

by Jeff Griffin ■ Senior Editor

# Changing World Of Fiber Continues To Drive Construction



## Regulatory Issues

Regulatory issues clearly have a significant impact on the telecommunications industry, ultimately affecting levels of construction.

"The biggest issue we face is obtaining local video franchises, in order to offer our FiOS TV service over fiber-to-the-home," says Mark Marchand, Verizon director of network operations media relations. "While we are already in over 100 communities in seven states, it's a very time-consuming process. We are working on the issue on three levels: local, state and federal. Some states such as New Jersey and Texas have already passed statewide video franchise laws and we're of course hoping that more states go that route."

David Grabert, Cox Communications director of media relations, says regulatory issues are a huge factor in their business.

"Regulations probably are most involved in the phone segment of the business," he continues. "As a full-service provider of lifeline communications, Cox complies with all of the same regulatory requirements imposed on the phone companies in each of the states in which we operate. As the phone companies enter the video business, we advocate that there will be a level playing field with the franchising requirements these new entrants face equal to the requirements imposed on cable."

At the beginning of 2007, it is clear that the telecommunications industry has put recent troubles behind.

Service revenues in the global telecommunications industry will reach \$1.3 trillion by the close of 2007, says a recent market analysis report from Insight Research Corporation, a company specializing in telecom research. Continued strong growth in wireless is leading the way in industry growth, the report adds.

"The telecommunications industry has fully recovered from the malaise of the past few years and is again in a growth mode as it ramps up to build the broadband networks that will provide new service types," says Insight Research President Robert Rosenberg.

Expanding on the growth theme, the Insight report says that wireless service revenues are expected to grow at a compounded rate of nearly 10 percent over the next few years, while wireline service revenues grow much more modestly at 2 percent. Nearly all of the growth in both sectors is expected to occur in broadband services, with wireless broadband service revenues expected to grow at a compounded rate of more than 60 percent over the forecast period, while wireline services grow at 10 percent over the same forecast horizon.

"With build-outs going full steam ahead, the overall revenue contribution from new IP services is expected to be modest," Rosenberg added. "Voice still rules, and will for some time to come."

Telecom analyst Jeff Kagan describes the telecom industry as very strong.

## Unpredictable

However, strong does not equate to stable – the state of telecommunications industry is more volatile than at any time in its history.

"The industry is much different than it was 10 years ago," Kagan points out. "The services are different, the competitors are different, and the bundles of services and prices are different. Telephone companies and cable television companies are gearing up for the biggest competitive battle. The cable television industry started deploying broadband years earlier, so they have a lead but phone companies are rushing to install the upgrades to their networks to deliver television and as the next few years unfold, we will have two strong competitors to choose from. Yesterday we used both companies, but tomorrow we'll be able to choose one for all the services, and say goodbye to the other."

Kagan notes that in the past, telephone companies and the cable television companies were regulated differently.

"But if they are going to be the main competitors going forward it is important to regulate them similarly," he says. "Cable television pricing has gone up year after year, since the beginning, while telephone company pricing has been going down because of all the competition. As phone companies start to compete with the big bundle of services against the cable television companies we hope to see the price of cable television services come down. That will be good news. Competition will turn the telecommunications marketplace into one that is consumer oriented."

An often overlooked element in the telecommunications construction picture is the growth of "private" fiber networks to link multiple buildings to high-speed broadband networks

for municipalities, large school districts, universities, government installations and large corporate complexes.

No longer willing to wait for conventional carriers to provide their broadband needs, a growing number of organizations are building their own.

Such projects are not considered in FTTP discussions, although the networks bring fiber directly to hundreds of structures.

## Private systems

Demand for private systems has grown rapidly over the past three years with hundreds of thousands of route miles of fiber – most of it underground – put in place for private networks.

Companies such as Fiberlink, AGL and American Fiber are busy designing, building and managing private fiber systems with construction contracted to telecommunications specialists.

Whether products belong to telcos, cable companies, or for private systems, market analysts and the business press rarely make an effort to relate industry data to the impact it will have on construction.

However, any organization involved in telecom construction today knows that expanding fiber networks is a key driving force in construction.

“Fiber deployment is the biggest area of activity,” says Rosenberg. “With Verizon, that means bringing fiber directly to customers. For AT&T, it’s bringing it somewhere close to the home.”

The slowness of the industry to extend fiber networks has put the United States far behind many other nations of the world. Verizon clearly leads the way in fiber-to-the-premises (FTTP) to bring its FiOS (fiber optic service) to residential and small business customers. Information provided to investors last fall said Verizon expected to pass six million premises by year-end 2006 (“pass” means fiber has been brought to locations which enable the passed premises to be connected to fiber). Looking ahead, projections are for Verizon to pass 18 million premises with its fiber network by the end of 2010 – more than 50 percent of the approximately 33 million households in the company’s 28-state wireline service area.

Verizon says that because fiber is a superior network platform that delivers the most bandwidth, Verizon’s FiOS is able to offer customers an innovative and differentiated product set when compared with traditional broadband and cable services.

“Our new fiber-to-the-premises network offers higher and more consistent broadband speeds than cable can offer over their existing architecture,” says Mark Marchand, Verizon director of media relations for network operations. “We offer downstream

speeds of up to 50 Mbps and upstream speeds of up to 10 Mbps. Our broadband customers also do not ‘share’ capacity or compete for speed with their neighbors, because of the different network architecture we use.”

FiOS also offers future opportunities for convergence with Verizon Wireless and future interactive services, such as intelligent media search, interactive advertising and personal broadcasting. Verizon Wireless already provides broadband services over its national EV-DO network, and broadband access and V CAST from Verizon Wireless bring music, video and broadband data to mobile customers.

## System improvements

Enhancements expected in 2007 with download speeds up to 100 Mbps, include a TV portal, home shopping and interactive broadcasting, gaming, and on-demand improvements in multimedia capabilities.

To bring FiOS to its customers, Verizon basically is overlaying its copper network with a new fiber system; and from the outset has been extremely candid about construction plans and progress.

Marchand says that fiber deployment simply mimics existing plant that is in place.

“If the existing plant is aerial,” he says, “we place aerial fiber and vice versa. Nationwide, the split is about 50-50 aerial versus buried. In some parts of the country, such as the northeast, there is more aerial than buried.”

Verizon has staffed for FiOS deployment and subcontracts much of the cable placement.

What AT&T is doing is unclear, and the company declined to provide information for this report. It is common knowledge that AT&T is deploying fiber, but details about its system and where construction is under way have not been announced.

Before SBC acquired AT&T, enthusiastic reports about SBC’s Project Lightspeed projected 40,000 miles of new cable would be deployed to bring fiber “closer” to customers homes, meaning that Lightspeed was to be fiber-to-the-node (FTTN), rather than premises. A year ago, AT&T continued to use the 40,000-mile figure, but provided no updated information about the progress or whether plans had changed to make direct fiber connections.

Late last year, AT&T announced extension of its “fiber-rich” optical network into parts of Houston in order to bring its U-verse package of services, including television, to new customers in that market. The only other market where U-verse is available is San Antonio, where it was launched in June 2006.

Apparently AT&T is sticking with the fiber-to-the node plan. Although AT&T has

de-emphasized the use of the term DSL in its heavily-promoted high-speed internet service packages, the internet connections remain DSL and not fiber connections.

Fiber expansions of BellSouth – soon to be a part of AT&T – and Qwest also appear to be primarily fiber-to-the-node, except in new developments where they perceive the economic potential of bringing fiber to the premises. BellSouth and Qwest were invited to comment for this report; BellSouth declined, Qwest did not respond.

Meanwhile, the cable companies try to hold on to their advantage in the high-speed internet market while developing bundled services to take telephone customers away from the traditional telephone service providers.

## Cable prospers

The cable industry performed very well in 2006, says David Grabert, director of media relations, Cox Communications.

“Most of the major players have reported successful quarters this year in terms of net adds in telephone and Internet customers,” Grabert continued. “Most of the major cable operators are embracing their roles as full-service providers of telecommunications services, including both phone and internet. Cox was the first to do this roughly 10 years ago when the ‘96 Telecom Act opened the door for competitors to enter the phone business, and we led the way in early entry into delivering a triple play of entertainment and telecom services.”

Grabert says cable companies are in a good position to compete with traditional telephone carriers.

“Whereas the phone companies are today working to string together a triple play of services,” he says, “we already are delivering the triple play in all of our markets. In addition to the convenience and value achieved by consolidating with one provider, we are today moving into service integration so that customers may enjoy even greater convenience. For example, viewing e-mail or caller ID on the TV, setting phone features using the high-speed Internet interface, etc.”

Cox broadband service is available to all of its customers, Grabert says.

“DSL providers,” he continues, “have issues with building out their networks and reaching more of their customers, while we offer the full triple-play of services everywhere, including a robust high-speed Internet service.”

Grabert says Cox is constantly upgrading its network with new technologies.

“At present, we are engaged in an initiative dubbed EON (extensible optical network). This enhancement will provide still more advanced services including more

high-definition channels and more video content in general, faster Internet speeds, as well as to launch a wireless component – a quadruple play. Our wireless initiative is in joint venture with Sprint PCS. Our cellular phone service will allow customers to interact with their home entertainment and telecom services via a mobile device.”

In addition to Cox, Charter Communications and Time Warner were invited to provide input for this report. Time Warner said it could not provide information citing recent stock filings that prohibit release of information pertaining to construction. Charter did not respond.

## Wireless factor

Rapid growth in the use of wireless communications systems affects demand for conventional wired telephone and internet services. Will wireless ultimately reduce the amount of telecom construction?

“We have seen some migration from local wireline to wireless,” says Verizon’s Marchand. “For some customers, the convenience and mobility of just having a cellular phone supports that decision. Of course, with our Verizon Wireless company, our customers have a nice option.”

Says Cox’s Grabert: “Clearly, wireless services have impacted traditional land lines, but so have the availability of competitive service providers such as Cox. This impact is seen most clearly on the RBOCs – they have lost land lines while cable has added them. Cox’s move into wireless recognizes that different customers will want multiple devices for telecom, and some will want only wireless.”

Researcher Rosenberg says wireless could be a wild card in the telecom build out.

“Moving to 2008, we’re talking moving to a new WiFi standard,” says Rosenberg. “Computers will have WiFi and WiMax available which provides a radio frequency schedule that will match first generation of high-speed wired capacity. That may drain more traffic off wired networks. For the construction industry, a supporting tower construction and related work may be a way to hedge its bet.”

And while proponents of broadband over power lines (BPL) are enthusiastic about growth potential, so far telephone and cable companies haven’t appeared to be concerned.

“Verizon is tracking and studying this new form of broadband delivery,” Marchand says. “But we believe fiber all the way to the

home offers a far superior medium to deliver broadband.”

Answers Cox’s Grabert: “We take all competition seriously, including broadband over power lines. At present, this technology is not significant in our markets. Providers using such technology would have a serious amount of catch-up to significantly threaten our business since we are already so well versed in delivering a triple play of services. It is challenging to enter any one area of our business – phone, Internet or video. To be competitive in the future, we believe that a provider will need to offer bundled services, and we believe this increases our advantage.”

## FOR MORE INFORMATION:

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## FCC Ruling Welcomed By Telephone Companies

Telephone companies who want to compete with cable television service providers for subscription TV got an early Christmas present last month from the Federal Trade Commission (FTC).

On Dec. 20, the commission approved new rules that will speed the process for telephone companies to obtain local television franchises. Under new rules, cities and other local jurisdictions may not impose unreasonable requirements that would delay awarding of television franchises. Telephone companies have complained that separate requirements for cable carriers and telephone companies trying to compete for video services have favored the cable companies.

Expected to benefit immediately are Verizon and AT&T who already are offering video services in some areas.

Telecom analyst Jeff Kagan noted that “with this vote, competitors won’t have to deal with different rules and requirements from every market they want to enter. It sets out a set of national rules that should speed up the Baby Bell entry into television from coast to coast.

“The Baby Bells still have to upgrade their networks so this will not be an instant solution, but at least it clears the way so the phone companies can compete with the cable television companies and that is the result the marketplace wants. This should cause cable television rates to drop because they will have competition sooner rather than later.”

It is reasonable to expect the FCC ruling will encourage telecom construction to facilitate entry into video markets by telephone companies.

# Contractors' Perspective

by Jeff Griffin ■ Senior Editor

Who knows better about what's going on in telecom construction than the contractors doing the work? Representatives of three respected contracting companies shared their views with *Underground Construction*.

**Team Fishel, Rick Keeler, director of market development:** "While we have seen an increase in general construction and maintenance construction with copper lines being replaced by fiber in the last mile, we are uncertain what the spending will be like in 2007. Telcos have to continue to replace their copper plant to compete with the cable companies; however, the issue of 'net neutrality' creates a lot of fear, uncertainty and doubt for the telcos. If Congress and the FCC are not careful in creating a clear and unified broadband policy, then the telcos will slow down their spending for fiber-to-the-home. Everyone is waiting for a national broadband policy and the longer we wait for Congress to make a decision, the further we fall behind.

"We have tried to sell the value of our turnkey services or managed network services and unfortunately that is not how our customers buy. They like to piecemeal the work apart to have greater control. Very few of our customers are willing to take a complete project and turn it over to the contractor for a turnkey solution. There are exceptions, but generally our work is separated into consulting/project management, engineering, construction, installation/splicing and maintenance.

"Ninety-five percent of our telecom construction work is underground. Of that 95 percent, half is new construction and the other half is maintenance and repair.

"Almost all our greenfield new construction work is done with backhoes in joint trench applications. In overbuild scenarios, we will directionally drill the last mile to minimize the amount of restoration we have to do. Directional drilling is great for last-mile underground fiber overbuilds.

"As a contractor, we rarely have input into whether plant is aerial or underground. It really comes down to cost and aerial is one third the price of underground. If we had our way, we would put everything underground.

"There are hundreds, if not thousands of small directional drilling contractors. It is a highly fragmented industry, and there is tremendous downward pricing pressure from our customers. The specialty drilling subcontractor is greatly needed for the deployment of fiber-to-the-premise networks; unfortunately our customers believe they

are a dime a dozen. What they don't realize is that if they buy on price, they will have more job damage and utility hits than they can possibly imagine. Directional drilling is an art and there are those that do it well and then those that don't.

"Looking ahead, we envision some sort of revised Telecom Act that will address 'net neutrality' among other things. Hopefully this will stimulate more telecom construction in 2008, but that would be unlikely. In 2010 the majority of the metropolitan fiber networks will have been built and the only thing left will be maintenance and repair work."

**Henkels & McCoy, Jim Mulhern, vice-president and director, corporate sales and marketing:** "While not back to the heady days of 2000, the general state of the industry is good. This is driven by demand for a bundle of services by consumers and the need to build the infrastructure to deliver these services whether an RBOC, ILEC or municipal system. For these reasons, construction activity looks good at the beginning of 2007. FTTX [fiber to wherever] seems to have reached a critical mass across all operations.

"The majority of capital expenditures are going to new builds of which FTTX is a component. We need to keep in mind that some of these new facilities will replace some of the older plant. We also need to keep in mind that it will still take time to get fiber to even a majority of customers so the maintenance of existing facilities and the use of copper will remain an important part of the network.

"Our telecommunications work is a mix of traditional work designed by the owner and turnkey projects. The mix of aerial and underground varies by locale and application but is generally 60-plus percent underground and the remainder aerial. Factors that determine whether plant goes underground or aerial include cost, the presence of existing facilities, reliability, local codes, environmental factors, the desire to not disrupt property, etc. In the case of some long-term or alliance relationships, we often work with the owner to devise the optimum route and methods to meet their goals. Underground segments may include traditional conduit and manhole, innerduct or direct buried. Trenching, plowing and trenchless technology are all options. Depending on the operator, the method may be specified or the option rests with the contractor. Given the amount of residential build in existing neighborhoods to satisfy FTTX requirements, the role of di-

rectional drilling contractors has increased in importance.

"Utility construction today benefits from better, more accurate locating equipment, improved controls on directional drilling, increasing emphasis on safety, wireless solutions to bridge the 'digital divide,' and the entrance of new technologies by alternate providers such as BPL.

"The marketplace is dynamic and exciting. Increased shrinkage in wireline telephone service, the further acceptance of VOIP and 'free' WiFi/WiMax will force service providers to be nimble to meet customer demands and expectations."

**Quanta Services, Ken Trawick, president, telecommunications and cable operations:** "Looking to 2007, I believe we will witness increased momentum surrounding outside plant construction, primarily related to the FTTH initiatives by multiple industry segments – from industry leaders such as AT&T and Verizon to co-ops and municipalities. Telecom service providers will increase spending relative to the build-out of their systems to remain competitive and meet the ever-growing demand for high bandwidth to support new technologies by consumers and businesses. Additionally, cable MSOs have also begun system enhancements to remain competitive with FTTH deployments by the telcos.

"Contribution to the improving health and momentum of the telecommunications industry are:

- "Focus on pushing fiber deeper into the network and closer to the end users;
- "Convergence of services: voice, video and data; and
- "Increased competition among service providers and between cable and telecom companies for bundled services.

"Quanta's services to the telecom industry vary based on the customer's scope and required support. Our turnkey services include engineering, planning, splicing, boring, construction, maintenance, etc. and from wireless to outside plant to central office initiatives. We also deliver these services on an individual basis to our customers throughout the nation. Currently, most of our contracts are to provide installation services.

"New construction makes up approximately 80 percent of our work in progress. Construction services to support FTTP deployments account for approximately 30 percent of our work. Just over 15 percent of our work is related to the replacement of old and deteriorating plants.

"Approximately 80 percent of our work is

underground. The remaining 20 percent is aerial. When our customers are determining whether a plant goes overhead or underground, the most influential factor is cost. Clearly, susceptibility to storms and risk of damage to the system plays a role as well.

“We often work as a strategic partner with customers to determine the most cost- and time-effective construction method for each project. There are other times that we are not involved in that process and the customer contacts us after they have determined whether the plant goes overhead or underground. Whatever construction methods are used are outlined in detailed project specifications and implemented by our crews. Because of our extensive service and scope, we utilize all types of underground construction methods from directional drilling to plowing and trenching.

“Horizontal directional drilling is an instrumental service provided by our specialty crews. Especially now that fiber in-

stallation is taking place in neighborhoods, in business centers and across apartment complexes, it is critical to take the environmental elements into consideration. Utilizing HDD enables the job to get done quickly and effectively with minimal disruption to the surrounding area.

“Looking ahead, we expect to experience continued growth in our telecom and other broadband markets. This growth is driven primarily by the FTTX initiatives of the various carriers, municipalities, ILECs and the enhancement of hybrid fiber-coax networks by the MSOs. As we look to the coming years, Quanta remains committed to supporting these initiatives to enable broad use and accessibility of new technologies.” ■