

Fixed wireless is a relatively new access technology that we believe will expand rapidly from a small base, as it is well-suited to service rural areas that DSL and cable modems currently do not reach. Fixed wireless requires a much less expensive infrastructure than land-based technologies, and consequently equipment revenue is relatively small. This technology will likely be helped by increased government investment in broadband and the growing emphasis on serving rural areas. We expect equipment revenue to increase from \$70 million in 2008 to \$220 million in 2012, a 33.1 percent compound annual increase.

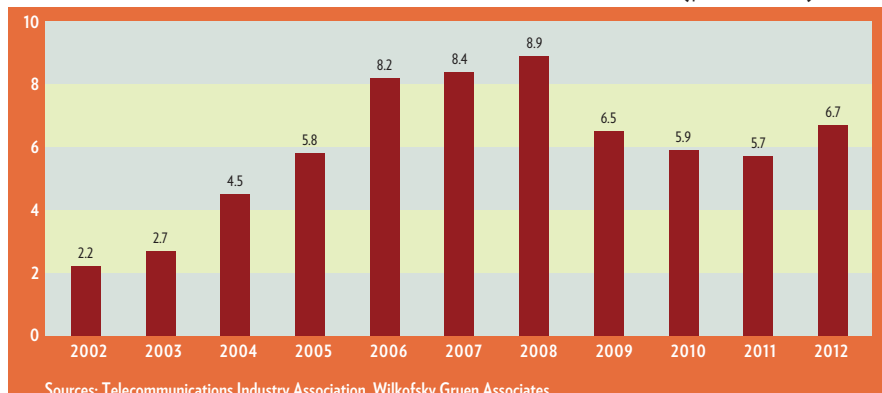
The access infrastructure market as a whole will reverse course beginning in 2009, falling 27 percent. We look for continued declines through 2011 before the market rebounds with an 18.2 percent rise in 2012. Overall revenue in 2012 will total \$6.7 billion, down 6.9 percent compounded annually from \$8.9 billion in 2008 (see **Tables 2-4.4** and **2-4.5**, page 2-54, and **Figure 2-4.4**, below).

Backbone Infrastructure

Network capacity has suddenly become scarce, a dramatic turnaround from the early part of the decade, when it appeared that there was excess capacity for the foreseeable future. The advent of video streaming and Internet video has used up or nearly used up much of that excess capacity. Between 2006 and 2008, global Internet traffic more than doubled, and it is expected to double again in 2010 and quadruple by 2012 (see **Figure 2-4.5**, page 2-56). The introduction of licensed video streaming services, the availability of television programs on network Web sites, the sharing of videos on social networking sites such as YouTube, and peer-to-peer sharing of videos are driving bandwidth demand.

Telephone companies are implementing new technologies to extend the fiber infrastructure. In addition to PON and GPON, fiber-to-the-telecommunications-enclosure (FTTE) is being adopted. It is based on the TIA/EIA-569 B *Pathways and Spaces*

FIGURE 2-4.4
ACCESS INFRASTRUCTURE REVENUE IN THE UNITED STATES (\$ BILLIONS)



Overall access infrastructure revenue in 2012 will total \$6.7 billion, down 6.9 percent compounded annually from \$8.9 billion in 2008.

TABLE 2-4.6
BACKBONE INFRASTRUCTURE
REVENUE IN THE UNITED
STATES (\$ MILLIONS)

Year	Revenue	Percent Change
2002	4,660	—
2003	3,590	-23.0
2004	4,920	37.0
2005	6,800	38.2
2006	7,460	9.7
2007	8,080	8.3
2008	8,660	7.2
2009	9,980	15.2
2010	10,130	1.5
2011	10,360	2.3
2012	9,940	-4.1
2009-12 CAGR	—	3.5

Sources: Telecommunications Industry Association, Wilkofsky Gruen Associates

standard, which defines the cabling used for telecommunications enclosures. The architecture extends the fiber backbone to the telecommunications enclosure. An optical network terminal that converts the optical signal to an electrical signal is used for the final distance.

Cable companies are deploying fiber in their infrastructure to extend the broadband network closer to the home. Because copper cabling has resistance, the longer the distance a signal has to travel from the home to the nearest node, the slower the transmission speed. Cable operators are expanding their fiber infrastructure to enable large amounts of data to travel over short distances, providing faster broadband service.

Backbone infrastructure revenue from all sources will increase by a projected 15.2 percent in 2009, one of the few components of the telecommunications market that we expect to expand at a double-digit rate. We look for backbone infrastructure revenue to continue to expand through 2011 and then to decrease 4.1 percent in 2012 as the backbone infrastructure is built out. Backbone infrastructure revenue will rise from \$8.7 billion in 2008 to a peak of \$10.4 billion in 2011 before dropping to \$9.9 billion in 2012. Revenue in 2012 will be 3.5 percent higher on a compound annual basis from 2008 (see **Table 2-4.6**, left, and **Figure 2-4.6**, page 2-57).

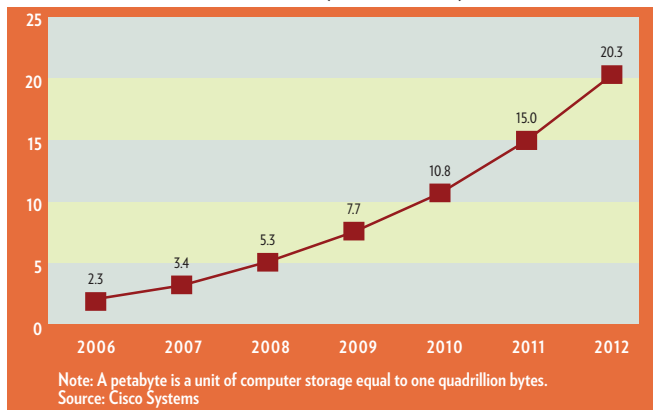
Central Office Infrastructure

The increased capacity facilitated by expansion of the fiber backbone has created demand for equipment such as optical gear and traffic management products. Switches and transmission equipment also need to be replaced or upgraded to maintain service.

During the past six years, telephone companies have spent between \$13 billion and \$15 billion annually on central office equipment. Those figures are down significantly from the \$27.6 billion spent in 2002 and even larger amounts in previous years. The surge of new companies entering the market following passage of the *Telecommunications Act of 1996* led to a surge in equipment revenue. That surge led to a subsequent shakeout in the early part of the decade. Fewer companies now remain and there is less duplication.

We expect telephone companies to cut back on central office equipment in 2009 as they look to conserve resources. We project an 11 percent decline followed by a further 6 percent decrease in 2010. We then expect revenue to pick up as economic conditions improve and the need to manage traffic becomes more compelling. We expect revenue to fall from \$14.05 billion in 2008 to a low of \$11.75 billion in 2010 before rebounding to \$12.5 billion in 2012, a 2.9 percent decrease

FIGURE 2-4.5
GLOBAL INTERNET TRAFFIC (PETABYTES)



Between 2006 and 2008, global Internet traffic more than doubled, and it is expected that it will double again in 2010 and quadruple by 2012.

compounded annually from 2008 (see **Table 2-4.7**, right, and **Figure 2-4.7**, page 2-58).

Total Landline Infrastructure

The telecommunications landline infrastructure market as a whole totaled \$31.6 billion in 2008, up 3.4 percent from 2007. We project an 8.3 percent decline in 2009 and an additional 4.3 percent drop in 2010 followed by a cumulative gain of 5 percent during the subsequent two years. Revenue will contract at a 2.0 percent compound annual rate to \$29.1 billion in 2012 (see **Tables 2-4.8** and **2-4.9**, page 2-58).

Services in Support of Network Infrastructure Equipment

The support services market has three major spending segments: traditional plain old telephone service (POTS) providers; telephone and broadband provided by cable operators; and spending by telephone companies and other non-cable providers to support broadband networks. Professional services revenue from all carriers rose 5.5 percent in 2008 to \$65.3 billion. We expect that as companies cut back on their equipment purchases they will reduce their spending on support services as well, again reflecting a reaction to the deteriorating economic environment. There was a similar reduction in spending in 2003 when equipment revenue fell. We look for two years of decline followed by two years of expansion as economic conditions improve during 2011–12.

Over the entire forecast period, POTS carriers will decrease spending on support services to \$32 billion in 2012 from \$34.2 billion in 2008, a 1.6 percent decline compounded annually. Cable operators will spend \$13.5 billion in 2012, a 0.2 percent compound annual decrease from \$13.6 billion in 2008. Services in support of broadband networks will be the only category that will be larger in 2012 than

TABLE 2-4.7

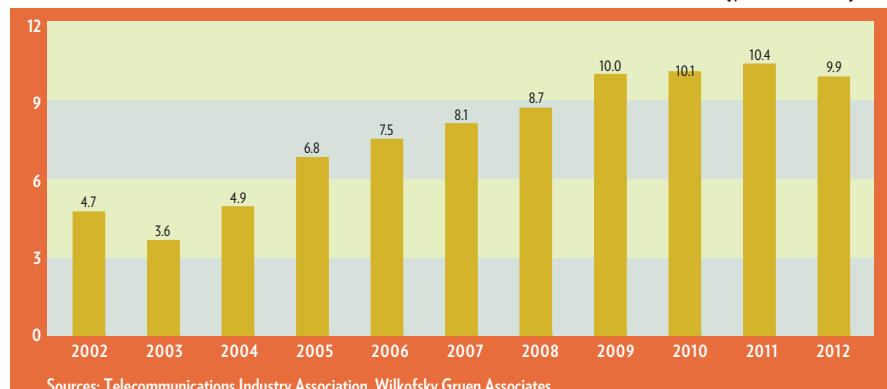
CENTRAL OFFICE INFRASTRUCTURE REVENUE IN THE UNITED STATES (\$ MILLIONS)

Year	Revenue	Percent Change
2002	27,620	—
2003	14,980	-45.8
2004	13,100	-12.6
2005	13,770	5.1
2006	13,690	-0.6
2007	14,100	3.0
2008	14,050	-0.4
2009	12,500	-11.0
2010	11,750	-6.0
2011	12,000	2.1
2012	12,500	4.2
2009-2012 CAGR	—	-2.9

Sources: Telecommunications Industry Association, Wilkofsky Gruen Associates

FIGURE 2-4.6

BACKBONE INFRASTRUCTURE REVENUE IN THE UNITED STATES (\$ BILLIONS)



Backbone infrastructure revenue will rise from \$8.7 billion in 2008 to a peak of \$10.4 billion in 2011 before dropping to \$9.9 billion in 2012.

TABLE 2-4.8
TOTAL LANDLINE INFRASTRUCTURE REVENUE
IN THE UNITED STATES (\$ MILLIONS)

Year	Central Office	Backbone	Access	Total
2002	27,620	4,660	2,150	34,430
2003	14,980	3,590	2,740	21,310
2004	13,100	4,920	4,510	22,530
2005	13,770	6,800	5,780	26,350
2006	13,690	7,460	8,170	29,320
2007	14,100	8,080	8,390	30,570
2008	14,050	8,660	8,900	31,610
2009	12,500	9,980	6,500	28,980
2010	11,750	10,130	5,860	27,740
2011	12,000	10,360	5,670	28,030
2012	12,500	9,940	6,700	29,140

TABLE 2-4.9
CHANGE IN TOTAL LANDLINE INFRASTRUCTURE
REVENUE IN THE UNITED STATES (PERCENT)

Year	Central Office	Backbone	Access	Total
2003	-45.8	-23.0	27.4	-38.1
2004	-12.6	37.0	64.6	5.7
2005	5.1	38.2	28.2	17.0
2006	-0.6	9.7	41.3	11.3
2007	3.0	8.3	2.7	4.3
2008	-0.4	7.2	6.1	3.4
2009	-11.0	15.2	-27.0	-8.3
2010	-6.0	1.5	-9.8	-4.3
2011	2.1	2.3	-3.2	1.0
2012	4.2	-4.1	18.2	4.0
2009-12 CAGR	-2.9	3.5	-6.9	-2.0

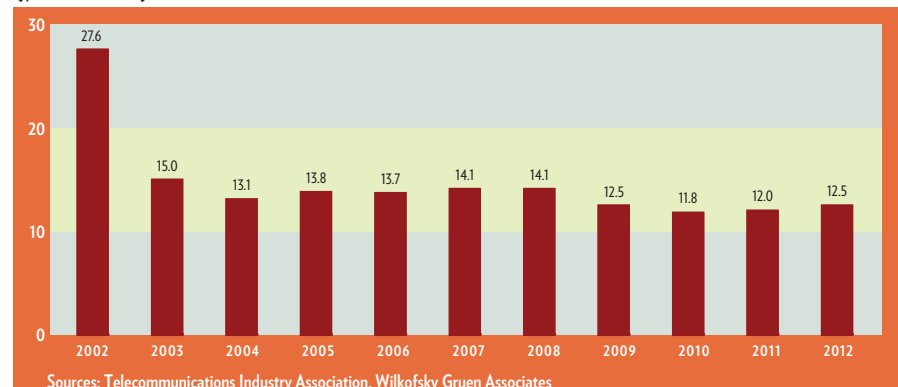
Sources: Telecommunications Industry Association, Wilkofsky Gruen Associates

in 2008. Revenue will rise at a 2.1 percent compound annual rate to \$19 billion in 2012 from \$17.5 billion in 2008. Overall spending for services in support of network infrastructure equipment will total \$64.5 billion in 2012, down 0.3 percent on a compound annual basis from 2008. The broadband share will rise from 26.8 percent in 2008 to 29.5 percent in 2012. The POTS share will drop from 52.4 percent in 2008 to 49.6 percent in 2012, while cable's share will edge up to 20.9 percent from 20.8 percent in 2008 (see **Tables 2-4.10, 2-4.11 2-4.12** and **Figure 2-4.8**, page 5-59).

Overall Equipment and Support Services

The overall equipment and support services market in the United States rose 4.8 percent in 2008 to \$96.9 billion. We project a 7.7 percent decrease in 2009 and a

FIGURE 2-4.7
CENTRAL OFFICE INFRASTRUCTURE REVENUE IN THE UNITED STATES
(\$ BILLIONS)



We expect revenue to fall from \$14.05 billion in 2008 to a low of \$11.75 billion in 2010 before rebounding to \$12.5 billion in 2012, a 2.9 percent decrease compounded annually from 2008.