Mobile Infrastructure Revenue: Worldwide, 1996-2005

Market Statistics

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GARTNER WORLDWIDE HEADQUARTERS

NORTH AMERICA

Corporate Headquarters
56 Top Gallant Road
Stamford, CT 06904-2212
U.S.A.
Tel: +1-203-316-1111
Fax: +1-203-316-6300

West Coast Headquarters
251 River Oaks Parkway
San Jose, CA 95134-1913
U.S.A.
Tel: +1-408-468-8000
Fax: +1-408-954-1780

EUROPE

European Headquarters
Tamesis
The Glanty
Egham
Surrey, TW20 9AW
United Kingdom
Tel: +44-1784-431611
Fax: +44-1784-268980

ASIA/PACIFIC

Asia/Pacific Headquarters
Level 7
40 Miller St.
North Sydney, NSW 2060
Australia
Tel: +61-2-9459-4600
Fax: +61-2-9459-4601

JAPAN

Japan Headquarters
Aobadai Hills 6F
7-7, Aobadai, 4-chome
Meguro-ku
Tokyo 153-0042
Japan
Tel: +81-3-3481-3670
Fax: +81-3-3481-3644

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Author Jason Chapman

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For More Information...

In North America and Latin America:	+1-203-316-1111
In Europe, the Middle East and Africa:	+44-1784-268819
In Asia / Pacific:	+61-7-3405-2582
In Japan:	+81-3-3481-3670
Worldwide via gartner.com:	www.gartner.com

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Executive Summary

The worldwide digital mobile infrastructure market has seen a marked reduction in forecast growth, as the industry feels the effects of global economic slowdown. With a few regional exceptions, such as North America, operators are generally spending considerably less on their networking equipment as they reassess their priorities for financial investment.

Overall, there has been a marked slowdown and reduction in revenue compared with previous mobile digital infrastructure forecasts. Although the dramatic and unforeseen changes in the infrastructure market have affected all equipment vendors, with cost-efficiency programs and streamlining commonplace, the outlook for the mobile infrastructure market remains optimistic.

Introduction

Europe

Large markets such as Western Europe have seen a slowdown in connection growth rates and a rise in costs resulting from third-generation (3G) license acquisitions. Revenue streams and debt burdens have been affected at a time when operators want to invest in 3G network deployments. This has resulted in a more-conservative timetable for 3G rollouts and prudent spending on 2G networks. By contrast, Eastern Europe is still growing as third- and fourth-entrant operators continue to deploy 2G networks and some small investment in 3G installations is made.

Asia/Pacific

China remains a profitable and expanding market with operators continuing to make major investments in their GSM and code division multiple access (CDMA) networks. Contracts for these networks are still being awarded as vendors continue to focus on this lucrative market (see Gartner Dataquest's "Mobile Network Infrastructure: Vendor Overviews" [TCMC-WW-CP-0001]). As with Western Europe, Asia experienced a reduction in infrastructure spending during 2001, with growth anticipated to return to the region from 2002.

North America

One region whose mobile infrastructure market continues to grow is North America. Mobile operators in North America continued to invest — with a number of multibillion-dollar contracts being awarded to expand and enhance existing networks — and to deploy new technology solutions.

Latin America

Global operators lost interest in expanding into new regions as they focused on the challenges of running their existing networks. This, combined with governments and regulators waiting for better market conditions before auctioning mobile licenses, is having a significant impact on Latin America. Previously cited as a significant source of infrastructure revenue, Latin America has not yet lived up to these high expectations.

Middle East and Africa

Both the Middle Eastern and African mobile infrastructure markets continued to grow as mobile networks become more widespread. With new networks launching regularly and the poor availability of fixed telephony services, Africa remains an untapped market, with potential for further expansion. In the Middle East several large contracts have been awarded especially in Saudi Arabia.

Methodology

The infrastructure revenue forecasts cover the following technology standards: GSM, CDMA, time division multiple access (TDMA), general packet radio service (GPRS), Enhanced Data Rates for Global Evolution (EDGE), cdma2000 and wideband CDMA (W-CDMA).

The infrastructure revenue forecasts in this document are derived using a "bottom-up" approach where regional connection figures drive technology usage levels. Usage levels feed into equipment requirements and this generates an equipment requirement per technology for the region. Connections are split by technology for the forecast period. Connection forecasts are based on work carried out by Gartner Dataquest's research teams, and combine input from the terminal devices, mobile services and regional forecasting groups.

Technology-specific voice and data traffic forecasts are associated with each set of connection forecasts. Erlang and megabyte usage levels are forecast for voice and data respectively. These are based on historical and forward-looking market information, trends and service uptake estimates. To model equipment requirements additional to those purely driven by connection traffic, such as technology rollout and coverage requirements (which are particularly applicable to 3G technologies), a series of percentage-based uplifts to the connection-related traffic requirements are used. This calculation produces an overall traffic requirement per connection per year.

The infrastructure forecast model uses the traffic requirement per connection per year to calculate the number of radio transceivers (TRXs) that would be needed to match this user-derived traffic. Thus, the model generates TRX requirements for the forecast period. These TRX numbers are allocated to macro, micro and pico base stations, depending on the market maturity of the region — for example, mature networks will have larger numbers of pico sites to provide "hot spot" coverage and capacity. As a result, the model generates a base station requirement for each forecast year. Associated equipment capacity assumptions are discussed and checked with mobile infrastructure equipment vendors.

Where appropriate, base station controllers (BSCs) are forecast based on the volume of TRXs that can be supported by the BSCs during the period. The quantity of mobile switching centers (MSCs) is calculated based on the BSCs that must be supported. This model generates equipment volumes for the primary mobile equipment elements. These equipment volumes relate to the volume of installed equipment in the forecast figures.

The volume of each network element that is needed to fulfil the traffic requirements in a particular year gives the number of shipments per year, which are then used to generate the revenue forecast for that element. Additional revenue is derived from maintenance and software upgrades, both of which are dependent on installed equipment numbers. The total revenue of the individual elements then gives the overall forecast for a particular industry standard in a specific region.

Data Sources

Validation of the key assumptions and methodologies involved in constructing these mobile network infrastructure revenue forecasts is critical to ensure that results are substantiated. As part of an ongoing process, the forecast model assumptions are reviewed and discussed with other Gartner analyst teams and external industry sources. In addition, operator infrastructure contract awards, vendors' annual reports and operator spending trends are also used as benchmarks. This industry corroboration provides an important feedback loop for finalizing the revenue forecasts. The set of forecasts has undergone a series of benchmarking exercises and various iterations before reaching their final state.

Assumptions

Connections

The connection numbers are based on actual operators' numbers and forward-looking estimates. These take into account the shift in focus toward 2.5G technologies and the investment toward 3G network deployment.

Traffic

Connection-related traffic figures are forecast for each technology. The forecast incorporates the fluctuations in voice usage. Data usage is also incorporated into the traffic forecasts and corroborated with Gartner Dataquest's service applications forecasts.

Pricing

Individual network element components are priced according to Gartner Dataquest's industry averages, but take into consideration regional variations, including hardware and software costs. Upgrade and maintenance charges are calculated as a percentage of the associated equipment charge. Price erosion is included for each individual element and region.

Network Elements

The infrastructure revenue forecasts are built around core mobile network elements such as TRXs, macro, micro and pico base transceiver stations (BTSs), BSCs and MSCs. Applications such as smart radios, capacity management systems or features yet to be incorporated (such as adaptive multirate) have not been taken into account.

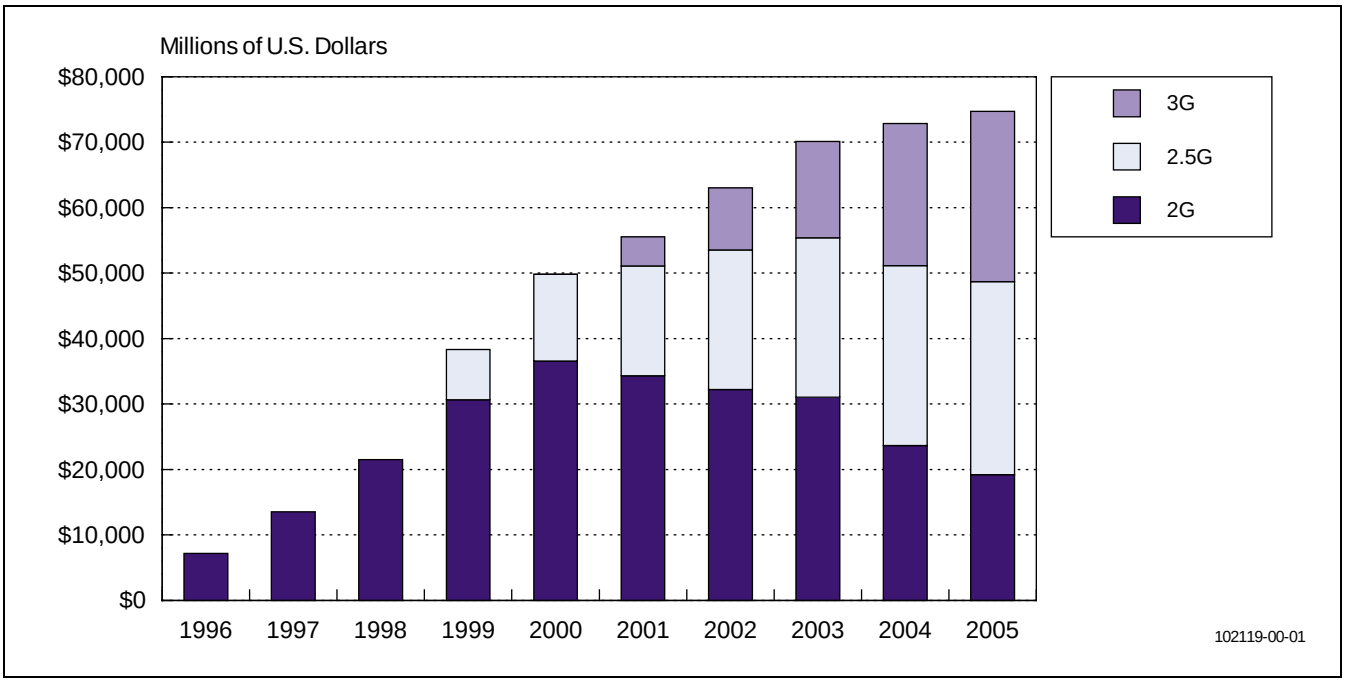
Network Element Capacity

Capacity assumptions have been made for each of the radio, radio controller, switching and server-based network elements. No software enhancements for improved capacity management have been built into the forecasting model.

Forecast

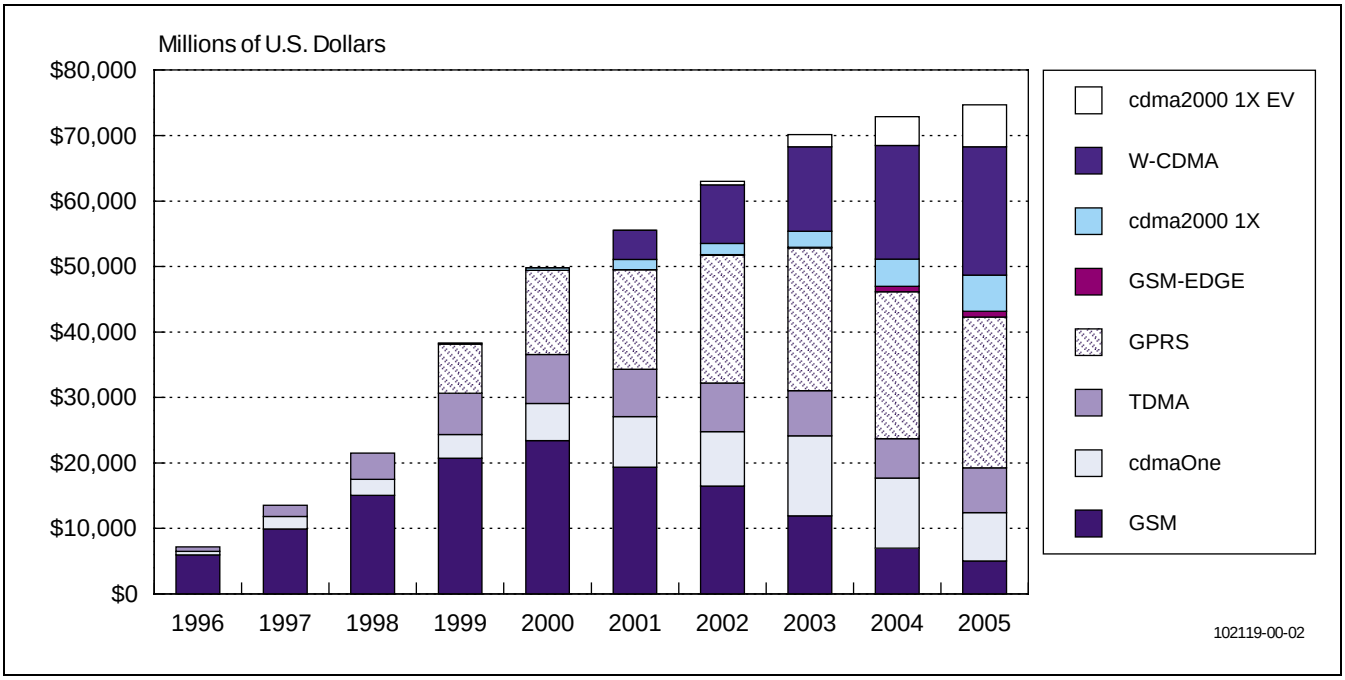
Figures 1 and 2 show worldwide mobile infrastructure revenue by infrastructure generation and industry standard respectively. Figures 3 and 4 show worldwide mobile infrastructure revenue by industry standard in 2001 and 2005 respectively. Tables 1 and 2 show digital transceiver and core network-element installations by industry standard respectively. Tables 3 and 4 show digital transceiver and core network-element shipments by industry standard respectively. Tables 5 and 6 show mobile infrastructure market revenue by generation and industry type respectively.

Figure 1
Digital Mobile Infrastructure Revenue — Worldwide, 1996-2005



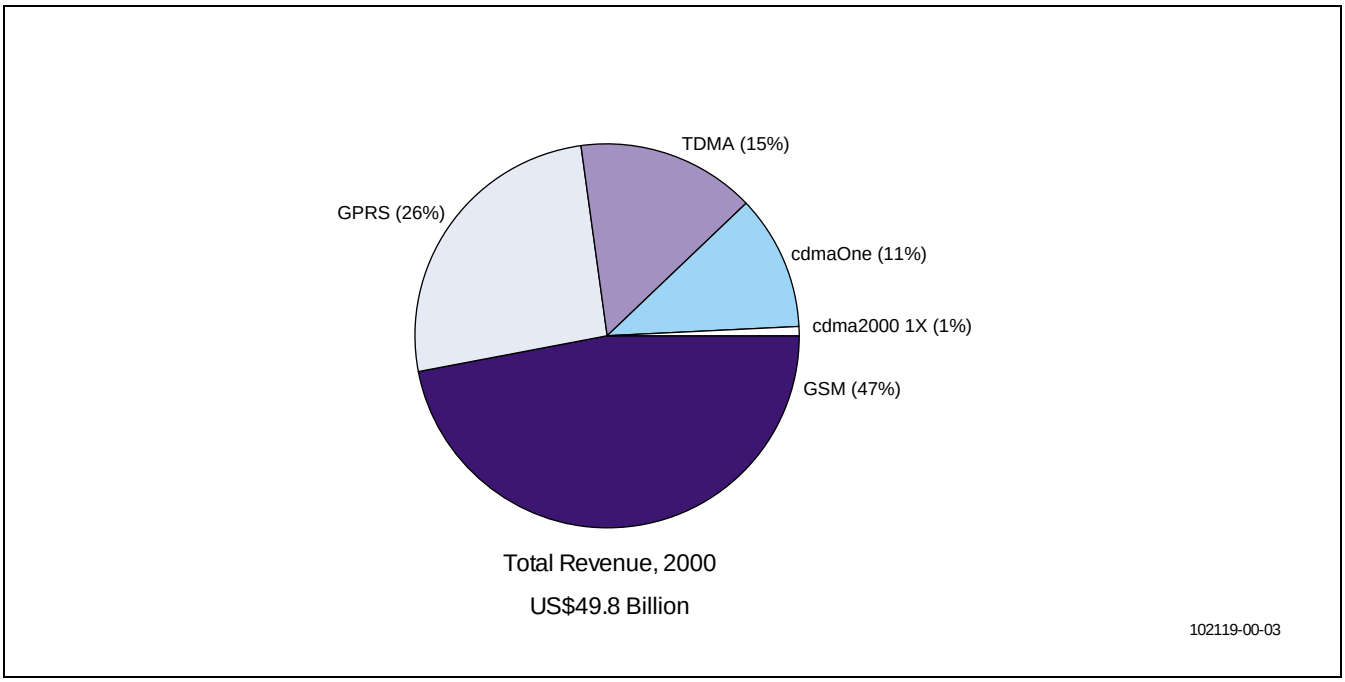
Source: Gartner Dataquest (November 2001)

Figure 2
Digital Mobile Infrastructure Revenue by Industry Standard — Worldwide, 1996-2005



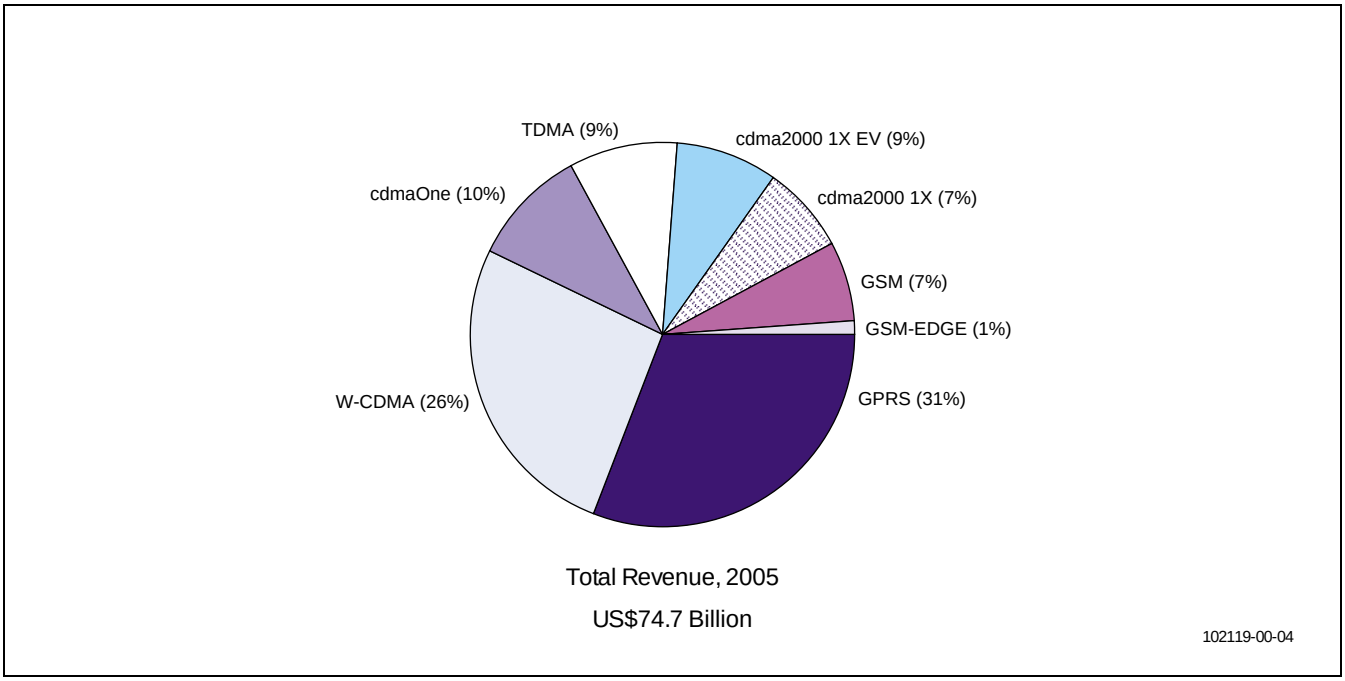
EDGE = Enhanced Data Rates for Global Evolution
GPRS = General Packet Radio Service
TDMA = Time division multiple access
W-CDMA = Wideband code division multiple access
Source: Gartner Dataquest (November 2001)

Figure 3
Digital Mobile Infrastructure Revenue by Technology — Worldwide, 2000



GPRS = General Packet Radio Service
TDMA = Time division multiple access
Source: Gartner Dataquest (November 2001)

Figure 4
Digital Mobile Infrastructure Revenue by Technology — Worldwide, 2005



EDGE = Enhanced Data Rates for Global Evolution
GPRS = General Packet Radio Service
TDMA = Time division multiple access
W-CDMA = Wideband code division multiple access
Source: Gartner Dataquest (November 2001)

Table 1
Digital Transceiver Installations by Industry Standard — Worldwide, 1996-2005

	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
2G	**1,408.7**	**3,031.4**	**5,650.5**	**9,739.9**	**15,118.9**	**19,851.7**	**23,617.4**	**25,163.9**	**22,807.8**	**21,119.0**
GSM	1,196.5	2,471.6	4,592.3	7,938.3	12,320.1	15,883.8	18,319.4	18,224.8	14,545.6	11,893.3
cdmaOne	123.3	342.8	600.5	898.3	1,285.0	1,784.0	2,300.1	3,088.8	3,741.1	4,181.7
TDMA	88.9	217.0	457.7	903.3	1,513.8	2,183.9	2,997.8	3,850.2	4,521.0	5,044.0
2.5G	**-**	**-**	**-**	**1,686.2**	**4,100.7**	**7,357.7**	**12,735.1**	**18,532.7**	**25,866.6**	**33,986.1**
GPRS	-	-	-	1,581.0	3,715.4	6,439.2	10,803.2	16,159.1	22,890.8	30,205.1
GSM-EDGE	-	-	-	-	-	5.0	27.4	44.3	99.9	168.2
cdma2000 1X	-	-	-	105.2	385.3	913.5	1,904.4	2,329.4	2,875.9	3,612.7
3G	**-**	**-**	**-**	**-**	**17.3**	**343.9**	**1,076.6**	**2,322.6**	**4,214.1**	**6,564.0**
W-CDMA	-	-	-	-	17.3	342.6	1,016.5	2,084.3	3,607.2	5,416.8
cdma2000 1X EV	-	-	-	-	-	1.2	60.1	238.3	606.9	1,147.2
Total	**1,408.7**	**3,031.4**	**5,650.5**	**11,426.1**	**19,236.9**	**27,553.2**	**37,429.0**	**46,019.2**	**52,888.5**	**61,669.2**

EDGE = Enhanced Data Rates for Global Evolution
GPRS = General Packet Radio Service
TDMA = Time division multiple access
W-CDMA = Wideband code division multiple access
Source: Gartner Dataquest (November 2001)

Table 2
Core Network-Element Installations by Industry Standard — Worldwide, 1996-2005
(Thousands of Units)

	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
2G										
GSM Base Station Controllers	3.3	6.9	12.9	22.3	34.2	43.1	51.1	53.6	54.1	54.1
GSM Mobile Switching Centers	0.7	1.4	2.6	4.5	6.8	8.6	10.2	11.2	11.7	11.9
cdmaOne Base Station Controllers	0.4	1.1	2.0	3.0	4.2	5.9	7.6	10.2	12.5	13.9
cdmaOne Mobile Switching Centers	0.1	0.4	0.7	1.0	1.4	2.0	2.5	3.4	4.2	4.7
TDMA Mobile Switching Centers	0.1	0.3	0.6	1.1	1.8	2.5	3.5	4.5	5.3	5.9
2.5G										
Serving GPRS Support Nodes	-	-	-	1.8	7.4	14.7	23.7	35.9	50.9	67.1
Gateway GPRS Support Nodes	-	-	-	3.4	14.8	29.6	49.6	77.0	112.1	151.0
Packet Controller Units	-	-	-	14.7	56.7	112.3	191.6	291.4	413.8	550.8
3G										
W-CDMA Radio Network Controllers	-	-	-	-	0.0	0.7	2.0	4.2	7.2	10.8
W-CDMA Mobile Switching Centers	-	-	-	-	0.0	0.2	0.7	1.4	2.4	3.6
cdma2000 1X EV Radio Network Controllers	-	-	-	-	0.0	0.0	0.2	0.5	1.1	2.0
cdma2000 1X EV Mobile Switching Centers	-	-	-	-	-	0.0	0.1	0.2	0.4	1.7

GPRS = General Packet Radio Service
TDMA = Time division multiple access
W-CDMA = Wideband code division multiple access
Source: Gartner Dataquest (November 2001)

Table 3
Digital Transceiver Shipments by Industry Standard — Worldwide, 1996-2005
(Thousands of Units)

	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
2G	**843.0**	**1,624.4**	**2,618.0**	**4,091.3**	**5,378.9**	**4,773.0**	**4,438.6**	**2,416.8**	**1,490.3**	**963.1**
GSM	730.9	1,275.1	2,120.7	3,346.0	4,381.8	3,606.0	3,108.3	776.5	146.4	-
cdmaOne	72.5	221.2	256.6	299.8	386.6	496.9	516.3	787.9	673.1	440.1
TDMA	39.6	128.2	240.7	445.6	610.5	670.0	814.0	852.4	670.8	523.0
2.5G	**-**	**-**	**-**	**1,622.5**	**2,414.5**	**3,257.0**	**5,377.4**	**5,928.6**	**7,333.9**	**8,216.2**
GPRS	-	-	-	1,517.2	2,134.4	2,723.8	4,364.1	5,486.8	6,731.7	7,411.0
GSM-EDGE	-	-	-	-	-	5.0	22.4	16.9	55.6	68.3
cdma2000 1X	-	-	-	105.2	280.1	528.2	990.9	425.0	546.6	736.8
3G	**-**	**-**	**-**	**-**	**17.3**	**326.5**	**732.7**	**1,246.0**	**1,891.5**	**2,350.0**
W-CDMA	-	-	-	-	17.3	325.3	673.9	1,067.8	1,523.0	1,809.6
cdma2000 1X EV	-	-	-	-	-	1.2	58.9	178.2	368.5	540.4
Total	**843.0**	**1,624.4**	**2,618.0**	**5,713.8**	**7,810.7**	**8,356.5**	**10,548.8**	**9,591.4**	**10,715.7**	**11,529.2**

EDGE = Enhanced Data Rates for Global Evolution
GPRS = General Packet Radio Service
TDMA = Time division multiple access
W-CDMA = Wideband code division multiple access
Source: Gartner Dataquest (November 2001)

Table 4
Core Network-Element Shipments by Industry Standard — Worldwide, 1996-2005 (Thousands of Units)

	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
2G										
GSM Base Station Controllers	2.0	3.6	6.1	9.5	11.9	8.9	8.0	2.5	0.5	0.0
GSM Mobile Switching Centers	0.4	0.7	1.2	1.9	2.4	1.8	1.6	1.1	0.5	0.2
cdmaOne Base Station Controllers	0.2	0.7	0.9	1.0	1.3	1.7	1.7	2.6	2.2	1.5
cdmaOne Mobile Switching Centers	0.1	0.2	0.3	0.3	0.4	0.6	0.6	0.9	0.7	0.5
TDMA Mobile Switching Centers	0.1	0.2	0.3	0.5	0.7	0.8	0.9	1.0	0.8	0.6
2.5G										
Serving GPRS Support Nodes	-	-	-	1.8	5.6	7.4	9.7	12.5	15.0	16.7
Gateway GPRS Support Nodes	-	-	-	3.4	11.4	14.8	20.0	27.4	35.1	39.0
Packet Controller Units	-	-	-	14.4	42.0	55.6	79.3	99.8	122.4	137.1
3G										
W-CDMA Radio Network Controllers	-	-	-	0.0	0.1	0.7	1.3	2.1	3.1	3.6
W-CDMA Mobile Switching Centers	-	-	-	-	0.0	0.2	0.4	0.7	1.0	1.2
cdma2000 1X EV Radio Network Controllers	-	-	-	-	-	0.0	0.1	0.3	0.6	0.9
cdma2000 1X EV Mobile Switching Centers	-	-	-	-	-	0.0	0.1	0.1	0.2	1.3

TDMA = Time division multiple access
W-CDMA = Wideband code division multiple access
Source: Gartner Dataquest (November 2001)

Table 5
Digital Mobile Infrastructure Revenue — Worldwide, 1996-2005 (Millions of U.S. Dollars)

	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
2G	$7,193.5	$13,529.7	$21,488.2	$30,650.9	$36,574.9	$34,301.7	$32,194.2	$31,038.2	$23,679.6	$19,236.5
2.5G	-	-	-	$7,659.5	$13,232.6	$16,770.8	$21,316.8	$24,344.3	$27,455.1	$29,438.0
3G	-	-	-	-	$0.1	$4,463.4	$9,513.7	$14,747.5	$21,736.7	$26,018.3
Total	**$7,193.5**	**$13,529.7**	**$21,488.2**	**$38,310.4**	**$49,807.5**	**$55,535.9**	**$63,024.7**	**$70,130.1**	**$72,871.3**	**$74,692.9**

Source: Gartner Dataquest (November 2001)

Table 6
Digital Mobile Infrastructure Revenue by Industry Standard — Worldwide, 1996-2005 (Millions of U.S. Dollars)

	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
2G	**$7,193.5**	**$13,529.7**	**$21,488.2**	**$30,650.9**	**$36,574.9**	**$34,301.7**	**$32,194.2**	**$31,038.2**	**$23,679.6**	**$19,236.5**
Total Hardware and Software	$4,831.9	$7,855.2	$11,633.6	$15,349.2	$15,938.3	$10,851.6	$7,967.3	$4,338.4	$1,300.8	$449.8
GSM Radio Transceivers	$4,164.3	$6,504.0	$9,381.7	$12,537.7	$13,010.2	$8,553.0	$6,244.3	$3,376.5	$1,197.9	$431.1
GSM Base Station Controllers	$149.2	$226.1	$324.9	$431.3	$467.0	$323.5	$235.3	$125.1	$46.8	$17.6
GSM Mobile Switching Centers	$518.4	$1,125.1	$1,927.0	$2,380.3	$2,461.2	$1,975.2	$1,487.7	$836.8	$56.1	$1.0
Total Hardware and Software	$414.4	$1,534.6	$1,795.1	$2,868.4	$4,634.6	$6,551.6	$6,954.4	$10,499.0	$8,765.2	$5,519.4
cdmaOne Radio Transceivers	$372.6	$885.7	$874.7	$923.3	$1,027.6	$1,215.0	$1,081.3	$1,450.1	$1,006.0	$537.5
cdmaOne Base Station Controllers	$41.5	$96.4	$107.3	$102.0	$111.9	$115.7	$95.0	$118.6	$80.6	$41.5
cdmaOne Mobile Switching Centers	$0.3	$552.5	$813.0	$1,843.2	$3,495.1	$5,220.9	$5,778.1	$8,930.2	$7,678.6	$4,940.4
Total Hardware and Software	$514.7	$1,295.4	$3,215.1	$4,993.1	$5,631.7	$4,996.6	$4,942.4	$4,271.7	$2,830.9	$3,186.6
TDMA Base Transceiver Stations	$446.8	$1,096.7	$2,869.7	$4,416.3	$4,917.6	$4,275.8	$4,108.2	$3,435.6	$2,275.1	$2,754.9
TDMA Mobile Switching Centers	$67.8	$198.7	$345.4	$576.8	$714.1	$720.8	$834.2	$836.0	$555.9	$431.7
Total Software Upgrade and Maintenance	$1,110.2	$2,043.0	$3,430.0	$5,373.7	$7,485.9	$8,495.8	$8,504.0	$7,571.7	$5,695.0	$4,551.5
GSM Base Transceiver Stations	$1,002.2	$1,816.9	$3,004.9	$4,637.1	$6,357.2	$7,084.0	$6,915.7	$5,966.9	$4,366.7	$3,434.5
GSM Base Station Controllers	$98.1	$205.5	$386.4	$669.6	$1,026.1	$1,283.5	$1,444.0	$1,458.9	$1,207.5	$1,015.4
GSM Mobile Switching Centers	$9.8	$20.6	$38.6	$67.0	$102.6	$128.3	$144.4	$145.9	$120.8	$101.5
Total Software Upgrade and Maintenance	$124.0	$369.1	$642.7	$740.8	$1,008.7	$1,186.5	$1,338.7	$1,727.1	$1,909.1	$1,894.7
cdmaOne Base Transceiver Stations	$104.4	$311.0	$541.5	$621.6	$823.1	$964.4	$1,068.3	$1,330.8	$1,400.2	$1,306.6
cdmaOne Base Station Controllers	$17.8	$53.0	$92.1	$108.4	$168.8	$202.0	$245.8	$360.3	$462.6	$534.6
cdmaOne Mobile Switching Centers	$1.8	$5.2	$9.1	$10.8	$16.8	$20.2	$24.6	$36.0	$46.3	$53.5
Total Software Upgrade and Maintenance	$198.2	$432.3	$771.7	$1,325.6	$1,875.6	$2,219.6	$2,487.5	$2,630.3	$3,178.6	$3,634.5
TDMA Base Transceiver Stations	$196.2	$428.0	$763.1	$1,309.5	$1,849.2	$2,181.8	$2,435.5	$2,563.4	$3,099.5	$3,546.0
TDMA Mobile Switching Centers	$2.0	$4.3	$8.5	$16.2	$26.4	$37.8	$51.9	$67.0	$79.1	$88.4

Table 6 (Continued)
Digital Mobile Infrastructure Revenue by Industry Standard — Worldwide, 1996-2005 (Millions of U.S. Dollars)

	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
2.5G	**-**	**-**	**-**	**$7,659.5**	**$13,232.6**	**$16,770.8**	**$21,316.8**	**$24,344.3**	**$27,455.1**	**$29,438.0**
Total Hardware and Software	-	-	-	$6,636.3	$10,343.2	$13,295.7	$17,003.2	$19,289.1	$21,353.6	$22,059.7
GPRS Radio Transceivers	-	-	-	$5,077.7	$5,388.3	$6,140.7	$7,627.4	$7,247.8	$5,799.4	$5,167.1
GSM-EDGE Radio Transceivers	-	-	-	-	-	$30.0	$120.3	$80.2	$829.5	$846.8
Serving GPRS Support Nodes	-	-	-	$880.0	$2,712.9	$3,418.6	$4,181.8	$4,906.6	$5,409.8	$5,478.0
Gateway GPRS Support Nodes	-	-	-	$391.0	$1,348.7	$1,728.1	$2,551.5	$3,449.9	$4,516.4	$5,111.5
Packet Controller Units	-	-	-	$215.9	$630.6	$833.5	$1,190.2	$1,496.4	$1,835.9	$2,055.9
cdma2000 1X	-	-	-	$71.6	$262.8	$1,144.8	$1,332.1	$2,108.2	$2,962.6	$3,400.4
Total Software Upgrade and Maintenance	-	-	-	$1,023.2	$2,889.4	$3,475.1	$4,313.6	$5,055.3	$6,101.5	$7,378.3
GPRS Elements	-	-	-	$978.1	$2,761.3	$3,072.1	$3,954.6	$4,725.7	$4,879.1	$5,248.6
GSM-EDGE Elements	-	-	-	-	-	$1.0	$4.5	$3.4	$11.1	$13.7
cdma2000 1X Elements	-	-	-	$45.1	$128.1	$402.0	$354.5	$326.2	$1,211.3	$2,116.1
3G	**-**	**-**	**-**	**-**	**$0.1**	**$4,463.4**	**$9,513.7**	**$14,747.5**	**$21,736.7**	**$26,018.3**
Total Hardware and Software	-	-	-	-	-	$3,412.2	$6,790.8	$9,603.8	$12,458.1	$13,775.6
W-CDMA Radio Transceivers	-	-	-	-	-	$2,815.4	$5,516.2	$7,681.7	$9,613.6	$10,425.8
W-CDMA Radio Network Controllers	-	-	-	-	-	$426.3	$910.5	$1,386.7	$2,113.2	$2,562.3
W-CDMA Mobile Switching Centers	-	-	-	-	-	$170.5	$364.2	$535.5	$731.3	$787.5
Total Software Upgrade and Maintenance	-	-	-	-	$0.1	$1,031.8	$2,169.4	$3,280.0	$4,896.1	$5,862.2
W-CDMA Base Transceiver Stations	-	-	-	-	$0.1	$852.7	$1,820.9	$2,784.3	$4,220.4	$5,142.3
W-CDMA Radio Network Controllers	-	-	-	-	-	$127.9	$248.7	$347.3	$474.1	$504.5
W-CDMA Mobile Switching Centers	-	-	-	-	-	$51.2	$99.8	$148.4	$201.6	$215.4
Total Hardware and Software	-	-	-	-	-	$14.9	$425.7	$1,425.8	$3,344.4	$4,869.5
cdma2000 1X EV Radio Transceivers	-	-	-	-	-	$12.5	$388.1	$1,206.3	$2,812.3	$4,082.6
cdma2000 1X EV Radio Network Controllers	-	-	-	-	-	$1.7	$14.3	$153.7	$369.6	$544.9
cdma2000 1X EV Mobile Switching Centers	-	-	-	-	-	$0.7	$23.3	$65.8	$162.4	$241.9

Table 6 (Continued)
Digital Mobile Infrastructure Revenue by Industry Standard — Worldwide, 1996-2005 (Millions of U.S. Dollars)

	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Total Software Upgrade and Maintenance	-	-	-	-	-	$4.5	$127.8	$437.9	$1,038.1	$1,511.0
cdma2000 1X EV Base Transceiver Stations	-	-	-	-	-	$3.7	$116.4	$361.9	$857.9	$1,248.8
cdma2000 1X EV Radio Network Controllers	-	-	-	-	-	$0.6	$4.4	$54.3	$128.7	$187.3
cdma2000 1X EV Mobile Switching Centers	-	-	-	-	-	$0.2	$7.0	$21.7	$51.5	$74.9
Total	**$7,193.5**	**$13,529.7**	**$21,488.2**	**$38,310.4**	**$49,807.5**	**$55,535.9**	**$63,024.7**	**$70,130.1**	**$72,871.3**	**$74,692.9**

EDGE = Enhanced Data Rates for Global Evolution
GPRS = General Packet Radio Service
TDMA = Time division multiple access
W-CDMA = Wideband code division multiple access
Source: Gartner Dataquest (November 2001)