

117 Models for Community Broadband – and Counting

An increasing number of communities are taking charge of their broadband destinies to improve their quality of life and economic viability.

By Masha Zager ■ *Broadband Communities*

Over the last year, this magazine's count of public and public-private fiber-to-the-premises networks rose from 106 to 117 – an increase of 10 percent. The additions to the list include several new projects, a few older projects that were missed in earlier counts, and one network (iProvo) that was returned from private to public ownership.

Early-stage projects are continuing to move forward, and many already operating networks are expanding or adding new types of customers and services. In addition, a number of public broadband projects are being planned today and are likely to be added to the list in the next year.

Public entities build fiber networks to give their communities a competitive edge. However, there is no single model for public broadband – in fact, it would be more accurate to say there are 117 different models. Municipalities face a variety of legal and competitive landscapes, employ different financing methods, enter into many kinds of partnerships, operate their systems in diverse ways, deliver different sets of services to different types of customers, and bring varying resources and competencies to the task. Local differences far outweigh the simple fact of public ownership.

Although a number of municipal broadband projects have met with noisy opposition, including lawsuits and legislative action, the majority appear to be uncontroversial. Many are altogether under the radar, and others are sources of civic pride.

In many communities, publicly owned fiber-to-the-home networks are sources of civic pride as well as economic renewal.

WHO'S ON THE LIST?

All the network deployers on this list

- Are public entities, consortia of public entities, consortia of public and private entities or, in a few cases, private entities that benefited from significant investment or participation by local governments.
- Own all-fiber networks that connect local homes or businesses to the Internet (or are actively developing such networks).
- Make available – directly or through retailers – such services as voice, Internet access or video (or are planning such services).

Excluded are the many municipalities that provide broadband services exclusively for city facilities and schools, those that serve private entities only by leasing dark fiber and those that provide broadband services only over cable or wireless networks.

This list includes only organizations with functioning networks or with approved plans and funding. However,

plans do not always materialize; several projects well beyond the wishful-thinking stage that were reported on earlier versions of the list failed to survive. Others, although still in existence (and still on this list), are behind where they expected to be at this point. Some of these projects may never become operational.

Multiple-municipality projects are becoming more common. Such projects can achieve economies of scale in construction and operation and, by aggregating demand, can attract third-party service providers more easily.

UTOPIA, in Utah, is an example of an early FTTH network built by a consortium of cities. More recent projects are ECFiber in Vermont, SMBS in Minnesota (featured in this issue) and FastRoads in New Hampshire. Other examples include a number of county-wide networks as well as LENOWISCO, which includes three counties and a city in Virginia. Urbana-Champaign Big Broadband is a consortium initiated by the University of Illinois (a state agency)

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and includes the cities of Urbana and Champaign.

Even a network owned by a single town or city 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. The city of Williamstown, Ky., is using broadband stimulus funding to expand its community networks beyond city borders. (Its original network was hybrid fiber-coax, but it is using FTTH for its expansion.)

In Washington state, though each public utility district 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.

MUNICIPAL UTILITIES

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

- 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 public 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.
- Public power utilities already have the back-office systems, such as billing and customer service, that they need for providing telecom services.
- Public power utilities may need to install communications networks for smart-grid applications; once they begin planning these networks, they often realize the networks are suitable for purposes such as business or residential broadband. Municipal utilities that are Tennessee Valley Authority distributors have been in

Municipal utilities often begin building fiber networks to improve their own operations and then offer telecom services to residents.

the forefront of combining smart-grid and telecom applications.

In some cases, such as Wilson, N.C., 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, N.C., do not have municipal electric utilities.

WHO ARE THE CUSTOMERS?

A typical path for growing an FTTP network organically is to start by installing an institutional network to serve municipal office buildings or utility substations, then extend fiber to commercial buildings or business parks, begin residential deployment with MDUs and greenfield developments, and finally reach single-family households and small businesses. The list shows deployers at various points along this path.

Twenty-four of the municipal networks on the list deliver fiber-based services to businesses only, apparently with no immediate plans to extend fiber to the home. (Some also deliver residential broadband services via cable or wireless; most do not serve residences at all.) A few that began as business-only networks, such as Gainesville Regional Utilities in Florida, now serve MDU or greenfield developments as well.

Cedar Falls Utilities in Iowa, which originally served businesses with fiber and residences with hybrid fiber-coax, is now building out fiber to the home throughout its service area. However, some other municipal providers that once planned to follow a similar path, such as Ashland Fiber Network, have been stymied by lack of funding.

Most of these deployers are small to mid-sized cities or groups of cities outside major metropolitan areas – large enough to carry out complex undertakings but small enough to be poorly served by private carriers. The city of Cortez, Colo.,

whose story is told in this issue, has a population of 8,300 and currently has 36 businesses in its pilot FTTP project. The largest deployment appears to be by EPB of Chattanooga, which made fiber available to about 170,000 premises. Though bigger cities, such as San Francisco and Seattle, have considered municipal FTTH projects, they have not moved forward with their plans.

WHOLESALE OR RETAIL?

Municipalities are more likely than private deployers to allow third-party providers on their networks – either because state laws require them to do so, because they do not have the expertise to provide services themselves or because they want to offer a wider variety of services than they could provide on their own.

Thirty municipal networks, or about a quarter of the total, either allow or plan to allow multiple retail service providers to deliver services. Eleven others that do not have an open-access model have contracted with a single third-party service provider to deliver services.

Some municipal providers have both wholesale and retail strategies. For example, ECFiber was conceived as an open-access network but is offering retail services until the network grows large enough to attract other providers. Urbana-Champaign Big Broadband has a similar strategy.

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. UTOPIA, for example, took many years to attract a diverse and reliable group of providers.

OTHER PARTNERSHIPS

At least 10 municipal fiber systems contract with third parties – either local

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CENSUS OF PUBLIC AND PUBLIC/PRIVATE FTTH NETWORKS

Network Deployer	Community(ies) Served	State	Date Project Started	Vendors (FTTH Electronics)	Technology	Services	Markets Served by Fiber (all premises unless otherwise noted)	Service Provider (if not network owner)	Operator (if not network owner)
American Samoa Telecom	American Samoa		2008	Calix	GPON	Triple Play			
Anderson Municipal Light and Power	Anderson	IN	2009		Active Ethernet	Data	Businesses	Multiple	
Ashland Fiber Network	Ashland	OR	2000			Triple Play	Mainly businesses	Multiple	
Auburn Essential Services	Auburn	IN	2006	Aurora	EPON	Voice, Data, Smart Grid			
Barbourville Utility Commission	Barbourville	KY	2010	Calix	GPON	Data, Video			
Barnesville Municipal Utilities	Barnesville	MN	2009	Calix	GPON	Triple Play			
Bellevue Municipal Utilities	Bellevue	IA	2006	Aurora	EPON	Triple Play			
Benton County Public Utility District	Kennewick, Prosser and Benton City	WA				Business Services, Data	Businesses		
Blue Ridge Crossroads Economic Development Authority (Wired Road)	Carroll and Grayson Counties, City of Galax	VA	2009			Data	Mainly businesses	Multiple	
BlueAlbany	New Albany	OH	2010			Business Services, Data	Businesses	Bluemile	Bluemile
Bowling Green Municipal Utility	Bowling Green and Warren County	KY	2007	CTDI	EPON	Voice, Data	Businesses		
Braintree Electric Light Department	Braintree	MA	2008		Active Ethernet	Data	Businesses		
Bristol Tennessee Essential Services	Bristol	TN	2005	Alcatel-Lucent	GPON	Triple Play, Smart Grid			
Burbank Water and Power (One Burbank)	Burbank	CA	2010	MRV		Data, Business Services	Businesses		
Burlington Telecom	Burlington	VT	2006	Calix	GPON	Triple Play, Business Services			
BVU Authority	Bristol	VA	2003	Calix, Alcatel-Lucent	GPON	Triple Play, Business Services, Smart Grid			
Cass County	Cass County	MO	2010	Calix		Data, Voice		Multiple	
CC Communications	Churchill County	NV	2004	Aurora, Calix	EPON, Active Ethernet	Triple Play			
CDE Lightband	Clarksville	TN	2007	Ciena, Zhone Technologies	Active Ethernet	Voice, Data, Video, Smart Grid			
Cedar Falls Utilities	Cedar Falls	IA	2006	Motorola	Active Ethernet, GPON	Data			
Chelan County Public Utility District	Chelan County	WA	2004	Alcatel-Lucent	GPON	Triple Play		Multiple	
Chicopee Electric Light	Chicopee	MA				Data	Businesses		
City of Ammon	Ammon	ID	2011			Data		Multiple	
City of LaGrange	LaGrange	GA		Calix	GPON	Data, Voice, Business Services	Businesses		
City of Leesburg	Leesburg	FL	2001			Data	Businesses		
City of Powell	Powell	WY	2007	Calix	GPON	Triple Play		Tri County Telephone, open to others	
City of Sandy	Sandy	OR	2011						

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City of Williamstown	Corinth, parts of Grant and Owen Counties (Williamstown itself served by HFC)	KY	2010			Triple Play			
City of Wilson (Greenlight)	Wilson	NC	2008	Alcatel-Lucent	GPON	Triple Play			
City Utilities of Springfield (SpringNet)	Springfield	MO	2000		Active Ethernet	Business Services, Data	Businesses		
Clallam County Public Utility District	Clallam County	WA	2002	Cisco	Active Ethernet	Data		Multiple	
Coldwater Board of Public Utilities	Coldwater	MI	2010		EPON	Data	Businesses		
Community Telecom Services	Monticello and Wayne County	KY	2009			Triple Play			
Cortez Fiber Network	Cortez	CO	2011	Calix	GPON, Active Ethernet	Triple Play	Businesses	Multiple	
Crawfordsville Electric Light & Power (Accelplus)	Crawfordsville	IN	2006	Aurora	EPON	Video, Data			
Crosslake Telephone	Crosslake	MN	2005	Calix	GPON, Active Ethernet	Triple Play			
Dalton Utilities	Dalton	GA	2003	Alcatel-Lucent	GPON	Triple Play			
Douglas County Public Utility District	Douglas County	WA	1999	Telco Systems	Active Ethernet	Triple Play		Multiple	
Dover Technology	Dover	OH	2004	Hitachi		Triple Play	Businesses		
ECFiber	23 Vermont towns	VT	2010	Calix	GPON			Multiple	
EPB Fiber Optics	Chattanooga and surrounding areas	TN	2007	Aurora, Motorola, Alcatel-Lucent	EPON, GPON	Triple Play, Smart Grid			
Farmers Mutual Telephone/Lac Qui Parle County	Parts of Lac Qui Parle County	MN	2010	Calix	GPON	Triple Play	Farmers Mutual Telephone	Farmers Mutual Telephone	
FastRoads	NH Community Development Finance Authority, Monadnock Economic Development Corporation, 42 towns	NH	2011	Calix				Multiple	
FiberNet Monticello	Monticello	MN	2008	Calix	GPON	Triple Play			
Fibrant Communications	Salisbury	NC	2008	Zhone Technologies		Triple Play			
Fort Pierce Utilities (FPUAnet Communications)	Fort Pierce	FL		Cisco	Active Ethernet	Data	Businesses		
Frankfort Plant Board	Frankfort	KY	2009	CommScope	RFoG	Triple Play			
Franklin County Public Utility District	Franklin County	WA			Active Ethernet	Data, Business Services	Businesses	Multiple	
Gahanna Net	Gahanna	OH	2010			Data	Businesses	Bluemile	Bluemile
Gainesville Regional Utilities	Gainesville	FL	2001	Cisco	Active Ethernet	Data	Businesses, MDUs, greenfield developments		

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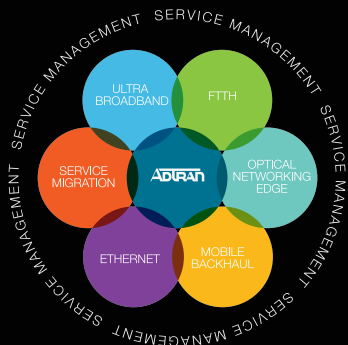
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Glenwood Springs Community Broadband Network	Glenwood Springs	CO	2002	Calix	GPON	Data, Voice		Multiple for residential services	
Goshen Fiber Network	Goshen (city and school district)	IN	2008			Triple Play	Businesses	Multiple	New Paris Telephone
Grant County Public Utility District	Grant County	WA	2000	Multiple	Active Ethernet	Triple Play		Multiple	
Grays Harbor County Public Utility District	Grays Harbor County	WA	1998			Data		Multiple	
Greenlight Communications	Dunnellon	FL	2010	Zhone Technologies	GPON	Triple Play			
Harlan Municipal Utilities	Harlan	IA	2010	Calix	GPON	Data	Businesses		
HES EnergyNet	Hopkinsville	KY				Data	Businesses		
Highland Communication Services	Highland	IL	2010	Calix	GPON	Triple Play			
Holland Board of Public Works	Holland	MI				Data	Businesses	Multiple	
Holyoke Gas & Electric Department	Holyoke	MA	1997			Data, Videoconferencing, Voice	Businesses, some MDUs		
Hometown Utilicom	Kutztown	PA	2002	Calix	BPON, GPON	Voice, Data, Video, Smart Grid		D&E Communications	
Idaho Falls Power (Circa)	Idaho Falls	ID	2007		Active Ethernet	Voice, Data	Businesses	Multiple	
Indianola Municipal Utilities	Indianola	IA	2012	Calix	Active Ethernet	Triple Play		Mahaska Communication Group	Mahaska Communication Group
iProvo	Provo	UT	2005	Telco Systems	Active Ethernet	Triple Play, Gaming		Veracity Networks	Veracity Networks
Jackson Energy Authority (EPlus Broadband)	Jackson and part of Madison County	TN	2004	Aurora	EPON	Triple Play, Smart Grid			
Kitsap County Public Utility District	Kitsap County	WA	2000		Active Ethernet	Data	Businesses	Multiple	
KPU Telecommunications	Ketchikan	AK	2007	Aurora, Zhone Technologies, ADTRAN	Active Ethernet, GPON	Triple Play			
Lake County	Lake County, part of Saint Louis County	MN	2010			Triple Play			
LENOWISCO Planning District Commission	Lee, Wise and Scott Counties, city of Norton	VA, KY	2004	Ciena	Active Ethernet	Data		Clariti Media	Sunset Digital
Lenox Municipal Utilities	Lenox	IA	2008	Calix	PON	Triple Play		Farmers Mutual Telephone	
liNKCity	North Kansas City	MO	2007	Ciena, Calix	Active Ethernet	Data			
Lit San Leandro	San Leandro	CA	2012	ADVA Optical Networks			Businesses, MDUs	Multiple	CrossLink Networks
Loma Linda Connected Communities Program	Loma Linda	CA	2005	Allied Telesis	Active Ethernet	Triple Play	New housing developments (developers install FTTH and turn network over to city)	Multiple	
LUS Fiber	Lafayette	LA	2007	Alcatel-Lucent	GPON	Triple Play, Smart Grid			



The only constant is change.

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Marshall Municipal Utilities	Marshall	MO	2005			Data, Smart Grid			
Martinsville Information Network (MINet)	Martinsville	VA	2009			Business Services, Data, Voice	Businesses		
Mason County Public Utility District	Mason County	WA	2000	Telco Systems, Ciena	Active Ethernet	Voice, Data		Multiple	
MI-Connection	Mooreville, Davidson and Cornelius	NC	2009	Calix	GPON	Triple Play			
MINET	Monmouth and Independence	OR	2007	Alcatel-Lucent	BPON	Triple Play			
Morristown Utility Systems (MUS FiberNet)	Morristown	TN	2006	Alcatel-Lucent	GPON	Triple Play, Smart Grid			
Murray Electric System	Murray	KY	2000		Active Ethernet	Triple Play	Businesses		
nDanville	Danville	VA	2007	PacketFront, Calix	Active Ethernet, GPON	Triple Play, Business Services, Security		Multiple	
NetQuincy	Quincy and surrounding areas	FL	2003	Alcatel-Lucent	BPON	Triple Play			
Norwood Light Broadband	Norwood	MA				Voice, Data	Businesses		
Ocala Utility Services	Ocala	FL			Active Ethernet	Business Services, Data	Businesses		
Okanogan County Public Utility District	Okanogan County	WA	2002		Active Ethernet			Multiple	
Opelika Light and Power	Opelika	AL	2010	Alcatel-Lucent	GPON	Triple Play, Smart Grid			
Orangeburg County	Nine communities in Orangeburg County	SC	2010			Data, Voice			
Pacific County Public Utility District	Pacific County	WA	2000			Data			
Paducah Power System (PPS FiberNet)	Paducah, McCracken County	KY	2004	Alcatel-Lucent, Allied Telesis	BPON, Active Ethernet	Triple Play, Security	Businesses	Multiple	
Palm Coast FiberNET	Palm Coast	FL	2009	Cisco	Active Ethernet	Data, Voice, Business Services	Businesses	Multiple	
Pend Oreille County Public Utility District	Pend Oreille County	WA	2001	Cisco	Active Ethernet	Triple Play, Business Services		Multiple	
Philippi Communications System	Philippi	WV	2005	Motorola	BPON	Data, Video			
Pulaski Electric System	Pulaski	TN	2007	Aurora	EPON	Triple Play, Smart Grid			
Reedsburg Utility Commission	Reedsburg	WI	2003	Calix	BPON, GPON	Triple Play			
Rochelle Municipal Utilities	Rochelle	IL		Zhone Technologies	Active Ethernet	Business Services, Data	Businesses		
Russelville Electric Plant Board	Russelville	KY	2010	Calix	GPON, Active Ethernet	Triple Play, Smart Grid			
Sallisaw Municipal Authority	Sallisaw	OK	2004	Aurora	EPON	Triple Play			
Sandersville FiberLink	Sandersville and surrounding area	GA				Data			
Santa Monica City Net	Santa Monica	CA	2004	MRV	Fiber to the Building, Active Ethernet	Data	Businesses	Multiple	

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Scottsboro Electric Power Board	Scottsboro	AL			Active Ethernet	Data, Smart Grid	Businesses		
Shawano Municipal Utilities	Shawano	WI	2008	Tellabs	GPON	Triple Play			
Sherwood Broadband	Sherwood	OR	2004			Data	Businesses	Multiple	
Southwest Minnesota Broadband Services	Bingham Lake, Heron Lake, Lakefield, Jackson, Round Lake, Brewster, Okabena, Wilder	MN	2010	Calix				Windom Telecommunications	
Spencer Municipal Utilities	Spencer	IA	2007	Calix	GPON	Triple Play, Smart Grid			
St. Joe Valley Metronet (Zing)	South Bend	IN	2005			Data, Business Services, Voice, Security, Videoconferencing	Businesses, MDUs, Institutions	Multiple	
Sun Prairie Water & Light Telecom	Sun Prairie	WI	1999	Ciena	Active Ethernet	Data, Smart Grid	Businesses		INOC
Swiftel Communications (Brookings Municipal Utilities)	Brookings	SD	2006	Calix	GPON	Triple Play			
Sylacauga Utilities Board	Sylacauga	AL	1997	Alcatel-Lucent	Active Ethernet	Data			
Taunton Municipal Lighting Plant	Taunton	MA	2003	Aurora	EPON	Data			
Thames Valley Communications	Groton	CT	2002			Data	Businesses		
Tifton CityNet	Tifton	GA	2007	CTDI	RFoG	Triple Play			
Tullahoma Utilities Board	Tullahoma	TN	2007	Aurora	GPON	Triple Play			
UC2B (Urbana-Champaign Big Broadband)	Urbana, Champaign and University of Illinois	IL	2010	ADTRAN	Active Ethernet	Triple Play			
UTOPIA	16 cities	UT	2004	Allied Telesis, Alcatel-Lucent	Active Ethernet	Triple Play		Multiple	
Vernon City Utilities	Vernon	CA	1999			Data	Businesses		
Windom Telecommunications	Windom	MN	2004	Calix	GPON	Triple Play			

exchange carriers or managed-service providers – to operate their networks. Such partnerships (which also exist in the private sector; Sprint’s cell service is managed by Ericsson) can be helpful for municipalities that have no experience operating telecommunications networks. On the other hand, as with any critical outsourcing contracts, they must be intensively managed. Several such arrangements have ended abruptly or even resulted in lawsuits. Just before this issue went to press, Hiawatha Broadband Networks, a highly experienced CLEC

that has managed FiberNet Monticello since startup, announced its intention to terminate its contract early.

Some municipalities have formed agreements with real estate developers, either to allow municipal providers to build fiber in new buildings or developments or to provide fiber backbone and services if developers build the local access infrastructure.

New partnership models continue to be developed all the time. This issue features two new deployers with unusual partnership arrangements: **Southwest**

Minnesota Broadband Services, a coalition of eight towns, purchases wholesale broadband services from a nearby municipal provider, WindomNet – an arrangement that benefits both parties – and **San Leandro Dark Fiber**, a privately owned company, trades fiber strands for the use of San Leandro city-owned conduit and involves the city (as well as several other public and private entities) in a complex web of reciprocal arrangements.

Finally, some networks, including St. Joe Valley Metronet and Urbana-Champaign Big Broadband, were de-

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veloped as partnerships among multiple anchor institutions, such as educational, health care and community service organizations.

VENDORS AND TECHNOLOGIES

Because of open-access requirements and the importance of business customers, active Ethernet networks are slightly more prevalent among municipalities than among private network builders. (Supporting open access is easier on point-to-point than on PON systems – or at least it was until recently.) At least one-third of municipal deployers use active Ethernet technology.

Several electronics vendors have sizable shares of this market, with no single vendor taking a leading position. Alcatel-Lucent, Calix, Aurora (which acquired the Wave7/Enablence portfolio) and Ciena each have several deployments and at least one sizable system, and a number of other vendors have also had significant customer wins.

GEOGRAPHIC DISTRIBUTION

Laws governing municipalities' ability to compete as telecommunications providers vary from state to state. Some states give municipalities a free hand, and others do not. (The National Broadband Plan calls for greater encouragement of public broadband deployers, and Blair Levin, the architect of the plan, recently said it was a "tragedy that the

FCC didn't preempt state anti-municipal broadband laws.")

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 for municipal broadband are wildly uneven in different parts of the United States.

This census identified community fiber systems in only 34 of the 50 states and in American Samoa. Five states account for nearly half the deployments: Washington (12), Kentucky (9), Florida (7), Tennessee (7), Minnesota (7) and Iowa (6).

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.

Finally, a few open-access networks are actively recruiting many different kinds of services. For example, on 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. If this strategy succeeds, more municipal networks – at least larger networks – may follow suit. Conceivably, more municipalities could try expanding their networks or partnering with other municipal networks, as has happened in Europe, to achieve the scale necessary to attract providers of innovative services.

IS MUNICIPAL BROADBAND VIABLE?

Municipal broadband is not for the faint of heart. Political opposition derails many network plans, and even municipalities that prevail in the legislative or judicial arena often spend so much time and money on their legal battles that their business plans are adversely affected.

Politics is only one of many challenges. Developing a competitive service offering is not simple, and neither is operating, maintaining and upgrading a network. Attracting third-party service providers is difficult. The time required to see any return on investment may be discouragingly long, and many networks have had cash-flow problems.

Many municipalities embark on broadband projects to boost economic development, but the mere existence of fiber infrastructure does not create jobs. A fiber optic network is only one aspect of a well-thought-out economic development program; it cannot compensate for other drawbacks. Furthermore, economic development agencies must work closely with agencies responsible for building and operating networks to market broadband services.

Municipalities that have launched broadband projects without adequate planning or financing have been disappointed; some have lost money for taxpayers. The good news is that municipalities continue to create successful networks that deliver significant benefits to their communities. Several of them are profiled in this issue and in past issues of **BROADBAND COMMUNITIES**. Plenty of good role models exist for other communities that are considering following in their footsteps. ♦

MAP OF MUNICIPAL FTTP SYSTEMS IN THE UNITED STATES

