Public Infrastructure/Private Service Model For 21st Century Broadband Proves Worthy

The emerging model presents a scalable option for communities that lack the expertise or interest to operate networks or act as ISPs themselves but want to own and control the core communications assets in their communities as a means of securing the benefits of broadband internet. Here's a look at the model's business case, technical elements and risks.

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This article is adapted from the Benton Institute for Broadband & Society's report "Public Infrastructure/Private Service: A Shared-Risk Partnership Model for 21st Century Broadband Infrastructure," October 2020. Read the entire report at https://www.benton.org/publications/public-infrastructureprivate-service.

Broadband networks rank among the most important infrastructure assets of our time – for purposes of economic development and competitiveness, innovation, workforce preparedness, health care, education, and environmental sustainability. The criticality of broadband was illustrated when the COVID-19 pandemic shut down the U.S. economy. Households with fast connections were able to continue working and attending classes online. Unconnected households found themselves more cut off than ever.

If there was ever any doubt about the centrality of broadband to the national interest, the devastating pandemic erased this doubt. Yet the United States faces persistent gaps in broadband availability and affordability – as well as a troublingly noncompetitive broadband ecosystem in which most communities are served by only one or, at best, two high-speed broadband providers.

The persistence of these gaps demonstrates that private-sector investment alone is not closing digital gaps. In rural areas of the country, in particular, there exists insufficient return on investment for private capital; as a result, broadband deployment does not emerge without some form of public support. In less rural areas, competition is rare because return-on-investment challenges deter new investors from competing against existing monopolies and duopolies.

Given these difficult economics, even the most optimistic estimate is that only a third of U.S. homes have access to all-fiber-optic networks. Fiber represents the holy grail of communications infrastructure, recognized as a future-proof technology for facilitating the bandwidth needs of homes, businesses, schools, libraries, institutions and government agencies – and a necessary platform for advanced wireless services that require fiber to deliver high speeds.

How, then, can U.S. communities secure the benefits of fiber optic infrastructure?

Our answer is that local governments need not accept a binary option of waiting for the private sector to solve the problem – which the private sector already would have done if it made business sense – or taking on the challenge entirely as a public enterprise. Rather, public-private collaboration can disrupt this binary and give communities options. Indeed, in recent months and years, a range of collaborative public-private models – involving various levels of risk-sharing – have emerged and proved worthy of emulation.

In some of the most promising partnerships, the public entity funds, builds and owns the underlying communications infrastructure, and the private entity does the rest: It provides the electronics and service over that infrastructure and deals with the complexities of running a broadband business.

The Public Infrastructure/Private Service model (hereafter called "the model") leverages the best capabilities of the public and private sectors. Cities and counties do what they've always done: finance and build basic infrastructure, manage rights of way, and maintain that infrastructure over long periods of time – ensuring that the entire community benefits from the infrastructure and that government functions can happen over fiber that connects municipal offices, libraries, public safety agencies and schools.

At the same time, private entities do what they traditionally do well: run a business, engage in sales and marketing, handle customer service and adapt to changing technologies and customer preferences. In some cases, public or cooperative entities ably perform these service roles in partnerships with their infrastructure collaborators.

This emerging model presents a scalable option for communities that lack the expertise or interest to operate communications networks or act as internet service providers (ISPs) themselves but want to own and control the core communications assets in their communities as a means of securing the benefits of broadband internet.

THE BUSINESS CASE FOR THE MODEL

The model holds the potential to combine the strengths of the private-only and public or cooperative-only models while minimizing their respective weaknesses. Here's why.

1. The model offers policymakers a tool to act on multiple critical priorities simultaneously and through a single investment. Cities and counties can invest in basic public infrastructure with a lifetime of decades (and far more in the case of conduit). Simultaneously, the model enables business opportunity and expansion for private-sector service providers that can compete over public infrastructure. It also creates construction jobs almost immediately, as well as permanent local operations jobs – a high priority at all times but particularly in the current moment as communities seek to recover from the fallout of COVID-19.

   Most importantly, this model enables localities to realize all the benefits of 21st century broadband infrastructure for health care, education, environmental protection, civic participation, economic development and much more.
2. The model leverages the respective strengths of all parties. For local governments, it taps into their ability to access the capital markets at low cost. The model also leverages localities' expertise at building and maintaining physical infrastructure in public rights of way. On the private-sector side, ISPs can focus on their core strengths of delivering services to the public rather than the need to finance and build infrastructure.
3. The model gives local government choice and influence in broadband decision-making. If a locality owns the underlying infrastructure over which ISPs provide service, the locality does not have to rely on the viability of single providers. It can seek out potential partners and give competing ISPs opportunity to enter markets quickly by leasing access to the public infrastructure. In some markets, there may be economic potential for more than one ISP to lease access to the infrastructure, securing the benefits of competition over a single network rather than requiring multiple, inefficient networks.
4. The model offers localities a prudent, lower-risk way to chart their broadband futures. Because of the potential for creative risk-sharing within the model, governments potentially get considerable bang for their broadband bucks while taking on less risk than if they were trying to start up a broadband business on their own – or if they were providing subsidy money and hoping recipients followed through on their promises.

   In addition, the model provides a clear and familiar target for government investment: basic infrastructure. For the most part, the current modes of enabling broadband deployment involve federal, state and local governments giving grants or loans to individual public or private network operators to build networks and deliver services over them. By contrast, the Public Infrastructure/Private Service model can provide a new way to focus investment on the basic infrastructure, built by localities with grants or low-cost public financing – much as the federal government has invested in transportation and other forms of basic infrastructure over the decades – and then offered to private providers at competitive cost.

TECHNICAL ELEMENTS OF THE MODEL

The model is structured to enable localities to use their experience, capabilities and assets to build broadband infrastructure that can be made available to the private sector for competitive services and innovation. The public sector, in this structure, will finance, build and maintain infrastructure but be largely uninvolved in the operational roles related to service delivery.

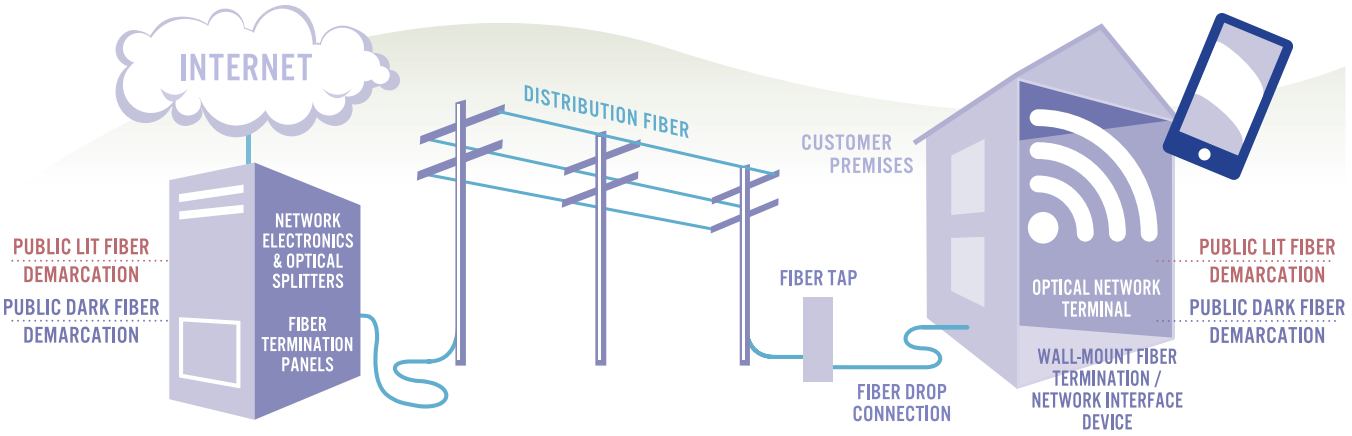

Figure 1

There are three primary technical approaches a community may consider under the "public" portion of the basic Public Infrastructure/Private Service model:

1 **Dark fiber approach:** The infrastructure provider is responsible for the physical fiber plant. This includes constructing the network, responding to and repairing fiber breaks, splicing new fiber, and performing ongoing maintenance tasks. Building and maintaining a dark fiber network also requires access to poles and/or conduit. The service provider lights the fiber and provides services and customer-premises equipment. When a new subscriber takes service, the infrastructure provider typically also is responsible for constructing the fiber "drop" cable from the street to the subscriber's home, where it connects to a network interface device at the premises.

2 **Lit fiber approach:** The infrastructure provider is responsible for the fiber network as well as for providing the network electronics required to light the fiber and deliver services from the service provider to the subscriber (terminating at an optical networking terminal located inside or on an outside wall of the customer premises). The lit fiber provider also creates a network operations center and performs ongoing maintenance and support tasks. The service provider sells services to subscribers using a virtual circuit over this lit network.

Figure 1 shows the different elements of the network, with the additional components the public entity owns and operates under the lit fiber approach. If the public entity's role is limited to providing dark fiber, the service provider is responsible for lighting the fiber (providing the electronics).

3 **Conduit approach:** The public infrastructure provider is responsible for the physical conduit plant. This typically includes constructing the conduit network, responding to and repairing any conduit breaks, maintaining network documentation, and providing access points for the service provider. The service provider does the rest, pulling fiber through the conduit, lighting the fiber and providing services.

Public ownership of the drop conduit provides the flexibility to change or add providers in the future. As an alternative, the customer or the service provider also could be responsible for paying for the drops. This has the advantage of reducing the locality's costs, but with the downsides of inhibiting sign-ups (if the customer must pay extra for the drop) or limiting the locality's control (if the service provider owns the drop).

Figure 2 illustrates a public conduit-to-the-premises approach.

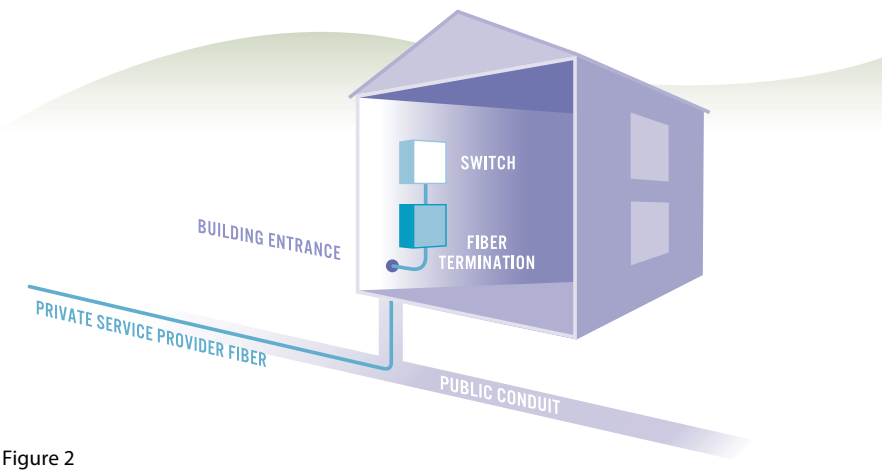

Figure 2

The ISP owns the fiber itself, as well as all the equipment in the home; the city or county owns all the conduit to the home.

THREE GENERAL RISKS OF THE MODEL

In the Public Infrastructure/Private Service model, localities and their private collaborators create business arrangements under which the partners find creative ways to share the capital, operating, and maintenance costs of a broadband network – as well as the rewards.

As localities evaluate proposed models, they must consider three general categories of risk and consider ways to mitigate, share and avoid these risks in ways ideally targeted to their respective strengths and weaknesses and those of their private collaborators or lessees.

1 **Construction risk:** This category refers to risk associated with construction of the fiber or conduit infrastructure itself. The risk arises from challenges with underground or aerial construction that may sometimes be difficult to predict or foresee – and that could increase costs to the extent of making a project less viable than had been anticipated.

For example, construction costs for aerial fiber can balloon in situations where utility-pole owners are slow to issue permits or require expensive replacement of many utility poles by the entity seeking to attach its new cables to the pole. Similarly, costs for underground construction can grow based on complications of needing to dig through hard subsurface rock or avoid existing utilities in a crowded right-of-way. These risks can be mitigated through rigorous planning, detailed engineering, and robust construction management.

2 **Performance risk:** This risk concerns the challenges associated with operating the network on a day-to-day basis and delivering services adequately and in a way that meets the needs of customers; as such, it includes both technical and business execution elements.

For example, operating an optical network delivering marketable services takes capital, experience, and highly skilled personnel. Enormous expertise and organizational capacity are required for daily operations across a wide range of functions. In the technical areas in particular, personnel with these skills are in great demand and can be challenging to recruit and retain as employees.

3 **Market risk:** Market risk is intimately related to performance risk and concerns the financial elements of securing sufficient revenues from customers to meet financial targets. For an internet service provider, this requires achieving and maintaining the necessary take rates, at high enough price points, to achieve sufficient revenue to meet investment expectations.

An entity's ability to mitigate market risk depends on a wide range of factors, many of them external to operations. These include the level of existing competition in the market; changes in consumer preferences; demographic factors such as disposable income and age (which frequently align with how much consumers can spend on internet service); and the state of the national and local economy.

Market risk can be mitigated through successful efforts in sales, marketing and customer service, but it frequently represents an area of risk that some localities prefer not to undertake or that is unfamiliar to them and that they would like to shift to private collaborators.

RISK ALLOCATION in THE MODEL

	MARKET RISK	PERFORMANCE RISK	CONSTRUCTION RISK
ALLOCATION	Private	Private	Public
FUNCTIONS	Sales Marketing Service Delivery Customer Service	Network Operations	Engineering Constructions Maintenance
KEY FACTORS	Competition Demographics Consumer Preference	Access to Skilled Labor Technical Expertise	Utility Pole Access Make-ready Cost Right-of-way Congestion

LEGAL ISSUES IN PUBLIC-PRIVATE PARTNERSHIP BROADBAND PROJECTS

Though all community broadband projects require careful attention to legal issues, this is especially true of broadband public-private partnership projects – particularly complex ones requiring extensive commitments by the public and private sectors over many years. The key legal issues that arise in each of the three major stages of the development of a public-private partnership deal include confirmation of authority, pre-negotiation project planning and negotiation of the agreement.

1 **Confirmation of authority:** As an initial step, a local government contemplating a broadband public-private partnership must determine whether it has authority to participate in such a venture and, if so, whether there are any limitations on its authority or procedural steps that it must take to perfect its authority (e.g., hearings, referenda).

It is critically important to sort out authority issues at the outset, because mistakes can be costly – and are often avoidable. Also, incumbent carriers, threatened with loss of business, have often challenged public communications

initiatives for alleged lack of authority or failure to comply with required procedures.

Federal law encourages local governments to provide communications services of all kinds, but it does not affirmatively empower them to do so. For such authority, local governments must look to state and local law. Moreover, if a public entity provides services or facilities as part of a broadband public-private partnership, it must have authority to do so.

Confirming authority may require reviewing state constitutions and state laws that may affect a local government's authority to participate in a broadband public-private partnership. During the past three years, numerous states have enacted or expanded public-private partnership statutes, including many with a broadband focus. As a result, a substantial majority of states now have such statutes, although they vary greatly in scope and breadth.

A full due diligence review of local authority must also include potential restrictions at the local level. Even if a local government has ample state-granted power to participate in a broadband public-private partnership, it may still be constrained by self-imposed limitations. Such restrictions may appear in the local government's charter or ordinances, or in franchises, municipal pole attachment agreements, contracts or other local undertakings. When local limitations are identified early on, there may be time to remove them by local action or state legislation.

2 **Pre-negotiation project planning:** Once a local government has confirmed its authority and established the zone within which it believes it can operate lawfully, it can turn to exploring the options that it may realistically have within that zone. Several important legal issues may affect these options, including financing, access to public rights of way, access to infrastructure and facilities, regulatory compliance, organizational issues and tax issues.

Financing: Several legal issues may affect the ability of local governments and private partners, working individually or together, to take advantage of available funding resources. For instance, if state law permits public subsidies of communications networks, local governments can invest surplus revenues from other sources (e.g., municipal utility revenues) in communications networks. For various reasons, local governments have rarely used this approach, but some exceptions exist.

Both federal law and the laws of a number of states also encourage communities to use tax incentives to attract private-sector investments. For example, federal tax law encourages local governments to use tax incremental financing (TIF) to stimulate private investment in geographic areas that require revitalization.

A local government that does not have sufficient funds from other sources to pay for a network itself – and for legal, political, or other reasons is unwilling to tax the public – can use debt financing to help pay for the project. This is usually done through general obligation bonds or revenue bonds.

Local governments also sometimes finance communications networks by issuing certificates of participation. Such instruments essentially enable investors to purchase a share of the revenues from leasing the facilities developed with project funds.

A community may also choose to crowdfund a network by borrowing small amounts from local investors. Crowdfunding tends to be a slow and labor-intensive process – the monetary values of individual promissory notes are often small, and it can be difficult to reach out to potential participants.

Depending on state law, local governments have many other tools they can use to finance a project and/or stimulate private investment, including contributing, selling, or leasing real property as part of encouraging a fiber build.

In some states, local governments may be able to form councils of governments to undertake economic-development initiatives on their collective behalf. Such councils enable participants to pool their resources to plan and develop programs aimed at economic improvement. Councils of governments may also form Small Business Administration Section 53 Certified Development Corporations. These corporations are authorized to make long-term financing available through the Small Business Administration's 504 loan program.

Finally, even before the outbreak of the coronavirus pandemic, there were already dozens of federal and state funding programs seeking to encourage and support broadband deployment. Now that the pandemic and the vast economic and social disruptions it has wrought have underscored the critical importance of affordable access to robust broadband capabilities, several new federal programs, and a skyrocketing number of state programs, have emerged to address this challenge.

These programs have annual spending caps ranging from several hundred thousand dollars to several billion dollars. Federal funding for broadband service providers was further expanded in 2020 through the FCC's Rural Digital Opportunity Fund (RDOF) and the Coronavirus Aid, Relief, and Economic Security (CARES) Act.

To some communities, public financing options are not attractive, either because they require more public involvement than the local government wishes to provide or because they believe that the private

sector is better suited to acquiring and managing project financing. In these cases, private partners have a wide range of options to acquire financing for projects directly or indirectly, including through equity, debt, contributions of equipment and facilities, in-kind services, third-party co-builds and fiber-for-pole attachment deals.

Access to public rights of way: Broadband service providers typically require access to public rights of way (PROW) to install fiber and facilities on poles or in underground conduit. To obtain such access, they must get permission from the federal, state, or local regulatory authority that owns or controls the particular PROW in question.

Given the critical importance of rapid buildout to developers of fiber broadband projects, efficient PROW access can be a central issue for a broadband partnership. In general, local governments may consider various steps to streamline the PROW access process. They can, among other things, develop accelerated timetables for permitting, preapprove specific techniques (e.g., micro-trenching), and make dedicated inspectors available. Local governments can also consider reducing fees associated with PROW access.

Access to infrastructure and facilities: Existing or new infrastructure and facilities are among the most important assets that local governments may be able to bring to a broadband public-private partnership. Facilities may include fiber, poles, ducts, conduits, sewers, streetlights, towers, rooftops, co-location space and other property.

Local government-owned land can also be an important and valuable asset to contribute to a partnership. Taking stock early of a city's inventory of current and potential future infrastructure is tremendously important to a local government as it considers whether and how it can best leverage those assets.

Other access issues: Aside from PROW and infrastructure/facilities access issues, many other kinds of access issues can arise in the context of a public-private broadband partnership. These include access to towers; sides and rooftops of buildings; private easements; distributed antenna system (DAS)/small cell sites; wetlands; historical or other protected properties; environmental issues and much more.

Regulatory compliance: When considering the types of services that a public-private partnership will offer and who will be responsible for them, it's important to consider how those activities will be regulated at the federal and state levels. This will depend on multiple factors, including the nature of the services provided, the manner in which they are offered, and the current state of ever-evolving law. Of greatest importance is that the parties identify all applicable regulatory requirements and make sure that at least one of them assumes responsibility for timely compliance with each requirement.

Organizational issues: In addition to considering how a broadband public-private partnership itself will be structured, it is important for a local government to consider how it will organize and run its side of the partnership – including whether to use an existing branch of government to oversee the project; whether to create a new division, commission, authority, nonprofit or cooperative; and how to involve the key stakeholders, including the school system and the municipal utility (if the local government has one). How a public entity chooses to organize itself may be based on political, legal and practical considerations.

Other tax considerations: Given the nature of public-private partnership projects and the possibility of using tax-advantaged municipal or state bonds to help finance the project, it is particularly important to understand the potential tax implications of the public-private partnership models under consideration. For example, under the private business use exception, the federal tax advantages of municipal bonds can be lost if the private entity benefits in ways that exceed certain limits set forth in the tax code.

3 **Negotiating an agreement:** After the local government develops a short list of the potential partners, negotiations to finalize an agreement can commence. The local government's objective will be to achieve the best possible allocation of risks, responsibilities and rewards for the community.

As major long-term capital projects, fiber broadband partnerships will inevitably encounter delays, disruptions, or other challenges at some point during the life of the project.

Allocating the risks of these potential problems is typically the most difficult part of negotiating a public-private broadband partnership agreement. As a general principle, the parties will be best served by allocating particular risks primarily to the party that is in the best position to avoid or minimize the problem that creates the risk and to provide that party reasonable compensation to undertake that risk.

Allocating responsibilities in a fiber broadband partnership project is generally simpler than allocating risks, because both parties largely know what responsibilities they are taking on from the outset of the deal.

In assigning responsibilities, the parties should consider potential cost savings. For example, assigning related responsibilities to a party can provide it an incentive to capture cost savings across the various phases of the contract. Similarly, making one party – usually the private party – responsible for both constructing

and maintaining the outside plant may encourage that party to use more expensive, higher-quality fiber, knowing it is harder for animals to chew through that fiber jacket and, thus, that the fiber will minimize maintenance costs down the road.

Finally, a successful fiber broadband partnership will produce benefits for both the public and private parties. Some of the benefits may be what are considered traditional benefits – e.g., revenue the network produces from user fees. If the network is producing traditional monetary benefits, the parties may agree to a mechanism for sharing the rewards/revenue.

Benefits may also take the form of cost savings. For example, if the public entity is also a system user, it may benefit by obtaining higher-capacity broadband at lower costs from the partnership than it had obtained from the prior service provider.

Fiber broadband partnerships also offer substantial benefits that are not as easy to measure as user fees or cost savings. For example, a public entity's primary goal may not be to produce significant revenue or induce material cost savings from the network but to give the community prompt and affordable access to all of the features, applications and other advantages that a fiber network will support.

A growing number of local governments are coming to see fiber broadband networks as essential infrastructure for the 21st century, capable of driving and supporting simultaneous progress in just about every area of significance to their communities. This includes economic development, education, health care, environmental protection, energy, transportation, government services, digital equity, and much more. Although such benefits may be difficult to measure in monetary terms – as is also true of the monetary benefits of roads, sidewalks, electricity, sewers, and water – they are real nonetheless. For many communities, these benefits are likely to be the primary reasons for entering into a public-private partnership. ❖

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