

INDUSTRY ANALYST FORUM

Carrier Capital Expenditures

John M. Celentano, Skyline Marketing Group

ABSTRACT

Capital expenditures (capex) remain the most closely-watched metric for determining the direction and level of investment that telecommunications carriers are making in network equipment and services.

In turn, carrier capital spending is driven by the combination of two primary factors: the number of customers served by that carrier, and the volume of services demanded by those customers.

This article analyzes the size, scope, and outlook of capital expenditures among telecommunications carriers in the U.S., and assesses the significance of capital expenditures for the carriers' customers, equipment vendors, and investors.

Written by John Celentano, a highly-regarded telecom marketing consultant, the paper's findings and conclusions are based on a study of more than 50 wireline and wireless carriers that will spend a combined US\$65 billion in 2008.

INTRODUCTION

Capital expenditures (capex) remain the most closely-watched metric for determining the direction and level of investment that telecommunications carriers are making in network equipment and services.

In turn, carrier capital spending is driven by the combination of two primary factors: the number of customers served by that carrier and the volume of services provided by that carrier to those customers. For example, the base of wireless customers in the United States has grown to an estimated 230 million, surpassing the base of about 160 million wired customers. (It is interesting to note that the base of wireless customers continues to grow and is around 77 percent population penetration, whereas the wired customer base is declining at -7-8 percent a year.)

As consumers of wireless services, our collective usage now averages around 700 minutes-of-use (MOU) per month. With large blocks of minutes being offered by the carriers at fixed monthly rates, customer usage is trending towards 1000 MOUs. More important, the mix of usage is changing from voice calling to increasing volumes of data for text messaging, email messages, file transfers, picture exchanges, and video downloads. As a consequence, wireless carriers must continue to invest billions in

new cell sites, data switching, and high-speed backhaul circuits to accommodate this increase in mixed traffic volumes.

How much and how quickly the carriers will invest is a function of the state of their installed networks, customer demands, and competitive threats. The common theme underlying all capital investments in both wired and wireless, however, is the need for widespread deployment of high-speed broadband connections.

THE BIG PICTURE

Aggregate capital spending in 2007 among 53 U.S. wireline and wireless, publicly-held carriers reached \$63.9 billion, up +1 percent over the \$63.5 billion spent in 2006. Over the past two years, aggregate capex has grown at a 3 percent compounded annual growth rate (CAGR) from \$60.4 billion in 2005.

For 2007, wired carriers spent \$42.9 billion or 67 percent of the aggregate. Wireless carriers accounted for the remaining 33 percent or \$21.1 billion. Wireline capital expenditures for 2007 were \$42.9 billion, a +13 percent increase over the \$38.1 billion spent in 2006. Major broadband initiatives led by AT&T's Project Lightspeed and Verizon's Fiber Optic System (FiOS) helped boost the wireline capital spending.

By contrast, wireless capex reached \$21.1 billion in 2007, down -17 percent from \$25.4 billion in 2005. The single biggest reason for the drop was that AT&T Mobility completed much of the Cingular and AT&T Wireless network integration activities in 2006 and so was able to scale back its 2007 capital spending.

These data indicate that capital spending is not linear behavior and varies each year among individual carriers and in different product lines. Moreover, spending continues to shift dramatically from legacy systems to new capacity and service growth projects that support broadband services.

These growth projects involve broadband deployments in both wired and wireless networks for multimedia services, the so-called triple-play, that comprise voice (mainly, voice-over-IP [VoIP]), high-speed Internet data access, and increasingly, video.

QUARTERLY SPENDING PATTERNS

While the carriers will provide guidance on their planned capital investments for the coming year, it is difficult to anticipate how that capital will be

spent on a quarter-to-quarter (QtQ) basis throughout the year.

Going back to when the telephone industry was made up of local telephone companies with a central office (CO) focus, QtQ capex followed a traditional cycle with a modest 1Q, a strong 2Q, a slowdown in 3Q (when the industry went on vacation), and a big uptick in 4Q, ostensibly to complete scheduled programs and to clear the budget. Today, the carriers comprise quite a different mix of companies. In addition, there is much activity in the field away from the CO as the wired carriers deploy broadband from outside plant cabinets, and the wireless companies erect new cell sites. These types of construction activities occur year-round with most of the installations taking place during the months when the weather is good.

In 1Q07, U.S. wireline and wireless carriers together spent \$14.1 billion, up +1 percent from \$14.0 billion spent in 1Q06 but down -24 percent from the \$18.6 billion peak reached in 4Q06. Carriers spent 22 percent of their aggregate full-year 2007 budgets in 1Q.

2Q07 capex totaled \$15.7 billion, up +11 percent from 1Q07 and up +3 percent from \$15.2 billion spent in 2Q06. Spending in this period accounted for 25 percent of the budget, bringing the cumulative capex through mid-year to 47 percent of the full-year budget.

Activity held, with 3Q07 capex totaling \$15.6 billion, essentially flat with 2Q07 and down just -1 percent compared to 3Q06 spending. Through 3Q07, carriers spent 71 percent of full-year budgets, the same proportion as spent through the first nine months of 2006.

At \$18.5 billion, the 4Q07 capex jumped +19 percent on a sequential basis from 3Q07 and was down -1 percent compared to the \$18.6 billion in 4Q06. The 4Q spending in both years accounted for 29 percent of the full-year budgets.

CAPITAL EXPENDITURE OUTLOOK

With guidance provided at year-end 2007, aggregate wireline and wireless capex is projected at \$65.0 billion, up +2 percent over the \$63.9 billion spent in 2007, as shown in Fig. 1.

The chart shows that capital spending in the U.S. telecom industry has stabilized since the bubble burst in 2000–2001. From a peak of \$125 billion in 2000 that resulted in too many networks with excess capacity, capital spending nosedived for the next three years before turning the corner in 2004. Since then, carrier budget capital spending is based on a “success-based” model, where network infrastructure is built as demand dictates versus a “build it and they will come” mentality.

For full-year 2008e (estimate), wireline expenditures are projected to increase +1 percent to \$43.4 billion from \$42.9 billion in 2007. Similarly, 2008e wireless capex is projected to increase +2 percent to \$21.6 billion from \$21.0 billion in 2007, as shown in Fig. 2.

Rationalizing network investments means paying closer attention to two key metrics — capex/revenues and capex/earnings before interest, taxes, depreciation and amortization (EBITDA) — as measures of capital efficiencies, that

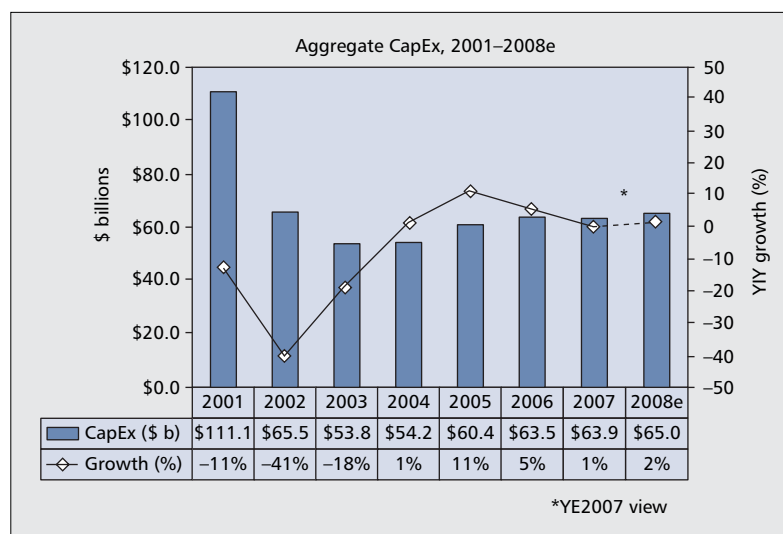


Figure 1. Aggregate CapEx, 2001–2008e.

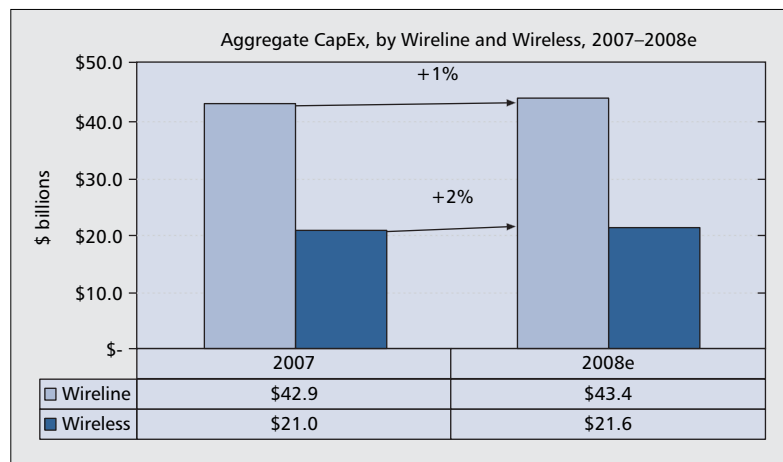


Figure 2. Aggregate CapEx, by wireline and wireless, 2007–2008e.

is, how efficiently the carriers are deploying capital to grow and upgrade their networks with respect to their revenues and operating cash flow growth.

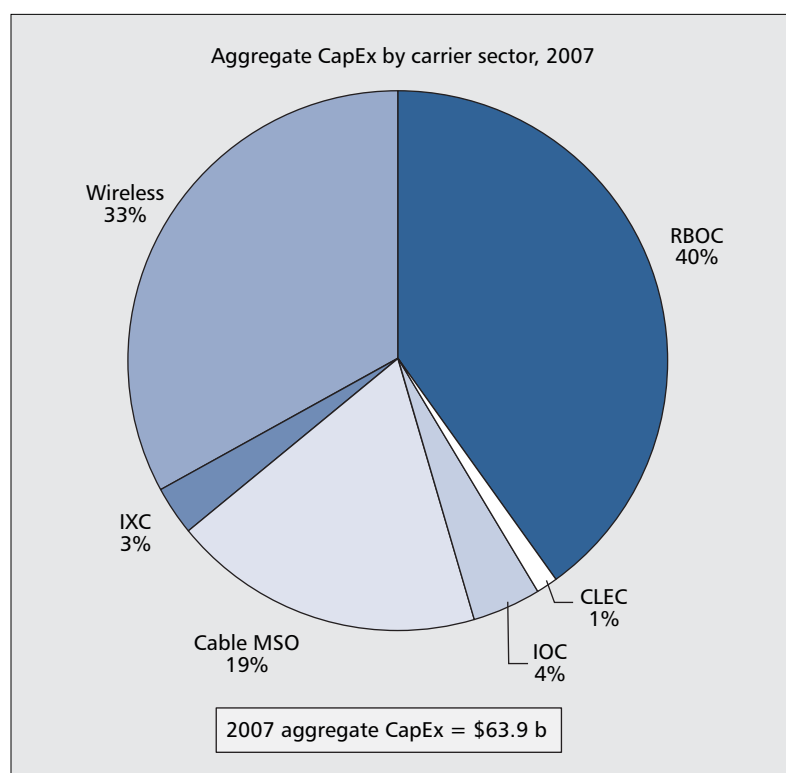
Capex/revenues of 20 percent and capex/EBITDA of 50 percent are considered as *incumbent* levels that are representative of established carriers. Percentages that are higher than these levels indicate an expansion mode where capital is invested ahead of new revenues and cash flow. Percentages below incumbent levels indicate a maintenance mode with investment going for incremental new capacity or services.

In 2007, wireline carrier capex/revenues were at 18 percent with capex/EBITDA at 55 percent. By comparison, wireless carriers registered capex/revenue at 15 percent and capex/EBITDA at 39 percent.

CAPEX BY CARRIER SECTOR

Figure 3 shows a breakdown of 2007 capex by carrier sector.

Wireless capital spending accounted for \$21.6 billion or 33 percent of the 2007 total. With consolidations and continued subscriber growth and



■ Figure 3. Aggregate CapEx by carrier sector, 2007.

demand for new services, work continues to improve call quality and coverage and to add wireless data capabilities.

The regional Bell operating companies (RBOCs) remain the big spenders with \$25.7 billion or 40 percent of the 2007 aggregate. RBOC spending increased on the strength of major broadband deployment projects.

Independent operating company (IOC) capex is proportionally small, but consistent. IOCs accounted for 4 percent of the 2007 total. The \$2.5 billion spent by the IOCs in 2007 is flat with their 2006 capex.

Competitive local exchange carriers (CLECs) capex accounted for a just 1 percent of 2007 aggregate spending. The CLECs together spent \$810 million in 2007. That figure was up +28 percent from \$634 million in 2006.

Cable multiple system operators (MSOs) accounted for 19 percent, or \$12 billion of 2007 spending. The MSO capex is driven by new digital cable and voice subscriptions along with high-speed Internet access.

Interexchange carriers (IXCs) accounted for \$1.8 billion or 3 percent of 2007 aggregate capex. That figure is up +10 percent over 2006 spending. IXCs are steadily adding to their long distance capacity for both broadband and wireless transport traffic. Overcapacity in long-haul networks is burning off. IXC spending is closely tied to RBOC strategic initiatives, especially for enterprise accounts.

CAPEX BY SECTOR OVERVIEW

Regional Bell Operating Companies — During 2007, RBOCs invested \$25.7 billion, up +10 percent from \$23.3 billion in 2006. Since 2005, RBOC capex has grown at an +18 percent CAGR.

AT&T and Verizon, with the largest access line bases, together accounted for 95 percent of the sector total. Qwest made up the remaining 5 percent with its investment proportional to the size of its respective networks. The concentration of capital spending among the two largest telcos is reflective of the consolidations that have taken place in the industry since 2005.

The current spending focus among the RBOCs is on broadband involving fiber-to-the-node (FTTN) for digital subscriber line (DSL) deployments and fiber-to-the-premise (FTTP) initiatives for triple-play delivery and much less on legacy, copper-based access, and circuit switching as access lines continue to decline.

The companies are focusing on transmission and switching platforms for bundled service offerings — voice, long distance, DSL, video, and wireless — to offset access line losses that are averaging –7–8 percent a year. IPTV is starting to roll out.

Moreover, RBOCs are at the threshold of a long-term circuit-to-packet (C2P) switch upgrade that is expected to ramp up through 2008–2009.

Since 2005, RBOC spending has ramped up, driven by consolidations and network transformation to broadband.

RBOC capex grew to \$23.8 billion in 2006, up +26 percent from \$18.5 billion in 2005. Sector investment increased another +10 percent in 2007 to reach \$25.7 billion. 2008e spending will increase another +4 percent to \$26.6 billion.

The slower pace is indicative of the completion of key merger activities at AT&T and the fact that all of the RBOCs are achieving capital efficiencies as they drive volume discounts from their vendors. Customer demand for broadband has not slowed nor have the RBOC programs.

Collectively, the RBOCs are shifting more and more capital dollars to new technologies and systems that support new revenue streams to offsets basic local services losses. The primary enabling technology is broadband, which is being deployed in various forms — xDSL, FTTx, xPON, CO DSLAM, and extended reach DSL (ERDSL).¹

Figure 4 compares the RBOC capex allocation between 2004 and 2008e for both broadband capex and investments in legacy network systems, mainly non-broadband transmission systems and circuit-switching systems.

In 2004, RBOCs allocated just 18 percent of their collective spending to broadband projects and 82 percent to legacy network systems. By 2007, broadband capex accounted for 37 percent of the RBOC total. For 2008e, broadband projects will account for 45 percent of total capital expenditures, whereas 55 percent will go to core network systems.

INDEPENDENT OPERATING COMPANIES

The IOCs represent an interesting mix of incumbent telephone companies that serve mainly tier 2/3 cities and rural markets. Many IOCs are full-service providers that incorporate non-incumbent local exchange carrier (ILEC) operations — CLEC, cable, Internet access, and in some cases, wireless.

¹ Wireline Broadband technologies include: digital subscriber line (DSL) available as asymmetrical DSL (ADSL) or very high-speed DSL (VDSL), and delivered from a DSL access multiplexer (DSLAM); passive optical network (PON) available as broadband PON (BPON) and gigabit Ethernet PON (GPON); fiber-to-the-x (FTTx), where x can be the node (FTTN), premise (FTTP), home (FTTH), and so on.

IOCs spent \$2.5 billion in 2007, flat with spending in 2006.

EMBARQ leads all IOCs accounting for \$819 million or 32 percent of the 2007 spending. Windstream, CenturyTel, Citizens/Frontier, Cincinnati Bell, and TDS Telecom represent a solid second tier that collectively accounted for \$1.4 billion or 54 percent of the 2007 total IOC capex. Small rural IOCs that are geographically dispersed around the country make up the remaining 14 percent.

The top-tier IOCs are growing and expanding through both organic growth and through acquisitions of other, smaller IOCs or of rural properties being divested by the RBOCs.

The appeal of the IOCs is that they often are early adopters of advanced technology and serve as a ready market for many equipment vendors. IOCs fund these purchases with the assistance of federal government programs such as the Universal Services Fund (USF) or the Department of Agriculture's Rural Utilities Service (RUS) that administers the Broadband Fund. More important, many IOCs operate in smaller markets that are less vulnerable to competition.

As a result, IOCs are focusing their capex on next-generation technology including packet switching and multi-service access platforms (MSAPs) that can deliver VoIP, DSL, and IPTV.

Since 2001, IOC capex has held steady in the \$2.5–3.0 billion a year range. Sector spending stayed around the \$2.5 billion level between 2005 and 2007.

That total is projected to grow +11 percent to \$2.8 billion in 2008e, mainly on the strength of a significant increase at Fairpoint Communications.

Fairpoint just completed a \$1.6 billion acquisition of 1.5 million access lines from Verizon in the northeast states of New Hampshire, Vermont, and Maine where Fairpoint already has rural operations. Fairpoint's planned 2008e capex will jump 512 percent to \$362 million from \$59 million in 2007 as the company upgrades and integrates the Verizon lines into its operations.

A full 44 percent of the total of the IOC budgets is used to expand, support, and maintain their vast, predominantly rural outside plant (OSP)/cable infrastructure.

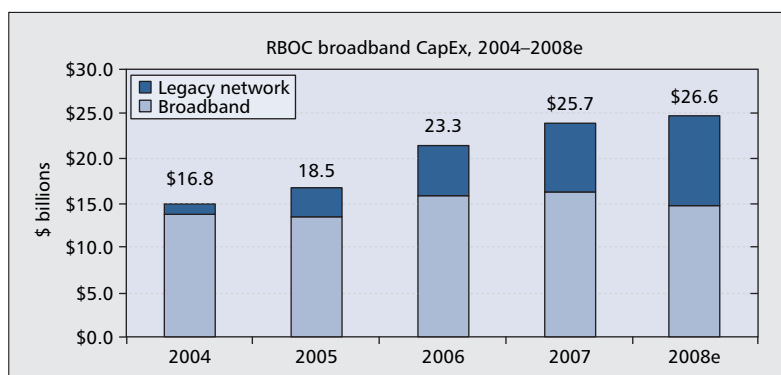
Switching systems comprise another 16 percent. This segment is gaining greater priority as the IOCs move forward with their C2P migration plans.

Transmission, mainly for broadband deployments, accounts for 21 percent of the total. This segment is growing as IOCs evaluate and deploy MSAPs for triple-play service delivery, with similar FTTx architectures that are being deployed by the RBOCs.

Another 9 percent was allocated to operation support systems (OSSs) that support both legacy and next-generation systems. DC power systems with batteries account for 2 percent of the total spending.

COMPETITIVE LOCAL EXCHANGE CARRIERS

Together, CLECs spent \$810 million in 2007, up +28 percent over the \$634 million invested in



■ Figure 4. RBOC broadband CapEx, 2004–2008e.

2006. Since 2005, CLEC capex has grown at a +24 percent CAGR.

Time Warner Telecom, a solid performer in its select markets, led the sector with 32 percent of the 2007 capex. XO Communications, along with its Nextlink wireless broadband subsidiary, accounted for 27 percent of the total. RCN, through a combination of its CLEC and cable operations, accounted for 14 percent. PaeTec, Cbeyond, and ITC^Deltacom together made up another 23 percent; each company is expanding through both organic growth and acquisition. Other CLECs combined made up the remaining 4 percent.

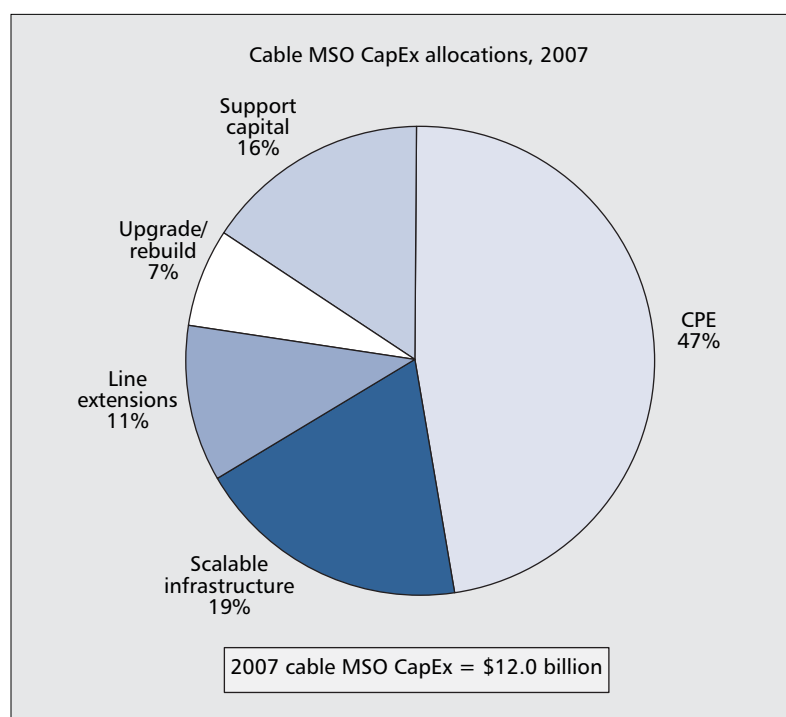
Included in the coverage are facilities-based CLECs, both standalone companies and ILEC subsidiaries. The sector has stabilized and is showing signs of growth among the CLECs that survived the telecom bubble bust. The sector is undergoing consolidation as the stronger companies absorb smaller, less profitable operators.

Current capital spending is focused on boosting utilization and efficiencies of both circuit and broadband infrastructure, primarily for business customers in their operating markets. After the leading companies stabilized their operations, they were able to sell their services and expand their network infrastructure each time they added new customers.

From a peak of nearly \$10 billion in 2000, CLEC dropped to almost half that level in 2001, then fell precipitously to \$1.1 billion in 2002. The slide continued but slowed through 2005 when CLEC capex hit bottom at \$529 million.

The turnaround occurred in 2006 in the aftermath of bankruptcies, sell-offs, and acquisitions that eliminated the weak players leaving the companies still standing with focused business goals and targeted strategies. CLEC capex in 2006 grew +20 percent to \$634 million and then another +28 percent to \$810 million for 2007. The outlook for 2008e is up slightly with capex levels projected to grow +4 percent to \$839 million.

CLECs invest mainly in their own switching and transmission facilities, which accounts for 52 percent on the total. Associated DC power systems used in COs account for 2 percent of the total. Investment in outside plant facilities accounts for 26 percent of CLEC capex. In addition to extending or adding to their own fiber cable routes, CLECs lease available cable and outside plant facilities from the ILECs or other



■ Figure 5. Cable MSO CapEx allocations, 2007.

infrastructure providers in the form of capitalized right-to-use (RTU) fees. Spending on improving back-office systems and OSSs accounted for another 12 percent.

CABLE MULTIPLE SYSTEM OPERATORS

Cable MSO coverage comprises the top seven publicly-held cable MSOs. The top seven MSOs spent \$12.0 billion in 2007. Comcast is the big cat on the block and accounted for 50 percent of the sector total. Time Warner Cable made up another 29 percent. Spending for both Comcast and TW Cable reflects the absorption of the acquired Adelphia assets. Cablevision Systems and Charter Communications together accounted for 16 percent. The remaining MSOs spent 5 percent of the total.

Through 2007, the major MSOs claimed that with almost all of their cable plant converted to hybrid fiber coaxial (HFC), new “success-based” investment will be made in response to subscriber demand for bundled triple-play (voice, Internet data, video) or in some cases, quadruple-play (3-play + wireless) service offerings.

New MSO spending focuses on adding new subscribers or revenue generating units (RGUs) and up selling the new service bundles to these RGUs. These bundles can include basic and digital video, premium digital and high-definition (HD) video services, high-speed Internet access, and VoIP telephony service.

The major cable MSOs, under the SpectrumCo name, were big winners in the recent Federal Communications Commission (FCC) spectrum auctions. We can expect that in the near future, these MSOs will offer their own branded wireless services as they build out these licenses.

Cable MSO spending peaked at \$17.5 billion in 2001. As network upgrade activity neared completion, cable MSO capex declined –29 percent to \$12.4 billion in 2002, then dropped another –19 percent to \$10.1 billion in 2003. With two-way HFC network upgrades completed, MSO capex dropped another –6 percent to \$9.5 billion in 2004 and a further –14 percent to \$8.2 billion in 2005.

Since then, with the upgraded network in place, the MSOs focused on capital investments required to connect new subscribers to their networks and to add new services such as IP-based cable telephony. Cable MSO capex grew to \$9.9 billion in 2006 and again to \$12 billion in 2007, a +21 percent CAGR over the two years. With current guidance, cable MSO capex will decrease somewhat by –6 percent to \$11.3 billion in 2008e.

Cable MSO capex allocations for 2007 are shown in Fig. 5. Cable companies spent 47 percent of their 2007 budget on customer premise equipment (CPE); comprising set-top boxes, digital video recorders, and cable modems that MSOs generally include as rental items along with the service charges. By contrast, the telephone companies do not include CPE in their capital expenditure budgets after telco CPE was deregulated in the 1980s.

Only 7 percent was spent on network upgrade and rebuilds reflecting the completion of that activity. Line extensions that are required to connect new subscribers to the HFC backbone accounted for another 11 percent. Investments in scalable infrastructure including head-end equipment and systems and packet-switching systems absorbed another 19 percent. The support/other category that includes call centers, back-office systems, billing systems, and field support and maintenance facilities made up the remaining 16 percent.

INTEREXCHANGE CARRIERS

Sprint Long Distance and Level3 Communications lead this small group of publicly-held interexchange carriers (IXCs), each with 34 percent of the 2007 total capex of \$1.8 billion. Together, Qwest Long Distance and Global Crossing account for the remaining 32 percent.

Note that the former AT&T Long Lines and MCI still provide interexchange carrier services, but their capital expenditures are now accounted for in the total wireline spending of their respective parent companies, AT&T and Verizon, respectively.

The IXC business has been hard hit by ebbs and flows in long-haul traffic volumes that are being driven by flat-rate voice, unlimited Internet traffic, and growing wireless voice and data call transport. Long distance carriers that built out capacity in anticipation of a huge ramp in Internet traffic have fallen by the wayside or have been bought for pennies on the dollar.

The remaining IXCs are adding long-haul optical transport capacity as traffic volumes grow and are gradually transforming their network switching through their own C2P programs. At the same time, these IXCs are expanding their traffic-management capabilities with new optical switches/routers, bandwidth management systems, and OSSs.

IXC spending peaked at \$41.7 billion in 2000, driven by irrational exuberance. That level dropped –31 percent to \$28.9 billion in 2001. Both of these figures were inflated by Worldcom, Global Crossing, and Qwest. All three companies restated their financial reports for those periods, and their executives were prosecuted. IXC capex tumbled again by –78 percent to \$6.4 billion in 2002, and declined steadily each year to \$1.7 billion in 2006.

The turnaround took place in 2007 when capex grew to \$1.8 billion, up +10 percent on a year-to-year basis. IXC capex is expected to remain flat at \$1.8 billion for 2008e.

Current IXC investments are success-based with an increasing proportion shifted to enterprise long-haul voice and data requirements; and wholesale wired and wireless voice, Internet data, and increasingly, video transport.

Because they operate national terrestrial networks, IXCs invest a combined 54 percent in long-haul cable and transmission facilities. Switching systems accounted for just 9 percent in 2007. We can expect a greater capex shift to switching as the IXCs replace their aged tandem circuit switches with packet switches.

OSSs account for 18 percent of the total. The IXCs invest a lot of money in systems that operate and maintain the network and provision and bill for services. DC power systems with back-up batteries tallied 3 percent of the total.

WIRELESS COMPANIES

U.S. wireless carriers served 232 million subscribers at the end of 2007. Wireless penetration in the United States is now around 77 percent. The number of wireless subscribers surpassed wired subscribers some time ago. One would think that the industry is reaching a saturation point and that a spending slowdown is inevitable. However, that does not appear to be the case.

On the contrary, demand for wireless services continues. In their efforts to boost average revenue per user (ARPU) and to reduce customer churn, wireless carriers are introducing new data and video capabilities into their digital voice networks.

Capital spending is concentrated among the big four national carriers and accounted for \$18 billion or 85 percent of the \$21 billion spent in 2007.

Verizon Wireless led the pack with \$6.5 billion or 31 percent of the total. Sprint-Nextel followed at \$5 billion or a 23 percent portion. AT&T Mobility and T-mobileUSA together made up another 31 percent. Regional carriers led by Alltel and US Cellular accounted for the 15 percent balance.

Regional carriers affiliated with the big four are upgrading their networks in tandem with the national carriers to maintain roaming integrity. More important, national and regional carriers alike regularly swap or sell licenses to create contiguous operating areas.

Consolidation continues apace across the industry as the national carriers shore up their coverage areas and augment their subscriber counts.

All wireless carriers, particularly the national

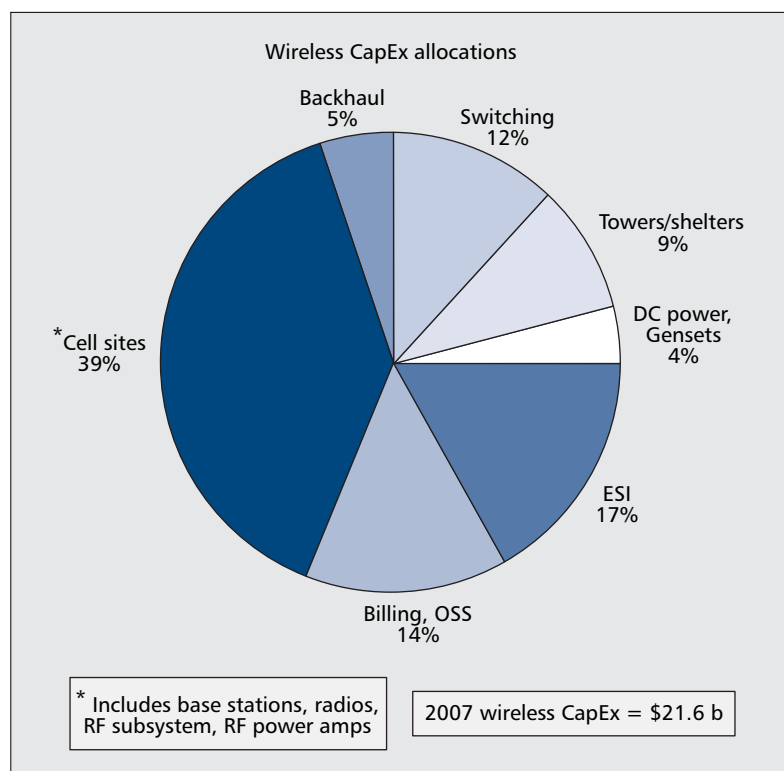


Figure 6. Wireless CapEx allocations.

carriers, were big participants in the recent FCC spectrum auctions. Opening up new frequency bands holds the promise of new wireless services that utilize high-speed data links.

Wireless network investment is cyclical, involving adding capacity in waves to meet customer demand. Wireless capex peaked in 2001 at \$24.7 billion, then declined and subsequently recovered to another peak of \$27.4 billion in 2005.

2006 spending declined –7 percent to \$25.4 billion, then dropped another –17 percent to \$21.0 billion in 2007. These reductions had more to do with the completion of network build-outs in licensed areas and less to do with scale-backs due to economic conditions. Certainly, the biggest drop in 2007 was due to the fact that AT&T Mobility completed a number of investment phases associated with the Cingular and AT&T Wireless integration.

The year-end 2007 view is that 2008e wireless spending likely will grow modestly at +2 percent to \$21.6 billion. Although improving quality and coverage remains an important driver, fewer new cell sites are being added. Rolling out third generation (3G) wireless services is a priority that can be implemented in many cases through incremental cell site additions versus building new cell sites.

Figure 6 shows how the wireless carriers collectively allocated the capex in 2007. Cell site equipment is the biggest piece, absorbing 44 percent of the total capex, including terminal gear for terrestrial back-haul systems. Cell site investments include base station radios, the RF subsystem (antennas, coaxial cable, filters), and RF power amplifiers, but exclude the towers and equipment shelters.

Capex is deployed in cycles and is never linear in its nature, whereas the mix of spending allocations is constantly changing. In the end, the continual study of carrier capital expenditures provides valuable insights into the critical telecom industry that are not available from any other source.

Switching systems account for 12 percent of the total. An increasing proportion of switching expenditures are for packet switches that displace the original circuit switches.

Engineering and installation (E&I) services make up 17 percent of the total. E&I includes a significant amount of site location, RF interference studies, site acquisition, and site engineering activity that must occur even before the equipment is installed. Billing and OSSs make up another 14 percent.

Tower and shelters account for 9 percent of the total. It is becoming more difficult for the industry to erect new towers due to municipal zoning restrictions and public objections. More cell sites are either colocated on existing towers or are being installed on non-tower structures such as building roof tops.

DC power systems with batteries, and back-up generators account for roughly 4 percent of the total. Of necessity, wireless carriers have boosted the back-up power reserves at cell sites as subscribers have become increasingly dependent on wireless services.

WHY UNDERSTANDING CARRIER CAPEX IS IMPORTANT

An understanding of the capital expenditures of telecommunication carriers is important to three key groups: customers, vendors, and investors.

Customers, whether consumers or businesses, increasingly are demanding an anywhere, anytime, and any media model for their communications services. Moreover, they expect a high quality of service at a reasonable price. Customers are asking, "Are the connections there when and where I want them? Are they reliable? Are they fast?" Certainly, customers are less tolerant of poor quality of service and are inclined to switch service providers in search of better service. So the level of capital investments that the carriers are making in their networks is an indication of their commitment to delivering a rich set of high-quality services to their customers.

Vendors use capex as a bellwether for future purchases of equipment and services by the carriers. Many vendors try to tie their own sales performance to their customers' capital expenditures. The caveat with that approach is that the capex mix is steadily shifting toward next-generation systems and away from legacy products. So it is important for vendors to study the capex allocations and spending patterns as a way of discerning their respective opportunities and risks in a fluid spending environment.

Investors can use capex to evaluate the performance of management and to decide if a given carrier represents an investment opportunity or not. Comparing capex/revenues and capex/EBITDA provides investors with insights into how efficiently management is using its capital to expand the business, and what sort of financial results are being achieved.

CONCLUSION

Carrier capital expenditure is a key metric for analyzing and understanding the volume and pace of telecommunications infrastructure modernization. Capex is deployed in cycles and is never linear in its nature, whereas the mix of spending allocations is constantly changing. In the end, the continual study of carrier capital expenditures provides valuable insights into the critical telecom industry that are not available from any other source.

BIOGRAPHY

JOHN M. CELENTANO (john@skylinemarketing.com) holds a B.Eng in electrical engineering from McMaster University. He studied marketing at the University of California-Santa Barbara and is a graduate of the Bell System Center for Technical Education. He is president of Skyline Marketing Group, a Baltimore-based telecom market analysis and consulting firm. He is publisher of the *CapEx Report*[™], an authoritative source of capital expenditure analysis. He has over 30 years of telecommunications experience in engineering at Bell Canada, marketing at Nortel Networks, and consulting at NBI. In addition to publishing the *CapEx Report*[™], he writes extensively on network infrastructure markets.