

Cities Take the Lead

Whether building their own fiber networks or partnering with the private sector, cities are becoming more proactive in ensuring better broadband for residents and businesses.

By Masha Zager / *Broadband Communities*

BROADBAND COMMUNITIES' count of public and public-private fiber-to-the-premises network projects in the United States now stands at 178, an 8 percent increase over last year's count of 165. Of the new networks, some are pilot deployments and others are more comprehensive.

Many more communities are actively exploring the possibility of building fiber to homes or businesses. Some initiatives will fizzle out, and others will hit speed bumps – for example, the Massachusetts coalition WiredWest, which I described last year as “very close to pushing the ‘go’ button,” was required by the state funding agency to revise its plan and is still in limbo. Still other initiatives will become moot if they spur incumbent providers to upgrade their existing networks. However, I expect a number of new municipal and public-private network projects to launch in the next year.

At the same time, some communities are considering either exiting the broadband business or bringing in private partners. Crosslake Communications, the municipal provider in Crosslake, Minnesota, was sold to a consortium of local telephone cooperatives in August 2016. BVU Authority of Bristol, Virginia, is in negotiations to sell its fiber optic network, OptiNet, to Sunset Digital Communications. Tacoma, Washington, is considering leasing its Click! Network (which is mostly HFC but offers some fiber connections for businesses) to a private operator.

Though some cities have sold or even shut down their networks because they did a poor

job building, managing or marketing them, that is not the only reason to do so. A city may build a network because no other operator will make the investment and be happy to sell the asset if a private investor does appear on the scene. Crosslake, for example, sold its profitable network for about two and one-half times the outstanding debt. The network needed to be upgraded and expanded, and it appears that the city (which has fewer than 2,000 permanent residents) preferred a private party to make that investment.

The majority of community fiber networks appear to be self-sustaining or profitable. Many continue to expand or add new types of customers and services. Often, a municipal fiber network begins in one community and expands by popular demand into neighboring communities, though in some cases, expansions requested by residents have been quashed by state legislatures.

Well-run community fiber networks are instrumental in attracting new businesses and retaining existing businesses in their communities. The most common rationale for building community networks is to provide businesses with affordable fiber connections; in fact, many networks are built or extended to accommodate specific requests by local businesses. The articles in this section give several examples of this phenomenon.

However, community fiber networks do not lead automatically to economic development. Where they have succeeded in doing so, network operators understand what businesses are looking for (price-performance, redundancy,

reliability, service level agreements), and economic development agencies can communicate the network's capabilities to prospective businesses.

THE CHANGING LEGAL AND POLITICAL LANDSCAPE

About 20 states either prohibit communities from building

community networks altogether or impose restrictions that discourage or effectively prevent them from building such networks. (State legislatures aren't the only obstacles; often, opposition comes from community members who disapprove of municipal broadband on principle.) In February 2015, the FCC voted to preempt state laws in North

Carolina and Tennessee that limited the expansion of municipal networks into neighboring communities. The city of Wilson, North Carolina, took advantage of the decision to expand its Greenlight FTTH service to the neighboring town of Pinetops, but in August 2016, a federal appellate court overturned the FCC decision, and it

WHAT'S A MUNICIPAL NETWORK?

There are many ways to define a municipal fiber network. Even state legislatures that want to restrict such networks disagree about what they are restricting.

BROADBAND COMMUNITIES identifies networks as municipally owned if a public agency undertakes most of the investment, incurs most of the risk and exercises most of the control over the network.

All the "MUNI" network deployers on this list

- Are public agencies, public authorities, public benefit corporations or consortia of public entities
- Own all-fiber infrastructure that connects local homes or businesses to the internet (or are actively developing such networks). In most but not all cases, they also own the equipment that lights the fiber.
- Make available – directly or through retailers – such services as voice, internet access or video (or are planning such services)
- Are in the United States or U.S. territories.

Excluded are municipalities that provide broadband services exclusively for municipal government facilities, schools and other anchor institutions; those that provide broadband services only over cable or wireless networks; and those that serve private customers only by leasing conduit or dark fiber to them. (However, a few, such as Circa and Huntsville Utilities, lease dark fiber to *retail service providers* that serve private customers.)

This list includes only organizations that have either functioning networks or approved plans and funding. However, plans do not always materialize; every year, one or more listed projects fail to survive. Some others, although still in progress, have not met their deployment goals.

Multiple-municipality projects have become more common because they can achieve economies of scale in construction and operation and, by aggregating demand, they can attract third-party service providers more easily. Recent projects include ECFiber in Vermont, SMBS in Minnesota and FastRoads in New Hampshire.

BROADBAND COMMUNITIES maintains updated information about community fiber networks and other FTTP deployments in the U.S. on a searchable database at www.fiberville.com. The database field labeled "Community Benefits" contains a wealth of information on the economic development and other benefits of these networks.

Even a network owned by a single town or city may provide service beyond city limits. For example, Jackson Energy Authority and Chattanooga EPB in Tennessee both serve areas adjacent to the cities that own them – areas that were already served by their electric utilities. The city of Williamstown, Kentucky, used broadband stimulus funding to expand its community network beyond city borders. (Its original network was hybrid fiber-coax, but the expansion area is FTTH.) In Washington state, though each public utility district builds and operates its own network, most or all belong to the Northwest Open Access Network (NoaNet), a coalition of public utility districts that linked their fiber optic networks together to achieve economic feasibility in underserved areas. NoaNet offers long-haul transport and last-mile access to wholesale communications providers throughout the Pacific Northwest.



Community fiber networks are found in 38 states and American Samoa. (Alaska and American Samoa are not shown.)

appears that service to Pinetops will have to be terminated.

If nothing else, the FCC decision, along with President Obama's expressed support for public broadband, raised public awareness about municipal fiber networks and brought media attention to the issue – which encouraged many municipalities to begin considering investing in fiber infrastructure.

Because the pendulum of public opinion shifts constantly, a broadband project that is legally or politically impossible one year may become feasible the next year. In Colorado, for example, the state law that restricts municipal broadband has been effectively nullified in the last few years as dozens of cities and counties voted to exempt themselves from it. Holding a referendum is an expensive, time-consuming and unnecessary step in building a broadband network, but it does not seem to be deterring many Colorado cities at this point.

In several cases, city leaders and broadband activists succeeded in changing public opinion by educating

citizens about the economic and social benefits of high-speed broadband. Some states now actively support municipal broadband projects. Recently, Illinois helped fund OnLight Aurora, Wisconsin awarded a grant to Reedsburg to expand its FTTH network and Massachusetts supported municipal networks in Leverett and Westfield.

MUNICIPAL UTILITIES

Municipalities are more likely to become broadband providers when they are already in the business of providing electric power. Citizens in these municipalities are already used to the idea of government-provided utility services. Many public power utilities were set up in response to the failure of the private sector to deliver adequate services, and residents accept that government might set up communications utilities for the same reason. In most cases, citizens have had positive experiences with their municipal utilities and are prepared to buy additional services from them. In addition, public power utilities already

have the outside-plant personnel and back-office operations, such as billing and customer service, that they need to provide telecom services.

Finally, public power utilities are building communications networks for smart-grid applications; once they begin planning these networks, they often realize the networks are suitable for business or residential broadband. Municipal utilities that distribute Tennessee Valley Authority electricity have been in the forefront of combining smart grid and telecom applications. In some cases, such as Hudson, Ohio (profiled in this issue), the city operates a municipal electric utility but set up the telecommunications utility as a separate entity or department. A few cities, such as Salisbury, North Carolina, do not have municipal electric utilities.

WHO ARE THE CUSTOMERS?

Cities often begin by installing institutional fiber networks to serve municipal office buildings or utility substations, then extend fiber to

commercial buildings or business parks, add multiple-dwelling-unit properties and greenfield residential developments, and finally reach single-family households and small businesses. The list shows deployers at various points along this path. Building an institutional fiber network can also be a starting point for a path to a public-private partnership, as

exemplified by UC2B.

Fifty-eight community networks, nearly one-third of the total, deliver fiber services only to businesses, and several others serve mainly businesses. (Some of these networks deliver residential broadband services via cable or wireless; most don't serve residences at all.)

Some fiber networks that began

as business-only, such as nDanville in Virginia and Cedar Falls Utilities in Iowa, built out fiber to residential customers citywide. Owensburg Municipal Utilities in Kentucky (profiled in this issue) and Whip City Fiber in Massachusetts recently added residential pilot programs to their fiber-to-the-business networks. Still others,

WHAT'S A PUBLIC-PRIVATE PARTNERSHIP?

Throughout the broadband industry, the term public-private partnership is used loosely – and no two partnerships seem to follow the same model. In the last few years, cities have become much more proactive about working with private providers and offering a variety of concessions and assistance to encourage the provision of better broadband.

To keep the list to a manageable size, we restrict the usage to cases in which both public and private partners make significant investments into the access network, incur significant risk and retain significant control. The investments may include contributing preexisting conduit or fiber.

However, as there is no accepted definition of a public-private partnership, we do not argue for our definition over any other.

To make matters even more confusing, descriptions of the details of public-private partnerships are not always very precise or complete, and the agreements themselves change over time; in some cases, we are guessing about whether a public-private network meets our definition.

To the best of our knowledge, then, all the "PUBLIC-PRIVATE" network deployers on this list

- Are consortia of public and private entities, public entities that built networks and later received infusions of private capital, or private entities that built networks with significant investment or participation by local governments
- Own all-fiber networks that connect homes or businesses to the internet (or are actively developing such networks)
- Make available – directly as a partnership, through one of the partners or through third-party retailers – such services as voice, internet access or video (or are planning such services)
- Are in the United States or U.S. territories.

Excluded are publicly owned networks that contract

with private retail service providers or operators (those are labeled as MUNI); privately owned networks for which public entities have helped raise funding; privately owned networks for which public entities have donated access to rights-of-way, expedited permitting or marketing assistance; privately owned networks for which municipalities have committed to be anchor tenants; and privately owned networks that lease backbone fibers from public entities in arms-length, market-rate contracts.

Public financing for private networks. One of the excluded categories – private networks for which public entities have helped raise funds – deserves special mention both because it fits many people's definitions of public-private partnerships and because it is a rapidly growing category. In fact, RS Fiber, the cooperative that is the subject of an article in this issue, is an example of this type of arrangement.

In these cases, a municipality obtains capital funding that a private operator is not eligible for – either grant funding or low-cost tax increment financing (or "tax abatement financing," as it is called in some states) and passes it through to the private operator. If the funding is a loan, the private operator is obligated to repay the municipality.

Cities entering into these arrangements take on considerable risk (they are on the hook if revenues are insufficient to repay loans or if private operators do not comply with grant terms) without gaining ownership or control. That's why we don't consider these arrangements true public-private partnerships. However, as the RS Fiber article makes clear, entering into this type of arrangement can still be a reasonable choice for a municipality. Typically, an operator commits to build out a high-quality network throughout the municipality in return for access to the funds. The network may be a "life or death" investment for the community, and if it succeeds and bolsters the local economy, the investment can be well worth the risk.

such as Chanute Utilities in Kansas, gave serious consideration to building out fiber to residences but did not gain political support for their projects.

THIRD-PARTY SERVICE PROVIDERS AND OPERATORS

Municipalities are more likely than private deployers to allow third parties to provide services on their networks. There are several reasons for this: State laws or federal funding conditions may require a wholesale model; local political support may depend on a city's following a wholesale model; municipalities may not have the expertise, resources or will to become service providers; some municipalities want to offer a wider variety of services than they can provide on their own.

Forty community fiber networks either allow or plan to allow multiple retail service providers to deliver services. At least 19 others have contracted with a single third-party service provider to deliver services (in a few cases, just phone service). Some of these, such as the city of Westminster, Maryland, plan to transition to a full open-access model in the future. UC2B, which began by delivering services directly, turned network management and service delivery over to a private partner, iTV-3, with the intention of transitioning to open access, but the sale of iTV-3 left the network in an uncertain position. As of press time, UC2B was exploring its options to contract with a new private partner.

Certain states, such as Utah and Washington, prohibit municipalities from providing retail services. This can pose a problem for municipal fiber deployers at startup, when third-party providers (especially for residential services) may not find joining the network worthwhile.

At least 20 municipal fiber systems contract with third parties – local exchange carriers or other network operators – to operate their networks. Such contracts (which privately owned networks also enter into) can be helpful for municipalities that lack experience operating telecommunications networks. On the other hand, like any

critical outsourcing contracts, they must be intensively managed. Several such arrangements have ended abruptly or even resulted in lawsuits. UC2B, as mentioned above, is currently grappling with the sale of its private operator (and investor) iTV-3; whether the purchaser of iTV-3 will remain as operator is unknown as of press time.

TECHNOLOGY

Community broadband networks use a mix of PON and active Ethernet technologies. At this point, active Ethernet is used primarily for business customers, but in earlier years, active Ethernet was preferred even in residential networks for its ease of supporting open access. (Open access can now be supported on GPON networks.)

Municipalities have been leaders in deploying gigabit networks – Chattanooga EPB had the first citywide gigabit network in 2010 – and now they are leading the way in deploying 10 Gbps networks. Fibrant and EPB were among the first U.S. providers to announce 10 Gbps residential service. (See the Tullahoma case study in this issue for an account of what was once the smallest gigabit city in the United States.)

The **BROADBAND COMMUNITIES** database does not contain enough information on vendors to make any definitive statements about market share for community fiber networks, but judging by the announcements that have been made in the last few years, it appears that Calix now has a large share of this market in terms of FTTH electronics, replacing Alcatel-Lucent (now Nokia), which was the leader a decade ago.

GEOGRAPHIC DISTRIBUTION

Laws that govern municipalities' ability to compete as telecommunications providers vary from state to state. Some states give municipalities a free hand, and others do not. Municipal electric utilities are more common in some areas than others, and some regions are better served by private providers

than others are. Considering all these factors, the chances of municipalities' building their own broadband networks are wildly uneven in different parts of the United States. This census identified community fiber systems in 38 of the 50 states and in American Samoa. There are also about a dozen fiber networks, not listed here, built on tribal lands by tribal governments. Seven states account for a large number of deployments: California, Florida, Iowa, Kentucky, Minnesota, Tennessee and Washington.

TRIPLE PLAY AND BEYOND

Though some municipalities offer only internet access over their fiber networks, most whose planned or actual services we could determine offer the triple play of voice, video and data. Specialized business services are common, as are smart-grid applications. Broadband stimulus funding and encouragement from the Tennessee Valley Authority have made smart-grid applications more prevalent in the last few years, and these applications are likely to become still more important in the future. A few open-access networks are actively recruiting many different kinds of services. For example, on the St. Joe Valley Metronet, 30 providers deliver 20 different types of services, including such offerings as conferencing, disaster recovery and video surveillance. Enabling a wide variety of broadband services could become a way to make more community networks financially viable.

In conclusion, there is no single model for public broadband. Each project takes a slightly different approach, depending on the legal and political landscape, the availability of financing, the interest of potential partners, and the skills and assets that public agencies possess. Communities have many options and should explore as many as possible before committing to a plan or deciding that public broadband is not for them. ❖

*Masha Zager is the editor of **BROADBAND COMMUNITIES**. You can reach her at masha@bbcmag.com.*

MUNICIPAL AND PUBLIC-PRIVATE FTTP NETWORKS IN THE UNITED STATES

NETWORK DEPLOYER	COMMUNITY(IES)	STATE(S)	MUNI OR PUBLIC-PRIVATE	DATE PROJECT STARTED	TECHNOLOGY	SERVICES	MARKETS SERVED BY FIBER (all premises unless otherwise noted)	SERVICE PROVIDER (if other than network owner)	OPERATOR (if other than network owner)
AccessEagan	Eagan	MN	MUNI	2013	Active Ethernet	Business Services, Data	Businesses	Multiple	
Albany Water, Gas & Light Commission	Albany	GA	MUNI			Data, Video, Voice	Businesses		
Algona Municipal Utilities	Algona	IA	MUNI	2013	Active Ethernet, GPON	Data, Video, Voice			
ALP Utilities	Alexandria	MN	MUNI			Data, Video, Voice	Businesses		
Altitude Community Broadband	Highlands	NC	MUNI	2016	GPON	Data	Downtown area only		
American Samoa Telecom	American Samoa		MUNI	2008	GPON	Data, Video, Voice			
Anderson Municipal Light and Power	Anderson	IN	MUNI	2009	Active Ethernet	Data	Businesses	Multiple	
Ashland Fiber Network	Ashland	OR	MUNI	2000		Data, Video, Voice	Businesses	Multiple	
Athens Utilities Board	Athens	TN	MUNI	2015		Data	Businesses		
Auburn Essential Services	Auburn	IN	MUNI	2006	EPON	Data, Smart Grid, Voice			
Barbourville Utility Commission	Barbourville	KY	MUNI	2010	GPON	Data, Video			
Barnesville Municipal Utilities	Barnesville	MN	MUNI	2009	GPON	Data, Video, Voice			
Bellevue Municipal Utilities	Bellevue	IA	MUNI	2006	EPON, GPON	Data, Video, Voice			
Benton County Public Utility District	Kennewick, Prosser and Benton City	WA	MUNI			Business Services, Data	Businesses		
Bowling Green Municipal Utility	Bowling Green and Warren County	KY	MUNI	2007	EPON	Business Services, Data, Voice	Businesses		
Bozeman Fiber	Bozeman	MT	PUBLIC-PRIVATE	2015		Data			
Braintree Electric Light Department	Braintree	MA	MUNI	2008	Active Ethernet	Data	Businesses		
Bristol Tennessee Essential Services	Bristol	TN	MUNI	2005	GPON	Data, Smart Grid, Video, Voice			
Buffalo Municipal Utilities	Buffalo	MN	MUNI	1996		Data	Businesses		
Burlington Telecom	Burlington	VT	PUBLIC-PRIVATE	2006	GPON	Business Services, Data, Video, Voice			
BVU OptiNet (BVU Authority)	Bristol	VA	MUNI	2003	GPON	Business Services, Data, Smart Grid, Video, Voice			
Calnet (Calhoun Utilities)	Calhoun	GA	MUNI	2012 (built 1997)	Carrier Ethernet	Data, Voice	Businesses		
CBPU Telecom (Coldwater Board of Public Utilities)	Coldwater	MI	MUNI	2010	EPON	Data	Businesses		
CC Communications	Churchill County	NV	MUNI	2004	EPON, Active Ethernet	Business Services, Data, Security, Video, Voice			

COMMUNITY BROADBAND

NETWORK DEPLOYER	COMMUNITY(IES)	STATE(S)	MUNI OR PUBLIC-PRIVATE	DATE PROJECT STARTED	TECHNOLOGY	SERVICES	MARKETS SERVED BY FIBER (all premises unless otherwise noted)	SERVICE PROVIDER (if other than network owner)	OPERATOR (if other than network owner)
CDE Lightband	Clarksville	TN	MUNI	2007	Active Ethernet	Data, Smart Grid, Video, Voice			
Cedar Falls Utilities	Cedar Falls	IA	MUNI	2006	Active Ethernet, GPON	Data, Smart Grid, Video	Businesses, residential		
Chanute Utilities	Chanute	KS	MUNI	2005		Data	Businesses		
Charles City County	Charles City County	VA	MUNI	2015		Data		Multiple	?
Chaska.net	Chaska	MN	MUNI	2004	Active Ethernet	Data	Businesses		
Chelan County Public Utility District	Chelan County	WA	MUNI	2004	GPON	Data, Video, Voice		Multiple	
Chicopee Electric Light	Chicopee	MA	MUNI			Data	Businesses		HG&E Telecom
Circa (Idaho Falls Power)	Idaho Falls	ID	MUNI	2007	Active Ethernet	Data, Voice	Businesses	Multiple	
City of Ammon	Ammon	ID	MUNI	2011		Data		Multiple	
City of Cortez	Cortez	CO	MUNI	2011	Active Ethernet, GPON	Data, Video, Voice	Businesses	Multiple	
City of Ellsworth	Ellsworth	ME	MUNI	2015		Data	Businesses		
City of Eugene	Eugene	OR	MUNI	2015		Data	Businesses, pilot project	Multiple	
City of Hamilton	Hamilton	OH	MUNI	2014	Active Ethernet, GPON	Business Services, Data	Businesses	CenterGrid	
City of Jasper/Smithville	Jasper, Dubois County	IN	PUBLIC-PRIVATE	2015	GPON	Data, Video, Voice			
City of LaGrange	LaGrange	GA	MUNI		GPON	Business Services, Data, Voice	Businesses		
City of Laurinburg	Laurinburg	NC	MUNI	2014		Data	Businesses	Broadplex	
City of Leesburg	Leesburg	FL	MUNI	2001		Data	Businesses		
City of Madison	Madison	WI	MUNI	2015		Data	Pilot project	ResTech	
City of Mishawaka	Mishawaka	IN	MUNI	2012		Data	Businesses		St. Joe Valley MetroNet
City of Mount Vernon	Mount Vernon, Burlington and Port of Skagit	WA	MUNI	2002	GPON	Data, Voice	Businesses	Multiple	
City of Ontario	Ontario	CA	MUNI	2015		Data			
City of Ponca City	Ponca City	OK	MUNI			Data	Businesses		
City of San Bruno	San Bruno	CA	MUNI	2015	Active Ethernet, GPON	Data			
City of South Portland/GWI	South Portland	ME	PUBLIC-PRIVATE	2014		Data			
City of Vernon	Vernon	CA	MUNI	1999		Data	Businesses		
City of Westminster	Westminster	MD	MUNI	2014	GPON	Data		Ting	Ting
Clallam County Public Utility District	Clallam County	WA	MUNI	2002	Active Ethernet	Data		Multiple	
Click! Network (Tacoma Power)	Tacoma	WA	MUNI		Carrier Ethernet	Data	Businesses	Multiple	
Community Fiber Network (formerly Goshen Fiber Network)	Goshen, New Paris, Milford, Nappanee, Wakarusa	IN	PUBLIC-PRIVATE	2008		Data, Voice		New Paris Telephone	New Paris Telephone
Community Network Services (South Georgia Governmental Services Authority)	Thomasville and seven other communities	GA	MUNI	1999	Carrier Ethernet	Data, Video, Voice	Businesses only in some communities		

NETWORK DEPLOYER	COMMUNITY(IES)	STATE(S)	MUNI OR PUBLIC-PRIVATE	DATE PROJECT STARTED	TECHNOLOGY	SERVICES	MARKETS SERVED BY FIBER (all premises unless otherwise noted)	SERVICE PROVIDER (if other than network owner)	OPERATOR (if other than network owner)
Community Network System (Pend Oreille County Public Utility District)	Pend Oreille County	WA	MUNI	2001	Active Ethernet	Business Services, Data, Video, Voice		Multiple	
Concord Light Broadband	Concord	MA	MUNI	2014		Data, Smart Grid			
Conway Corporation	Conway	AZ	MUNI	2011		Data, Voice			
Culver Connect	Culver City	CA	MUNI	2016		Data	Businesses	Multiple	Mox Networks
DiamondNet (Sallisaw Municipal Authority)	Sallisaw	OK	MUNI	2004	EPON	Data, Video, Voice		Momentum Telecom (phone service)	
Douglas County Public Utility District	Douglas County	WA	MUNI	1999	Active Ethernet	Data, Video, Voice		Multiple	
Dover Technology Services	Dover	OH	MUNI	2004		Data	Businesses		
DubLink	Dublin	OH	MUNI			Data	Businesses	Multiple	
ECFiber	Consortium of 23 Vermont towns	VT	MUNI	2010	GPON	Business Services, Data, Voice			
EmeryConnect	Emeryville	CA	PUBLIC-PRIVATE	2013	Active Ethernet	Data		Multiple	
EPB Fiber Optics	Chattanooga and surrounding communities	TN	MUNI	2007	GPON, NG-PON2	Data, Smart Grid, Video, Voice			
EPlus Broadband (Jackson Energy Authority)	Jackson and part of Madison County	TN	MUNI	2004	EPON, Carrier Ethernet	Data, Smart Grid, Video, Voice			
Erwin Utilities	Erwin	TN	MUNI	2014		Data, Smart Grid, Voice	Pilot project		
FairlawnGig	Fairlawn, Ohio	OH	MUNI			Data, Video, Voice			
FastRoads	NH Community Development Finance Authority, Monadnock Economic Development Corporation, 42 towns	NH	MUNI	2011		Data		Multiple	WideOpen Networks
Fayetteville Public Utilities	Fayetteville	TN	MUNI	2010	EPON, RFoG	Data, Video, Voice			
FiberCom (City of Cartersville)	Cartersville and surrounding areas	GA	MUNI		Carrier Ethernet	Business Services, Data, Voice	Businesses		
FiberNet Monticello	Monticello	MN	MUNI	2008	GPON	Data, Video, Voice			
Fibrant	Salisbury	NC	MUNI	2008		Data, Video, Voice			
FPUAnet Communications (Fort Pierce Utilities Authority)	Fort Pierce	FL	MUNI		Active Ethernet	Data, Voice	Businesses		
Frankfort Plant Board	Frankfort	KY	MUNI	2009	Carrier Ethernet, RFoG	Data, Security, Video, Voice			
Franklin County Public Utility District	Franklin County	WA	MUNI		Active Ethernet	Business Services, Data		Multiple	
Franklin Municipal FiberNET	Franklin	KY	MUNI	2013		Data	Businesses		
Gahanna Net	Gahanna	OH	PUBLIC-PRIVATE	2010		Business Services, Data			WOW Business

COMMUNITY BROADBAND

NETWORK DEPLOYER	COMMUNITY(IES)	STATE(S)	MUNI OR PUBLIC-PRIVATE	DATE PROJECT STARTED	TECHNOLOGY	SERVICES	MARKETS SERVED BY FIBER (all premises unless otherwise noted)	SERVICE PROVIDER (if other than network owner)	OPERATOR (if other than network owner)
Gainesville Regional Utilities	Gainesville	FL	MUNI	2001	Active Ethernet	Data	Businesses, MDUs, greenfield developments		
Get Wired Alabama (South Central Alabama Broadband Commission and Oasis Construction)	17 counties	AL	PUBLIC-PRIVATE	2015		Data, Video, Voice		Multiple	Oasis Alabama Broadband
Glasgow Electric Plant Board	Glasgow	KY	MUNI			Data	Businesses		
Glenwood Springs Community Broadband Network	Glenwood Springs	CO	MUNI	2002	GPON	Data, Voice		Multiple	
Grant County Public Utility District	Grant County	WA	MUNI	2000	Active Ethernet	Data, Video, Voice		Multiple	
Grays Harbor County Public Utility District	Grays Harbor County	WA	MUNI	1998		Data		Multiple	
Greenlight	Wilson	NC	MUNI	2008	GPON	Data, Video, Voice			
Harlan Municipal Utilities	Harlan	IA	MUNI	2010	GPON	Data, Video, Voice			
HES EnergyNet (Hopkinsville Electric System)	Hopkinsville	KY	MUNI			Data	Businesses		
HG&E Telecom (Holyoke Gas & Electric Department)	Holyoke (also serves Chicopee and Springfield)	MA	MUNI	1997	Carrier Ethernet	Data, Voice	Businesses, some MDUs	OTT Communications (voice service)	
Highland Communication Services	Highland	IL	MUNI	2010	GPON	Data, Video, Voice			
Holland Board of Public Works	Holland	MI	MUNI			Data		Multiple	
Hometown Utilicom	Kutztown	PA	MUNI	2002	BPON, GPON	Data, Video, Voice, Smart Grid		D&E Communications	
Huntsville Utilities	Huntsville	AL	MUNI	2016		Data		Multiple	
Independence Light and Power Telecommunications	Independence	IA	MUNI	2013	GPON	Data, Video, Voice	Businesses		
Indianola Municipal Utilities	Indianola	IA	MUNI	2012	Active Ethernet	Data, Video, Voice		MCG	
Islesboro Municipal Broadband	Islesboro	ME	MUNI	2016	GPON	Data, Voice		GWI	GWI
Kitsap County Public Utility District	Kitsap County	WA	MUNI	2000	Active Ethernet	Data	Mainly businesses	Multiple	
KPU Telecommunications	Ketchikan	AK	MUNI	2007	Active Ethernet, GPON	Data, Video, Voice			
Lac qui Parle County Economic Development Authority/ Farmers Mutual Telephone	Lac qui Parle County	MN	PUBLIC-PRIVATE		GPON	Data, Video, Voice			
Lake Connections	Lake County, part of Saint Louis County	MN	MUNI	2010	Active Ethernet, GPON	Data, Video, Voice			
LanCity Connect	Lancaster, PA	PA	MUNI	2015		Data, Smart Grid, Video		MAW Communications	
Lenox Municipal Utilities	Lenox	IA	MUNI	2008	PON	Data, Video, Voice			
LeverettNet (Leverett Municipal Light Plant)	Leverett	MA	MUNI	2012	Active Ethernet	Data, Voice		Crocker Communications	HG&E Telecom
LightTUBE (Tullahoma Utilities Board)	Tullahoma	TN	MUNI	2007	GPON	Data, Video, Voice			

NETWORK DEPLOYER	COMMUNITY(IES)	STATE(S)	MUNI OR PUBLIC-PRIVATE	DATE PROJECT STARTED	TECHNOLOGY	SERVICES	MARKETS SERVED BY FIBER (all premises unless otherwise noted)	SERVICE PROVIDER (if other than network owner)	OPERATOR (if other than network owner)
iINKCity	North Kansas City	MO	MUNI	2007	Active Ethernet	Data			DataShack
Lit San Leandro	San Leandro	CA	PUBLIC-PRIVATE	2012		Data			
Loma Linda Connected Communities Program	Loma Linda	CA	MUNI	2005	Active Ethernet	Data, Video, Voice		Multiple	
Longmont Power and Communications	Longmont	CO	MUNI	2012	GPON	Data, Voice			
Los Angeles Department of Water and Power Fiber Optic Enterprise	Los Angeles	CA	MUNI		Carrier Ethernet	Business Services, Data	Businesses		
LUS Fiber	Lafayette	LA	MUNI	2007	GPON	Data, Video, Voice, Smart Grid			
Marshall Municipal Utilities	Marshall	MO	MUNI	2005		Data, Smart Grid			
Martinsville Information Network (MINet)	Martinsville	VA	MUNI	2009		Business Services, Data, Voice	Businesses		
Mason County Public Utility District	Mason County	WA	MUNI	2000	Active Ethernet	Business Services, Data, Voice		Multiple	
Mayfield Village	Mayfield Village	OH	MUNI	2012		Data	Businesses		OneCommunity
Medina County Fiber Network	Medina County Port Authority	OH	MUNI	2012		Data	Businesses	Multiple	
MI-Connection	Mooreville, Davidson and Cornelius	NC	MUNI	2009	GPON	Data, Video, Voice			
MINET	Monmouth and Independence	OR	MUNI	2007	BPON	Data, Video, Voice			
Montana Economic Revitalization & Development Institute/ Fatbeam	Butte	MT	PUBLIC-PRIVATE	2013		Business Services, Data, Voice			
Morristown Utility Systems (MUS Fibernet)	Morristown	TN	MUNI	2006	GPON	Data, Smart Grid, Video, Voice			
Mount Washington Fiber Network	Mount Washington	MA	MUNI	2016		Data, Video			
Murfreesboro Electric Department	Murfreesboro	TN	MUNI	2015		Data	Pilot project		
Murray Electric System	Murray	KY	MUNI	2000	Active Ethernet	Data, Video, Voice	Businesses		
Muscatine Power & Water	Muscatine	IA	MUNI	2015		Data, Video			
nDanville	Danville	VA	MUNI	2007	Active Ethernet, GPON	Business Services, Data, Security, Video, Voice		Multiple	
New Albany Net	New Albany	OH	MUNI	2010		Business Services, Data	Businesses	WOW Business	
Norwood Light Broadband	Norwood	MA	MUNI			Data, Voice	Businesses		
Ocala Utility Services	Ocala	FL	MUNI	1995	Active Ethernet	Business Services, Data	Businesses		

COMMUNITY BROADBAND

NETWORK DEPLOYER	COMMUNITY(IES)	STATE(S)	MUNI OR PUBLIC-PRIVATE	DATE PROJECT STARTED	TECHNOLOGY	SERVICES	MARKETS SERVED BY FIBER (all premises unless otherwise noted)	SERVICE PROVIDER (if other than network owner)	OPERATOR (if other than network owner)
Okanogan County Public Utility District	Okanogan County	WA	MUNI	2002	Active Ethernet	Data		Multiple	
OMU Fibernet (Owensboro Municipal Utilities)	Owensboro	KY	MUNI	1998		Data	Businesses, residential pilot project		
ONE Burbank (Burbank Water and Power)	Burbank	CA	MUNI	2010	Active Ethernet, Carrier Ethernet	Business Services, Data	Businesses		
OnLight Aurora	Aurora	IL	MUNI	2012		Business Services, Data	Businesses		
Opelika Power Services	Opelika	AL	MUNI	2010	GPON	Data, Smart Grid, Video, Voice			
Optilink (Dalton Utilities)	Dalton	GA	MUNI	2003	GPON	Data, Video, Voice			
Orangeburg County Broadband	Orangeburg County (serves nine communities in the county)	SC	MUNI	2010	Active Ethernet	Data			
Osage Municipal Utilities	Osage	IA	MUNI	2016	GPON	Data, Video, Voice	Pilot project		
OTO Fiber	Old Town, Orono	ME	MUNI			Data, Video, Voice			
Pacific County Public Utility District	Pacific County	WA	MUNI	2000		Data			
Palm Coast FiberNET	Palm Coast	FL	MUNI	2009	Active Ethernet	Business Services, Data, Voice	Businesses	Multiple	
PES Energize (Pulaski Electric System)	Pulaski (also serves Giles County)	TN	MUNI	2007	EPON	Data, Smart Grid, Video, Voice			
Philippi Communications System	Philippi	WV	MUNI	2005	BPON	Data, Video			
Piqua Municipal Power System	Piqua	OH	MUNI	2013		Data	Businesses		
PowellLink	Powell	WY	MUNI	2007	GPON	Data, Video, Voice, Security		Tri County Telephone	
PPS FiberNet (Paducah Power System)	Paducah, McCracken County	KY	MUNI	2004	Active Ethernet, BPON	Data, Security, Video, Voice	Businesses	Multiple	
Princeton Electric Department	Princeton	IL	MUNI	2003		Data	Businesses	IVNet	IVNet
Reedsburg Utility Commission	Reedsburg (also serves nearby rural communities)	WI	MUNI	2003	BPON, GPON	Data, Video, Voice			
Rio Blanco Broadband	Rio Blanco County	CO	PUBLIC-PRIVATE	2015		Data		Multiple (wholesale and retail)	Colorado Fiber Community
Roanoke Valley Broadband Authority (RVBA)	Roanoke, Salem, Botecourt County, Roanoke County	VA	MUNI	2015		Data	Businesses		
Rochelle Municipal Utilities	Rochelle	IL	MUNI		Active Ethernet	Business Services, Data	Businesses		
Rock County Broadband Alliance (Alliance Communications/Rock County)	Rock County	MN	PUBLIC-PRIVATE	2015		Data		Alliance Communications	Alliance Communications

NETWORK DEPLOYER	COMMUNITY(IES)	STATE(S)	MUNI OR PUBLIC-PRIVATE	DATE PROJECT STARTED	TECHNOLOGY	SERVICES	MARKETS SERVED BY FIBER (all premises unless otherwise noted)	SERVICE PROVIDER (if other than network owner)	OPERATOR (if other than network owner)
Rock Falls Electric Utilities	Rock Falls	IL	MUNI	2007		Data	Businesses	Essex Telcom	
Rockbridge Area Network Authority	Buena Vista, Lexington and Rockbridge County	VA	MUNI	2013		Data		Multiple	
Russellville Electric Plant Board	Russellville	KY	MUNI	2010	Active Ethernet, GPON	Data, Smart Grid, Video, Voice			
Sandersville FiberLink	Sandersville and surrounding area	GA	MUNI			Data			
SandyNet Fiber	Sandy	OR	MUNI	2011		Data, Voice			
Santa Monica City Net	Santa Monica	CA	MUNI	2004	Active Ethernet	Data	Businesses	Multiple	
Scottsboro Electric Power Board	Scottsboro	AL	MUNI		Active Ethernet	Data, Smart Grid	Businesses		
Sebewaing Light and Water Department	Sebewaing	MI	MUNI	2013	GPON	Data, Voice			
Selco (Shrewsbury Electric and Cable Operations)	Shrewsbury	MA	MUNI	1999	Active Ethernet, GPON	Data, Video, Voice			
Sherwood Broadband	Sherwood and nearby areas	OR	MUNI	2004		Data	Businesses	Multiple	

COS SYSTEMS

COS Service Zones

Know Where Your Customers Are Before You Build Your Networks.

Demand Aggregation

-The Complete Solution

- ✓ Divide your area into competing fiberhoods
- ✓ Survey the community
- ✓ Set fiberhood take-rate targets
- ✓ Sign up customers before build-out
- ✓ Build where take-rate targets are met
- ✓ Deploy incrementally based on ROI
- ✓ Real-time data from YOUR customers

www.cossystems.com
 800-562-1730

9% TAKE RATE
27% TAKE RATE
33% TAKE RATE
54% TAKE RATE

KPUD | **Nemont** | **GASIS** | **FIBERSPARK**
Cruzio Internet | **VUMA** | **SONIC** | **ideatek**

COMMUNITY BROADBAND

NETWORK DEPLOYER	COMMUNITY(IES)	STATE(S)	MUNI OR PUBLIC-PRIVATE	DATE PROJECT STARTED	TECHNOLOGY	SERVICES	MARKETS SERVED BY FIBER (all premises unless otherwise noted)	SERVICE PROVIDER (if other than network owner)	OPERATOR (if other than network owner)
Southwest Minnesota Broadband Services	Bingham Lake, Heron Lake, Lakefield, Jackson, Round Lake, Brewster, Okabena, Wilder	MN	MUNI	2010		Data, Video, Voice			Windom Telecommunications
Spanish Fork Community Network (SFCN)	Spanish Fork	UT	MUNI			Data, Video, Voice			
Spencer Municipal Utilities	Spencer	IA	MUNI	2007	GPON	Data, Video, Voice, Smart Grid			
SpringNet (City Utilities of Springfield)	Springfield	MO	MUNI	2000	Active Ethernet	Business Services, Data	Businesses		
Sun Prairie Utilities	Sun Prairie	WI	MUNI	1999	Active Ethernet	Data, Smart Grid	Businesses, MDUs, residential pilot project		INOC
Swiftel Communications (Brookings Municipal Utilities)	Brookings	SD	MUNI	2006	GPON	Data, Video, Voice			
Sylacauga Utilities Board	Sylacauga	AL	MUNI	1997	Active Ethernet	Data			
SyncSouth (SGRITA)	Baker, Calhoun, Early, Miller, Mitchell, Terrell, & Seminole Counties	GA	MUNI	2007		Data	Mainly businesses		
Taunton Municipal Lighting Plant	Taunton	MA	MUNI	2003	EPON	Data			
Town of Rockport/GWI	Rockport	ME	PUBLIC-PRIVATE	2014		Data, Voice			
UC2B (Urbana-Champaign Big Broadband)	Urbana-Champaign	IL	PUBLIC-PRIVATE	2010	Active Ethernet	Data, Video, Voice		iTV-3	iTV-3
UTOPIA	Consortium of 16 cities	UT	MUNI	2004	Active Ethernet	Data, Video, Voice		Multiple	
Velocity Broadband	Hudson	OH	MUNI	2015		Data	Businesses – pilot project		
Wadsworth CityLink	Wadsworth	OH	MUNI		Carrier Ethernet	Data	Businesses		
Waverly Utilities	Waverly	IA	MUNI	2016		Data, Video, Voice			
Whip City Fiber	Westfield	MA	MUNI	2015		Data	Businesses, residential pilot project		
Williamstown Cable & Broadband	Williamstown (serves Corinth and parts of Grant and County and Owen County)	KY	MUNI	2010		Data, Video	Fiber in network extension area only; Williamstown served by HFC		
Windomnet (Windom Telecommunications)	Windom	MN	MUNI	2004	GPON	Data, Video, Voice			
Wired Road (Blue Ridge Crossroads Economic Development Authority)	Galax, Carroll County, Grayson County	VA	MUNI	2009		Data		Multiple	WideOpen Networks
Zing (St. Joe Valley Metronet)	South Bend, Mishawaka, St. Joseph County	IN	PUBLIC-PRIVATE	2005		Business Services, Data, Security, Videoconferencing, Voice	Businesses	Multiple	