or mechanisms by which prices are determined,
- (c) Privacy of communications,
- (d) Confidentiality of customer information,
- (e) Refunds or other rebates for service problems or over-billing,
- (f) Payment terms, including any applicable interest or administration charges,
- (g) Minimum contract period,
- (h) Customer and Licensee rights of termination,
- (i) The customer shall not use the SIM/RUIM/TERMINAL for unsolicited, abusive, obnoxious, offensive, indecent, obscene, or menacing messages, calls or communications or for any improper, immoral or unlawful purpose, and
- (j) In case of loss or theft of the SIM/RUIM/TERMINAL, the Customer shall immediately inform and request operator, in writing, to block the Terminal/SIM Card, failing which, the Customer shall not be absolved from criminal liability, if any, arising due to use of such SIM/RUIM/TERMINAL /connection in any unlawful/criminal act.

1.31 COMPLAINT SYSTEM

1.31.1 The Licensee shall establish an efficient and easy-to-use system to promptly receive, process and respond to complaints, claims or suggestions by customers of Licensed Services.

1.31.2 The Licensee shall make all reasonable efforts to resolve customer complaints or disputes without delay and without recourse to the Authority.

1.31.3 If a dispute is filed with the Authority in connection with any dispute between the Licensee and a customer regarding any activity that is the subject of this Addendum, the Authority may settle the dispute. Without prejudice to the appeal and revision rights established in section 7 of the Act, the Licensee shall abide by any resulting decision of the Authority.

1.32 CONTENT AND FORMAT OF BILLS

1.32.1 The Licensee may determine the content and format of its bills to customers provided that:

- (a) in relation to a customer, the bill reflects the types of service and the units for which charges are made including, but only to the extent requested by the customer, the starting time of each connection, other relevant details the duration and number of sessions , and
- (b) the Licensee retains in its records information sufficient:
 - (i) to identify for customers the basis of the amount charged for use of its Telecommunication Services, and
 - (ii) to provide the Authority with an independent quality assurance that the billing process complies with the requirements set out above.

1.32.2 The Licensee shall maintain appropriate billing processes to enable the Licensee to comply with the billing requirements in this section 1.32.

1.33 CODE OF COMMERCIAL PRACTICE

1.33.1 The Licensee shall publish within six months of the date of addendum, a code of commercial practice approved by the Authority. Once approved by the Authority, the code of commercial practice shall be binding on the Licensee. The code of practice shall include, at a minimum, provisions covering the following issues:

- (a) A commitment to take steps to remedy service interruptions as soon as reasonably possible and to provide reasonable credits to customers for lengthy outages,
- (b) Protection of the privacy of information transmitted over its Telecommunication System,

- (c) Maintenance by Licensee of the confidentiality of customer information,
- (d) Procedures and timing for resolving complaints between Licensee and customers, and
- (e) Availability to customers of information concerning their accounts with the Licensee.

1.34 PRIVACY OF COMMUNICATIONS

1.34.1 The Licensee shall not monitor or disclose the contents of any communication conveyed over its telecommunications network except to the extent necessary for the purpose of maintaining or repairing any part of its Telecommunication System or monitoring the Licensee's quality of service, or except as required by law.

1.34.2 The Licensee shall take reasonable measures to safeguard its Telecommunication System from unauthorized interception of communication carried on the Telecommunication System.

1.35 CONFIDENTIALITY OF CUSTOMER INFORMATION

1.35.1 Except as permitted below, the Licensee shall take all reasonable measures to prevent information about its customers, including information about their business, other than directory information, from being disclosed to third parties, including the Licensee's own subsidiaries, affiliates and associated companies, except information which is required:

- (a) for the process of collection of debts owed to the Licensee,
- (b) by another Operator in relation to the provision of services to the customer, and provided that the information is disclosed in confidence to that Operator,
- (c) by the Licensee's auditors for the purpose of auditing the Licensee's accounts, or
- (d) for the prevention or detection of crime or the apprehension or prosecution of offenders or as may otherwise be authorised by or under any law of Pakistan.

1.35.2 A Licensee shall be permitted to disclose confidential information about a customer where the Licensee has clearly explained to the customer (a) the nature of the information to be disclosed, (b) the recipients of the information to be disclosed and (c) the purpose for the disclosure, and the customer has provided Licensee with consent to such disclosure.

1.36 HARASSING, OFFENSIVE OR ILLEGAL CALLS

1.36.1 The Licensee shall take all reasonable steps to track and locate the source of harassing, offensive or illegal calls. For that purpose:

- (a) Any customer of the Licensee may request that the Authority or other duly authorized authority in Pakistan authorize a Licensee to monitor services of the customer's CPE,
- (b) The Authority or other duly authorized authority in Pakistan may direct a Licensee to monitor services to and from the said customer's CPE,
- (c) The Licensee shall provide to the Authority the information resulting from the monitoring of the services to and from the customer's CPE, including the details that are the source of harassing, offensive or illegal activity and the dates of occurrence of such services and their frequency,
- (d) The Authority may undertake any appropriate action to protect the public from harassing, offensive or illegal services and, if necessary, refer the matter to the competent authorities for further action, and
- (e) The Licensee shall at the direction of the Authority suspend or terminate service to any customer that is the source of harassing, offensive or illegal.

1.37 NO REGULATION OF PRICES

1.37.1 Except as otherwise provided in this Addendum or as required by law, the Licensee is free to set prices for the Licensed Services as it may deem fit.

1.37.2 If the Authority determines that the Licensee's prices for any Licensed Services are unfair and unreasonable to individual customers, the Authority may regulate Licensee's prices, terms and conditions for those Licensed Services. The Licensee shall comply with the Authority's orders and determinations relating to the Licensee's prices, terms and conditions for those Licensed Services.

1.38 PRICE REGULATION OF OPERATORS WITH SMP

1.38.1 If the Authority determines that the Licensee possesses SMP in a relevant market, the Authority may regulate Licensee's prices, terms and conditions, for those Licensed Services where the Licensee possesses SMP and any Licensed Services incidental thereto as determined by the Authority. The method of regulation shall be determined by the Authority, subject to compliance with any applicable provisions of the Rules and Regulations, and may include a requirement for prior Authority approval of any price, term or condition, or the maximum or minimum price, or both, for the Licensed Services.

1.39 SANCTIONS FOR VIOLATIONS OF THE ADDENDUM

1.39.1 In addition to the sanctions available under the Act, if the Authority determines that the Licensee has violated a provision of this Addendum or the Act, Rules or Regulations, the Authority may by order impose one or more of the following sanctions, which the Licensee shall promptly comply with:

- (a) The Authority may issue an order to the Licensee requiring the Licensee to cease any continuation of the violation,
- (b) The Authority may require the Licensee to remedy the effects of the violation, in a manner determined by the Authority,
- (c) The Licensee shall issue a public apology for its violation, in wording acceptable to the Authority, that the Licensee arranges to have prominently published, at its cost, in a newspaper of general circulation in the Licensed Regions for two (2) consecutive days, and
- (d) The Authority may suspend one or more of the rights granted to Licensee under the Addendum, for so long as the Authority considers appropriate in the circumstances.

1.40 TERMINATION OF THE ADDENDUM

1.40.1 The Addendum shall remain in force until it is terminated by one of the following events:

- (a) The term of the CVAS License expires without renewal,
- (b) The Licensee agrees to the termination of CVAS License, or
- (c) The License is suspended or terminated in accordance with the Act, Rules or Regulations, or the provisions of this Addendum.

1.41 AMENDMENT

1.41.1 CVAS License may be amended by written agreement between the Licensee and Authority, or pursuant to the provisions of the Act, Rules or Regulations.

1.42 NO LIABILITY BY THE AUTHORITY

1.42.1 Without prejudice to the rights of the Licensee under section 7 of the Act, no suit, prosecution or other legal proceeding shall lie against the Authority or Board or any member or employee of the Authority or Board in respect of anything done or intended to be done by the Authority or Board in the good faith exercise of its powers.

1.43 FORCE MAJEURE

1.43.1 Not with standing anything contrary to the one contained in this License/Addendum, if the Licensee shall be rendered unable to carry out the whole or any parts of its obligations under this Addendum for any reason beyond the control of the Licensee, including but not limited, to acts of God, strikes, war, riots etc, then the performance obligations of the licensee as it is affected by such cause shall be excused during the continuance of any inability so caused, provided that the Licensee has taken all appropriate precautions and reasonable measures to fulfill its obligation and that it shall within 14 days of its first occurrence notify to the Authority the same and cause of such inability and its effects to remove such cause and remedy its consequences.

1.44 COMMUNICATION WITH THE LICENSEE

1.44.1 The Licensee shall maintain on file with the Authority a current address for the Licensee, including telephone number, fax number and email address, and the name and title of a contact person, for the purposes of receiving communications from the Authority. Any notice or other communication to the Licensee permitted under this Addendum may be given by hand delivering the same, or by mail, facsimile, or electronic mail addressed to the Licensee at its most recent address on file with the Authority.

1.45 ASSIGNMENT OF RIGHTS

1.45.1 This Addendum with CVAS License granted under the Act and Rules shall be personal to the licensee and shall not be assigned, sub-licensed to, transferred, directly or indirectly or held on trust any person, without the prior written approval of the Authority.

APPENDIX 1 - LICENSED REGION

MAPS OF THE REGIONS

APPENDIX 2 - QUALITY OF SERVICE STANDARDS

- 1.1 The Licensee shall take reasonable and prudent measures to ensure that its Telecommunication System and Licensed Services are available and operate properly at all times.
- 1.2 Any fault in any component of its Telecommunication System or Licensed Service shall be repaired as early as possible.
- 1.3 During each calendar month, Licensee shall meet or exceed the following quality of service standards (except for causes attributable to another Operator or a service provider that provides telecommunication services outside Pakistan):

Quality of Service Indicator	Standard
Network Availability	100%
Service Accessibility	97 %
Service Retain-ability	>=95 %
Customer satisfaction	<= 0.2 %
Billing errors	0.2 per 100 bills issued
Mean Time to Restore (MTTR)	95% in <= 24hrs 100% in <= 48hrs
Automated Outage notification	> = 90%
Data Rate (for average Download Speeds 128 Kbps)	>=80 %

Note: IN ADDITION TO ABOVE MENTIONED QUALITY STANDARDS ANY QoS KPI'S DEvised IN FUTURE AND REGULATIONS MADE THERE TO BY THE AUTHORITY SHALL BE STRICTLY FOLLOWED. THE LICENSEE SHALL BE SOLELY RESPONSIBLE FOR MEETING ALL REGULATORY OBLIGATIONS AND RELEVANT INTERNATIONAL STANDARDIZATION FORUMS SUCH AS ETSI, ANSI, ITU, 3GPP/2, IEC ETC.

PAKISTAN TELECOMMUNICATION AUTHORITY PTA Headquarters

Building, F-5/1 Islamabad, Pakistan

www.pta.gov.pk

Draft Annex to CVAS Licensee (Licensee name) (1.9 & 3.5) GHz

Dated:-

ANNEX TO CVAS LICENSE**RADIO FREQUENCY SPECTRUM ASSIGNMENT, TERMS AND CONDITIONS****1.1 RADIO FREQUENCY SPECTRUM ASSIGNED TO LICENSEE:**

- 1.1.1 Subject to the terms and conditions of CVAS license, the licensee is assigned the following radio frequency spectrum for use in providing the Licensed Services in the Licensed Region(s) for 15 years:

[Spectrum Details]

- 1.1.2 The Radio spectrum cannot be sold, transferred, splitted to any entity. The renewal will be subject to the satisfactory performance including but not limited to clearance of outstanding dues, implementation of National security requirements, Quality of Services and proper utilization of spectrum. The existing License will be renewed against the following Spectrums:-

[Will be written after Auction]

- 1.1.3 The licensee shall strictly follow the Limited Mobility as per PTA guidelines/instructions, determination and Policy in true letter and spirit.

1.2 RADIO FREQUENCY SPECTRUM PERFORMANCE REQUIREMENTS:

- 1.2.1. Prior to 18 (eighteen) months from the assignment date, and at all times thereafter, the Licensee shall establish, maintain and operate in the Telecom region as identified in section 1.1.1 of this Appendix , as part of its Telecommunication System, at least the following number of radio base stations that operate on the radio frequency spectrum assigned to Licensee and described in this Appendix , where the radio base stations are being used on a continuous basis to provide Services on a commercial basis to its customers:

- a) Number of radio base stations: at least three (3);
- b) Number of Customers: at least twenty (20).

Every page shall be stamped and signed with date

- 1.2.2 The Authority reserves the right to suggest operator for extension of services to their respective Telecom regions of Pakistan where technically and commercially viable, with or without assistance of USF, after negotiation.
- 1.2.3 If the Radio spectrum is not utilized as identified in 1.1.1 and 1.1.2 then the same may be withdrawn.

1.3 FEES RELATED TO RADIO FREQUENCY SPECTRUM:

- 1.3.1 In addition to any other fees payable by the Licensee under the Licence, the Licensee shall pay one-time fee to the Authority in the amount of:
- a) 50% of USD _____ or equivalent Pak rupees at the time of assignment of the spectrum as identified in clause 1.1.1 of this appendix;
 - b) Remaining 50% of USD _____ or equivalent Pak rupees in equal annual installments over the next ten years from the date of assignment;
 - c) The successful bidder shall deliver to PTA an irrevocable and continuing Bank Guarantee acceptable to PTA, from AAA rated bank, for amount of 50% of Auction Winning Price in US Dollars as a continuing guarantee for payment of annual installments before allocation of spectrum.
- 1.3.2 In addition to any other fees payable by the licensee under the license, the licensee shall pay an annual fee to the Authority in the amount of:
- a) USD _____ or equivalent Pak Rupees (with respect to Frequency spectrum/ band in Telecom region identified in clause 1.1.1 of this appendix.
- 1.3.3 The annual fees in clause 1.3.2 of this Appendix are subject to revision at any time and from time to time in accordance with the provisions of rules or regulations that may come into effect concerning fees and other charges for radio frequency spectrum.

Pakistan Telecommunication Authority
Auction of 1.9 GHz & 3.5 GHz Spectrum 2012
Bid Form (Out-cry)

Name of Company _____

Name of Authorized Representative _____

Bid Amount in Figures US\$ _____

Bid Amount in Words US\$ _____

I solemnly declare that this bid for mobile cellular license is unconditional, irrecoverable and is valid for sixty (60) days from the date of submission of this bid, and all other conditions of the where applicable.

Signature of Authorized Representative

Date : _____

Annex 'I'

RADIO FREQUENCY SPECTRUM REQUEST FORM

Sr. No	TELECOM REGION	1.9 GHz	3.5GHz
1	CTR	1900-1905/1980-1985	<div style="border: 1px solid black; padding: 2px; margin-bottom: 2px;">3541.25 – 3563.25</div> <div style="border: 1px solid black; padding: 2px; margin-bottom: 2px;">3563.25 – 3585.25</div> <div style="border: 1px solid black; padding: 2px; margin-bottom: 2px;">3415.25 – 3436.25</div> <div style="border: 1px solid black; padding: 2px;">3478.25 – 3499.25</div>
2	FTR	1900-1905/1980-1985	<div style="border: 1px solid black; padding: 2px;">3562.25 – 3585.25</div>
3	GTR	1900-1905/1980-1985	<div style="border: 1px solid black; padding: 2px; margin-bottom: 2px;">3499.25 – 3520.25</div> <div style="border: 1px solid black; padding: 2px;">3583.25 – 3585.25</div>
4	HTR	1900-1905/1980-1985	<div style="border: 1px solid black; padding: 2px; margin-bottom: 2px;">3541.25 – 3563.25</div> <div style="border: 1px solid black; padding: 2px;">3563.25 – 3585.25</div>
5	ITR	1900-1905/1980-1985	<div style="border: 1px solid black; padding: 2px;">3562.25 – 3585.25</div>
6	KTR	1900-1905/1980-1985	<div style="border: 1px solid black; padding: 2px;">3562.25 – 3585.25</div>
7	LTR	1900-1905/1980-1985	<div style="border: 1px solid black; padding: 2px;">3562.25 – 3585.25</div>
8	MTR	1900-1905/1980-1985	<div style="border: 1px solid black; padding: 2px; margin-bottom: 2px;">3541.25 – 3563.25</div> <div style="border: 1px solid black; padding: 2px;">3563.25 – 3585.25</div>

9	NTR-I	1900-1905/1980-1985	3541.25 – 3563.25
			3563.25 – 3585.25
10	NTR-II	1900-1905/1980-1985	3541.25 – 3563.25
			3563.25 – 3585.25
11	RTR	1900-1905/1980-1985	3562.25 – 3585.25
12	STR-I	1900-1905/1980-1985	3541.25 – 3563.25
			3563.25 – 3585.25
13	STR-V	1900-1905/1980-1985	3541.25 – 3563.25
			3563.25 – 3585.25
14	WTR	1900-1905/1980-1985	3541.25 – 3563.25
			3563.25 – 3585.25

Instructions:-

Tick each of the boxes that you are interested in applying for. If you have a preference for band, state your preference by inserting a number (either 1,2,3 or 4) in the box, rather than a tick. The number “1” indicates the greatest preference.

SMRA Procedure (Example)1.9 GHz Spectrum

Bidder Name	Telecom Regions (Price in US \$ Million)			
	CTR	HTR	GTR
	Blocks in each region with (frequency) {Reserve price}			
	(1900-1905/1980-1985)MHz {2.7596}	(1900-1905/1980-1985)MHz {2.3035}	(1900-1905/1980-1985)MHz {6.7281}
	Bid Price (US \$ Million) by Bidders			
a	2.8	2.4	7
b	2.9	3	6.8
c	3	2.5	6.9
Winner Round 1	c	b	a	
Price	3	3	7
Round -2 (Five minutes after displaying highest bid of Round-1)				
a	4	4	7.1	...
b	4.1	-	7.2
c	4.2	-	7.3	-
Round-N (Last one)				
a	-	-	-	-
b	-	-	-	-
c	-	-	-	-

3.5 GHz Spectrum

Company Name	Telecom Regions (Price in US\$ Million)						
	CTR			HTR		FTR	
	Blocks in each region with (frequency MHz) {Reserve price}						
	(3541.25 - 3563.25) {0.25}	(3563.25 - 3585.25) {0.25}	(3415.25 - 3436.25) {0.24}	(3478.25 - 3499.25) {0.24}	(3541.25 - 3563.25) {0.25}	(3563.25 - 3585.25) {0.25}	(3562.25 - 3585.25){1.75}
	Bid Price (US \$ Million) by Bidders						
a	0.6	0.3	0.2	-	0.3	-	1.8
b	0.8	0.6	-	-	0.5	-	1.9
c	0.9	0.4	0.1	-	0.4	-	2
Winner Round 1	c	b	a	-	b	-	b
Price	0.9	0.6	0.2	-	0.5	-	2
Round -2(Five minutes after displaying highest bid of Round-1)							
a	1.0	-	0.3	-	-	-	-
b	-	0.7	-	-	-	-	-
c	1.1	-	-	-	0.6	-	3
Round-N (Last one)							
a	-	-	-	-	-	-	-
b	-	-	-	-	-	-	-
c	-	-	-	-	-	-	-