

## **WIRELESS GLOSSARY OF TERMS**

**Air Interface:** The operating system of a wireless network. Technologies include AMPS, TDMA, CDMA, GSM and iDEN.

**AMPS:** Advanced Mobile Phone Service (AMPS) is the original analog “cellular” service transmission standard first deployed in the United States, still used as a default standard for cellular systems in the U.S., and in some regions around the world.

**Analog:** The traditional method of adapting radio signals so they can carry information. AM (Amplitude Modulation) and FM (Frequency Modulation) are the two most common analog systems. Analog has largely been replaced by digital technologies, which are more secure, more efficient and provide better quality.

**Antenna:** A device for transmitting and receiving radiofrequency (RF) signals. Often camouflaged on existing buildings, trees, water towers or other tall structures, the size and shape of antennas are generally determined by the frequency of the signal they manage.

**Base Station:** The central radio transmitter/receiver that communicates with mobile telephones within a given range (typically a cell site).

**Bluetooth:** The name for a technological standard (a communications protocol) that enables mobile devices equipped with a special chip to send and receive information wirelessly. Using Bluetooth, electronic devices such as desktop computers, wireless phones, electronic organizers and printers can communicate over short-ranges using the 2.4 GHz spectrum band.

**Bonded copper:** Aggregating DSL circuits together to boost throughput.

**BREW:** Binary Runtime Environment for Wireless is a service application developer’s platform. The BREW platform was introduced by QUALCOMM in 2001 to provide developers with the ability to create a wide variety of applications that users can download wirelessly via any BREW-enabled handset. Thanks to common standards, software applications will automatically work on new device models.

**Broadband:** A transmission facility having a bandwidth (capacity) sufficient to carry multiple voice, video or data channels simultaneously. Broadband is generally equated with the delivery of increased speeds and advanced capabilities, including access to the Internet and related services and facilities “that provide 200 kbps upstream and downstream transmission speeds” (per the FCC’s Fourth Annual Report to Congress on the “Availability of Advanced Telecommunications Capability in the United States,” September 2004).

**BTA (Basic Trading Area):** A geographic area designed by Rand McNally to reflect business centers, and adopted by the FCC for the licensing of Personal Communications Services and some other wireless services. BTAs are composed of several neighboring counties associated by business and commuting patterns. The U.S. is divided into 493 BTAs.

**Carrier:** Also known as service provider or operator, a carrier is the communications company that provides customers service (including air time) for their wireless phones.

**CDMA (Code Division Multiple Access):** A technology used to transmit wireless calls by assigning them codes. Calls are spread out over the widest range of available channels. Then codes allow many calls to travel on the same frequency and also guide those calls to the correct receiving phone.

**CDMA2000 1XRTT:** The first step in the evolution to 3G is cdma2000 1X, which improves packet data transmission capabilities and speeds in the network, and also boosts voice capacity. (Speed of up to 307 kbps.)

**CDMA2000 1XEV-DO:** (Evolution Data-Only). CDMA2000 1XEV represents the second step in the evolution of CDMA2000. Commercially launched in 2001, offers data speeds of up to 2.4 Mbps.

**CDMA2000 1XEV-DV:** (Evolution Data-Voice). CDMA2000 1XEV represents the next step in the evolution of CDMA2000. Approved by the International Telecommunications Union (ITU), a standards body based in Geneva, as a 3G technology to provide data and voice services together, with data rates of up to 3.09 Mbps.

**Cell:** The basic geographic unit of wireless coverage. Also, shorthand for generic industry term "cellular." A region is divided into smaller "cells," each equipped with a low-powered radio transmitter/receiver. The radio frequencies assigned to one cell can be limited to the boundaries of that cell. As a wireless call moves from one cell to another, a computer at the Mobile Telephone Switching Office (MTSO) monitors the call and at the proper time, transfers the phone call to the new cell and new radio frequency. The handoff is performed so quickly that it's not noticeable to the callers.

**Cell Site:** The location where a wireless antenna and network communications equipment is placed in order to provide wireless service in a geographic area.

**Cell Splitting:** A means of increasing the capacity of a wireless system by subdividing one cell into two or more smaller cells.

**Channel / Circuit:** A communications pathway that may take the form of a connection established over wireless, wired, or fiber optic facilities.

**CSD (Circuit Switched Data):** One technological approach used for the exchange of data. A circuit connection is made that is exclusively reserved for the individual's use. This can be inefficient, as many communications do not require a dedicated communications channel, but only brief connectivity, for the transmission of short messages.

**CMRS (Commercial Mobile Radio Service) Provider:** An FCC designation for any wireless carrier or license owner whose wireless service is connected to the public switched telephone network and/or is operated for profit. Wireless services that are offered to the public are classified as CMRS, unlike private systems which are classified as "Private Mobile Services."

**Co-Location:** Placement of multiple antennas at a common site. Some companies act as brokers or cell site managers, arranging cell sites and coordinating many carriers' antennas at a single cell site.

**Digital:** Technological approach that converts signals (including voice) into the binary digits '0' and '1'. This data is compressed, and then transformed into electronic pulses for a wired network, optical light waves for fiber optic networks or radio waves for wireless networks. Digital wireless technology has largely superseded analog technology, because digital delivers more capacity and supports more applications, as well as offers better sound quality, and more secure signals.

**DSL (Digital Subscriber Line):** A digital line connecting the subscriber's terminal to the serving company's central office, providing multiple communications channels able to carry both voice and data communications simultaneously.

**Dual Band:** A wireless handset that works on more than one spectrum frequency, e.g., in the 800 MHz frequency and 1900 MHz frequency bands.

**Dual Mode:** A wireless handset that works on both analog and digital networks.

**EDGE:** Enhanced Data Rate for Global Evolution is an evolutionary step in the GSM-development path for faster delivery of data, delivered at rates up to 384 Kbps. The standard is based on the GSM technology platform and uses the TDMA approach (see TDMA, below).

**ESMR (Enhanced Specialized Mobile Radio):** A single wireless device that combines a two-way radio, phone, mobile dispatch, radio paging and Mobile data capabilities, and operates on digital networks. Examples of ESMR service providers include Nextel Communications, Nextel Partners, and Southern LINC Wireless, among others.

**ESN (Electronic Serial Number):** The unique serial identification number programmed into a wireless phone by the manufacturer. Each time a call is placed, the ESN is transmitted to a nearby base station so the wireless carrier can validate the call. The ESN differs from the Mobile Identification Number, which identifies a customer's wireless phone number. MINs and ESNs are electronically monitored to help prevent fraud.

**FDD (Frequency Division Multiplexing):** Frequency-division multiplexing is a method in which numerous signals are combined for transmission on a single communications channel. Each signal is assigned a different frequency (subchannel) within the main channel.

**GPRS (General Packet Radio Service):** A packet technology approach that enables high-speed wireless Internet and other GSM-based data communications. It makes very efficient use of available radio spectrum for transmission of data.

**GPS (Global Positioning System):** A worldwide satellite navigational system, made up of 24 satellites orbiting the earth and their receivers on the earth's surface. The GPS satellites continuously transmit digital radio signals, with information used in location tracking, navigation and other location or mapping technologies.

**GSM (Global System for Mobile Communications):** A technological approach also based on dividing wireless calls into time slots. GSM is most common in Europe, Australia and much of Asia and Africa. Generally, GSM phones from the United States are not compatible with international GSM networks because the U.S. and many other nations use different frequencies for mobile communications. However, some phones are equipped with a multi-band capability to operate on such other frequencies.

**Handoff:** The process when a wireless network automatically switches a mobile call to an adjacent cell site.

**HSCSD (High Speed Circuit Switched Data):** In using HSCSD a permanent connection is established between the called and calling parties for the exchange of data. As it is circuit switched, HSCSD is more suited to applications such as videoconferencing and multimedia than 'bursty' type applications such as email, which are more suited to packet switched data.

**iDEN (Integrated Digital Enhanced Network):** A specialized mobile technology that combines two-way radio, telephone, text messaging and data transmission into one digital network. iDEN is designed to give users quick access to information on a single device. Introduced by Motorola and used by AirTel Montana, Nextel Communications, Nextel Partners, and Southern LINC Wireless, among others.

**Interconnection:** Connecting one wireless network to another, such as linking a wireless carrier's network with a local telephone company's network.

**Interoperability:** The ability of a network to coordinate and communicate with other networks, such as two systems based on different protocols or technologies.

**LAN (Local Area Network):** Local Area Network (LAN) is a small data network covering a limited area, such as a building or group of buildings. Most LANs connect workstations or personal computers. This allows many users to share devices, such as laser printers, as well as data. The LAN also allows easy communication, by facilitating e-mail or supporting chat sessions.

**Megahertz:** Megahertz (MHz) is a unit of frequency equal to one million hertz or cycles per second. Wireless mobile communications within the United States generally occur in the 800 MHz, 900MHz and 1900MHz spectrum frequency bands.

**MIN (Mobile Identification Number):** The MIN, more commonly known as a wireless phone number, uniquely identifies a wireless device within a wireless carrier's network. The MIN is dialed from other wireless or wireline networks to direct a signal to a specific wireless device. The number differs from the electronic serial number, which is the unit number assigned by a phone manufacturer. MINs and ESNs can be electronically checked to help prevent fraud.

**MSA (Metropolitan Statistical Area):** One of the 306 urban-centered cellular service areas based on the largest urban markets as designated by the U.S. government in 1980. Two "cellular" service operators are licensed in each MSA.

**MTA (Major Trading Area):** A geographic area designed by Rand McNally to reflect business centers, and adopted by the FCC for the licensing of Personal Communications Services and some other wireless services. MTAs are composed of neighboring basic trading areas (BTAs) associated with major business centers. The U.S. is divided into 51 MTAs, which do not reflect state boundaries.

**MTSO (Mobile Telephone Switching Office):** The central computer that connects wireless phone calls to the public telephone network. The MTSO controls the series of operations required to complete wireless calls, including verifying calls, billing and antenna handoffs.

**MVNO (Mobile Virtual Network Operator):** A company that buys network capacity from a network operator in order to offer its own branded mobile subscriptions and value-added services to customers.

**NAM (Number Assignment Module):** The NAM is the electronic memory bank in the wireless phone that stores its specific telephone number and electronic serial number.

**Number Portability:** The ability of a customer to retain their telephone number when changing service providers in a specific area, whether changing from one wireless company to another, one wireline company to another, or between wireless and wireline companies.

**OFDM (Orthogonal Frequency Division Multiplexing):** A system for the transmission of digital message elements spread over multiple channels within a frequency band, in order to achieve greater throughput while minimizing interference and signal degradation through the use of multiple antennas.

**Packet:** A piece of data sent over a packet-switching network, such as the Internet. A packet includes not just the data comprising the message but also address information about its origination and destination.

**Packet Data:** Information that is reduced into digital pieces or ‘packets’, so it can travel more efficiently across networks, including radio airwaves and wireless networks.

**PCS (Personal Communications Services):** Defined by the FCC as a broad family of wireless services, commonly viewed as including two-way digital voice, messaging and data services. One set of “PCS” licenses established by the FCC operates in the 1900 MHz band.

**PDA (Personal Digital Assistant):** A portable computing device capable of transmitting data. These devices offer services such as paging, data messaging, e-mail, computing, faxes, date books and other information management capabilities.

**PIN (Personal Identification Number):** An additional security feature for wireless phones, much like a password. Programming a PIN into the Subscriber Information Module (SIM) on a wireless phone requires the user to enter that access code each time the phone is turned on.

**POPs:** For wireless, POPs generally refers to the number of people in a specific area where wireless services are available (the population). For traditional ‘landline’ communications, a “Point of Presence” defines the interconnection point between the two networks.

**Protocol:** A standard set of definitions governing how communications are formatted in order to permit their transmission across networks and between devices.

**PSD (Packet Switched Data):** A technological approach in which the communication “pipe” is shared by several users, thus making it very efficient. The data is sent to a specific address with a short delay. This delay depends on how many users are using the pipe at any one time as well as the level of priority requested for

your information. PSD is the technology used for data communication across the Internet and makes more efficient use of the network.

**Repeater:** Devices that receive a radio signal, amplify it and re-transmit it in a new direction. Used in wireless networks to extend the range of base station signals and to expand coverage. Repeaters are typically used in buildings, tunnels or difficult terrain.

**Roaming:** When traveling outside their carrier's local service area, roaming allows users to continue to make and receive calls when operating in another carrier's service coverage area.

**RSA (Rural Service Area):** One of the 428 rural markets across the United States, as designated by the FCC for the delivery of cellular service outside of the initial 306 MSAs.

**Smart Antenna:** A wireless antenna with technology that focuses its signal in a specific direction. Wireless networks use smart antennas to reduce the number of dropped calls, and to improve call quality and channel capacity.

**Smart Phone:** Wireless phones with advanced data features and often keyboards. What makes the phone "smart" is its ability to manage and transmit data in addition to voice calls.

**SMS:** Short Messaging Service enables users to send and receive short text messages (usually about 160 characters) on wireless handsets. Sometimes referred to as "text messaging."

**Spectrum Allocation:** Process whereby the federal government designates frequencies for specific uses, such as personal communications services and public safety. Allocation is typically accomplished through lengthy FCC proceedings, which attempt to adapt allocations to accommodate changes in spectrum demand and usage.

**Spectrum Assignment:** Federal government authorization for the use of specific frequencies within a given spectrum allocation, usually in a specific geographic location. Mobile communications assignments are granted to both private users such as businesses, and commercial providers such as wireless and paging operators. Spectrum auctions and/or frequency coordination processes, which consider potential interference to existing users, may apply.

**Spread Spectrum:** A method of transmitting a radio signal by spreading it over a wide range of frequencies. This reduces interference and can increase the number of simultaneous users on one radio frequency band.

**TCP/IP (Transmission Control Protocol/Internet Protocol):** A protocol permitting communications over and between networks, the TCP/IP protocol is the basis for the Internet communications.

**TDMA (Time Division Multiple Access):** A technological standard that permits the transmission of information by dividing calls into time slots, each one lasting only a fraction of a second. Each call is assigned a specific portion of time on a designated channel. By dividing each call into timed 'packets,' a single channel can carry many calls at once.

**Third-Generation (3G):** A general term that refers to technologies which offer increased capacity and capabilities delivered over digital wireless networks.

**Tri-Band Handset:** Phones that work on multiple frequencies, typically in the 1900 MHz, 800 MHz, and 900 MHz frequencies used in the U.S. and elsewhere.

**Tri-Mode Handset:** Phones that operate in different modes, such as the CDMA, TDMA, and analog standards.

**UMTS (Universal Mobile Telecommunications Systems):** This is third generation technology generally based on W-CDMA (Wideband Code Division Multiple Access). UMTS promises a communications speed between 384 kbps and up to about 2 Mbps.

**VoIP (Voice over Internet Protocol):** VoIP is not simply capable of delivering voice over IP, but is also designed to accommodate two-way video conferencing and application sharing as well. Based on IP technology, VoIP is used to transfer a wide range of different type traffic.

**Voice Recognition:** The capability for wireless phones, computers and other devices to be activated and controlled by voice commands.

**WAN (Wide Area Network):** A general term referring to a large network spanning a country or around the world. The Internet is a WAN. A public mobile communication system such as a cellular or PCS network is a WAN.

**WAP (Wireless Application Protocol):** Wireless Application Protocol is a set of standards that enables wireless devices, such as phones, pagers and palm devices, to browse content from specially-coded Web pages.

**W-CDMA:** Wideband Code Division Multiple Access, one of two 3G standards that makes use of a wider spectrum than CDMA and therefore can transmit and receive information faster and more efficiently.

**WiFi (Wireless Fidelity):** WiFi provides wireless connectivity over unlicensed spectrum (using the IEEE 802.11a or 802.11b standards), generally in the 2.4 and 5 GHz radio bands. Wi-Fi offers local area connectivity to WiFi-enabled computers.

**Wi-Max:** A wireless technology based on the IEEE 802.16 standard providing metropolitan area network connectivity for fixed wireless access at broadband speeds.

**Wireless Internet:** A general term for using wireless services to access the Internet, e-mail and/or the World Wide Web.

**Wireless Local Area Network (WLAN):** Using radio frequency (RF) technology, WLANs transmit and receive data wirelessly in a certain area. This allows users in a small zone to transmit data and share resources, such as printers, without physically connecting each computer with cords or wires.

**Wireless Private Branch Exchange (PBX):** Equipment that allows employees or customers within a building or limited area to use wireless devices in place of traditional landline phones.

**WLL (Wireless Local Loop):** WLL is a system that connects wireless users to the public switched telephone network (PSTN) using wireless technology and other circuitry to complete the "last mile" between the wireless user and the exchange equipment. Wireless systems can often be installed faster and cheaper than traditional wired systems.