

# Behind the Numbers: Fiber-Connected Communities and Communities with Fiber

What's driving deployments of fiber to the premises?  
That depends on who's doing the deploying.

By Masha Zager ■ *Telecom Editor*

**FTTP** has reached takeoff speed and is growing exponentially, both in the US and worldwide. You can track the numbers, along with other relevant industry statistics, in our monthly “First Mile” section and our in-depth research reports (stay tuned for Michael Render’s newest research next month). But the numbers don’t tell you everything.

As of this fall – to return to RVA data for a moment – there are about 370 fiber-to-the-home providers in the US, and presumably some smaller number of providers serving businesses only. Outside the United States there are many others. Some have deployed fiber in multiple communities, others in only one or two. Each provider has gone through a complex business analysis for each deployment, and no two analyses are the same.

But their conclusions follow certain patterns, and some of these are revealing. One pattern that struck us while reviewing this month’s deployment news was the contrast between what might be called “fiber-connected communities” and “communities with fiber.”

“Fiber-connected community” deployers roll out fiber to entire communities, or to as much of the community as they possibly can. “Communities with fiber” de-

ployers make decisions at a more granular level – the neighborhood, the apartment building, the distribution area.

Granted, the distinction between the two isn’t always clear-cut: Deployments in fiber-connected communities may be rolled out over a period of years; also, one person’s community is another person’s neighborhood or MDU. (Two years ago, when we asked Rural Utilities Service officials how they identified a community, the answer was essentially ‘If anyone else identifies it as a community, we do, too.’)

## Different Mindsets for Different Builders

Still, there is a difference in mindset between the two categories of network builders. It isn’t a case of the right approach versus the wrong approach, or of private versus public. It’s a question of the builder’s goals in deploying fiber.

“Communities with fiber” deployers – including many telcos and MDU owners – balance the costs of fiber to the premises against projected new service revenues, reduced customer acquisition costs, and reduced maintenance costs. If they are planning to deploy IPTV, they may also be thinking about new revenues from targeted advertising. They are likely to end up deploying FTTH in some places and

fiber-to-the-node or hybrid fiber cable in others, depending on buildout costs and customer demographics.

The “fiber-connected community” providers evaluate all of these benefits, but they consider others as well, and they tend to have a longer time horizon. Municipalities, consortiums of municipalities, and some telcos, especially cooperatives, look at the economic development impact of fast and future-proof networks. (This month we report on a public provider that is building out FTTP to an entire principality, citing economic development needs.) In addition, some members of this group are interested in overcoming the “digital divide” and using broadband to further social and economic inclusion.

Developers and integrators of master-planned communities value FTTH for yet another set of reasons, including selling houses faster, raising lot value, and fostering social interaction and cohesiveness.

These community-level benefits are often speculative and hard to quantify – and lenders may fail to be impressed by them – but, if you read some of the quotations below, it is these benefits that are inspiring the buildout of fiber to entire communities, large and small.

## Saint Paul Soon to Be America's Most Connected City



**Saint Paul, Minnesota**, plans to become "America's Most Connected City" by building a fiber network that could lay the groundwork for the largest municipal fiber-to-the-premises system in the United States. Saint Paul, a city of about 300,000, is the state capital as well as the county seat of Ramsey County. The plan proposed by the city's Broadband Advisory Committee and adopted by the City Council in September calls for creating a cooperatively managed Community Fiber Network (CFN) through a collaborative effort by public entities.

The CFN will begin by connecting city, county and state government facilities as well as local schools and possibly other public institutions. After building this core fiber network, the CFN will determine whether and how to expand its range – possibly by bringing fiber to every home and business in Saint Paul. CFN will be an open-access network and cannot offer services directly. Incumbent carriers, local businesses and others will be invited to offer a variety of services over the network.

While many cities opt for municipal broadband because they have been overlooked by private carriers, Saint Paul is unusual in that it is already well supplied with broadband by US standards. Comcast offers cable service to nearly every household in the city, Qwest offers DSL to two-thirds of households, and Sprint plans to offer WiMAX coverage next year, supposedly with bandwidths equivalent to cable modem.

But the Broadband Advisory Committee report argues that the city should apply international rather than national standards in evaluating broadband service, and that a municipal fiber network

can improve delivery of government services, promote economic development, and benefit citizens' lives. The committee's complete report is available at [www.stpaul.gov/docs/BACFinalReport.pdf](http://www.stpaul.gov/docs/BACFinalReport.pdf), and an excerpt from it is presented in this month's "Why We Need More Fiber" section.

## "Let There Be Light" in North Kansas City

Mayor Gene Bruns of **North Kansas City, Missouri**, proclaimed "Let There Be Light" in a ceremony held last month to inaugurate the city's fiber optic network, liNKCity. The network is the first municipally owned and operated FTTP network in Missouri.

**"The fiber-optic network was an overwhelming factor in our decision to relocate and expand our business in North Kansas City."**

– Derek Rolfe, co-owner of Virtual Building Logistics, which develops 3-D virtual models of construction projects

The network, based on active Ethernet equipment from World Wide Packets, has been operating for more than a year, with the first customers going online in August 2006. But construction delays held up the rollout and full-scale marketing efforts did not begin until recently. New customers are now joining the original 300 residential and business users.

The network is already stimulating transformation in the commercial district, liNKCity says. For example, the building where the lighting ceremony was held was converted into small spaces that would be attractive to technology companies, and many of the tenants chose the location because of the fiber. One tenant – Virtual Building Logistics, which develops 3D virtual models of construction

projects – called the fiber optic network "an overwhelming factor" in its decision to relocate and expand in North Kansas City. The company plans to bring \$5 million in investment and 195 new jobs to the North Kansas City area.

## Tullahoma Chooses Vendors



The **Tullahoma (Tennessee) Utilities Board** approved a \$3.6 million bid from Atlantic Engineering Group for design and construction of its FTTP network, which will begin delivering services in late 2008. It also selected Wave7 Optics' Trident7 electronics to power the network.

TUB will begin construction – a \$16.9 million project that will cover the entire city – later this year and expects to complete the project in 2010. Owned and operated by TUB, the network will offer a triple play of voice, very high-speed data (20+ Mbps) and a 200-channel IPTV offering with VoD options.

"We embarked upon this project because we saw the community falling behind in broadband infrastructure, especially when it comes to high-speed data services," says Brian Skelton, General Manager, TUB. "We're also doing it in the spirit of increased choice and competition for our residents and business owners. Having this type of infrastructure in place also will help us compete with other regions for new businesses and, as such, will serve as a spur for economic development."

## Monticello Referendum Okays Fiber

Residents of **Monticello, Minnesota**, voted 3 to 1 for fiber in a referendum last month. The city had been researching the feasibility of constructing a city-wide fiber optic network for more than two years, with the intention of providing voice, data and video services, but it was not permitted to provide telephone

service without approval by at least 65 percent of voters. September's referendum was approved by 74 percent.

The proposed network will be financed with revenue bonds and will not be backed by city taxes. The city's financial advisor is confident that the revenue bonds can be sold successfully. In addition to securing funding, the city is moving forward to select an engineering firm and complete the design of the network. Construction is expected to take 18 months, and the first homes and businesses could be connected to the new network by summer 2009.

## Other US Deployment News

- Last month we reported that the **Electric Power Board** in Chattanooga, Tennessee, had approved a fiber-to-the-home project. The decision has been challenged by the Tennessee Cable Telecommunications Association, a trade group, which called the proposed network imprudent and illegal. However, the Chattanooga City Council has voted unanimously to approve the project.
- **Verizon** continued building out its FiOS network, introducing triple play bundles in Washington State and Florida, obtaining television franchises in New York, Pennsylvania, Oregon and Massachusetts, and launching video services in Massachusetts, New York and New Jersey.
- Network builder **Connexion Technologies** announced a spate of new fiber optic network projects in greenfield developments, in partnership with several different developers. (See chart at right). Connexion Technologies funds the deployment of fiber optic networks, serving as a "one-stop" shop by not only designing and installing the networks but also operating and maintaining them. These recent partnerships translate into more than 6,000 additional units for Connexion Technologies to connect.

## Vendor Spotlight

### FTTH Electronics:

Alloptic	<a href="http://www.alloptic.com">www.alloptic.com</a>
Calix	<a href="http://www.calix.com">www.calix.com</a>
Centillum Communications	<a href="http://www.centillum.com">www.centillum.com</a>
Cisco Networks	<a href="http://www.cisco.com">www.cisco.com</a>
FiberHome Telecom	<a href="http://www.fiberhomegroup.com">www.fiberhomegroup.com</a>
Genexis	<a href="http://www.genexis.eu">www.genexis.eu</a>
Occam Networks	<a href="http://www.occamnetworks.com">www.occamnetworks.com</a>
PacketFront	<a href="http://www.packetfront.com">www.packetfront.com</a>
UTStarcom	<a href="http://www.utstar.com">www.utstar.com</a>
Wave7 Optics	<a href="http://www.wave7optics.com">www.wave7optics.com</a>
World Wide Packets	<a href="http://www.wwp.com">www.wwp.com</a>

### Network Design/Integration:

Atlantic Engineering Group	<a href="http://www.atlantic-engineering.com">www.atlantic-engineering.com</a>
SPIE Communications	<a href="http://www.spiecom.com">www.spiecom.com</a>
Telindus SAU	<a href="http://www.telindus.com">www.telindus.com</a>

### Fiber Cabling:

ACOME	<a href="http://www.acome.fr/index_en.html">www.acome.fr/index_en.html</a>
Corning	<a href="http://www.corning.com">www.corning.com</a>
Nexans	<a href="http://www.nexans.com">www.nexans.com</a>

### Services:

Axione	<a href="http://www.axione.fr">www.axione.fr</a>
VUDU	<a href="http://www.vudu.com">www.vudu.com</a>

## New Connexion Technologies FTTH Projects

Project Type	Name	Location	Developer
Mixed-Use	Verdae Development	Greenville, SC	Verdae Development
	Leatherman Master-Planned Community	Walls, MI	Leatherman Family
	Landmark at Doral	Doral, FL	EB Developers
Condo	The 500 Brickell	Miami, FL	The Related Group
	The Meridian	Las Vegas, NV	American Invsco
Single-Family	Fountainbrook	Walls, MI	J Sweeney Homes and Sweeney-Bronze Holdings
	Saguaro Desert	Yuma, AZ	Hall's Construction
Town Homes	Sierra Montana	Yuma, AZ	Kammann Developments
High-Rise	Park Lafayette	Milwaukee, WI	Renaissant Development Group

# Independent Telcos Bringing Customers up to Speed

**EMBARQ**, one of the largest independent operating companies, has been stepping up its fiber-to-the-home activities in new greenfield communities in its service area. One of these communities is Portofino, a 300-acre luxury development in Johnston County, North Carolina, where EMBARQ will build a communitywide FTTH network providing voice and data services. “Our goal is to make Portofino the most advanced, state-of-the-art community in Johnston County,” says Norwood Thompson of the Waltham Group, Portofino’s developer. “Whatever communication advancements are discovered in the future, our residents will be able to immediately take advantage of the technology without disruption to their property.”

**Greenfield Communications**, a CLEC specializing in fiber-to-the-home projects in new developments, has signed a distribution agreement with VUDU to deliver video on demand (VoD) services to the company’s southern California and Arizona customers starting in Q4 2007. Greenfield will market VUDU to its existing customers, install the equipment and provide hands-on tutorials. “The company’s extensive relationships with major studios and independent distributors made the decision easy for us. VUDU is what we’ve all been waiting for,” says Mike Powers, Greenfield’s president. Greenfield uses FTTH GPON access equipment from Calix that can deliver more than 150 Mbps of usable bandwidth to a customer.

**La Compagnie de Telephone Warwick**, a Quebec ILEC, and its CLEC subsidiary **IVIC Telecom** have chosen the Calix C7 multiservice access platform (MSAP) and the Calix Management System (CMS) to deliver an array of new voice, video and data services that will “enable Telephone Warwick to position itself against its cable competition and IVIC Telecom to compete against services offered by Bell Canada.” A portion of the companies’ service area will be built out with a GPON FTTH network.

**Lexcom**, an ILEC in Lexington, North Carolina, that also operates a cable TV system, has selected Alloptic’s MicroNode technology to provide voice, two-way video, and high-speed data services over a fiber-to-the-home infrastructure. Lexcom selected the MicroNode because it allows the company to take fiber to customers while preserving its existing headend investment in forward and return path

technology. Richard Reese, Lexcom’s president, explains, “We can compete effectively, while using our existing cable modems and set-top boxes, and easily migrate to a full GePON solution as the customer requirements dictate.”

**North Central Telephone Cooperative (NCTC)**, a fast-growing telecom services provider headquartered in Macon County, Tennessee, has purchased components of Occam’s Broadband Loop Carrier system to provide its customers with triple play services including IPTV. When its upgrade is complete, the telco will manage a hybrid network with video over copper lines out to 5,000 feet and active FTTH to subscriber areas beyond that. The deployment allows for multiple streams of high-definition video as well as significant amounts of data bandwidth for subscribers.

**Orlando Business Telephone Services (OBTS)** and its sister company **Orlando Telephone Company (OTC)** are installing new FTTP networks to serve businesses and residences, using equipment from Wave7 Optics. OBTS and OTC are active throughout Florida, with more than 14,000 access lines in the Orlando area. They offer triple play services to residential customers in apartment complexes and new single-family home developments, as well as to large and small business customers, with an emphasis on the hospitality industry. For this project they have deployed a Trident GePON network to about 1,600 homes and apartments.

Lewiston, Maine-based **Oxford Networks** will invest more than \$4 million to build a 3½-mile FTTP network in downtown Bangor and Brewer that will offer business customers voice and data service. Oxford had built several earlier FTTP networks in Maine over the last six years and had been scouting out additional candidates for fiber projects. It chose the current location based on “the growth, community vitality and strategic importance of the Bangor-Brewer business community,” according to Craig Gunderson, Oxford’s president and CEO.

Construction is expected to begin in December, with FTTP service at speeds up to 1 Gbps becoming available next May. Service to residential areas is not currently planned, but the company says it hasn’t been ruled out, either.

# Europe:

## Corning's Mystery Deployer and Others

**F**iber manufacturer Corning announced during a recent investment conference that it was shipping products to a new **European fiber-to-the-premises customer** that represents a "significant growth opportunity for the company." Although Corning couldn't yet name the customer, it stated that while the number of homes in its territory is "less than, say, Verizon," the revenue opportunity per home passed and per home connected is very similar.

A new municipal fiber network called **SEQUANTIC** is slated to begin service this month in 86 municipalities around Paris. This network was created by **SIP-PEREC**, a public consortium with 1.7 million residential, commercial and industrial customers. **SEQUANTIC** will connect 147 business districts, at least one in each of the 86 municipalities, and will operate as an open-access network.

**ID-RESO**, the company created to manage **SEQUANTIC**, will deploy **Wave7 Optics' Trident7 OLT** solution configured for **GePON**. A typical **SEQUANTIC** business service package will provide symmetric and guaranteed data services of up to 1 Gbps. **SPIE Communications** will provide delivery, implementation, support and maintenance services.

Jacques Poulet, president of **SIP-PEREC** and Mayor of **Villetaneuse**, calls the **GePON** solution compatible with the economic plans of small-to-medium

enterprises in suburban areas and says it will enable local service providers to offer new services and innovative applications. Each service provider will retain control of user authentication, authorization and accounting, quality of service and bandwidth management, and will provide its own end-user equipment.

Dutch provider **KPN** has taken a different approach from **SIPPEREC** to the problem of providing multiple services from multiple providers. For its fiber-to-the-home rollout to greenfield and other locations it has selected a single piece of customer premises equipment, the **Genexis** fiber-to-the-home gateway. **KPN** says the gateway, which delivers 100 Mbps to users, can combine services from multiple providers over a single connection.

In **Gonfreville-l'Orcher**, near the French city of **Le Havre**, cooperative provider **CODAH** is building a **FTTH** system with the participation of vendors **ACOME** and **Axione**. One of the services provided by the **Gonfreville-l'Orcher** system will be emergency evacuation notifications to residents in case of industrial accidents, in accordance with the EU's "Seveso" directive.

**AB Stokab**, the municipal provider that owns Stockholm's 'Citynet' broadband infrastructure, has ordered fiber optic equipment worth approximately €1 million for the city's **FTTH** program



from cable manufacturer **Nexans**. **Stokab** will be using **Nexans' N3S High Density** fiber system, a space-saving solution that allows fiber to be brought to every apartment in a dense city environment.

**Telenor**, Norway's leading service provider, has selected **Alcatel-Lucent** as a preferred supplier for both **FTTH** and **FTTN** installations. **Telenor** will be using **GPON** fiber-to-the-home solutions in greenfield deployments and some other locations, and **VDSL2** fiber-to-the-node solutions elsewhere. It will offer high-definition television (**HDTV**), **IPTV**, video on demand (**VoD**) and high-speed Internet access. Initial deployments are expected by the end of 2007 in Norway, and will be extended later to other **Telenor** affiliates.

**Wien Energie Wienstrom**, a utility owned by the city of **Vienna, Austria**, will be using **PacketFront's** solution for an open-access **FTTH** network. **Wien Energie Wienstrom** says it opted for **PacketFront** because of the company's provisioning system, which allows end users to provision their own services. **Wien Energie** will connect 50,000 **Viennese**

## Deployer Spotlight



### North American Telcos:

EMBARQ  
Greenfield Communications  
Lexcom  
North Central Telephone Cooperative  
Orlando Business Telephone Services  
Oxford Networks  
Telephone Warwick  
Verizon Communications

[www.embarq.com](http://www.embarq.com)  
[www.egreenfield.com](http://www.egreenfield.com)  
[www.lexcominc.net](http://www.lexcominc.net)  
[www.nctc.com](http://www.nctc.com)  
[www.orlandotelco.com](http://www.orlandotelco.com)  
[www.oxfordnetworks.com](http://www.oxfordnetworks.com)  
[satat.qc.ca/English/Membres/Warwick/index.asp](http://satat.qc.ca/English/Membres/Warwick/index.asp)  
[www.verizon.com](http://www.verizon.com)

### North American Municipalities:

City of Monticello  
City of North Kansas City  
City of Saint Paul  
Electric Power Board (Chattanooga)  
Tullahoma Utilities Board

[www.ci.monticello.mn.us](http://www.ci.monticello.mn.us)  
[www.nkc.org](http://www.nkc.org)  
[www.stpaul.gov](http://www.stpaul.gov)  
[www.epb.net](http://www.epb.net)  
[www.tub.net](http://www.tub.net)

### North American Network Builder:

Connexion Technologies

[www.cnxntech.com](http://www.cnxntech.com)

### European and Asia/Pacific Providers:

Bell & Tell  
BT  
CODAH  
Hong Kong Broadband Network  
KDDI  
KPN  
Servei de Telecomunicacions d'Andorra  
SIPPEREC  
Stokab  
Telenor  
Telstra  
Wien Energie Wienstrom

[www.worldcall.com.pk](http://www.worldcall.com.pk)  
[www.bt.com](http://www.bt.com)  
[www.agglo-lehavre.fr](http://www.agglo-lehavre.fr)  
[www.hkbn.net/index\\_e.htm](http://www.hkbn.net/index_e.htm)  
[www.kddi.com/english](http://www.kddi.com/english)  
[www.kpn.com/kpn/show/id=838669](http://www.kpn.com/kpn/show/id=838669)  
[www.sta.ad](http://www.sta.ad)  
[www.SIPPEREC.fr](http://www.SIPPEREC.fr)  
[www.stokab.se/templates/StandardPage.aspx?id=306](http://www.stokab.se/templates/StandardPage.aspx?id=306)  
[www.telenor.com](http://www.telenor.com)  
[www.telstra.com](http://www.telstra.com)  
[www.wienstrom.at](http://www.wienstrom.at)

households during the next two years to its network, which it calls "blizznet."

**Servei de Telecomunicacions d'Andorra (STA)**, a public telecom provider in Andorra, has selected Wave7 Optics, Telindus SAU and Cisco Spain to construct a new FTTP network using Wave7's Trident7 Universal Access Platform in the access network and Cisco 7600 Series Routers in the aggregation network. Telindus is responsible for turnkey system integration for the entire project, including the IP Video

and Voice solutions, in addition to the Wave7 Optics and Cisco equipment.

STA expects to begin serving the capital city of Andorra La Vella in Q1 2008 and achieve principality-wide coverage by Q2 2009. The project is a complete overbuild of the existing copper network, which will be retired as service activation on the new network occurs. STA's mission statement includes, beyond providing the country's telecommunications services, "acting as a catalyst and assisting in the development of the country's economy and society, and becoming a

reference point and technological partner for Andorran businesses."

The tide may be turning in the UK, where incumbent telco **BT** has long resisted calls for fiber to the home. Government minister Stephen Timms recently issued a stern warning that the country was falling behind the rest of the world in terms of broadband speed, and the Financial Times reports that BT's retail chief will be discussing network upgrades with regulators when they meet this fall.

# Asia-Pacific:

## FiberHome Telecom and Centillium Have Their Own Mystery Deployers

In mainland China, EPON vendor FiberHome Telecom signed an FTTH contract with an **operator in Hubei**, following up on recent successes with Sichuan Telecom and Wuhan Telecom. The Hubei project will be a collaborative effort by the local government, network operator and equipment supplier, a new business model for FTTH in China.

Centillium Communications has received a multimillion-dollar order for one of its Mustang system-on-chip (SoC) processors for expected delivery within the next six months. This chipset will be the core processor for GePON customer premises devices for **one of Japan's leading telecommunications service providers**, powering broadband access for hundreds of thousands of subscribers.

Another – or possibly the same – Japanese telco, the competitive service provider **KDDI**, discussed FTTH in its annual report, calling its acquisition of Tokyo Electric Power Company's FTTH business one of its “two major developments during the fiscal year” and “one of our first strategic steps to expand our subscriber base with an eye to the spread of broadband.”

KDDI says its strategy is to acquire a critical mass of FTTH subscribers in order to make its fixed-line business competitive again: “To begin with, we are targeting a 30 percent share of the FTTH market in the Tokyo metropolitan service area. The successful business model developed there will then be ap-

plied to other regions. Progressive development of the FTTH business will depend on services that appeal to customers and thorough cost reduction. We aim to rise to the challenge and move into the black not only in our FTTH business, but also in our overall fixed-line business by March 2011.”

Residents of The New Rouse Hill development in northwest Sydney, Australia, will receive triple play services over fiber to the home as the result of an agreement between incumbent **Telstra** and developers Lend Lease and The GPT Group. The New Rouse Hill is a mixed residential and commercial development; the first stage of the residential development will be completed at the end of 2007. Services, including broadband Internet access at speeds up to 20 Mbps, will be connected when residents move into their homes.

Pakistani competitive provider **Bell & Tell** will be providing voice and data services in Pakistan using UTStarcom's GePON and VoIP technologies. Previously, Bell & Tell had sold long-distance and cable TV services, but it will now be able to sell a triple play bundle at what UTStarcom calls “very attractive pricing.” Focusing on areas that are underserved or unserved by the incumbent provider, Bell & Tell will roll out fiber to a region west of Islamabad by the end of this year and to other regions of Pakistan early in 2008; the company anticipates signing up about 100,000 subscribers. The deployment will include a mixture

of fiber to the building and fiber to the home or unit, depending on the condition of existing in-building wiring.

Bell & Tell attributes its aggressive deployment of new network technologies to the changing telecom climate in Pakistan. The Pakistani telecom market is facing deregulation, and the area is experiencing consistent annual growth in telecommunications usage.

**“A revolution in Hong Kong's broadband market”: Hong Kong Broadband Network offers 100 Mbps residential broadband access at \$48.50 per month, 200 Mbps for \$88.20 and 1 Gbps service for \$215.40.**

**Hong Kong Broadband Network** announced what it calls “a revolution in Hong Kong's broadband market,” offering 100 Mbps residential broadband access at \$48.50 per month, 200 Mbps for \$88.20 and 1 Gbps service for \$215.40. The company is phasing out its entry-level symmetrical 10 Mbps service; its lowest-level offering will now be 25 Mbps symmetrical. In Hong Kong, possibly the most fiber-connected economic region in the world, providers have traditionally relied on fiber to the building and Ethernet over copper within the building; however, HKBN has now made the move to true FTTH.