have simultaneous voice and data access with multiple parties at the same time using a single mobile handset, whether driving, walking, or standing still in an office setting.

As mentioned in Chapter 1, and described in detail in [Lib99], the International Telecommunications Union (ITU) formulated a plan to implement a global frequency band in the 2000 MHz range that would support a single, ubiquitous wireless communication standard for all countries throughout the world. This plan, called International Mobile Telephone 2000 (IMT-2000), has been successful in helping to cultivate active debate and technical analysis for new high speed mobile telephone solutions when compared to 2G. However, as can be seen in Figures 2.2 and 2.3, the hope for a single worldwide standard has not materialized, as the worldwide user community remains split between two camps: GSM/IS-136/PDC and CDMA.

The eventual 3G evolution for 2G CDMA systems leads to cdma2000. Several variants of CDMA 2000 are currently being developed, but they all are based on the fundamentals of IS-95 and IS-95B technologies. The eventual 3G evolution for GSM, IS-136, and PDC systems leads to Wideband CDMA (W-CDMA), also called Universal Mobile Telecommunications Service (UMTS). W-CDMA is based on the network fundamentals of GSM, as well as the merged versions of GSM and IS-136 through EDGE. It is fair to say that these two major 3G technology camps, cdma2000 and W-CDMA, will remain popular throughout the early part of the 21st century.

Table 2.3 illustrates the primary worldwide proposals that were submitted for IMT-2000 in 1998. Since 1998, many standards proposals have capitulated and joined with either the cdma2000 or UMTS (W-CDMA) camps. Commercial grade 3G equipment is expected to be available in the 2002-2003 time frame. Two good Internet sources for up-to-the-minute 3G developments can be found at GSM World (*www.gsmworld.com*) and the CDMA Developers Group (*www.cdg.org*). The ITU IMT-2000 standards organizations are currently separated into two major organizations reflecting the two 3G camps: 3GPP (3G Partnership Project for Wideband CDMA standards based on backward compatibility with GSM and IS-136/PDC) and 3GPP2 (3G Partnership Project for cdma2000 standards based on backward compatibility with IS-95).

Countries throughout the world are currently determining new radio spectrum bands to accommodate the 3G networks that will likely be deployed in the 2004-2005 time frame. ITU's 2000 World Radio Conference established the 2500–2690 MHz, 1710–1885 MHz, and 806–960 MHZ bands as candidates for 3G. In the US, additional spectrum in the upper UHF television bands near 700 MHz is also being considered for 3G. Given the economic downturn of the telecommunications industry during 2001, many governments throughout the world, including the US, had postponed their 3G auctions and spectrum decisions as of late 2001.

Some European governments, however, auctioned off radio spectrum for 3G well before the telecommunications industry depression of 2001. The sale price of the spectrum was astounding! England's first ever spectrum auction netted $35.5 Billion USD in April 2000 for five nationwide 3G licenses. Germany's 3G auction generated $46 Billion USD later the same year, for four competing nationwide licenses [Buc00, pp. 32-36.].