

Municipal Utilities Deliver Fiber to the Premises

A tradition of public service and concern for economic development drive many local authorities to deliver fiber-based services to homes and businesses.

By Masha Zager ■ *Broadband Properties*

This issue introduces a new Broadband Properties feature: a census of municipal and public utility fiber-to-the-premises systems. We plan to maintain the census online at www.bbpmag.com, and to summarize our findings in the magazine on a regular basis.

Municipal fiber deployments generate both tremendous enthusiasm and opposition from the residents they serve. (This month's fiber deployment roundup recounts some of the political and legal hurdles that proposed municipal systems have encountered in recent weeks.) Their successes and failures – unlike those of private companies – are often cited as evidence of whether the municipal model is valid.

In fact, what we have found is that there is no “municipal model.” Municipalities and other public entities build FTTP systems for many reasons and in many situations. They face a variety of legal and competitive landscapes, employ different financing methods, operate their systems in diverse ways, deliver different sets of services to different types of customers, and bring a diversity of resources and competencies to the task. While there are certain recurrent themes, there is no single distinguishing feature. Local differences appear to far outweigh the simple fact of public ownership.

WHO'S ON THE LIST?

Our list shows 66 fiber-to-the-premises deployments by public and (so far) public-utility providers. While we may have missed a few, we believe this represents the great majority of existing deployments in the United States that meet our criteria.

The criteria – admittedly somewhat arbitrary – are as follows. All of the providers on the list:

- Are either public entities or traditional utility companies that provide power, water or other non-telecom services.
- Run optical fiber directly to homes and/or businesses (or are planning such a network).
- Make available – directly or through retailers – telecom services such as voice, Internet access or video (or are planning such services).

Using these criteria, we omitted municipalities that own and operate institutional fiber networks for city facilities and schools, others that lease dark fiber to businesses, and still others that provide broadband or other telecom services over city-owned hybrid fiber-cable networks. We also excluded private not-for-profit fiber deployers, even those that might be considered “community broadband networks.”

Not all of the providers listed have deployed their systems yet, but all have moved beyond the exploratory stage. Dozens of municipalities are conducting feasibility studies for fiber, or preparing to do so, but we have included only those with approved plans and projects that are actively under way.

MUNICIPALS VS. UTILITIES

Even though we set the criteria for the list as “public entities or utilities,” all of the providers on the list are publicly owned. Most of them are also utility companies.

Municipalities and other public entities are more likely to become broadband providers when they are in the business of providing electric power. There are several reasons for this:

- Their citizens are already used to the idea of government providing utility services. Many public power utilities were set up in response to the failure of the private sector to deliver adequate services, and people accept that government might set up public communications utilities for the same reason. This acceptance isn't just theoretical – in most cases, citizens have had positive experience with their municipal utilities as providers, and are prepared to buy additional services from them.
- Public power utilities already have the back-office systems, such as billing and customer service, that they will need for providing telecom services.
- Public power utilities may need to install HFC or fiber-to-the-premises networks in order to use advanced network management and demand-response management solutions (see the article by Carina Technologies in

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FTTP deployments by public agencies are clustered in parts of the country where the legal environment is favorable.

this issue); once they begin planning these networks, they often realize the networks are suitable for business or residential broadband.

In some cases, like Wilson, North Carolina, the city operates a municipal electric utility but appears to have set up the telecommunications utility as a separate entity or department. A few cities, like Salisbury, North Carolina, do not have municipal electric utilities at all.

Even though this class of providers is referred to as “municipalities,” it is important to note that it includes more than just cities and towns. UTOPIA is a consortium of cities in Utah; other consortia such as the Iron Range Community Fiber Network in Minnesota and ECFiber in Vermont are in the formative stages and are not included on this list. LENOWISCO is a planning district that includes three counties and a city in Virginia. And in Washington state, countywide public utility districts have the legal authority to set up telecommunications systems, and a number of them have done so, or are in the process of doing so.

And even when a network is owned by a town or city, it may provide service beyond city limits. For example, Jackson Energy Authority in Tennessee and NetQuincy in Florida both serve areas adjacent to the cities that own them.

We did not identify any privately owned utilities in the US providing fiber to the premises, or any other broadband services. (There are examples in Europe, such as the Danish cooperative EnergiMidt.) Why are private utilities with fiber-to-the-home systems rare or nonexistent, when municipal utilities are so active in this field?

We can only speculate about the answer. One possibility is that private electric utilities are either for-profit companies operating in densely populated areas well served by for-profit telecom providers, or electric cooperatives operating in rural areas well served by local telephone cooperatives. Municipal electric utilities, on the other hand, are more likely to operate in marginal areas with neither an enticing market nor a “hometown” telecom provider.

Christopher Mitchell of the Institute for Local Self-Reliance suggests several other possibilities: private electric utilities do not always operate their own distribution networks; they have even less competition than telecom providers, and so are not used to thinking entre-

preneurially; and they are not as ideologically committed to serving their communities as municipal utilities are. Certainly many municipal utilities are willing to accept longer payback periods than most private investors would because they view broadband, and fiber to the premises in particular, as key to economic development for their cities.

WHO ARE THE CUSTOMERS?

An easy way to grow an FTTP network “organically” is to start as an institutional network serving municipal office buildings or utility substations, then to extend fiber to commercial buildings or business parks, and eventually to reach households and smaller businesses as well. Our list shows providers at various points along this path.

We found 10 providers that deliver fiber-based services to businesses only, with no plans (that we could discover) to extend fiber to the home. We also found three (Chattanooga, Dover and Ashland) whose fiber networks serve only or primarily businesses today but that have announced plans to bring fiber to at least some residences. One (Cedar Falls Utilities) is already building fiber to homes in new developments, in addition to serving businesses. The rest were mostly conceived as fiber-to-the-home projects.

Another organic growth path is to begin as a municipal cable TV provider and then overbuild the system with fiber to the home. This is the path followed by several providers, including Glasgow Electric Plant Board in Kentucky (see this month’s “Why We Need Fiber”), which is now conducting a pilot FTTH project. Successful implementation of pilot projects often – though not always – leads to their expansion throughout the municipality.

In terms of numbers of customers, these providers range from small municipalities to quite large ones, and the range of their fiber deployments is also large. Pend Oreille Public Utility District carried out a pilot project to 10

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households (“all 10 consumers have the broadband bug and attest they would be hard pressed to ever revert back to dial-up,” the PUD’s Web site reports).

Chattanooga’s system could conceivably make fiber available to 168,000 customers. In general, however, the providers belong to small- to mid-sized cities outside of major metropolitan areas – large enough to carry out a complex undertaking, but small enough to be poorly served by private carriers.

DISTRIBUTION MODELS – OPEN VS. CLOSED, WHOLESALE VS. RETAIL

Municipal FTTH providers are more likely than private providers to be wholesalers rather than retailers of communications services. Wholesaling isn’t unknown among private network builders – Connexion Technologies and Zoomy Communications are two notable examples – but it is unusual.

We found 14 municipalities that allow, or plan to allow, multiple retail service providers to deliver services over their networks. Several others, which could not be classified as “open” networks, have contracted with a single retailer to provide one or more services, usually because the municipality is not an authorized local exchange carrier.

Some municipal providers are both wholesalers and retailers of services, and some have even more complex arrangements. For example, the Jackson Energy Authority started out by retailing video services while two other companies provided voice and data services on its network. Now one of those two companies provides telephony and Internet back-office functions, while JEA retails all three services – and also allows competitive providers to retail phone and Internet services.

Open access networks are not always the result of municipal preferences. In some states, such as Utah and Washington, legal constraints encourage or require open networks. It is worth noting that the city of Provo, Utah, recently announced that it was selling its municipal fiber network to a private provider, and the open-access requirement seems to have contributed to that decision. UTOPIA, another open access provider, has also experienced difficulties.

In a recent interview with Broadband Properties, Steve Christensen, CEO of Broadweave, the company acquiring Provo’s network, said, “There are inefficiencies that beleaguer this [open access] model and make it difficult for municipalities to generate profitabilities.” On an accounting level, Christensen said, the fact that retailers have to account for transport and switching as “cost of goods sold” rather than as a capital investment makes it difficult to show positive EBITDA. More fundamentally, “When the customer calls in for support you have amazing lack of coordination... there’s a huge problem with finger pointing.”

Provisioning customers for services can also be more cumbersome in a multiprovider system. And finally, because retailers are not required to invest in network equipment, the model tends to attract providers that lack the technical sophistication to troubleshoot problems effectively.

Nevertheless, the open access model has worked well in Sweden and in Japan. This suggests the problems are not insurmountable.

OTHER PARTNERSHIPS

In addition to partnering with retail service providers, municipalities have relationships with other entities. A few have agreements with developers, either to build fiber in new developments or to provide the fiber backbone and services if the developers build out the local access networks.

In addition, some of the Washington State vendors have agreements with Northwest Open Access Network (NoaNet), a coalition of public utility districts that have linked their fiber optic networks to achieve economic feasibility in underserved areas. NoaNet offers long-haul transport and last-mile access to wholesale communication providers in a large part of the Pacific Northwest.

VENDORS AND TECHNOLOGIES

In part because of open access requirements, Active Ethernet networks are more prevalent among municipalities than among private network builders. (It is easier to support open access on point-to-point than on PON systems, in large part because colocation is easier.)

At least a quarter of the municipal deployers use Active Ethernet technology, compared to about 10 percent of independent telcos and none of the RBOCs.

Several electronics vendors have sizable shares of this market, with no single vendor taking a leading position. Alcatel-Lucent, Calix, Wave7 Optics (now owned by Enablence), and World Wide Packets (now owned by Ciena) each have several deployments and at least one sizable system, and a number of other vendors also have had significant customer wins.

GEOGRAPHICAL DISTRIBUTION

Laws governing municipalities’ ability to compete as telecommunications providers vary from state to state. Some states give municipalities a free hand, others outlaw municipal activity entirely and still others put some restrictions on them. (Federal legislation preempting some of these laws has been proposed but not enacted.) In addition, municipal electric utilities are more common in some areas than others. Between these two factors, the chances for municipal broadband are wildly uneven in different parts of the United States.

We identified municipal fiber systems in only 28 of the 50 states (independent telcos operate fiber-to-the-premises systems in 42 states, plus the District of Columbia and Puerto Rico). More than half of municipal deployments are located in one of eight states: Washington (7), Tennessee (7), Iowa (5), Georgia (4), Kentucky (4), Minnesota (4), Florida (3) and Virginia (3).

TRIPLE PLAY AND BEYOND

Finally, of those providers whose planned or actual services we could identify, most were offering the triple play of voice, video and data. A few were offering business services in addition, and several were using their fiber systems to help manage the electric utility.

A few municipalities were offering data only, or voice and data only, or video and data only. **BBP**

About the Author

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PUBLIC AND UTILITY FTTP PROJECTS

To add or correct information on this list, send an e-mail to masha@broadbandproperties.com.

Provider	Municipality	State	Primary Vendor (for electronics)	Announced or Started	Technology	Services (Planned or Actual)	Potential Subscribers	Partnerships
Ashland Fiber Network	Ashland	OR		2000		Video, data	Primarily businesses (most residences connected by HFC, long-term plan is FTTH)	Retail service providers
Auburn Essential Services	Auburn	IN	Wave7 Optics	2006	EPON	Voice, data	20,000	Telephone, ISP, wiring services
Barnesville Municipal Utilities	Barnesville	MN	Calix	2009	GPON	Triple play	1,100	
Bellevue Municipal Utilities	Bellevue	IA	Wave7 Optics	2006	EPON	Triple play		
Bowling Green Municipal Utility	Bowling Green & Warren County	KY	Alloptic	2007	GePON	Voice, data	Fiber to businesses only	
Bristol Tennessee Essential Services	Bristol	TN	Alcatel-Lucent	2005	BPON	Triple play, utility svcs		
Bristol Virginia Utilities	Bristol	VA	Calix, Alcatel-Lucent	2003	BPON, GPON	Triple play, business svcs	16,500	
Burlington Telecom	Burlington	VT	Calix	2006	GPON	Triple play, business svcs	15,400	
CDE Lightband	Clarksville	TN	World Wide Packets	2007	Active Ethernet	Triple play, utility svcs	55,000	
Cedar Falls Utilities	Cedar Falls	IA					Fiber to businesses & new development	
Chelan County Public Utility District	Chelan County	WA	Alcatel-Lucent	2004	BPON	Triple play	40,000	NoaNet and retail service providers
City of Danville Utilities Department	Danville	VA	PacketFront	2007	Active Ethernet		44,000	Will contract with retail svc providers
City of LaGrange, Georgia	LaGrange	GA	Calix		PON		Fiber to business only	
City of Philippi, West Virginia	Philippi	WV	Motorola	2005	BPON			
City of Powell, Wyoming	Powell	WY		2007				Tri County Telephone
City of Salisbury, N Carolina	Salisbury	NC		2008				
City of Shafter, California	Shafter	CA		2007				
City of Wilson, N Carolina	Wilson	NC		2008		Triple play		
Clallam County Public Utilities District	Clallam County	WA	Cisco Networks	2002	Active Ethernet	Data	Trial project - 5,000	Retail service providers
Crawfordsville Electric Light & Power	Crawfordsville	IN	Wave7 Optics	2006	EPON	Video, data	9,500	
Crosslake Telephone	Crosslake	MN	Calix	2005	GPON	Triple play		
Dalton Utilities	Dalton	GA	Alcatel-Lucent	2003	BPON	Triple play	19,000	
Douglas County Public Utilities District	Douglas County	WA	Telco Systems	1999	Active Ethernet	Triple play	5,100	Retail service providers
Dover Utilities	Dover	OH	Hitachi	2004	BPON	Triple play	Fiber to business only; eventually 5,700 homes	
EPB Telecom	Chattanooga	TN	Wave7 Optics, Motorola	2007	EPON	Triple play	Fiber to business only, eventually 165K homes	
FiberNet Monticello	Monticello	MN						
Gainesville Regional Utilities	Gainesville	FL			Fiber to the building	Data	15,000	
Glasgow Electric Plant Board	Glasgow	KY	Wave7 Optics	2007	EPON		620 (pilot project)	
Grant County Public Utility District	Grant County	WA	Cisco Networks at core, multiple at edge	2000	Active Ethernet	Triple play	4,300	Retail service providers
Harlan Municipal Utilities	Harlan	IA					Fiber to businesses only	Walnut Communications

FIBER DEPLOYMENTS

Provider	Municipality	State	Primary Vendor (for electronics)	Announced or Started	Technology	Services (Planned or Actual)	Potential Subscribers	Partnerships
Holland Board of Public Works	Holland	MI	Retail service providers use own electronics			Data	~100	Retail service providers
Hometown Utilicom	Kutztown	PA	Calix	2002	BPON,GPON	Triple play, utility services	2,000	D&E Communications
Idaho Falls Power	Idaho Falls	ID	Retail service providers use own electronics	2007		Voice, data	Fiber to businesses only	Five retail service providers
Jackson Energy Authority	Jackson and part of Madison County	TN	Wave7 Optics	2004	EPON	Triple play	35,000	Retail service providers
KPU Telecommunications	Ketchikan	AK	Pannaway	2007	Active Ethernet		Five pilot projects	
Lafayette Utilities System	Lafayette	LA	Alcatel-Lucent	2007	GPON	Triple play	57,000	
LENOWISCO Planning District Commission	Lee, Wise and Scott Counties and the City of Norton	VA	World Wide Packets	2004	Active Ethernet			
Lenox Municipal Utilities	Lenox	IA	Calix	2008	PON	Triple play		Farmers Mutual Telephone
liNKCity	North Kansas City	MO	World Wide Packets	2007	Active Ethernet	Data	3,000	
Loma Linda Connected Communities Program	Loma Linda	CA	Allied Telesis	2005	PON	Triple play	9,000	Property developers
Mason County Public District Utilities	Mason County	WA	Telco Systems, World Wide Packets	2000	Active Ethernet	Voice, data	3000	Retail service providers
MINET	Monmouth and Independence	OR	Alcatel-Lucent	2007	BPON	Triple play	5,000	
Morristown Utility Systems	Morristown	TN	Alcatel-Lucent	2006	BPON	Triple play	10,000	
Murray Electric System	Murray	KY		2000	Active Ethernet	Triple play	Fiber to businesses only	
NetQuincy	Quincy (also serves surrounding areas)	FL	Alcatel-Lucent	2003	BPON	Triple play		
Newnan Utilities*	Newnan	GA					Fiber to businesses only	
Norwood Light & Cable	Norwood	MA				Voice, data	Fiber to businesses only	
Okanogan Public Utilities District	Okanogan County	WA		2002	Active Ethernet		160	Retail service providers
Paducah Power System	Paducah	KY	Alcatel-Lucent, Allied Telesis	2004	BPON	Voice, data	Fiber to businesses only	Retail service providers
Pend Oreille Public Utilities District	Pend Oreille County	WA	Cisco Networks	2001	Active Ethernet	Data, bus services	Pilot project to 10 households	NoaNet
Provo City Power**	Provo	UT	World Wide Packets	2003	Active Ethernet		36,000	Retail service providers
Pulaski Electric System	Pulaski	TN	Wave7 Optics	2007	GPON	Triple play	4,700	
Reedsburg Utility Commission	Reedsburg	WI	Calix	2003	BPON,GPON	Triple play	4,400	
Rochelle Municipal Utilities	Rochelle	IL	Zhone Technologies		Active Ethernet		Fiber to businesses only	
Sallisaw Municipal Authority	Sallisaw	OK	Wave7 Optics	2004	EPON	Triple Play	3,000	New Roads Telecom
Shawano Municipal Utilities	Shawano	WI	Tellabs	2008	GPON	Triple play		
Spencer Municipal Utilities	Spencer	IA	Calix	2007	GPON	Triple play		
Sun Prairie Water & Light Commission	Sun Prairie	WI		1999		Data	Fiber to businesses only	
Swiftel Communications (Brookings Municipal Utilities)	Brookings	SD	Calix	2007				
Sylacauga Utilities Board	Sylacauga	AL	Alcatel-Lucent	1997	Active Ethernet	Data	5,000	
Taunton Municipal Lighting Plant	Taunton	MA	Wave7 Optics	2003	EPON	Data	32,000	
Tifton CityNet	Tifton	GA	Alloptic	2007	RF PON			
Tulahoma Utilities Board	Tulahoma	TN	Wave7 Optics	2007	GPON	Triple play	4,000	
Utilities Commission, City of New Smyrna Beach***	New Smyrna Beach	FL					One or two new developments	
UTOPIA	Consortium of 11 cities	UT	PacketFront		Active Ethernet		70,000	Retail service providers
Windom Telecommunications	Windom	MN	Calix	2004	GPON	Triple play	2,000	

* System being sold to NuLink | ** System being sold to Broadweave Communications | *** FTTH trial may be ending