

# The Art of the Possible

Communities trying to acquire high-speed networks have a variety of options for owning and operating such networks. Though there are trade-offs among the options, many have proven successful.

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*Editor's note: This article was adapted from a report published by the New America Foundation. The complete report is available at [http://oti.newamerica.net/publications/policy/the\\_art\\_of\\_the\\_possible\\_an\\_overview\\_of\\_public\\_broadband\\_options](http://oti.newamerica.net/publications/policy/the_art_of_the_possible_an_overview_of_public_broadband_options)*

**A** community should consider three issues when considering a public broadband project:

- 1 Control: who owns the network and decides how it operates?
- 2 Risk: how do the costs associated with developing and running the network balance against the revenue it generates?
- 3 Reward: what benefits are achieved through successful implementation of the project?

Achieving the desired level of control, minimum risk and maximum reward is difficult. Officials should consider carefully which components of these three items are important and be prepared to make sacrifices where appropriate.

A community may or may not wish to control an entire network or even parts of a network. In some instances, it is beneficial for a municipality, county, or tribal government to become a service provider itself and to sell services over the infrastructure it has built. In other cases, a community has no interest in this level of control as long as it can guarantee that a private partner is meeting certain goals for the project, such as affordability, level of service or service to a specific constituency.

Achieving these goals does not necessarily require a local government to control or provide the service. However, ensuring sufficient accountability for private partners will require developing a strong governance model. A locality seeking partners should therefore figure out the specific goals of the project, determine what kinds of control or accountability measures these goals require and evaluate local risk tolerance. This analysis will help a community decide which ownership and governance models are most suited for a project.

Some communities have no tolerance for financial risk; others can afford to spend significant resources for a potential long-term payoff. If a community has a significant financial stake in a network, it will likely need strong assurances that it will be able to break even on the investment, that the network will pay for itself over time or, at minimum, that it will service debt from bonds or other financial instruments.

Nonfinancial risks also exist, including the risk of falling short of stated goals. A local government can reduce financial risk with a good private partner, but, without the right arrangement, there can be a high risk of failing to achieve the goals that led the community

to pursue a broadband project in the first place. Achieving community-driven goals such as open access, increased competition, affordable pricing, universal service, economic development and service to public institutions may not be realistic without taking a financial risk.

Communities should seriously consider that doing nothing is also a risk. Entering into a costly infrastructure project with or without private partners is certainly a risk but so is the prospect of citizens' and businesses' lacking sufficient access to high-speed Internet and the associated benefits it provides.

The most common measurement of success is financial. However, with due consideration to financial goals and constraints, communities can measure success based on other benefits, such as spurring economic development or improving educational and health care outcomes. After all, building a network that prioritizes these aspirations is often among the reasons for public sector involvement in broadband planning and provisioning. Yet these types of rewards for a community are not specifically reflected in the financial statements of the community broadband enterprise. It would be unusual for a municipality, county or tribe to enter the broadband market simply to generate income like a private company. Other community benefits can be more difficult to evaluate than revenues and profits, but they should not be ignored.

### **PUBLIC OWNERSHIP**

In a public ownership model, a local government takes the lead in building and operating a broadband network. Generally speaking, publicly led projects use bond financing to pay for capital construction costs and revenue from subscribers or private providers' leases to pay for operational costs.

As a result of taking on much of the financial risk, these communities enjoy high levels of control over their projects. Local governments design the networks, determine service offerings and prices, operate the networks and control future decisions, including when to expand networks or upgrade services.

## **Building a community network through a municipal electric utility is one way to mitigate risk while retaining significant community control over the network.**

**Municipal electric utility.** In some of the most successful community broadband networks, a locally owned municipal electric utility plays a central role. The networks in Chattanooga, Tenn., and Lafayette, La., are examples of this situation. Bristol Virginia Utilities (BVU) was among the nation's first municipal utilities to build a fiber-to-the-premises (FTTP) network to serve residents, local businesses and community institutions such as schools and libraries. BVU OptiNet, like many other networks built and operated by municipal electric utilities, offers a full suite of retail services – including broadband, cable television and telephone – directly to the public.

Part of the reason for the success of municipal electric utilities in deploying broadband services is that utilities already have experience in managing infrastructure. They own repair trucks and employ field engineers who can perform installations and conduct maintenance. Utilities also have experience with customer service, managing individual accounts and staffing call centers to handle questions or complaints. With a local electric utility as a partner, a network automatically has an important anchor tenant. Finally, utilities have established institutional structures to provide for local oversight. Public utilities have boards of directors to guide their activities as well as mechanisms for oversight by a city council or other governing body. As local supervision is a natural component of public utilities, community control and input are likely to be built into the network.

**City department.** Not every community has a locally owned electric utility to serve as the lead for its project. A network can be operated as

a division of local government, perhaps within an information technology (IT) department, instead of as a branch of a power utility. Local utilities provide significant resources and experience that help lessen some of the financial and operational risks associated with broadband projects, and communities that wish to proceed without the possibility of a utility as a partner will have to address these risks in a different way.

For example, communities may choose to build out networks slowly over time or choose not to issue large, project-specific bonds. They may focus on serving the connectivity needs of local government and community anchor institutions before considering a full FTTP network to serve residents.

Santa Monica City Net in Santa Monica, Calif., is an example of a successful community network operated by a municipality through an IT department. Santa Monica chose to implement a community network in a cautious manner. Buildout occurred gradually, focusing first on serving communications needs of the local government and community anchor institutions such as libraries and a local university. The network expanded over time by following a local "dig once" strategy, a process that took advantage of planned construction to install fiber when road maintenance occurred. The city further leveraged its fiber network to support local businesses by working with commercial building owners and property managers to cover the up-front costs of buildout to those locations.

Santa Monica City Net now offers up to 10 Gbps broadband service to at least 19 commercial buildings. Businesses in these buildings can choose services, including IP transit,

## Some cities choose to share the risks, rewards and control over a broadband network with private partners, whether those are for-profit companies, nonprofits or individuals.

virtual private networks and cloud services, from more than 160 Internet service providers, all of which are interconnected to the Santa Monica network Internet exchange point in Los Angeles.

Another example is Farmington, a city in northwestern New Mexico. The city already has about 80 miles of fiber in its possession. Currently, the municipality's electric utility, the Farmington Electric Utility System, is the only user of this fiber, but the city is exploring expanding the use of the fiber to provide service to residents and businesses. After studying possible business models, the city determined that leasing the municipally owned fiber to existing ISPs is the best option.

The resulting partnership model is public ownership and private operation, which allows the city to offer use of the fiber at a low cost while guaranteeing an open-access network to private providers. The city stands to benefit financially both from leasing the fiber and from the economic development benefits of better broadband service.

Leverett, a small town in rural western Massachusetts, is in the process of building its own FTTP network. Leverett received a support grant from the Massachusetts Broadband Institute to do initial feasibility planning for a local broadband network. When asked whether the town should move forward with the proposal, voters overwhelmingly supported a referendum to request bond funding financed by an increase in property taxes to pay for the network.

Leverett then issued a request for proposals for network design and construction and selected a vendor. The network is currently under

construction, and the town's goal is to complete the network and begin providing service by the end of 2014.

### **PUBLIC-PRIVATE PARTNERSHIP**

In some sense, every infrastructure project involves both public and private participation. In traditional business models used by incumbent providers, infrastructure must be built in public rights-of-way and often on publicly owned or regulated utility poles. In public ownership models, private entities are hired to build, operate or maintain the network (or some combination of the three). Therefore, even when infrastructure is owned, operated and maintained by a public entity, the private sector will play some role and will benefit from the public investment.

However, not every community has to finance or operate a local broadband network on its own. In some cases, it makes sense to share the risks, rewards and control of the project across several parties. Partners can include private for-profit companies, local nonprofits and even local residents. The variety of public-private partnership models reflects the diversity of interests, goals and resources among communities.

In some cases, the locality plays only a limited role in the partnership and may only provide access to rights-of-way or other city infrastructure, such as light poles or local government buildings. In other cases, a local government may agree to become an anchor tenant and pay for service on the network for an extended period, providing business case stability for the network project partner. In more extensive partnerships, the locality can play a larger role, such as paying for

part or all of the network construction and leaving the operation of the network to the project partner.

When public and private partners share the capital or operational costs of a local network, the public entity is in a better position to drive its policy goals, and the private partner is able to address its business goals. Sharing the risks and benefits allows communities to pursue projects that might otherwise be unattainable. For a local jurisdiction to conduct a costly buildout to unserved areas can be a formidable challenge, and the same can be true for private providers; a public-private partnership can help control costs for all parties. Public-private partnership models for broadband are relatively new and are in a constant state of change, largely driven by the business needs and interests of companies that are willing to partner with local communities.

For that reason, communities should approach them with a certain amount of caution and apply a critical lens to partnership models as well as to claims that any financial or other risks to the community can be removed entirely.

The most talked about example of a public-private partnership is the Google Fiber project in the Kansas City area. After a public search and application process, Google chose Kansas City, Kan., and Kansas City, Mo., as partners for a public-private broadband project because of their commitment to facilitate access to local infrastructure and rights-of-way. Kansas City, Mo., also committed to waive local permitting fees and even provided Google with dedicated city staff to support the project. Some commenters point out that these terms amount to public subsidies for Google Fiber.

In return, Google agreed to build and operate the network and provide Internet access service with 1 Gbps speeds. Google Fiber will not serve all households in the Kansas City metropolitan area; Google will build only in neighborhoods (called "fiberhoods") where enough residents (between 5 and 25 percent of households, depending on the estimated cost of construction in the

fiberhood) preregister for service. At the end of the registration period in the Kansas City area, 90 percent of neighborhoods qualified. Google has indicated a willingness to offer fiberhoods another opportunity to qualify for service but only recently provided details for such a process.

An emerging, smaller-scale example of a public-private partnership for a local broadband network is Westminster, Md. In 2013, the Westminster City Council voted to fund two FTTP pilot projects, one in a business area and the other in a large residential senior community. The city is building fiber optics to all premises in the pilot areas and is in the process of seeking private providers who are interested in selling competing services to residents and businesses over that fiber. The council left open the possibility of expanding the network to other areas of the city at a later point.

Westminster and Kansas City are both examples of a municipal partner that facilitates access to local infrastructure in return for varying levels of commitment from private partners to build a fiber network and/or offer next-generation broadband service. This approach reflects the reality that municipalities and other local governments control local rights-of-way and conduit and private firms have more experience providing telecommunications services to customers.

In the Kansas City model, local governments do not commit funds to build networks; as a result, they face limited financial risks associated primarily with transaction costs and forgone revenues. However, it is important to note the relative uniqueness of Google Fiber's projects in Kansas City and other locations. In many examples, despite favorable rights-of-way policies, most incumbent broadband providers have not been willing to provide levels of service on par with Google's commitments. In contrast, by owning the fiber itself, Westminster is able to ensure that fiber-based services are extended to all areas it selects.

## By limiting their risk, municipal governments in the Kansas City area ceded control over broadband deployment to Google, which makes all operational decisions.

There is another trade-off: In the Kansas City-area arrangement, the communities ceded control over the projects to their partners. Google leads the projects and makes all current and future operational decisions. Local leaders cannot determine how the network is designed, which services are offered or what customers are charged. Nor do they control whether the network will be built out to all residents, whether it will be upgraded in the future or even whether it will operate at all over the long term. Those decisions ultimately will rest with the private partner.

In contrast, Westminster took more financial risk but secured more control over the network. The community determined that it can better ensure meeting its goals by funding part of the infrastructure.

In a related model, a community can provide an alternative form of funding by agreeing to provide a private operator with a steady revenue stream through a long-term agreement to use the network. A local government could agree to share some portion of capital or operating costs with a private partner to incent the private partner to offer next-generation service. It is up to the community to negotiate any service-level requirements or other conditions on the local investment. This type of partnership makes sense in communities in which the subsidy for a private provider is relatively modest compared with the economic benefits for small businesses, institutions or residents.

### COOPERATIVE MODEL

In many rural parts of the country, electric cooperatives provide electricity. Several of these member-owned organizations can trace their histories

to the push for rural electrification in the 1930s. At that time, the newly formed cooperatives received targeted loans and technical support from the federal government to build out electric transmission lines to unserved areas. Some communities also formed cooperatives to operate local telephone networks.

Today, some cooperative electric utilities and cooperative phone companies are constructing broadband networks within their existing service areas. Similar to municipally owned electric utilities, cooperative utilities are in many ways natural partners for public broadband projects. Working with a co-op enables benefits such as access to utility poles, existing maintenance crews and experience with customer support. Many of the cooperatives building these broadband networks have received, or are eligible for, federal loan and grant support from programs targeted to broadband deployment and other rural development initiatives.

Kit Carson Electric Cooperative, a cooperative electric utility in New Mexico that serves nearly 30,000 members, applied for and received \$63.7 million in combined grant and loan funding from the USDA Broadband Initiative Program to build a 2,400-mile FTTP network. Prior to receiving the funding, Kit Carson offered dial-up and limited DSL service to its members. The fiber project will connect thousands of households as well as businesses and nearly 200 community anchor institutions located in the cooperative's service area.

Co-Mo Electric Cooperative is a 25,000-member cooperative utility located in central Missouri. Co-Mo attempted to secure federal funding for a FTTP network but was denied on

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several occasions. However, through door-to-door outreach and member-to-member conversations, 25 percent of existing electrical customers agreed to purchase broadband services, enough to justify building an FTTP network with its own funds. Co-Mo is constructing the network in a phased deployment over the next few years with a goal of expanding the network throughout its entire electricity service area. In December 2013, the cooperative announced a series of speed increases on its broadband service tiers, including upgrading its top speed offering to 1 gigabit per second.

There are currently only a few viable examples of cooperatives formed specifically for broadband service (rather than phone or electric service), and most depend upon local governments rather than individual subscribers for support. East Central Vermont Community Fiber Network (ECFiber) is a cooperative project among 24 towns in rural Vermont to build an FTTP network in their communities. ECFiber is organized with an interlocal contract according to Vermont law, under which municipalities can contract with one another to provide services; the cooperative governing board consists of delegates appointed by the select board or city council in each of the member towns. ECFiber contracts with ValleyNet, a local nonprofit that has extensive experience bringing Internet connectivity to residents and businesses in the region, to operate the network.

Another example is WiredWest, a project among towns in western Massachusetts to build and operate a regional FTTP broadband network. WiredWest is an intermunicipal

cooperative according to state law, which will allow it to issue municipal bonds. Founded in 2011 by 22 member communities, the project now boasts 42 municipalities. Each municipality that joins WiredWest has a representative on the cooperative's board of directors, and the project is led by an executive committee elected from existing board members. WiredWest plans to build a last-mile fiber network by capitalizing on improved access to middle-mile fiber thanks to the MassBroadband 123 project, a middle-mile network in western Massachusetts that received state funding and federal support from the Broadband Technology Opportunities Program.

The cooperative received a network planning grant from the Massachusetts Broadband Institute and is supported by membership dues, donations and in-kind staffing contributions from volunteers. Like other cooperative broadband projects, WiredWest has also been collecting presubscription pledges for service from area residents and businesses to prove market demand and bolster the project's business planning.

## BUSINESS MODELS

A community should perform a robust feasibility analysis to demonstrate that a business case exists and that social and economic goals will be realized through a particular business model. All such projects and business models entail financial and other risks for the community at the same time that they enable enormous direct and indirect benefits.

**Retail Service.** In this model, a local government builds an FTTP infrastructure and offers retail phone, video and Internet services to businesses

and residences. In terms of direct financial factors, a "pure" retail FTTP network operated by a community entails more significant risks than other business models because of the size of the up-front capital commitment necessary and the ongoing operating costs to run the network.

In this business model, the locality may also be an overbuilder, providing services in competition with existing phone and/or cable incumbents. Although the potential exists for the community to obtain sufficient market penetration and cash flow to sustain its network, this can be a significant challenge, particularly when well-resourced incumbent providers can aggressively market or discount services in response to the entry of a public provider.

**Open Access.** In this model, the local government builds, owns and maintains fiber optics all the way to homes and businesses. Rather than becoming a provider serving the public, however, it leases access to private providers who then offer services directly to the public. Under an open-access model, a community can operate and maintain the fiber and the transport electronics, or it can contract these tasks out to a private-sector partner. Private providers then lease access to the infrastructure, which they use to deliver phone, video and Internet services.

Thus a wholesale or open-access model separates the infrastructure from the retail service. In this way, a community can address the high cost of market entry for providers and facilitate the ability of multiple providers to serve residents and businesses over the same infrastructure. The result is the potential for new competition.

The business model involves significant risk with respect to recovery of project costs through network revenues. A number of factors outside the control of the local government, including the interest of retail providers in offering services over the network and the retail providers' marketing success, have the potential to reduce revenues below break-even cash flow needs.

**Institutional/Middle-Mile Model.** In this model, a local government builds a network focused on connecting government and community anchor institutions, including government agencies, schools, libraries and hospitals. It can also lease out excess capacity to private providers that offer services to the public.

This model requires a smaller capital investment than does more extensive FTTP deployment. Experience suggests that a community with an institutional network can realize a modest revenue stream by leasing parts of the network and at the same time reduce its own cost of purchasing communications services from private providers. This model requires less involvement in operations than does a retail model because it does not require a local government to go into the business of providing communications services.

Though this model has the potential to benefit some business customers, it is unlikely to address the needs of most residents and small businesses. The model offers some incentives for a private provider to construct its own infrastructure, but this may not be enough to attract private sector investment in a communitywide FTTP network because it lowers the cost of outside-plant construction by only a few percent.

The following local governments, school districts, or other anchor institutions were able to realize substantial cost savings by shifting their broadband services from private providers to local options.

- Santa Monica, Calif., operates its institutional network in conjunction with the school district and a local college. By self-provisioning their bandwidth needs instead of purchasing commercial services, within a few years of operation the three local partners were saving a combined \$500,000 annually on their telecommunications service budgets.
- Martin County, Fla., operates an institutional network with several local partners. The school district in Martin County saves more than \$82,000 annually by purchasing

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services from this local network rather than from commercial entities. Once the school district's share of capital investment payments for the local fiber network is completed in 2017, the annual IT budget savings is expected to grow to \$340,000 annually. In addition to enabling substantial savings, the local network provides the school system with superior networking speeds of 1 Gbps.

- Martinsville, Va., saves approximately \$140,000 on telephone services alone by self-provisioning services over the local fiber network rather than leasing from a private provider.
- The City of Greenacres, Fla., saves more than \$24,000 a year while increasing bandwidth capacity sixfold by switching service from a commercial provider to a locally owned county fiber network.
- Highland Public School system in Medina County, Ohio, saves \$82,000 a year after switching broadband service to a local municipal network.
- In Royal Oak, Mich., a suburb of Detroit, the municipal government and school district are partnering on the construction of a local fiber network to serve their sites. The school district estimates that self-provisioning its broadband will save it more than \$114,000 annually.

**Infrastructure Participation.** Most local governments own assets in key locations that could reduce FTTP deployment costs for private providers. Construction costs could be reduced through use of such assets as fiber optics, communications conduit and facilities. In this model, the public sector makes selected assets available for

lease to a private sector entity, enabling the private entity to more efficiently and expeditiously build and operate a network. Extending fiber into business parks and selected neighborhoods could provide some attraction to a private sector investor or operator.

This model seeks to encourage private investment. However, to attract an investment, public financing guarantees may be required, entailing public risk with limited control.

As government leaders evaluate their options, it is important that they focus on developing the most appropriate network model to meet the goals of the community while accounting for fiscal realities and associated risks. There is no one-size-fits-all approach. A government can utilize any number of different permutations for a public project that offer different benefits and trade-offs. Taking the time to perform the proper due diligence on any broadband project is critical to developing a successful, sustainable and scalable project. ❖

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