

Successful Strategies for Broadband Public-Private Partnerships

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Executive Summary

The transition from last generation basic broadband networks to next-generation fiber-optic networks is underway. The rise of municipal gigabit networks, Google Fiber cities, and many small entrepreneurial firms offering fast, low cost Internet access has forced major incumbents like AT&T and CenturyLink to upgrade their networks in a small number of cities.

But most Americans continue to only have one option for high-speed Internet access, according to the Federal Communications Commission, often a cable network with limited upload speeds. Smart cities are realizing they need to act or risk being left behind. However, many do not want to embrace the purely municipal model, where the city would engage in direct competition with existing providers.

One way for those communities to move forward is with a public-private partnership (PPP). But for all the excitement around this model, there are few concrete examples from which to draw lessons.

This paper explores lessons from PPPs and offers in-depth case studies of three high profile models: Westminster and Ting in Maryland, UC2B and iTV-3/CountryWide in Illinois, and LeverettNet in Massachusetts.

Westminster is building a citywide fiber network and leasing it to Ting, a relative newcomer to wired networks. Ting will operate the network and has an initial period of exclusivity, after which it will continue to be an ISP but also operate the network on an open access basis. Westminster owns the network, ensuring it will continue to meet local needs.

The Illinois cities of Urbana and Champaign built a core network called UC2B and leased it to a local

provider iTV-3 to expand it citywide. But one year later a company named CountryWide announced it was buying iTV-3. Urbana and Champaign had written a right of first refusal into the contract with iTV-3, which gave them some leverage in the transition even though they decided not to use it.

Leverett had similar concerns as Westminster and UC2B regarding the challenges of operating a municipal network but used a series of bids and contracts to maintain local control while leaving key responsibilities to the private sector. The city sets the prices and has achieved a stunning 80 percent take rate.

Each of these approaches offers important lessons from how to set community expectations, define goals, negotiate with partners, and address common challenges. This paper identifies the key elements that allowed the communities to achieve their policy goals, from universal access to requiring that ISPs have humans answering the phone rather than automated systems.

A key lesson from the paper is that PPPs are increasingly viable but are not a panacea, which is why we discuss some failed PPPs. Partnerships can introduce additional risks while minimizing others.

Communities engaging in a PPP should retain some agency for future decision-making. Westminster, Leverett, Santa Cruz, and others own part of the network to retain that control. They have each spent tremendous effort educating the community and demonstrating support.

Finally, any PPP has risks and communities should be extremely wary of any potential partner that claims there are no risks with their preferred approach. ■



Introduction

For many years, communities could be divided into “digital haves” and “have nots” by whether or not they had “broadband” — generally defined as an always-on Internet connection with greater capacity than dial-up. However, as cable and DSL networks expanded to cover most urban communities with “broadband,” a new divide has emerged. The gigabit divide — pitting those with only basic broadband connectivity against those able to take full advantage of modern technologies for commerce, education, and the pursuit of happiness.

Internet Access in the U.S. hit a turning point in 2010. In February, Google announced its gigabit Google Fiber project.¹ Later that year in Tennessee, Chattanooga’s publicly-owned Fiber-to-the-Home (FTTH) network began offering its residents and businesses a 1 gigabit per second tier of Internet access.² Chattanooga was the first “gigabit city” in the United States.³

These two projects played a major role raising expectations for Internet service. “Broadband” was defined so loosely that it ceased to have much meaning in terms of whether a connection met modern needs. Businesses and tech enthusiasts sought high quality services that went beyond just advertised download speeds. What is the upload capacity? Reliability? Cost? DSL and cable service began to feel inadequate by comparison due to their comparatively slow asymmetric speeds and unreliable nature.

The ultra high-speed fiber-optic services offered by Chattanooga and other cities, Google, and small innovative ISPs began to show what was possible — more reliable, much higher capacity connections

at reasonable prices. The market took notice, with businesses and entrepreneurs moving to these metros. The projects proved that next-generation Internet access could be deployed and operated independently of the duopoly of incumbent telephone and cable television companies. From federal officials to city council members, policy makers around the country increasingly saw the need to take action and upgrade Internet infrastructure.

This new sense of urgency was underscored by increasingly vocal demands from local businesses and residents demanding better Internet access options.⁴ Communities around the country recognized the advantages of next-generation Internet access. Hundreds have already built their own fiber-optic networks, using a variety of models.⁵ Those without local fiber networks began focusing on how to make sure they would get it next.

Many local leaders hoped existing cable and telephone companies would simply invest in the next generation of technology. Most of them have since recognized those companies have little incentive to invest significantly in new networks in the absence of meaningful competition. Some communities have pinned their hopes on Google or other new entrepreneurial firms. But the number of locations where new competitors will build a network from scratch are limited by market dynamics. Therefore, more and more communities are searching for an approach where they can take an active role in shaping the future of local Internet access.

Verizon built a full fiber-optic network called FiOS that reached millions of households. But the

Spectrum of Cooperation for Local Networks

Public-Private Cooperation	FULLY PUBLIC
	Chattanooga, Tennessee; Lafayette, Louisiana; Wilson, North Carolina
	PUBLIC-LED CONTRACTING
	Examples: Leverett, Massachusetts; Indianola, Iowa
	PUBLIC ASSETS - OPEN ACCESS
	Examples: Mount Vernon, Washington; Rockport, Maine; Huntsville, Alabama
PPP	BALANCED PARTNERSHIP
	Examples: Westminster, Maryland; Urbana-Champaign, Illinois; Santa Cruz, California
Public-Private Cooperation	PRIVATE-LED INVESTMENT, PUBLIC SUPPORT
	Examples: Kansas City; Austin, Texas; Holly Springs, North Carolina
	FULLY PRIVATE
	Examples: US Internet in Minneapolis; Ting in Charlottesville, VA

company followed the cable model with similar speed tiers and prices. Verizon FiOS did not disrupt the broadband market in the way that municipal fiber networks, Google Fiber, and other small non-incumbent ISPs have.⁶

One means of unlocking capital and potentially lowering risk for local governments is to partner with a trusted entity to build a network. Broadly called public-private partnerships (PPPs), local governments have been seeking partners to share the costs, responsibilities, and benefits of local network projects. This paper will document several examples of local partnerships and explore the benefits, tradeoffs, and lessons from each.

We aim to bring some balance to the PPP discussion, which has suffered at times from what we might call irrational exuberance given the few partnerships that actually have been executed. We believe PPPs will continue to evolve and more communities will work with partners in some fashion. However, PPPs should be recognized as just one of many possible approaches to ensure communities have universal access to fast, affordable, and reliable Internet connectivity.

What is a public-private partnership?

Before discussing specific examples of PPPs, we should examine the term “public-private partnership” more broadly. This is particularly important as the approach seems beyond criticism: who can oppose a partnership between the public and private sectors? But the term has become meaningless through overuse. We believe the term has been misapplied to arrangements that are not actual partnerships.

A report by the Coalition for Local Internet Choice (CLIC) and the Benton Foundation, called “The Emerging World of Broadband Public-Private Partnerships: A Business Strategy and Legal Guide,” draws a distinction between three different models that have been lumped together as partnerships.⁷ Only one of them involves shared investment and

risk with the other two characterized as “private investment with public facilitation” or “private execution with public funding.” The CLIC and Benton report is well worth reading, offering a wider look at partnerships whereas we take a deeper dive into specific arrangements.

For the purposes of this report, we focus on agreements that balance risks and rewards; true partnerships. But we acknowledge that the PPP will always be an imprecise term. Therefore it is helpful to consider the phrase as representing a spectrum of shared risk and shared benefit models of public and private sector cooperation.

Not PPPs

While the two ends of this spectrum are not considered PPPs, we readily concede that they depend on contributions from both the public and the private sector. However, merely involving both the public and private sector should not be considered a partnership.

Fully Public

The public sector assumes full control and risk over the local network. A public agency finances construction, operates the network, and serves as the retail broadband provider, handling customer service requests from subscribers. Examples of this approach include Chattanooga, Tennessee; Lafayette, Louisiana; and Wilson, North Carolina. Yet the private sector retains a role even within this fully public approach. Often communities build these networks with the advice and support of private consultants, contractors, and depend on various vendors.

Fully Private

This is the status quo for the majority of communities. A private Internet service provider (ISP) invests, or does not invest, in its network according to its own priorities and without the input of the community.

Cooperation versus Partnership

The term PPP has been applied to models with widely diverging roles and responsibilities for public and private partners. We see these models as falling into either public-private cooperation or balanced public-private partnerships.

Public-Private Cooperation: Private-Led Investment with Public Support

Some local network projects billed as “public-private partnerships” are, in fact, dominated by the private sector. While this model does represent a level of cooperation and engagement beyond the status quo, the public sector’s involvement and control over the overall project is very limited. Any subsequent network is controlled entirely by the private entity with no substantive oversight by the public.

A common example of this approach is a local government taking steps to encourage additional private investment. Louisville, Kentucky, passed a “one touch make-ready” ordinance that allows for easier installation of new infrastructure on utility poles.⁸ This policy lowers barriers for ISPs to expand networks by reducing construction costs. Local officials hope the additional investments make a positive impact by improving competition.

Google Fiber is the most prominent example of this kind of private-led cooperation. Municipal governments have partnered with Google to facilitate new private investment streamlining permitting processes and providing property for network huts in the field. These incentives are then typically available to other providers as well.

An important result of this approach is that the subsequent Google Fiber network is designed, owned, and operated totally independent of public sector partners. In Google Fiber cities, no one except Google knows how many subscribers the network has, what services are available,⁹ or who could buy the network if Google decides to exit the business. Stating this reality is not a criticism of Google, which

has built impressive networks and has a long list of cities begging them to invest. But we do not consider those arrangements a partnership in any meaningful sense of the term. Google’s leasing of municipal dark fiber in Huntsville, Alabama is on the other side of the spectrum but we would still hesitate to call it a partnership.

Public-Private Cooperation: Public-Led Contracting

Other local network projects are led by the public sector. Here the public actor takes on most of the project’s responsibilities: financing, constructing and owning the network infrastructure. Private sector engagement can be limited to more specific tasks. A public actor seeks a private partner specifically to handle network operations, for example. Leverett, MA is one example and we discuss it briefly at the end of our report.

Public-Private Cooperation: Public Assets and Open Access

In this model the public sector invests in significant infrastructure that can support a local network project. The public sector takes on an active role by building assets that can be leased to an independent partner. The resulting network may have some components that are publicly-owned (often the longer-lived, more expensive passive assets like conduit and/or fiber) and some that are privately owned (e.g. ONTs and other electronics). For example, Ammon, Idaho; Rockport, Maine; Mount Vernon, Washington; and Huntsville, Alabama, have all developed models that involve network ownership by the public while independent service providers market and deliver services to end users.

Balanced Partnerships

In this report we focus on balanced PPPs — Models that share risk and reward between the public and private partners (roughly) equitably.

Finding that balance is not easy. The public and private sectors naturally have different priorities. For local governments, the value of a local fiber-optic Internet access network hinges on the benefits it generates for the community: the ability to retain or attract new businesses, improve educational opportunities, and increased property values for premises. These positive externalities are important public good impacts, but are not captured in the revenue collected by the network. They are benefits beyond the balance sheet.¹⁰

This perspective means public sector partners have a different requirement on a network’s return on investment timeline. Local governments are more comfortable with a longer payback period and in some cases are willing to subsidize the network to achieve greater benefits beyond the balance sheet.

Private partners need a faster return on investment for their business to be successful. Balancing short term business needs with long-term public interest outcomes is difficult. Both sides must have sufficient incentives, protections, and trust for a partnership to succeed.

Yet it is possible to create balanced PPPs. No single condition or term makes an agreement equitable. There is no “magic bullet.” Instead, balanced partnerships are the result of honest and respectful negotiation. Partners must understand each other’s priorities and be able to compromise. As Westminster City Council President Dr. Robert Wack told us:

“There has to be a shared sentiment that ‘we are in this together.’”

“There has to be a shared sentiment that ‘we are in this together. We will fail together or we will succeed together.’

Both parties have to give to get. Whether it is the debt service guarantee or some other thing, the specific detail is not as important as shared willingness to make sacrifices to reach this common goal. That is the key of a successful public-private partnership.”¹¹ ■

Why look to partner at all?

In the last few years, communities around the nation, from large cities to small rural towns, have successfully built their own networks using a variety of models that can minimize risk and cost.¹² But other communities have preferred to seek partners for some of the following reasons:

Share Costs

Building an Internet access network is expensive. However, such networks are often within the “ballpark” of what local governments finance, including roads, bridges, sewer, water systems, and sometimes sports stadiums. PPPs can nonetheless spread a project's costs across the partners.

Address Risk

Sharing the cost can lower local government’s exposure to financial risk. Yet no PPP is entirely risk-free. **PPPs should not be used merely for the public sector to hide risk.** The economics of Internet service are challenging; a PPP should not seek to hide risk or pretend it is not there. PPPs can introduce new risks that are not present in public-led models as well, from managing the partnership and potentially having to forego some public policy goals.¹³

Digital Self-Determination

Another reason a community might seek a private partner is to increase public input on private investment. Communities increasingly fear that some neighborhoods will be passed over while others have more robust competition.

Public-private partnerships can be a way for local governments to promote important public interest outcomes that may not occur under purely private projects, including more provider choices and universal access to high-quality, next-generation infrastructure.

Building Expertise

The economics of broadband service are challenging. Technical questions about how to design, maintain, and upgrade networks can be daunting. Communities that do not have this experience could develop it with the right hires or could embrace models that require less in-house expertise.

Wally Bowen, founder of the local nonprofit ISP Mountain Area Information Network (MAIN) that brought the first broadband to many in rural North Carolina, made this point in a 2012 interview:

One of the problems we face in this country is a culture problem. We are so marinated in this corporate culture that we assume you’ve got to be a Fortune 500 company to deal with high tech. But if you actually look at the history of telephony or electricity, it’s been a grassroots, bottom up solution. ...

It doesn’t take a Fortune 500 company and a PhD in telecommunications engineering to build and operate a local community network.¹⁴

We have heard the same point many times from many people. These networks are complex and difficult. But they are within the capacity of a committed and educated community developing locally. **We believe that communities should be free to work with trusted partners, but they shouldn’t believe partnerships are the only viable way to move forward.**

Balanced Partnerships

Examples and Key Themes

We examine balanced PPPs by focusing on Westminster, Maryland and Champaign-Urbana, Illinois. Then, we contextualize these examples with additional information about other communities that have worked with private sector ISPs.

These communities demonstrate how the public sector can work with willing private sector partners while still ensuring that the project achieves specific goals. They also show how communities can structure PPPs to leave themselves options should challenges arise. These examples have already served as a template to others and we hope that reviewing key points of these two agreements in detail will help inform still more communities as they consider partnerships.

Westminster, Urbana, Champaign, and most of the other communities discussed in this report are members of Next Century Cities and have used that network to share their experiences. For more information about it, see NextCenturyCities.org



Westminster

Overview

Westminster, Maryland is a small town that had suffered from a lack of high quality Internet service, relying mostly on Comcast cable and spotty Verizon DSL. In response, local leaders sought to build a last mile FTTH network to connect every household and business in the community, taking advantage of Carroll County's publicly-owned middle mile network. Officials wanted the network to be publicly-owned and open access, meaning multiple ISPs would compete for customers on the same network.

Westminster ultimately decided to work with a relatively new entrant in the fiber business, Ting.¹⁵ The city is responsible for all network construction and owns the fiber infrastructure, which is being built incrementally. Ting leases access to the network and is responsible for providing services to subscribers. After an initial period of exclusivity, Ting will manage the network on an open access basis.

Background

Westminster is a town of 18,000 residents located in Maryland's Carroll County, where it is the county seat. As the town is about 35 miles from Baltimore and 40 miles from Washington, D.C., two thirds of residents commute to jobs located outside of the town.

Like many communities around the nation, local leaders recognized that they were being left behind in the Internet age. Comcast and Verizon were not offering the next-generation

services other communities had. Community anchor institutions, like schools, libraries, and government offices, could not get access to affordable, high-speed Internet access.¹⁶ Conversations with existing providers revealed that there was no new significant investment forthcoming. At that moment, local leaders recognized that they would have to solve the problem themselves.

In 2004, the Carroll County Government, Carroll County Public School system, Carroll County Libraries and the Carroll County Community College formed a consortium to improve their Internet access. The groups pooled their resources, shared expertise, and leveraged their combined purchasing power to create the Carroll County Public Network (CCPN).

CCPN owns and operates over 160 miles of fiber that connects 120 community anchor institutions throughout the county.¹⁷ The network saves local institutions hundreds of thousands of dollars in telecommunication costs while also providing significantly faster, better services.¹⁸ While CCPN does not offer service directly to local residents, it was "designed and built with substantial capacity to support business and economic development."¹⁹

Local Planning – Feasibility Study & Pilot Projects

Following the success of CCPN, local officials began to contemplate how to improve broadband connectivity for residents. The community was stuck with a broadband duopoly between Comcast

and Verizon. With neither of these companies investing in last mile fiber-optic infrastructure,²⁰ City Council President Dr. Robert Wack became a champion for a municipal FTTH network.

City officials commissioned a feasibility report in 2012 to provide recommendations on how to proceed. Based on the findings, Westminster decided to build two FTTH pilot projects. “The pilot projects allowed the city to stick our toe in the water to see how this works and is hopefully a first step toward doing it for the entire city,” said Dr. Wack at the time.²¹ The city moved forward with funding the project even before they found a partner to operate the network.

The pilot phase was expected to cost \$1.2 million and was paid for with existing capital assessment funds.²² While it was risky to authorize construction before a formal agreement with a service provider was in place, local officials stated that they wanted to demonstrate their commitment to the project to any potential partners.²³

The pilot phase included two locations, one residential and one commercial, both of which were located near existing CCPN access to minimize build costs. One was a retirement community while the other was an industrial park complex home to several local businesses. Local

interest quickly picked up, with neighbors adjacent to both pilots asking to be included in the trial network. The project broadened to include an additional residential neighborhood and another business center. Expanding the pilot projects increased the overall budget from \$1.2 million to \$1.8 million.²⁴

Publicity around the pilot projects raised community awareness. More and more local businesses asked to be connected to the local network and one business, Carlisle Etcetera, moved some of its IT operations to Westminster to take advantage of the network.²⁵ The high demand validated the arguments for the network — that there was a significant unmet demand for better telecommunications services.

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Responding to the demand and positive feedback generated by the pilot projects, Westminster officials approved the construction of a complete FTTH network throughout the whole community, though it would still be done incrementally. As Westminster City Council President Dr. Wack explained:

[T]he combination of all the positive feedback we’ve gotten from just floating this idea of this pilot project has energized the city staff and other

Santa Cruz, California

Santa Cruz announced a public-private partnership in 2015 with local ISP Cruzio to build a \$45 million open access FTTH network in an arrangement similar to the Westminster-Ting PPP. The city will own the network while Cruzio constructs and operates it. Funding will come from a financing bond that will be repaid by revenue from the network. Any funding gaps will be paid for 80 percent by Cruzio and 20 percent by the city. For the first several years after the network is completed, Cruzio will be the exclusive operator. After that, the network will become open access, and other ISPs will be able to compete for customers in Santa Cruz.

elected officials too -- and opened their eyes to the potential of [a local FTTH network], and the wider appeal to the entire community. And so we're plowing right ahead with the rest of the build.²⁶

In May 2014, the Westminster City Council voted to issue a \$21 million general obligation bond to finance construction of the rest of the network. This decision was made before they had selected a partner for even the pilot phases — something they believe gave them more credibility in negotiating with partners.²⁷ By having funds at the ready, they showed their commitment to the success of the project, giving them credibility in partner negotiations.

Finding a Partner – the RFP

Having financed the network, the city issued an RFP for a PPP in June 2014. In the “Policy Goals” section of the document, **the city listed core principles** that any respondent had to support in order to be considered.

One core principle stated that all passive fiber **network infrastructure would be publicly-owned**, including the individual drop lines to each premise. However, the optical network terminal (ONT) on the premise of each subscriber would be owned by the partner.²⁸

City officials wanted to retain oversight over the project going forward. Owning the infrastructure assets means the city can ensure accountability from its partner. The RFP proposed a specific business plan with clear roles for each partner. The city would design, construct, and own the network. The partner would lease access to the fiber infrastructure, manage the network, and provide services to residents and businesses. Respondents had to negotiate within this proposed project structure.

Second, a private partner had to **manage the network on an open access** basis. The lack of competition was one of the main reasons the community decided to build the network in the first place. The city did not want to only create a third option for Internet access, local leaders wanted “disruptive services at disruptive prices.”²⁹ However, the RFP does acknowledge that a potential partner might need a temporary period of exclusive rights to sell services on the network to be financially viable. The city was willing to entertain such a request for time-limited exclusivity but the long-term goal of open access infrastructure was not negotiable.

Initial feedback from the private sector was positive. Several companies expressed an interest in working with Westminster on a fiber

network. But the proposed terms of the agreement and the demand for an open access network were met with skepticism. Companies offered to build a local fiber network, but only on their

own terms, not the city's terms as outlined in the RFP.³⁰ Yet Westminster held strong. The city did not give up the vision for a locally owned, open access network and found a private sector partner that project leaders felt would be a good match.

The Agreement

On January 12, 2015, the mayor and city council of Westminster voted unanimously to approve a PPP with Ting.³¹ The term is ten years with the option of two ten-year extensions. Westminster and Ting describe their partnership as a shared risk model where the project's responsibilities are not borne disproportionately by either party.³² Rather, the partners depend on each other for mutual success through a series of milestones related to construction and signing up subscribers. “We don't make money unless [Ting] make[s] money,” City Council President Dr. Wack said.³³

The city did not give up the vision for a locally owned, open access network and found a private sector partner that project leaders felt would be a good match.



Ting is a subsidiary of the Canadian company Tucows. Tucows began in the 1990s as a website domain hosting company. It launched Ting in 2012 as a wireless service provider offering mobile voice, texting, and data services. In 2015, Consumer Reports ranked Ting among the highest rated mobile service for customer satisfaction, coming well ahead of the four large national mobile providers.³⁴ Prior to partnering with Westminster, Ting purchased and is expanding an existing ISP in Charlottesville, Virginia. The company has also announced networks in Sandpoint, Idaho and Holly Springs, North Carolina, both of which involve leasing some municipal fiber.

Ting considers impeccable customer service a key component of their business plan. And CEO Elliot Noss has used somewhat unconventional methods to underscore this point.

During a meeting with the Westminster city council, Mr. Noss handed over his mobile phone and told a council member to call Ting’s customer service and ask any question she wanted. After a few seconds a customer service representative answered. The council member asked “What is the population of Westminster, Maryland?” After a short pause the representative provided the correct answer and asked if there was anything else they could help them with today. Council members were impressed and knew that Ting had a real commitment to customer service. Author Christopher Mitchell has also interacted with their customer service and can attest to the company’s commitment to providing responsive customer service.

Infrastructure

Westminster will own all of the network’s fiber-optic infrastructure. The city is responsible for all the financing, engineering, construction, and maintenance of the network and ensuring that every address is passed and connected to the network if feasible. (Westminster cannot force an apartment building or condo to be connected, for instance.)

The contract established broad guidelines for scheduled and unscheduled maintenance and clarifies that the city bears the financial burden for such services. The city will have a crew ready to respond 24/7 to address emergency maintenance and will be on site within 4 hours of the time the city is made aware of the problem. Municipal

networks and other small providers regularly contract this work to firms that specialize in it.

Ting is both the network operator and a service provider. The provider is responsible for purchasing, installing, and operating all networking equipment needed to activate the network and provide services to residents and businesses.³⁵ The agreement makes it clear that Ting, and not the city, is responsible for responding to any and all customer service inquiries related to residential or commercial broadband services offered on the network.

Leasing Access

Ting will lease Westminster’s fiber-optic infrastructure at a monthly rate based on how

many households the network can reach. The **baseline fee is \$6 per month** for each premise passed. This fee applies simply if it is *technically feasible* for a premise to subscribe to services from the network. Ting must pay the fee regardless of whether the premise actually subscribes to services or not. Officials said the \$6 fee is important to the project because it provides a guaranteed “baseline rent” income for the city that is independent of Ting’s own commercial success in attracting customers.³⁶ It provides an incentive for Ting to sign up customers and start generating income as soon as possible to offset this expense.

The lease fee increases to \$17 per month per active subscriber on the network, regardless of whether the subscriber takes service from Ting or other ISPs that may enter in the open access phase. Ting may pass these lease fees through to any provider operating on the Westminster network, but it must do so fairly. As network operator, Ting is required to treat all service providers on the network equally and charge them the same rates, whether it is their own retail service or that offered by a competitor. Across its many ventures, Ting’s parent Tucows has extensive business experience in wholesaling. Tucows is a wholesaler of domain names, and Ting Wireless purchases wholesale access to cell phone networks. As such, they believe they are well prepared to manage the open access network in an evenhanded manner.³⁷

The lease fees will be adjusted annually beginning from one year after Ting has activated 1,500 total subscribers. The parties will determine a baseline Average Revenue Per Unit (ARPU) by dividing Ting’s gross revenue collected from Internet access, voice, and video subscribers in Westminster during the past year and dividing it by the total number of subscribers. After determining that baseline ARPU, the partners will revisit it annually and adjust it based on several factors, including revenue from all services and revenue Ting receives from other providers on the

network, such as the third party voice and video providers.³⁸

Service Expectations

Ting is expected to fill two distinct roles in the project. Ting is 1) the network operator and 2) a service provider that will offer television, Internet access, and telephone services. As the network operator, Ting must negotiate fairly and allow other ISPs to offer competing broadband services over Westminster’s network. However, the partnership does **grant Ting an initial period of exclusivity** as an opportunity to achieve a better return on investment. Ting may operate as the sole ISP on the network for a period of two years, or until Ting signs up 3,000 customers, whichever comes first.

The agreement **requires Ting to offer a 1 Gbps Internet service plan** to all Westminster businesses and residences connected to the network. Ting must also offer video and voice, but it can do so through a third party if it chooses.

Lastly, Ting must **adhere to specific customer service standards** for its services. All customer calls must be answered by a human customer service agent. Ting may not use an automated menu to process calls. It must attempt to answer all inbound calls within 90 seconds and inbound emails within 24 hours. The contract also establishes a reimbursement schedule to customers in the event Ting is responsible for any service outages.

Expanding the Network

Westminster has the ultimate authority about expanding the network across the community with universal access the ultimate goal. Ting will research and assess local demand to provide suggestions for future expansion as the community moves toward universal access.

The network will be constructed incrementally with the city and Ting determining the scope and

Customer Service

Americans generally hate their ISPs. Comcast, Time Warner Cable, AT&T and others combine to have the lowest customer satisfaction ranking of any commercial sector, even lower than companies from long maligned industries like airlines or health insurance providers.³⁹ For years the public has had to endure horrific customer service as part of getting access to the Internet, experiences perhaps best epitomized by a recording that went viral of a Comcast customer service representative refusing to let a subscriber cancel their account.⁴⁰

Therefore it is interesting, but not surprising, to see that the PPPs highlighted in this report specifically address the issue of customer service. Local broadband networks make headlines for ultra-fast gigabit Internet service. But an increasingly important aspect of local networks is responsive and human-based customer service. The agreements in Westminster and Leverett both require Ting and Crocker to answer all customer calls with a human representative, not an automated phone menu.

In Champaign-Urbana, iTV-3 agreed to maintain local offices where residents could walk-in and pay bills, return equipment, or make customer service requests in person. Just before the public-private partnership was finalized Comcast, the incumbent cable and Internet provider, closed its only office in the community, despite the objections of local leaders.⁴¹

Customer service is a reflection of a company's commitment to the community. Large incumbent providers are headquartered hundreds, if not thousands, of miles away from most communities. But broadband networks that are owned and operated locally are different. Being small and local means such networks have to be responsive.

timing of each phase. Once a completed phase of the network reaches a 20 percent subscriber take rate the city is obligated to begin the next phase of financing and construction. City officials said that this approach is important for two reasons. First, it ensures Ting is holding up their end of the bargain and attracting customers at a consistent rate. Second, it ensures that the capital expenses, and the subsequent debt service payments, are kept in proportion to the network's ability to generate income from subscribers.

Community Engagement

Westminster and Ting share **responsibilities for community engagement** activities. The agreement states that "the [c]ity will work with Ting to educate residents and businesses about construction

phases and pre-subscription thresholds for construction" of the local fiber network.

The two partners agreed to commit funds towards a local "hackerspace and/or broadband incubator venue," a place where residents can have public access to 1 Gbps broadband service and innovative new technologies, such as 3-D printers. Another Carroll County-based ISP, Freedom Broadband, has joined the effort, leading to the creation of the tech incubator MAGIC, or the Mid-Atlantic Gigabit Innovation Collaboratory, a 501(c)3 nonprofit organization.

Mutual Protections

The agreement also **provides mutual protections** to both parties.

For Westminster, the greatest risk associated with the project is the debt service payments on the bonds issued to build the network. Both Westminster and Ting share the burden to pay the city's debt service if the project does not generate enough revenue. Westminster is responsible for the first \$50,000 shortfall in a fiscal quarter if network revenue does not cover debt service payments. Ting will cover the additional debt service payments up to \$150,000. At that point Westminster will be responsible for all additional debt service payments. In a hypothetical scenario where there was a \$200,000 quarterly shortfall between revenue and debt service payments, the costs would be split evenly between Westminster and Ting at \$100,000 each.

The two partners agreed to commit funds towards a local “hackerspace and/or broadband incubator venue,” a place where residents can have public access to 1 Gbps broadband service and innovative new technologies, such as 3-D printers.

The agreement also protects Ting if Westminster decides to cease involvement in the network or sell it. With six months written notice, the city may terminate the contract if its obligation to the network is causing a significant economic hardship. However, in doing so, it must purchase all of Ting's networking equipment or allow Ting to remove it. The city may only sell the network under the condition that any future buyer allows Ting the right to continue to lease access to the network.

Lastly, the agreement also provides Ting with important guarantees to continue the partnership should the network be successful. The initial term of the agreement is 10 years. The agreement is automatically renewed for another 10 years if, in fiscal quarter immediately prior the end of the initial agreement, network revenue is 10 percent greater than the debt service obligations.

Current Status

Westminster broke ground on the local fiber network in October 2014.⁴² On August 18, 2015, Ting began serving its first residential broadband

customer.⁴³ As of the first quarter of 2016, approximately 450 households have access. The city is on schedule and proceeding with the next phase of network construction, and expects the entire network to be completed by 2019 or 2020.⁴⁴

Ting would not comment on a specific take rate but did report that residents are subscribing at a rate in line with their initial projections.⁴⁵ Ting is offering Internet access via two tiers: a gigabit (symmetrical upstream and downstream) for \$89/month and a 5 Mbps (megabits per second)

connection for \$19/month. Gigabit business-class service is priced at \$139/month. Both parties remain positive about the future.

The public-private partnership between Westminster and Ting has been recognized as an influential example for other communities. It received the National Association of Telecommunications Officers and Advisors 2015 *Community Broadband Innovative Partnership of the Year* “award for showcasing an entirely new approach in public/private partnerships to reach the common goal of bringing next generation fiber broadband to communities while demonstrating the possibility of creative solutions.”⁴⁶

Conclusion

Westminster was fortunate to find Ting, an outside-the-box-thinking ISP. Ting embraced the city's terms after incumbent providers Comcast and Verizon refused to upgrade their networks to modern specifications.

Westminster leaders prioritized public ownership of the fiber. They had to finance the network but have long-term security in knowing that the network will remain accountable to the public even if Ting's plans changed or it was sold. Owning the network

allows the city to ensure universal access and a choice in providers via the open access policy.

In setting the cost structures of the network, Ting has to pay a fee for every premise that could take service, creating a strong incentive for Ting to sign

those customers up. Some open access networks have had problems where ISPs had too little incentive to maximize their number of customers. Additionally, Ting may have to cover a share of the debt if the network is unable to generate enough revenue to pay all of its costs. ■



Champaign-Urbana

Overview

Champaign and Urbana are sister cities in Illinois that received a broadband stimulus grant to improve Internet access in their community. A local coalition, led by the University of Illinois, built a largely middle mile network that connected many community anchor institutions as well as a last mile network that served low-income neighborhoods. Next, the coalition partnered with the local Illinois company iTV-3 to expand the last mile network across the entire community, which proceeded more slowly than expected.

Early in 2016, CountryWide Broadband announced plans to acquire iTV-3.⁴⁷ The community is currently assessing how the project could continue. This unexpected transition actually helps make a key point in the UC2B model, the right of first refusal. The community had the opportunity to purchase iTV-3 assets before other potential buyers.

Despite this recent development, the formation of UC2B continues to provide important lessons for other communities considering a partnership. Communities are attempting to build a very long term infrastructure by partnering with entities in what can be a fast moving and consolidation-happy industry. Local officials in Champaign-Urbana now find themselves evaluating how to proceed, with some leverage because of how they structured the partnership.

Background

The neighboring cities of Champaign and Urbana form a single metropolitan area in central Illinois. The two communities are home to over 120,000 people as well as the main campus of the University of Illinois system. These cities have a long history of community organizing and engagement around media and technology issues. It is home to the Urbana-Champaign Independent Media Center, which in addition to operating an independent local newspaper and radio station, also plays an important local role in addressing the digital divide by hosting a public computing center with free digital literacy training.⁴⁸ Champaign and Urbana do not operate any utilities, including neither water nor wastewater.

Like so many other communities around the nation, residents in Champaign-Urbana recognized that the broadband marketplace was not meeting local needs. Former Urbana city council member Brandon Bowersox-Johnson described the frustration:

We were in a situation where our incumbent [cable and telephone] providers were not building out the fastest connectivity to all our neighborhoods. And I have been a City Council member here the past eight years, and saw that we weren't able to convince the monopoly cable or



monopoly phone provider here to really bring our community faster connectivity, or make sure that that was universal access for everybody.⁴⁹

The community took matters into its own hands. In 2007 the Champaign-Urbana Cable Commission formed the Broadband Access Committee to explore if the two municipal governments and university could partner to build a last mile fiber network. They held public meetings to solicit feedback from the community and began building a foundation for a better network.⁵⁰

The 2009 American Recovery and Reinvestment Act included funding for the National Telecommunications and Information Agency (NTIA) to support construction of a high-speed, fiber-optic network infrastructure. Because Champaign-Urbana was already discussing how to build a fiber network, local leaders were able to leverage the Broadband Access Committee's existing plans and respond quickly to this federal funding opportunity.⁵¹

The community submitted an application led by the University of Illinois and the two local governments. Organizers made a strong effort to ensure that the planning for the network included as many stakeholders as possible. Among others, the area mass transit authority and a local ISP, Champaign Telephone Company, joined the effort. One critical component of the application is that all members made written pre-commitments to use the fiber infrastructure. Rather than just be generally supportive, participants briefly described how they would use the network and how much they would contribute financially to the project.⁵²

This consortium branded itself the Urbana-Champaign Big Broadband Project (UC2B) and

submitted a joint application to the NTIA for a federal Broadband Technology and Opportunity Program (BTOP) grant to build a local middle mile network. But unlike most BTOP applicants, they also planned to build and operate a pilot deployment last mile FTTH network in some underserved low-income neighborhoods.

The application was approved in 2010 and the UC2B coalition received over \$22 million in federal grants to build the network. UC2B partners also contributed over \$3.4 million in their own funding,⁵³ and the project also received an additional matching \$3.5 million grant from the State of Illinois.⁵⁴

Completed in 2013, the network connected more than 250 local community anchor institutions including local schools, libraries, health care sites, and youth centers with more than 180 miles of fiber.⁵⁵ The project served 1,000 households in low-income areas and initially offered residents a symmetrical speed of 20 Mbps for \$19.99 a month.⁵⁶

While UC2B's BTOP network succeeded, the organizers always envisioned a citywide network. As the project construction concluded, the communities explored how to connect the rest of the businesses and residents with fiber-optics.

Because neither local government nor the University wanted to take responsibility for expanding the network, they sought an independent partner. They began a pre-subscription campaign to

improve their attractiveness to potential suitors. Residents and small businesses signed pledges committing to subscribe to services offered by a prospective partner. Pledges agreed to pay for some of the construction costs themselves. They would pay both a "commitment fee" deposit, due when signing the pledge, as well as an additional

Completed in 2013, the network connected more than 250 local community anchor institutions including local schools, libraries, health care sites, and youth centers with more than 180 miles of fiber.

installation fee, due when the partner would begin construction in their neighborhood. Both fees would be repaid to the pledgees as a recurring discount on future monthly bills. It demonstrated the business case for investing in additional FTTH infrastructure and led to more than 530 pre-commitments by the time UC2B issued the call for a partner.⁵⁷

Local leaders also changed how they administered the network. Initially, the network was governed as an intergovernmental consortium that included the University of Illinois and representatives from the Champaign and Urbana municipal governments. Officials felt a single non-profit entity would have fewer challenges in finding a partner and entering into a partnership. In 2013 the consortium transferred day-to-day management of the network to the newly created non-profit, also named UC2B. But the two city governments and university still retained ownership of the infrastructure they had built.⁵⁸ And these three consortium members nominate the board of directors for the new non-profit UC2B, ensuring a level of public oversight.⁵⁹

Local Planning – Issue RFI

UC2B issued a Request for Information (RFI) in 2012 seeking a partner to expand its network.⁶⁰ The RFI offers many lessons for PPPs, including setting clear expectations. UC2B lists **three “core**

principles” for the broadband project as “very close to non-negotiable.” The principles are:

1. The network must be fiber, not alternative technologies, offering high speeds.
2. There must be open access to enable fair and open competition forever.
3. The network must be built to all members of the community, with no redlining.⁶¹

Champaign-Urbana’s past community engagement informed the core principles of the RFI. Years of gathering stakeholders together to discuss broadband infrastructure meant that the community had a clear sense of what its priorities were. Any potential partner had to be on the same page. The RFI states that private sector applicants must acknowledge the principles and “[a]ffirm that you are interested in this partnership under the core values and requirements listed above.”

The RFI also documents the extensive local network infrastructure the partner would gain access to. UC2B’s network also already had residential subscribers - households in the FTTH low-income deployment areas. The partner would enjoy an income stream from existing customers on day one and have a lead on many more additional potential subscribers nearby.

UC2B specifically reached out to several major ISPs and invited them to respond to the RFI.

iTV-3 Background

iTV-3 is a subsidiary of Family Video. Founded in Springfield, Illinois, and headquartered in Glenview, the family-owned company owns and operates more than 775 Family Video movie rental stores in 19 states and Canada, including three locations in the Champaign-Urbana metro area. In the 1990s Family Video started a dial-up ISP business named Family Online. At its peak it had over 30,000 subscribers. Family Video sold the business once they realized that dial-up technology’s days were numbered and that fiber-optics was the future of home Internet access. In 2009, the company acquired a Peoria fiber-optics firm and launched its iTV-3 service.⁶² iTV-3 operated fiber-optic based broadband services in Pekin, Morton and East Peoria, Illinois, prior to the agreement in Champaign-Urbana.

They made sure to contact ISPs already in the community as well as those outside, including Google Fiber.⁶³ The non-profit received nine responses while many other companies indicated they were not interested in partnering under the terms of the core principles.

Several applications did meet the criteria and Gigabit Squared was initially a leading candidate for the partnership.⁶⁴ Formed in 2010, Gigabit Squared seemed like a promising new potential partner for many communities looking to increase investment in fiber infrastructure. It was the most exciting partner in the trade press and had agreements to build networks in Seattle and Chicago. But, by early 2014, its funding turned out to be a house of cards (See “Lessons Learned” section below). UC2B was already leaning toward a more local option anyway.

The Agreement

On May 29, 2014 UC2B officials announced they had finalized a public-private partnership.

UC2B selected a local, Illinois-based television, telephone, and Internet access provider named iTV-3 as the partner to expand the network. Since the agreement had not been made public, we interviewed those familiar with it to assemble the following information.

Partnership between UC2B and iTV-3

First and foremost, the agreement between UC2B and iTV-3 honored the community “core principles.” iTV-3 agreed to terms that ensured a fiber-optic network expansion, that the network would be managed with open access provisions, and that the network would serve the entire community.

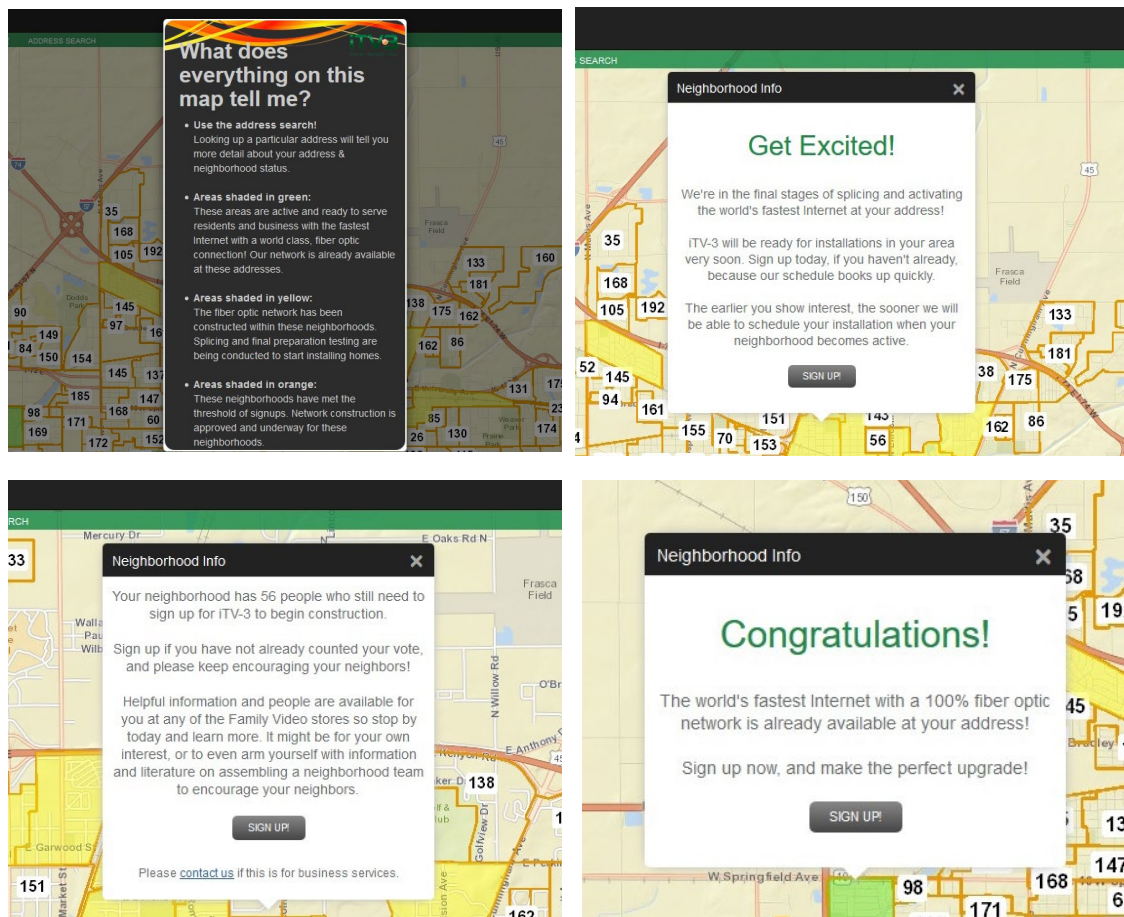
UC2B’s board of directors were swayed by the fact that iTV-3 was an Illinois-based company with a history of operating in the community with good reviews from its subscribers in nearby cities. As a locally-rooted ISP, iTV-3 understood UC2B’s core principles. Family Video, prior to responding to the

iTV-3 Price Points

The image displays four screenshots of the iTV-3 website's 'Build Your Package' interface, arranged in a 2x2 grid. Each screenshot shows a different service tier with its price and internet options. The interface includes a 'Check For Service' button, a 'Selected Package' section with price and speed, 'Internet Options' with a dropdown menu, and 'Television Options' with a 'Select Television' dropdown and checkboxes for service details.

Selected Package	Price /month	Internet Options
50/10 Mbps	\$49.99	50/10 Mbps
100/25 Mbps	\$59.99	100/25 Mbps
200/60 Mbps	\$69.99	200/60 Mbps
1000/200 Mbps	\$79.99	1000/200 Mbps

Tracking Demand in Neighborhood Sectors



RFI, was already investing in fiber-optic technology in other communities because they understood fiber is best positioned to deliver the highest quality service going forward.⁶⁵

Network Expansion

Broadband infrastructure constructed as part of the BTOP project remains the property of the original consortium partners — the two municipal governments and University. iTV-3’s PPP agreement was with UC2B, the non-profit administrator of the network. iTV-3 leased access to the existing fiber infrastructure and networking equipment and assumed full responsibility for management and maintenance of the existing network, serving as both the network operator and service provider.

iTV-3 was in charge of the network’s future expansion. It was responsible for managing

construction and building the last mile infrastructure to households, which it would own. Network expansion was based on residents pre-subscribing for service. The cities of Champaign and Urbana are divided into small neighborhood ‘sectors,’ which include approximately 300 households (either homes or apartment units). If 50 percent or more of these premises in a sector pre-subscribed for Internet service, then iTV-3 was required to expand the network in that area and to begin construction within 120 days.⁶⁶ All households in a qualifying sector would be “passed” by fiber infrastructure, which meant that even if a household did not sign up for service during the initial promotional period it could still get service later.

UC2B officials acknowledge that the 50 percent threshold was high.⁶⁷ Google Fiber uses a similar pre-subscription model to guide network

construction in Kansas City. However, thresholds for neighborhoods to qualify range between 5 and 25 percent of households and Google has been accused of redlining because some of the lower income neighborhoods did not hit the presubscription targets. UC2B officials emphasized that the high thresholds were established in the hope that the project would be economically viable and sustainable for iTV-3 over the long term. Ensuring universal access is difficult when the network is expected to fully pay for itself.

To help neighborhoods reach the threshold, UC2B partners help promote the network and encourage residents to sign up. However, in the 21 months iTV-3 managed the network (before it proposed to sell itself to Countrywide Broadband), it only built out to four of the 201 sectors, a much slower pace than was anticipated.⁶⁸

Importantly, the community did retain some oversight of the project's new privately-owned infrastructure. If iTV-3 went bankrupt or otherwise decided it was no longer interested in the partnership, **UC2B has the right of first refusal. UC2B can purchase all of iTV-3's last mile broadband infrastructure** and networking equipment before anyone else can. This provision ensured that, should something happen to the partnership, UC2B would still have an opportunity to maintain control over the network. However, UC2B chose to let ownership pass to CountryWide rather than purchase the iTV-3 assets in this case.

Importantly, the community did retain some oversight of the project's new privately-owned infrastructure.

Service standards

iTV-3 agreed to operate the network on an open access basis. These open access policies applied to both the original grant-funded BTOP network as well as to any new last mile infrastructure the company constructed on its own. The PPP actually stipulated conditions for implementing two different versions of open access: "Open Access Layer 1" and "Open Access Layer 2." Layer 1 involves leasing access

to fiber cables while Layer 2 concerns purchasing wholesale lit services. Communities considering an agreement along these lines should be aware that new network technologies like software-defined networks are blurring the lines between these layers. Thus, open access should be defined in terms of access to physical or virtual network assets.

From the onset of the agreement, iTV-3 was required to offer Layer 2 open access services: Other service providers could purchase data services delivered over iTV-3's network and offer residents a competitive broadband service. However, iTV-3 did not have to lease dark fiber to rival providers initially.

After five years the open access conditions are eligible for expansion to Layer 1. If iTV-3 had not built the network to all sectors of the community, the company would lose its exclusive access to UC2B's dark fiber. iTV-3 then would be required to offer "Layer 1" open access at pre-determined prices in areas where iTV-3 had not built last mile infrastructure. Other service providers would also then be allowed to lease dark fiber capacity on the UC2B network, install their own networking equipment, begin constructing last mile infrastructure, and operate on the network.

The differing Layer 1 and Layer 2 open access provisions balance the needs of both partners.

The delay in requiring Layer 1 conditions gave iTV-3 an initial period of exclusivity over network engineering and design on UC2B's infrastructure. But the immediate Layer 2 requirements ensured that the core principle of open access was active policy from day one of the partnership.

Additionally, **iTV-3 agreed to maintain "grandfathered" service and honor existing UC2B service contracts** to those who subscribed to the network prior to the partnership. This applies to both existing middle mile customers, community

anchor institutions, and residential customers from the stimulus-funded deployment.

Community Engagement

iTV-3 agreed to contribute to UC2B's "Community Benefit Fund" by giving a cumulative total of \$200,000 over the first five years of the partnership. UC2B will also seek additional contributions to the fund, which will then be distributed in the community as a series of small grants and projects to support local digital literacy efforts.

For customer service, iTV-3 agreed to maintain a local customer support presence. The three Family Video locations in the Champaign-Urbana community would serve as customer support locations for iTV-3 subscribers. Residents could visit these locations to return equipment, pay bills, or ask for customer service support in person.⁶⁹

Lastly, iTV-3 agreed to support outreach for the network buildout. The company had to host a public website that displayed up-to-date presubscription totals and showed how many sign ups remained before a sector qualified for service.⁷⁰ iTV-3 also sent sales agents door-to-door in neighborhood sectors that were approaching the 50 percent presubscription threshold.

Current Status

On May 8, 2015, iTV-3 and UC2B held a groundbreaking ceremony to mark the start of construction in the first sector to qualify for a network expansion.⁷¹ iTV-3 began serving its first new customers in July 2015. Since then, network expansion progressed at a slow pace, perhaps related to iTV-3 putting itself out for sale. Four

sectors outside the original BTOP last mile deployment have met the 50 percent threshold to trigger iTV-3 last mile construction. As of the fourth quarter of 2015 UC2B estimates that the network serves approximately 12 percent of community as a whole.⁷²

On February 23, 2016 CountryWide Broadband announced its intentions to purchase iTV-3. Local leaders seemed to have mixed feelings about the iTV-3 sale. They had spent so much effort vetting iTV-3 and believed they found a great partner. But iTV-3 had expanded the network much more slowly than expected and CountryWide Broadband was expected to bring much more capital into play, expanding the network faster.

Conclusion

UC2B provides several important lessons for communities considering PPPs.

Leaders in Champaign-Urbana put in a lot of work to engage and organize local stakeholders. They developed core principles that guided it through the stimulus effort and into the partnership with iTV-3 and now possibly CountryWide Broadband.

In structuring the partnership, the community retained a right of first refusal in the event that iTV-3 sold itself. This requirement gives the communities a seat at the table during negotiations for the future of the network even if they choose not to exercise the option. Their capacity to make that choice provides them leverage. This is a reminder that PPP structures may not have less risk so much as different types of risk. A right of first refusal to buy network assets can help communities control the future of the network if a partner considers selling itself. ■



Contracting vs. Partnering

We have focused on two agreements that are balanced and represent true partnerships between the public and private sector. But we think it is also worth briefly discussing another example, LeverettNet in western Massachusetts, because it features some of the same language and goals as Westminster and UC2B. Unlike those networks, LeverettNet uses a slightly different model that places it closer to the public end of our public-private spectrum.

Leverett, Massachusetts built its own FTTH network. The small rural community had neither a municipal electric utility nor a high profile partnership. Instead, Leverett took the lead on the project by contracting with various entities, both public and private, to build, manage, and activate the network. LeverettNet is not so much a comprehensive PPP agreement as it is a series of bids and awarded contracts culminating in a municipal network leased to a local ISP. Yet it does represent another approach to how public and private actors can work together on a local network project, one where the public actor takes on additional control and risk while outsourcing multiple roles to other partners.

Background

Leverett is a rural community of less than 2,000 residents. It is located just north of Amherst, a city with a population of 37,000 and home to the main campus of the University of Massachusetts system. Many of Leverett's residents are students, employees, or retirees of the university. Being in such close proximity to a larger university

community made local residents especially aware of the technology and services they lacked.

Leverett had to contend with substandard telecommunication service for years. No cable company operates in the area, and incumbent telephone provider Verizon simply neglected its infrastructure. Service was so bad that in 2011 the Massachusetts State Department of Communications ordered Verizon to assess and repair telephone infrastructure in Leverett and nearly 100 other towns in the region.⁷³

Recognizing that Verizon was uninterested in investing, local leaders took action themselves.⁷⁴ The community formed a broadband committee to assess what the community could do and commissioned a feasibility study.

In true New England fashion, the broadband committee shared its proposal at the next town meeting. The plan called for Leverett to issue a \$3.6 million general obligation bond to finance the construction of a FTTH network to every residence in town. A 6 percent increase in the property tax financed the capital costs and revenues from the network were expected to pay ongoing operating costs. The estimate for the median taxpayer was \$300 per year but was revised at the end of 2015 to be \$219 per year (\$18.25 per month).⁷⁵

Committee members emphasized that residents should contemplate this tax increase relative to their current expenses for telecommunications services, many of whom were paying a lot for slow connectivity from satellite, mobile service, etc.

Even after paying additional taxes, the new Internet service price would be low. Many would pay less in total than they had paid for services that could not meet their needs.⁷⁶ Leverett's residents supported the broadband committee's proposal at the town meeting by a vote of 303-33.⁷⁷

A Series Of Contracts

Leverett's local government took the lead on the project. Local officials broke the overall network project down into specific tasks and sought a partner for each one. Leverett issued separate RFPs to look for different contractors to build the network, operate and maintain the network, and serve as a service provider on the network.

For construction, Leverett chose Millennium Communications Group to build the network. This was a fairly straightforward, one-time contractor agreement. Millennium Communications was to build LeverettNet according to Leverett's preexisting network design plan.

Leverett selected nearby Holyoke Gas & Electric (HG&E) to serve as the network operator. HG&E is a municipal electric utility, based just 17 miles away in the city of Holyoke, Massachusetts. But over the last 15 years it has slowly expanded into the commercial broadband business, serving local businesses and community anchor institutions.

The community selected Crocker Communications to serve as the ISP. Like HG&E, Crocker is a locally-based organization that has its headquarters in Greenfield, just 11 miles from Leverett.⁷⁸

Leverett and Crocker Communications finalized their agreement in June 2014. The initial term

of the agreement is three years, but it may be extended by the consent of the parties.

Infrastructure

Leverett owns all of the network's fiber-optic infrastructure and the entire community is connected. Construction included a customer drop to all 800 premises. Residents are free to choose whether or not to subscribe to services on the network.

Crocker is not responsible for any capital expenses. The company does not need to purchase or operate any equipment within Leverett's network in order to offer service to residents. Because the city of Leverett wanted to set the prices Crocker could charge, Leverett officials said it was very important to offer a simple and complete "plug and play" arrangement that made it as low-cost as possible for Crocker to serve as the network's service provider.⁷⁹

Service Expectations

Crocker is the network's exclusive telephone and ISP. The arrangement reflects Leverett's priorities: simply to ensure the community has access to high-quality Internet service rather than promoting competition. However, the agreement lays out specific service expectations Crocker must meet in return for being the sole provider. First, **Crocker must offer landline telephone service and a broadband service with symmetrical speeds of 1 Gbps.**

Second, **Leverett sets the prices** Crocker can charge residents for these services. Crocker may charge \$24.95 a month for standalone telephone

In July 2015, Harvard University's Berkman Center for Internet & Society published an excellent report on Holyoke Gas & Electric. The case study documents the how the municipal electrical utility expanded to provide Internet service and partnered with neighboring municipalities to improve access regionally. The report is available [here](https://cyber.law.harvard.edu/publications/2015/municipal_fiber) (https://cyber.law.harvard.edu/publications/2015/municipal_fiber).

service; \$24.95 for standalone 1 Gbps service; or a discounted bundle of \$39.95 for both.⁸⁰ Crocker must also collect an additional monthly fee from each subscriber. This goes towards the annual operational and maintenance costs of the network and is used to pay HG&E for its services. While all Leverett residents paid for the construction of the network through property taxes, only those who subscribe to services are responsible for paying for its ongoing upkeep. Maintenance costs are divided equally between all subscribers, set at \$49.95 per month initially. All told, the median taxpayer, subscribing to both telephone and Internet service would pay \$108.15 per month for service.⁸¹

Third, Crocker must have **responsive customer service**. All customer service calls must be answered by a human employee “trained in general customer telephone support and resolution of equipment problems.” Crocker may not use an automated menu to process calls.

Lastly, Leverett maintains the right to a “**termination without cause**” and, with 6 months written notice, may end the partnership at any point. The language of the agreement makes it clear that this may be based on Crocker’s performance and the overall satisfaction level that residents have with its service.

Current Status

Crocker began serving residents in April 2015.⁸² They originally planned to activate the network all at once, but due to overwhelming demand from residents to get Internet access as soon as possible, neighborhoods were activated as they were connected.

As of November 2015 over 650 of Leverett’s 800 households connected to LeverettNet subscribed to services from Crocker. This 80 percent take rate exceeds the initial projections of 60 percent. As one member of the broadband committee said simply, “80 percent is wonderful.”⁸³

Conclusion

LeverettNet offers a model for a community-owned gigabit model in small cities that are unlikely to face stiff competition from incumbent providers. The community contracted with various public and private entities to build, maintain, and deliver network services. Though we would not consider these agreements to be PPPs, it may be a solution for some communities that are considering a partnership. ■

For more information on the various contracts Leverett used to build their network, see the presentation [“An Overview of Institutional, Contractual and Financial Arrangements”](#) hosted on the LeverettNet website.



Public-Private Partnerships: Other Lessons Learned

In the last few years, communities have found new and interesting ways to structure PPPs for local networks. The approaches in Champaign-Urbana and Westminster are already being used as examples by other communities trying to structure similar partnerships.

But history also has multiple examples of PPPs for networks that have failed to generate the expected benefits. Some were simply not well structured. Some agreements did not have well-defined policy goals from the public partner and lacked community support. Some were unbalanced and ceded too much control to a private partner who could not deliver on promises (to varying degrees of obviousness beforehand). Other partnerships, perhaps, would have been successful but faced local economic or legal issues that derailed the effort.

Our focus in this section is not to argue against PPPs or to discourage communities from entering into them. Rather, the goal is to highlight past failures and learn from what went wrong. These examples remind us that PPPs are never without risk and should not be considered the sole appropriate way to structure investment in needed Internet infrastructure.

Philadelphia, PA

Philadelphia grabbed headlines across the nation in 2004 when it announced it would build a municipal wireless Wi-Fi network.⁸⁴ City leaders

wanted to build a network to help bridge the digital divide and ensure all residents had affordable Internet access. Wi-Fi was expected to be a “third pipe” delivering needed competition to complacent DSL and cable monopolies, but the network did not succeed. Although many critics point to Philadelphia’s efforts as a failure of municipal government, the project was actually a private venture with some limited support from the public. This is a common confusion that reveals the ignorance of many critics that use Wi-Fi examples to discredit publicly-owned networks.

The city created the nonprofit *Wireless Philadelphia* to oversee and administer the network. Initial recommendations called for meaningful public sector involvement including owning the network infrastructure but not serving as the service provider. Large incumbent providers like Comcast and Verizon opposed the network and lobbied heavily against it.⁸⁵ Due in part to this pressure, local officials and *Wireless Philadelphia* ultimately selected a partnership model that was not balanced, ceding nearly all project control to the private sector.

Earthlink was selected to construct the network, own all the infrastructure, and be the service provider. In return, Earthlink’s primary concession in the agreement was to allow *Wireless Philadelphia* to bulk purchase discounted Internet subscriptions that the nonprofit could then promote in low-income areas. What started as a public process of engagement and local organizing

around the network ended when Earthlink took private control over the whole project. Ultimately, cost overruns during construction, inherent limits in the network technology (Wi-Fi was not able to deliver reliable and high-speed service on a large scale while being financially viable), and a lack of community support brought down the network. It was finally shut down in 2008.⁸⁶

Monticello, MN

Monticello is a small community with a population of 12,000 residents located 40 miles northwest of Minneapolis. Frustrated with the limited services offered by incumbent phone and cable companies, Monticello decided to invest in its own fiber-optic network in 2008. The local government would own the infrastructure, but sought a private-sector partner that would offer retail services to local residents and businesses. Monticello selected Hiawatha Broadband Communications (HBC), a very successful and well-liked competitive firm serving nearby communities.

The network has had to face many challenges beyond its control, most notably the aggressive response of incumbent telephone and cable companies. The telephone company TDS sued to stop the project before it even finished securing its financing. While that lawsuit was eventually thrown out, it still created a full year of project delays, during which TDS improved its dismal DSL service to a FTTH offering.

Monticello next faced apparently predatory pricing from the incumbent cable television company, Charter. Charter went door-to-door, dropping the price for its top TV and Internet access bundle from \$145/month to \$60/month guaranteed for 2 years.⁸⁷ In consulting with those familiar with the programming contracts that are hidden behind non-disclosure agreements, we could not find any expert that believed Charter could recover its costs from such a low price. Indeed, it was likely losing at least \$20 per subscriber per month on

the deal. But Charter was large enough to make up any loss in revenue in Monticello through cross-subsidization from larger, more profitable and less competitive markets. Monticello's subscriber growth plateaued when Charter unveiled that pricing.

The resulting pressure on both HBC and Monticello was so great that they decided to sever their partnership. Monticello decided to run the network in-house while dealing with its debt, ultimately having to give bondholders a haircut. After years of adjusting to the new environment, the community is preparing to team up with another partner to deliver services.

Monticello's experience was certainly a disappointment to those that wanted to see a competitive option without using any subsidies from the local government. However, both businesses and residents have gone from some of the worst connectivity in the upper Midwest to some of the best, and at some of the lowest prices available in this industry.

A major lesson from Monticello is that these partnerships may be subjected to the most stressful pressures imaginable in this business. Competitive rivals will seek to exploit any weakness in a desire to preserve their market power. Partnerships have to survive hard times as well as good.

Gigabit Squared in Chicago, IL and Seattle, WA

In late 2012 Seattle and Chicago announced public-private partnerships with Gigabit Squared. Founded in 2010 by partners with some experience in fiber networks, it claimed to have over \$200 million in private investment to build FTTH infrastructure. In Chicago, Gigabit Squared claimed it would build FTTH infrastructure in neighborhoods adjacent to the University of Chicago and received a state grant from Illinois

to support the project. In Seattle, it agreed to lease existing municipally-owned fiber-optic infrastructure and then build its own last mile infrastructure to connect and serve individual households.

Neither project was completed.

Gigabit Squared failed and disappeared even more quickly than it appeared. Public officials in both communities were left hanging. Seattle took Gigabit Squared to court for unpaid bills.⁸⁸ Officials in Illinois fought to reclaim a state grant given in support of the Chicago partnership, going so far as to claim that Gigabit Squared “lied” about its intentions in the project.⁸⁹ Others have

similar criticisms of Gigabit Squared, noting that statements from the startup were misleading, blurring the line between how much money the company hoped to raise versus how much money it had *actually* raised. The legacy of Gigabit Squared in Seattle and Chicago is not the unpaid dues. The legacy is that **partners may not be what they seem.**

In the end, the old adage “if it sounds too good to be true, it probably is” applies here. Building and operating broadband networks is a difficult business. We believe that some new firms will be valuable partners and others will struggle to meet their promises. But it will be hard to tell them apart in early years. ■



Final Word

Partnerships are one of many options available to local governments to improve Internet access. Local leaders should evaluate all their options before assuming that a partnership is the only path forward. The record of municipal networks is very strong. Among the local governments that have made incremental, low-risk investments, there is no failure to our knowledge.⁹⁰ Those that have been more ambitious have overwhelmingly succeeded, though the amount of work and stress has been significant.

For communities that decide to seek partners, take heed from the lessons above. Be sure to build community buy-in and document the outcomes sought. Vet partners carefully to ensure they will deliver what the community needs. Ensure that the community will continue to have some oversight or leverage over the network that the

community will depend upon for decades. It needs to remain accountable. Two means to ensure that are 1) outright public ownership of some assets and 2) a right of first refusal to purchase them in the event network ownership changes.

Finally, there is no way to dismiss risk in these projects. Partnerships should combine the best capacity of the public and private sectors, not serve merely to hide risk from voters. When a community hears that a partner has a “no risk” approach, they should be extremely skeptical. The PPPs that have delivered the best results and stood the test of time are those where the public has taken on greater risk, as in Westminster. They funded and own the network. We have yet to see partnerships in which the private partner provides all the financing but allows the public any meaningful voice in network outcomes. ■



Glossary

Bits-per-second

A metric to measure the download and uploads speeds of Internet access. Most Internet access subscriptions sold by cable and telephone companies are measured in Megabits per second (Mbps). The FCC defines “broadband service” as having a minimum download speed of 25 Mbps. Next-generation networks in Chattanooga, Tennessee or Google Fiber cities offer Internet access speeds measured in Gigabits per second (Gbps) - or one billion bits per second. 1 Gbps equals 1000 Mbps. Using an 8 Gbps connection, it would take 1 second to transfer a 1 GB (Gigabyte) file - a compressed 90 min movie, for instance.

Broadband Technology Opportunity Program (BTOP)

A federal initiative established by the 2009 stimulus legislation to disburse \$4.7 billion to improve broadband access and literacy throughout the country.

Community Anchor Institution (CAI)

These are important local organizations that provide public interest resources to their communities, such as schools, libraries, hospitals and other medical providers, public safety entities, institutions of higher education, and community support groups.

Conduit

A reinforced tube through which cabling runs. Conduit is useful both to protect fiber-optic cables in the ground and because one can place the conduit underground when convenient and later “blow” or “pull” the fiber cabling through the conduit.

Customer Drop

Most network infrastructure is located on public rights of way, either in conduit under streets or on utility poles. The “Customer” Drop is the final piece of infrastructure located on private property. It runs from a utility pole or street conduit to an individual residence to connect the customers to the wider network.

Dark Fiber

Fiber infrastructure that is not active or “lit” for Internet service. Data is transmitted by passing light through the fiber-optic cable; without light, the fiber remains dormant or “dark.” Towns and cities often can lease this dormant fiber to ISPs who will then “light” the fiber to provide Internet service for businesses and residents.

FTTH

Fiber-to-the-home. As most telecommunications networks use fiber in some part of it, *FTTH* is used to specify those that use fiber to connect the subscriber. Some claim they

have a *fiber-optic* network because they use fiber to the node, but they use phone lines or a cable network over the *last mile*.

Last Mile

Describes the final leg of a connection between a service provider and the customer. In DSL and cable systems, this is the most frequent bottleneck and the most expensive to resolve. The service provider may run a faster *fiber-optic* network into the neighborhood but deliver the *last mile* (which could be considerably less than a mile -"last" is the operative term) with a phone lines that cannot sustain fast speeds.

Middle Mile

Middle mile is a term most often referring to the network connection between the *last mile* and rest of the Internet. For instance, in a rural area, the middle mile would likely connect the town's network to a larger metropolitan area where it interconnects with major carriers and the rest of the Internet.

Network Operator

A Network Operator is responsible for running the network and keeping it up. It controls critical networking equipment like servers and switches. Network operators interact with other entities that offer services on the network. But network operators may not interact with individual residential customers connected to the network. In some cases network operators and service providers can be the same entity performing different roles. But in an open access model, the network operator and service provider can be different entities.

Open Access

An arrangement in which the network is open to independent service providers to offer services. In many cases, the network owner only sells wholesale access to the service providers who offer all retail services (i.e.: triple play of Internet access, phone, TV). Open access provides much more competition from which potential subscribers can choose. The term can have different definitions depending on where and how it is implemented in network architecture

= Open Access Layer 1

Allows open access at the infrastructure level. A competitive service provider may lease access to the fiber cables and install its own networking equipment. This approach has higher capital costs for the competitive entity but allows more independence over network design and the services it can offer to potential customers.

= Open Access Layer 2

Allows open access at the service level. A competitive service provider may gain access to a network by purchasing wholesale services from the network operator which the competitive entity can then rebrand and resell to customers. This approach has lower capital costs for the competitive entity as it must not purchase, install, or operate its own networking equipment. But it does not allow control over network design. It also limits the types of services the competitive provider can offer potential customers to those that it can purchase at a wholesale rate.

Passed

Residences or businesses that have access to the network. As a FTTH network is constructed, it will generally be built through a neighborhood before individual houses or businesses are connected via a customer drop (which is also a fiber-optic cable). When a house or business is “passed,” it means they are eligible to sign up for services (which may require a technician to hook up the drop cable).

Redlining

The term redlining has its origins in discriminatory housing or financial lending policies.

For telecommunications, redlining refers to the practice of network infrastructure selectively being built in only areas with a high potential return on investment, typically more densely populated or higher income areas, while areas with a low potential return on investment, typically more rural or lower-income areas, are left unserved.

Request for Information (RFI)

A business procurement practice used to collect more information on potential vendors before initiating a formal public bidding and selection process. It helps inform the party issuing the RFI on what next steps it should take before issuing a more detailed request for proposal.

Request for Proposal (RFP)

A business procurement practice that defines a specific need and invites vendors to submit competitive bids to accomplish the project. Bids are evaluated on various metrics that can include total costs, time to complete the project, and the vendors’ past experience. The process concludes when the party issuing the RFP selects a vendor and the two enter into a contractual agreement.

Internet Service Provider (ISP)

An entity that offers commercial Internet access or networking solutions to customers connected to a network. It is responsible for collection subscription fees from customers and for handling customer service responsibilities. In some cases network operators and service providers can be the same entity performing different roles. But in an open access network model the network operator and service provider can be different entities.

Take Rate

The number of subscribers to a service - typically expressed in a percentage of those taking the service divided by the total number of people who could take the service. If a community fiber network passes 10,000 people and 6,000 people subscribe, it has a take rate of 60 percent. When planning the network, it will be built to be profitable at or above a certain take rate (as defined in the business plan). Generally, networks require a few years to achieve take rates due to the long time it can take to connect each customer.

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