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.bbmpmag.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 in-stitutional 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
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 entrepreneurially; 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

We did not identify any privately owned utilities in the US providing fiber to the premises, although there are examples in Europe. Why, when municipal utilities are so active in this field in the US?
Communications are two notable ex-
- Connexion Technologies and Zoomy
known among private network builders
salers rather than retailers of communi-
liscriminantly provide services to other
likely than private providers to be whole-
Municipal FTTH providers are more
prefer to create their own networks
require open networks. It is worth not-
ning that the city of Provo, Utah, recently
advocates for open networks. For example, the
open access model has worked well in Sweden and in Ja-
This suggests the problems are not

DISTRIBUTION MODELS – OPEN VS. CLOSED, WHOLESALE VS. RETAIL
Municipal FTTH providers are more
likely than private providers to be whole-
also have more complex arrangements.
Some municipal providers are both
some have even more complex arrange-
ments. 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 com-
panies provides telephony and Internet
back-office functions, while JEA retails
all three services – and also allows com-
petitive 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 Wash-
ington, legal constraints encourage or
require open networks. It is worth not-
ing that the city of Provo, Utah, recently
announced that it was selling its munici-
pal 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
Broadwave, the company acquiring
Provo’s network, said, “There are ineffi-
ciences that beleaguer this [open access]
model and make it difficult for municipali-
ties 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 sup-
port you have amazing lack of coordi-
nation... there’s a huge problem with
finger pointing.”

Provisioning customers for services
also can be more cumbersome in a mul-
tiprovider 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 Ja-
pan. 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 ac-
cess networks.

In addition, some of the Washing-
ton State vendors have agreements with
Northwest Open Access Network (Noa-
Net), a coalition of public utility dis-
trics that have linked their fiber optic
networks to achieve economic feasibil-
ity 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 require-
ments, 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 de-
ployers use Active Ethernet technology,
compared to about 10 percent of inde-
pendent 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 signifi-
cant customer wins.

GEOGRAPHICAL DISTRIBUTION
Laws governing municipalities’ abil-
ity 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 differ-
ent parts of the United States.

We identified municipal fiber systems
in only 28 of the 50 states (independ-
et telcos operate fiber-to-the-premises sys-
tems in 42 states, plus the District of
Columbia and Puerto Rico). More than
half of municipal deployments are lo-
cated 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 of-
ferring 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.

About the Author
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reached at masha@broadbandproperties.
com. Rachel Ellner helped gather data for
this compilation.
## PUBLIC AND UTILITY FTTP PROJECTS

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

<table>
<thead>
<tr>
<th>Provider</th>
<th>Municipality</th>
<th>State</th>
<th>Primary Vendor (for electronics)</th>
<th>Announced or Started</th>
<th>Technology</th>
<th>Services (Planned or Actual)</th>
<th>Potential Subscribers</th>
<th>Partnerships</th>
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<tbody>
<tr>
<td>Ashland Fiber Network</td>
<td>Ashland</td>
<td>OR</td>
<td></td>
<td>2000</td>
<td>Video, data</td>
<td>Primarily businesses (most residences connected by HFC, long-term plan is FTTH)</td>
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<td>Retail service providers</td>
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<td>Auburn Essential Services</td>
<td>Auburn</td>
<td>IN</td>
<td>Wave7 Optics</td>
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<td>EPON</td>
<td>Voice, data</td>
<td>20,000</td>
<td>Telephone, ISP, wiring services</td>
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<td>Bowling Green &amp; Warren County</td>
<td>KY</td>
<td>Alloptic</td>
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<td>GePON</td>
<td>Voice, data</td>
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<td>TN</td>
<td>Alcatel-Lucent</td>
<td>2005</td>
<td>BPON</td>
<td>Triple play, utility svcs</td>
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<td>Calix, Alcatel-Lucent</td>
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<td>NoaNet and retail service providers</td>
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<td>VA</td>
<td>PacketFront</td>
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<td>Motorola</td>
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<td>Dover</td>
<td>OH</td>
<td>Hitachi</td>
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<td>Triple play</td>
<td></td>
<td>Fiber to business only; eventually 5,700 homes</td>
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<td>Wave7 Optics, Motorola</td>
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<td>Triple play</td>
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<td>Fiber to business only, 165K homes</td>
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<td>Provider</td>
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<td>Holland Board of Public Works</td>
<td>Holland</td>
<td>MI</td>
<td>Retail service providers use own electronics</td>
<td>2002</td>
<td>BPON, GPON</td>
<td>Triple play, utility services</td>
<td>~100</td>
<td>Retail service providers</td>
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<td>Hometown Utilicom</td>
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<td>PA</td>
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<td>EPON</td>
<td>Triple play</td>
<td>2,000</td>
<td>D&amp;E Communications</td>
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<td>Idaho Falls Power</td>
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<td>ID</td>
<td>Retail service providers use own electronics</td>
<td>2007</td>
<td>GPON</td>
<td>Triple play, voice, data</td>
<td>Fiber to businesses only</td>
<td>Five retail service providers</td>
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<td>Jackson Energy Authority</td>
<td>Jackson and part of Madison County</td>
<td>TN</td>
<td>Wave7 Optics</td>
<td>2004</td>
<td>EPON</td>
<td>Triple play</td>
<td>35,000</td>
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<td>Ketchikan</td>
<td>AK</td>
<td>Pannaway</td>
<td>2007</td>
<td>Active Ethernet</td>
<td>Five pilot projects</td>
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<td>Lafayette Utilities System</td>
<td>Lafayette</td>
<td>LA</td>
<td>Alcatel-Lucent</td>
<td>2007</td>
<td>GPON</td>
<td>Triple play</td>
<td>57,000</td>
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<td>LENOWSICO Planning District Commission</td>
<td>Lee, Wise and Scott Counties and the City of Norton</td>
<td>VA</td>
<td>World Wide Packets</td>
<td>2004</td>
<td>Active Ethernet</td>
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<td>Lenox Municipal Utilities</td>
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<td>IA</td>
<td>Calix</td>
<td>2008</td>
<td>PON</td>
<td>Triple play</td>
<td></td>
<td>Farmers Mutual Telephone</td>
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<td>LINNCity</td>
<td>North Kansas City</td>
<td>MO</td>
<td>World Wide Packets</td>
<td>2007</td>
<td>Active Ethernet</td>
<td>Data</td>
<td>3,000</td>
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<td>CA</td>
<td>Allied Telesis</td>
<td>2005</td>
<td>PON</td>
<td>Triple play</td>
<td>9,000</td>
<td>Property developers</td>
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<td>Telco Systems, World Wide Packets</td>
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<td>Active Ethernet</td>
<td>Voice, data</td>
<td>3000</td>
<td>Retail service providers</td>
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<td>MINET</td>
<td>Monmouth and Independence</td>
<td>OR</td>
<td>Alcatel-Lucent</td>
<td>2007</td>
<td>BPON</td>
<td>Triple play</td>
<td>5,000</td>
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<td>Morristown Utility Systems</td>
<td>Morristown</td>
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<td>Alcatel-Lucent</td>
<td>2006</td>
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<td>10,000</td>
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<td>Murray Electric System</td>
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<td>NetQuincy</td>
<td>Quincy (also serves surrounding areas)</td>
<td>FL</td>
<td>Alcatel-Lucent</td>
<td>2003</td>
<td>BPON</td>
<td>Triple play</td>
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<td>Newnan Utilities*</td>
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<td>Norwood Light &amp; Cable</td>
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<td>Paducah Power System</td>
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<td>KY</td>
<td>Alcatel-Lucent, Allied Telesis</td>
<td>2004</td>
<td>BPON</td>
<td>Voice, data</td>
<td>Fiber to businesses only</td>
<td>Retail service providers</td>
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<td>2001</td>
<td>Active Ethernet</td>
<td>Data, bus services</td>
<td>Pilot project to 10 households</td>
<td>NoaNet</td>
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<td>UT</td>
<td>World Wide Packets</td>
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<td>TN</td>
<td>Wave7 Optics</td>
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<td>GPON</td>
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<td>BPON, GPON</td>
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<td>IL</td>
<td>Zhone Technologies</td>
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<td>OK</td>
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<td>Alloptic</td>
<td>2007</td>
<td>RF, PON</td>
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<td>GPON</td>
<td>Triple play</td>
<td>4,000</td>
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<td>UTOPIA</td>
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<td>UT</td>
<td>PacketFront</td>
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<td>2,000</td>
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</table>

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