

Seven Models For Community Broadband

Municipalities that want to improve broadband services for their communities should consider the benefits and challenges of multiple approaches before they make their decisions.

By John Honker / *Magellan Advisors*

Cities across the United States are becoming aware of the importance of next-generation broadband services to support the future of their communities. Evidence suggests that broadband services have a net positive economic and social impact on communities by enhancing economic competitiveness, workforce development, educational capabilities, municipal operations and smart-city deployment.

Each local government must determine the right broadband business model to effectively meet community needs. To select the right model, a locality must understand its community's needs, know the competitive market factors that define its infrastructure options, and assess its organizational and operational capabilities.

PUBLIC POLICY ONLY

In the public-policy-only model, a municipality utilizes its public policy tools to influence how broadband services are likely to develop in its community. It shapes public policies to streamline the processes of designing, constructing and managing broadband infrastructure in its jurisdiction. Focus areas include right-of-way access, permitting processes and costs, construction practices and placement methods, franchises and utility fee assessments. Examples of policies and standards

include joint trenching and dig-once policies; utility relocations; and funding mechanisms for design, labor, and materials. This option is not a true business model, but it does impact the local broadband environment and is therefore included in this list.

Santa Cruz County, Calif. In 2013, the board of supervisors approved an overhaul of broadband infrastructure plans and regulations. Among other initiatives, it reduced permitting fees and proposed a dig-once ordinance to facilitate installation of fiber optic cables during other work on area roads or utility lanes.

Zach Friend, Santa Cruz County Supervisor, said, "Many regions throughout the country face a situation similar to ours: deemed too rural for real capital investment by the internet service providers but urban enough that this lack of investment really puts us at an economic and community disadvantage. To have these policies recognized at a national level shows their applicability and value throughout the country."

The county's initiatives were crafted into a comprehensive set of policies:

- A dig-once process that requires the county to notify broadband companies and provide opportunities to lay fiber whenever a street is open
- Development of master lease agreements to simplify access to county facilities

- Inclusion of conduit as part of public works projects, new developments and land divisions.

The key challenges to policy development and implementation relate to internal departments' working together and communicating the shortcomings in their current practices and policies. A better understanding of interdependent responsibilities can help cities improve policies. In addition, because changes often come with associated costs, a municipality needs to establish a fund to financially assist early adoption of certain policies.

PUBLIC SERVICES PROVIDER

Public services providers utilize fiber and broadband resources to connect multiple public organizations with fiber or wireless connectivity. These organizations are generally limited to the community anchors within their jurisdictions, including local governments, school districts, higher educational organizations, public safety organizations, utilities and health care providers. The majority of these anchors require substantial connectivity, and often a local government's network can provide higher capacity at lower costs than these organizations can obtain in the commercial market.

Seminole County, Fla. Seminole County owns and operates a 450-mile fiber optic network that it installed over the last 20 years primarily to serve transportation needs. The county's traffic engineering group developed the network in the early 1990s by connecting traffic signals to fiber to provide enhanced communications and better reliability. The network, originally conceived exclusively for transportation use, became a resource that connected public organizations across the county.

To date, the county's traffic engineering department has connected 26 fire stations, 58 county buildings, 44 schools, four Seminole State College campuses, 41 city buildings and 17 water treatment plants. In addition, the department maintains more than 375 traffic signals, 148 school flashers at 73

Seminole County in Florida saved millions of dollars for public agencies by building and operating a public services network.

locations, 46 beacons and flashers, and 29 variable message signs. The fiber network consists of different types of cables and strand counts: single-mode, multimode and hybrid. Altogether, there are approximately 1,246 active strand pair miles of fiber.

Seminole County's network has saved public organizations millions of dollars and enabled the county and its cities to

- Share resources among themselves and schools and community colleges

- Aggregate demand for public procurements to attain volume purchasing power
- Provide interjurisdictional public safety communications between the county and cities
- Reduce public organizations' spending on communications services on a countywide basis
- Future proof the communications needs of all organizations connected to the network.

Significant challenges resulted from commingling of fiber assets with the

	Government Does Not Operate			Government Operates			
	Public Policy Only	Infrastructure Only	Public-Private Partnerships	Public Services Provider	Open Access Wholesale	Retail Provider Business-Only	Retail Provider Residential & Business
Services Provided	None	Dark Fiber Only	None	Dark Fiber, Transport, Internet, Phone	Transport	Internet & Phone	Internet, TV, Phone & Value-Added Services
Customers	None	Broadband Providers	None	Public Organizations Only	Broadband Providers	Businesses	Businesses & Residents
Funding Required	Low	Moderate	Low to High	Moderate	Moderate	High	High
Competing with Broadband Providers	No	No	No	No	No	Yes	Yes
Operational Requirements	Low	Low	Low	Low	Moderate	High	Very High
Regulatory Requirements	Low	Low	Low	Low	Moderate	High	Very High
Revenue Generation	Low	Low	Low to High	Low	Moderate	High	Very High
Operational Costs	Low	Low	Low	Low	Moderate	High	Very High
Financial Risk	Low	Low	Low	Low	Moderate	High	Very High
Execution Risk	Low	Low	Moderate	Low	Moderate	High	Very High

Comparison of business models

Florida Department of Transportation (FDOT). Restrictions in the use of FDOT assets limited the county's opportunities to utilize this fiber in commercial transactions. However, the county was still able to utilize these assets for its own purposes as well as for other public organizations connected to the network.

OPEN-ACCESS PROVIDER

Local governments that adopt open access generally own substantial fiber optic networks in their communities. To provide open access, these governments light the fiber and equip the network with the electronics necessary to establish a transport service or circuit to service providers that connect to the local network.

Open access enables competition among service providers across a network owned by a local government. The municipality remains neutral and nondiscriminatory toward providers that deliver services over the network. It leases access to each service provider based on the amount of bandwidth required by the provider's end customers and establishes a standard rate structure and standard terms of service.

Municipalities generally charge retail broadband providers wholesale rates to use their networks. They publish rates to competitive service providers, charging a monthly fee based on bandwidth utilized or a flat fixed fee per month. Services may include internet, telephone, data connectivity (transport) and dark fiber.

Palm Coast, Fla. In 2006, the Palm Coast City Council approved a five-year fiber optic deployment project funded at \$500,000 annually for a total investment of \$2.5 million. The network was developed to support growing municipal technology needs across all public organizations, including city, county, public safety and education. The city utilized a phased approach to build its network, using cost-reduction opportunities to invest in new fiber optic infrastructure. As each phase was constructed, the city connected its own facilities and coordinated with other

public organizations to connect them, reducing costs for all organizations connected to the broadband network. By deploying this network, the city has saved nearly \$2 million since 2007 and projects further annual operating savings of \$350,000. The network provides valuable new capabilities that enhance its mission of serving community residents and businesses and generates more than \$500,000 annually in new outside revenue.

In a market in which local fiber was scarce and unaffordable for all but the largest businesses, Palm Coast FiberNET now provides cost-effective fiber access for as little as \$50 per month for a 10 Mbps connection. Service providers use the network to deliver internet and business communications services for significantly lower costs than were previously available. FiberNET has reduced the costs of business internet services across the city by 30 percent. The city has enabled new competition and introduced a competitively priced fiber product into the Palm Coast wholesale market.

Palm Coast struggles with decisions about whether to build out fiber to the providers' customers to help support local economic development. It has considered leaving the construction of all last-mile drops to its service providers or building last-mile drops only when the payback will cover its expenses. To date, all requested drops have had a reasonable payback, and the city has constructed them all, but this has been a recurring issue that FiberNET and several other municipally owned networks face.

INFRASTRUCTURE PROVIDER

Cities that provide conduit and dark fiber services to local organizations are generally considered infrastructure providers. They lease these assets to community organizations, businesses and broadband providers, which use the fiber to connect to one another and to data centers to reach the internet, cloud services and other content networks. Many municipal providers that have deployed these services began

by building their own fiber networks to serve purely municipal functions. As their networks grew, they realized that these networks could provide access to local organizations needing fiber connectivity.

Dark fiber is the core product of most infrastructure providers and is utilized by businesses, community anchor organizations and, in a few cases, residents. Commonly, municipalities lease dark fiber strands using a simple, mileage-based price calculation to the end user. However, customers may require new construction to reach their facilities. Construction costs that municipalities incur are charged back to customers to allow municipalities to recoup their investments.

Santa Monica, Calif. In 2002, when Santa Monica renewed its franchise with the local cable provider, it included a lease of fiber optic network capacity to connect schools and community college sites. The city paid construction costs of \$530,000 and shared the ongoing costs with the schools and community colleges – saving a combined \$400,000 in annual telecommunications costs, which grew to \$500,000 over several years. The savings were used as seed capital for the development of the city's own fiber optic network.

Today, 126 businesses are connected to CityNet, and approximately five are added monthly. The network covers approximately 8 square miles and soon will deliver up to 100 Gbps of symmetrical broadband access. The city negotiates prices for services for each business customer individually.

CityNet was able to

- Reduce costs of internet access for the city and schools
- Support free Wi-Fi in 35 public hot zones as well as free access through 375 computers in kiosks and libraries
- Nurture existing businesses, attract new businesses, and support startups, VCs and incubators
- Create an environment for other incumbents to invest in city infrastructure.

Santa Monica is evolving from its infrastructure-only model. As demand for high-speed internet services grew over the last five years, small and medium businesses desired an affordable internet solution enabled by a single provider. The struggle Santa Monica faced was to maintain lean operations and a hands-off approach while serving a range of business customers. Retail was a new business model that Santa Monica had not yet encountered. Truly impacting the small and medium business market required a change in thinking, and the city decided to offer direct internet services as part of its portfolio of services.

The city is also conducting a pilot residential project to assess the feasibility of expanding CityNet broadband to Santa Monica residents. The multiple-dwelling-unit buildings scheduled for the pilot are all affordable housing buildings, many with community rooms used for after-school programs.

RETAIL PROVIDER – BUSINESS ONLY

A common goal for municipalities that deploy broadband networks is to support local economic development needs. Local governments equip their business and industrial districts with fiber infrastructure through which they can provide cost-effective, high-speed internet and other services to local customers.

Municipal business providers offer internet and communications services that are generally priced very competitively against other provider offerings in the small and medium business market. In addition to offering lower prices than other service providers, they offer

- Higher bandwidth scalable to gigabit speeds
- Symmetrical service (the same upload and download speeds)
- Higher-quality fiber connections with less downtime and stronger service level agreements
- Responsive local customer service.

Hudson, Ohio. Like many other communities that have recently decided

to invest in municipal networks, Hudson delivers only internet access and voice services. Hudson Public Power will deploy the city's gigabit network incrementally, prioritizing the downtown and areas of high demand. By reinvesting customer service fees, the city plans to grow the network as a self-sustaining venture.

Hudson markets its municipal network under the name Velocity Broadband. It is one of the first cities in the Midwest to offer gigabit connectivity and is signing on business customers while deploying the network. The city has no definite plans to serve residents, but once business services are in place, it will consider a residential service offering.

Because it is launching at the time of this study, Velocity Broadband's impacts are too early to include here. A local public relations firm will be one of the beta testers as the network progresses. It uploads and downloads

large data files on a daily basis, and its current 5 Mbps connection is inadequate. The CEO of the company says that its current internet service is constantly going down, and when that happens, staff must leave their offices to find other places in town with available internet, such as coffee shops. Clearly, improved quality of broadband services will have an impact on this business, so similar business examples throughout Hudson, taken in aggregate, could have a substantial positive effect on the community.

RETAIL PROVIDER – RESIDENTIAL AND BUSINESS

Municipalities that provide direct services to residential and business customers are considered retail service providers. Most commonly, local governments offer triple-play services consisting of phone, television, and internet services. A retail provider is responsible for a significant number

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of operational functions, including management of retail services, network operations, billing, provisioning, network construction and general management.

Perhaps the most important decision when evaluating a retail business case is whether to provide linear television services. Television is the glue that holds a triple-play service bundle together; without television, many networks fail to achieve strong market share above 30 percent.

Costs vary among municipal retail providers. Therefore, it becomes difficult to set benchmarks consistently, as each provider has a cost structure that differs from those of its peers. We do not advise that a city rely on the performance of other municipal providers to forecast its own expected performance.

Morristown, Tenn. At the time of Morristown's initial deployment in 2004, fiber to the home was not common. However, once the city realized that fiber was a way to secure the network investment for the future, the decision was easy. Nearly a decade later, the upgrade to gigabit capability did not have to touch the fiber network – the electronics were simply changed on both ends.

Morristown Utility System (MUS) FiberNet started signing up customers in 2006, and by 2008, it had a take rate of 33 percent. By 2015, take rates were above 44 percent of homes passed and a greater percentage of businesses. Eighty percent of residents can choose from at least two of the four broadband service providers in the city, and 100 percent of Morristown households have access to broadband internet.

FiberNet has had a strong financial performance. It was cash flow positive two years after launch and net income positive after five years. It achieved revenues of \$8.6 million in 2013 and \$8.9 million in 2014. Businesses and residents save \$3.4 million annually, and the electric utility saves \$840,000 through a smart meter program.

FiberNet has also had a positive impact on economic development. For example, Oddello Industries, a contract furniture manufacturer that relies

on FiberNet for its communications, announced a \$4 million expansion that resulted in 228 new jobs. Molecular Pathology Laboratory Network, a global leader in personalized laboratory medicine, located its primary backup facility in Morristown.

Though its many benefits outweigh the challenges, MUS admits that operating a broadband and telecommunications network is tough for a small community, primarily because of the economies of scale. The challenge for Morristown leaders was to gain the political will to be successful, battle the telecom lobby and the Tennessee legislature, and make good business decisions with vendors. MUS leadership says that succeeding at broadband takes determination because it is not an easy business.

PUBLIC-PRIVATE PARTNERSHIPS

The emerging business model of public-private partnerships (P3s) provides an innovative solution to an ongoing municipal broadband issue: How can a local government invest in municipal broadband without operating a broadband network?

Generally, P3s bring a local government and one or more private organizations into a partnership to plan, fund, build, and maintain a broadband network within the municipality's jurisdiction. Many P3s are still in development, and very few operating networks today use this model.

The tricky part of a P3 is to find the right division of roles between the public and private partner. Public and private partners must agree on workable solutions to the following issues, among others:

- Who has rights to access the network, and is the P3 exclusive or nonexclusive?
- What are the public and private partners' goals, and how are they incentivized?
- What roles and responsibilities do the public and private partner have in the P3?

- What assets are financed through the public and private partners respectively?
- What revenue model do the public and private partners use to recoup their investments?
- What requirements must the private partner meet in terms of service availability, speed, price, locations and time frames?
- How will the partners determine future buildouts, and who pays for them?

Westminster, Md. The city recently developed a P3 with Ting Internet to build an FTTH network to approximately 9,000 homes and 500 businesses. The city approved a budget of \$650,000 to build out FTTH infrastructure in a pilot program to reach a subset of the entire community. Ting operates the network and, for a limited period, is the only service provider on the network.

Ting provides only internet services but plans to offer competitive television and voice services in the future.

CONCLUSION

Determining the right business model is key to the success or failure of a municipal broadband project. The selection of an appropriate business model should be based on factors that include a city's stage of broadband development, the local environment, the city's funding capacity, its organizational capabilities and the desired benefits to the community. Exploring all available options will help cities understand which business model provides the balance of risk and reward that fits best within their current environments in terms of financial and community benefits. ❖

John Honker is president and CEO of Magellan Advisors LLC, which offers strategic broadband, telecom, IT and security consulting services to the public and private sectors. This article is adapted from Magellan's Municipal Broadband Case Studies & Benchmarking Analysis, which was introduced at the BROADBAND COMMUNITIES Summit. For more information or to obtain a copy of the complete report, contact jhonker@magellan-advisors.com.