A Local Ownership Approach to Broadband

How to pay for the last mile, sustainably and at low risk

By Michael Curri / *Strategic Networks Group*

No one would say people don't deserve access to clean water, reliable electric power, safe roads, a right to equal participation in the economy or access to essential civic institutions. These are not luxuries in society but essential services.

Broadband has become an essential service because, without broadband, communities cannot succeed. They need broadband to be economically vibrant, retain and expand their local GDP and tax base, and attract new, high-paying local jobs.

However, the funding needed to build last-mile broadband is lacking, particularly in rural areas. Federal and state funds have become increasingly limited. With private-sector funds looking for private-sector returns on investment, many areas remain unserved or underserved with broadband.

The current business-case approach to providing broadband does not address the needs of these unserved and underserved areas. Simply put, many areas lack high-quality broadband because the business case does not work for private-sector providers. Clearly, a different approach is needed to connect businesses, organizations and households.

Rural subscribers get only half the bandwidth urban subscribers get for the same price, and bandwidth is lower with no competition.

QUANTIFYING BROADBAND GAPS

Reaching the conclusion that a new approach is needed to fund last-mile broadband came at the end of a long journey for me. It crystallized when I was asked to present to the Oregon Broadband Advisory Council in January 2017. In doing background research and talking to industry and community leaders about broadband in Oregon, I heard that the issue there, similar to that in many other places, was how to get broadband to unserved and underserved areas, particularly rural areas.

Gaps in broadband are nothing new for those of us who work on broadband issues. However, what struck me is that the data clearly shows gaps where the business case for broadband ends. The data also shows there is an economic case for investing in better broadband and a way to bridge those gaps that is sustainable and low risk.

To draw on evidence that would help the Oregon council, I looked into the data SNG collected in Tennessee in 2016 from more than 22,000 businesses, organizations and households. As my team analyzed this data, we saw some distinct patterns.

This data clearly shows that rural subscribers get only half the bandwidth urban subscribers get for the same price. (See Figure 1.)

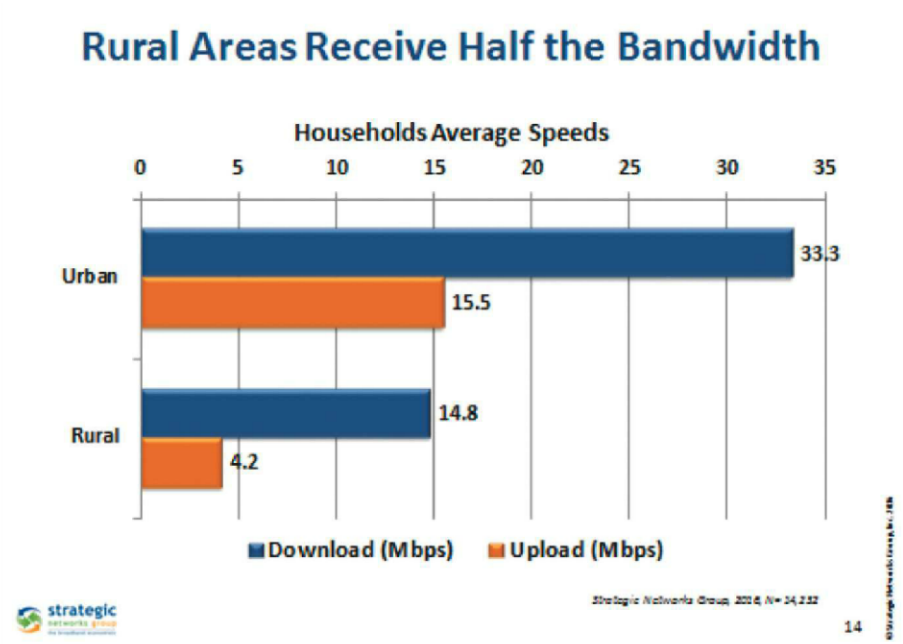

Figure 1

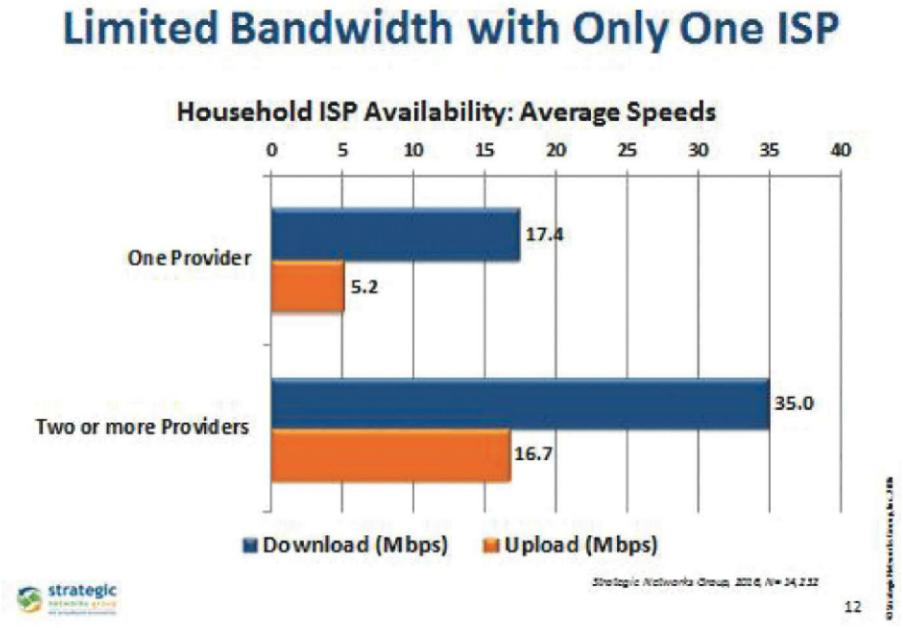

Figure 2

In addition, subscribers in areas with one broadband provider get less than half the bandwidth that subscribers in areas with two or more providers get for the same price. (See Figure 2.)

Furthermore, more than two-thirds of businesses across the United States don't have broadband that meets the FCC's definition of 25 Mbps download, and almost half don't have 3 Mbps upload speed. (See Figures 3 and 4.)

If broadband service providers cannot make a business case for investing because of high construction costs (for example, in the mountains), low population density, low expected take rates or low revenues per user, they won't invest – and, given their lack of a business case, they probably shouldn't.

This is a significant competitive disadvantage for rural businesses that need reliable, affordable, high-speed internet to participate effectively in the digital economy. SNG research shows that communities and regions have difficulty retaining businesses if they don't have broadband. (See Figure 5.)

Broadband is an essential service. It is the infrastructure for the digital economy, and broadband gaps must be addressed if communities in unserved and underserved areas are to

- Improve business competitiveness, innovation, and growth
- Retain and expand businesses
- Enhance quality of life and household income
- Enable "smart" municipal services.

COMMUNITY BENEFITS NOT ON THE BALANCE SHEET

When the same problem crops up over and over again, it's time to start looking for different options. For unserved and underserved areas, that starts with better understanding the realities of where the business case for broadband ends – which was the first step of my journey. The second step was to explore what can be done to bridge those gaps.

Even though private-sector broadband providers cannot and should not build where there is no business case for investing, there are community benefits that are off-balance sheet to private investors that make the case for public investment in broadband. Airports, roads and electric grids are examples of public investment in infrastructure that makes sense as essential public goods because community benefits are greater than private-sector profits.

For the last 15 years, SNG has focused beyond availability to meaningful use of broadband – that is, on how to drive economic and community benefits from whatever internet connection is available. Our

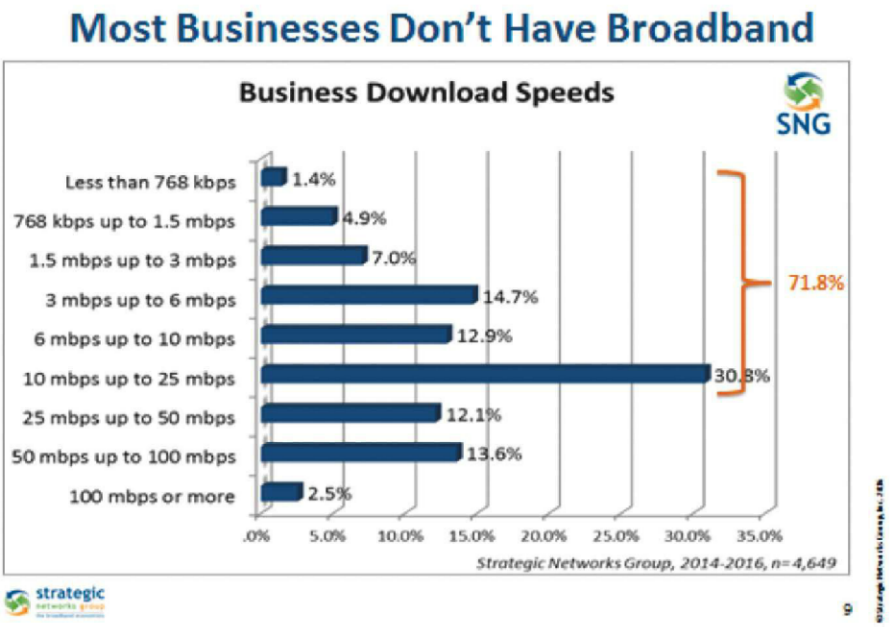

Figure 3

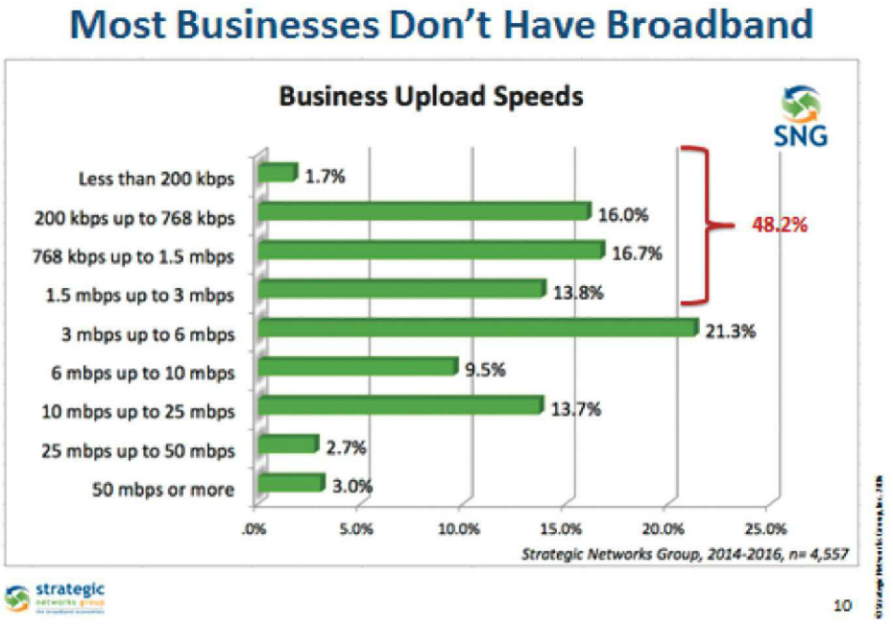

Figure 4

research shows there are public benefits from broadband that are off-balance sheet to private-sector broadband service providers:

- Retained and expanded tax base due to increased business productivity, new and higher-paying local jobs and higher real estate values
- Livability of a community
- Smart-city and smart-grid services
- Emergency communications and public safety
- Telemedicine and aging in place
- Innovation.

As most community benefits are off-balance sheet to private-sector broadband providers, there is underinvestment in broadband. When returns on investment to a community are greater than private-sector returns, there is a case for public investment in infrastructure or services.

Government investment and public-private partnerships can bridge the gaps between service providers' business cases and the costs of building broadband. Several options are available to communities and regions.

Though political disagreements about using public funds for broadband can be contentious, fundamentally, broadband infrastructure is a utility – an essential service required for communities and regions to participate in the modern economy. Historically, taxpayers and local property owners have been responsible for deciding the most efficient way of building infrastructure in unserved and underserved areas, so for taxpayers and local property owners to make decisions about broadband infrastructure is consistent with past practices.

THE AHA! MOMENT

Communities frequently cite public benefits – particularly economic development – as reasons to build or subsidize broadband networks. The problem is that most communities don't know whether those public benefits will cover the gap between costs and revenues for a broadband network.

Though there are ways to make reasonable estimates of economic development benefits (more on this later), relying entirely on forecasts of what private businesses will or won't do isn't wise.

So the third step in my journey – the Aha! Moment – was to realize that SNG has already quantified several other types of relevant data on benefits that can pay for better broadband. In addition to data on broadband's economic impacts, we have collected data on municipal cost reductions and subscriber savings that result from competitive local broadband systems. This enables communities to project

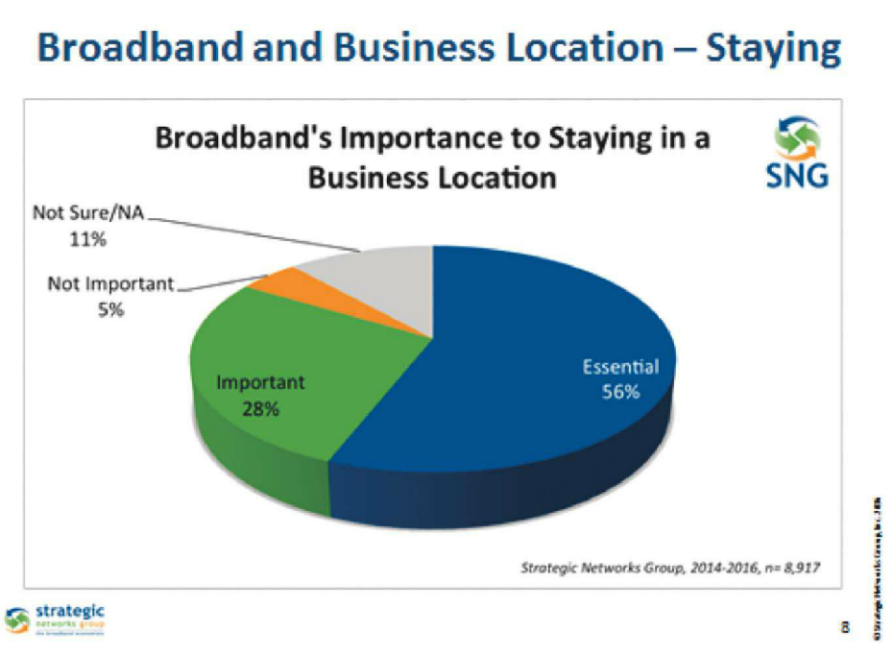

Figure 5

benefits from better broadband. These benefits include cost reductions in telecommunications and internet services, network performance increases, subscriber benefits (consumer surplus) and economic growth that leads to retained, expanded local GDP and tax base and new, high-paying local jobs.

The fourth and final step was to bring all these factors together, which had not been done before, to assess whether a case can be made for public investment to bridge gaps in broadband. Taking a holistic approach to quantify community benefits includes assessing cost reductions from a municipal network, local economic growth from business retention and expansion, and subscriber savings. A community that does this has the information to make a decision about whether the benefits outweigh the costs for investing in broadband (that is, about the economic case versus the business case for investing in broadband).

THE BROADBAND MASTER PLANNING PROCESS

How should an underserved community decide whether it has a case for public investment in broadband?

Focusing on the benefits broadband enables centers the process of discussion, planning and agreement on the community's needs rather than having technology drive the process. It is not enough for broadband to be a "good thing." Quantifying broadband's benefits prioritizes action items for a community and clarifies how stakeholders can better align with the community's situation, needs and goals.

The best infrastructure investments are aspirational – they are built for the future with capacity that can meet needs over 20–30 years. Whether or not private companies invest in broadband, more and more communities and regions realize that they need to take ownership of their broadband futures. Broadband – like any infrastructure – is an enabler for economic activity and civic services, and it needs to be incorporated into a city, town or county's master planning process.

Establishing a shared, holistic, long-range vision for a community's meaningful use of broadband includes exploring and defining broadband's direct and evolving relationship to local businesses, organizations and citizens. In particular, as the internet increasingly empowers customers, all businesses need to be online to be relevant to those customers, which requires that a community have broadband infrastructure sufficient to enable business retention, expansion and attraction.

Broadband drives economic growth in two ways. First, high-capacity, reliable, affordable broadband is a necessary condition for businesses to remain or move to an area, among other site selection criteria (tax rates, land costs, quality of local labor force). It is also a necessary condition for many households to remain in or move to an area.

Second, broadband is essential for businesses to compete in the marketplace and be relevant to customers in the digital economy. Most broadband-using businesses (more than 70 percent) have only scratched the surface of what they can do once they have better broadband. Thus, raising business owners' awareness and providing resources to help local businesses, especially small businesses, adopt online business practices (selling online, customer service, online marketing and so forth) is a critical part of a broadband plan.

Communities need not rely on hope that broadband investments will work. There is a way to project realistic benefits as part of broadband planning.

ASSESSING THE ECONOMIC CASE FOR BROADBAND

By quantifying the current and potential benefits to the community, it

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is possible to assess the economic case for investing in broadband. This process is similar to developing a business case, but it incorporates off-balance sheet community benefits. It is a more holistic approach to incorporating expected community returns on investment into the analysis. Where the business case ends for private-sector investors, local property owners and taxpayers can clearly see what broadband gaps need to be bridged and how much public investment is needed.

The economic case identifies who in the community benefits from better broadband. Quantifying how these beneficiaries will benefit from better broadband incorporates their off-balance-sheet benefits into the broadband planning process. Their returns on investment from better broadband become the basis for discussing financing broadband based on the expected benefits to local businesses, organizations and citizens.

Examining the community's anchor institutions is a good place to start. What are they paying for telecommunications services? What quality of service are they getting? What prices would they pay, and how much better would their service be with a community network?

Next, look at the economic benefits for local businesses doing more with better broadband. Reliable data exists to show how businesses use broadband to grow revenues. For example, using the database SNG has compiled over more than a decade of research, we can model the economic impact of better broadband by calculating the new revenues and cost savings businesses realize when they expand their use of online business practices, based on their industries and sizes.

There is no good way to estimate how many new businesses broadband will attract to a community, especially now that fiber communities no longer have a first-mover advantage. (In fact, losing businesses because of inadequate broadband is now more likely than attracting businesses because of good broadband.) Any community economic development strategy should include business attraction; however, business retention and expansion through broadband should be a priority because about three-quarters of economic growth is typically attributable to businesses already located in a community.

In addition, SNG's research shows that every dollar invested in driving meaningful use of broadband with local businesses returns $35 in gross domestic product and $4 in business taxes.

Finally, look at the savings that households and businesses will realize from purchasing better broadband at a lower price. A conservative approach will estimate only the savings realized by likely customers of the new network (based on expected take rates). However, many communities that built broadband networks have noted that incumbents also lower their prices when they face competition.

In the future, economic cases for broadband may also include the gains from smart-city services based on the internet of things. However, these gains are still too speculative to include today.

NEXT STEPS

If an economic case for investing in broadband exists, the next steps are to

- Develop and prioritize broadband-enabled goals aligned with the community's current and future needs and choose an appropriate broadband model to support these goals
- Develop a network business case and financial plan that includes identifying existing relevant assets, assessing the network cost, phasing the buildout and so forth
- Develop an economic development and marketing plan that drives local economic development through broadband
- Develop a strategy for civic engagement, access to municipal services, and integration with utilities and educational and health organizations.

With better information, community members can make objective decisions about whether public investments will be outweighed by community benefits. Utilities exist for this reason, and this approach needs to be an option for providing better broadband in unserved or underserved areas.

A UTILITY OR ESSENTIAL SERVICE APPROACH

There are proven models for building and managing utilities or essential services, typically using three cost categories:

- Infrastructure cost
- Maintenance and operations
- Subscribed services.

In approaching broadband infrastructure as a utility, the first step is to connect anchor institutions to the backbone. Anchor institutions provide essential services for the community and region (health, education, public safety), provide backbone access for laterals into neighborhoods, and are key providers of education and training to drive meaningful use of internet applications by local businesses and citizens.

Once the backbone network is in place, one approach to fund the last mile is for property owners to opt in and pay for the connections to their premises by creating broadband improvement districts. The city of Ammon, Idaho, is addressing its broadband needs in this manner. (For more information on Ammon's strategy, see "No Municipal Utility? No Problem," p. 44.)

Ammon's fiber network pays for itself in municipal and household telecom cost reductions. In addition, the network will generate $10 million per year in increased economic activity.

Ammon's local ownership of the broadband infrastructure aligns with community benefits. The community owns the infrastructure, has lit the infrastructure and responds to community needs through broadband improvement districts that enable property owners to opt in for better broadband. Property owners opt to pay for the cost of connecting their properties to the fiber backbone. In summary, the Ammon model to finance its fiber system is based on

- Cost-reduction financing for municipal telecommunications and internet services
- Local economic growth through broadband
- Broadband improvement districts for neighborhoods to self-fund the last mile in a manner that is both sustainable and low-risk.

This is essentially a "pay as you go" approach in which neighborhood demand drives last-mile investment. Ammon benefits from this approach by treating broadband as an essential service while reducing investment risks. The key elements of the Ammon model are

- The model lowers financial risk for the city – and for taxpayers.
- The model is opt-in, which lowers political risk.
- Because homeowners are paying for the infrastructure anyway, giving them ownership and control increases take rates.
- The model is sustainable because it does not depend on take rates beyond the initial take rate, customer stickiness is very strong, and it protects the infrastructure owner from fluctuations in the price of services.

The common argument against municipal broadband, especially by incumbent ISPs, is that municipal networks often fail to live up to what they promise, leaving taxpayers to foot the bill. This is always a risk, but with the Ammon approach, this risk is mitigated or avoided by property owners opting in to pay up front.

In preparing a broadband benefits assessment for the city of Ammon (available at ww.sngroup.com/ammon), SNG found that

- The city saves $40,000 per year in telecom and internet costs, which pays off the initial $1 million investment in 25 years, per its business plan. The network, built 2011–14, is now valued at $1.2 million.
- The school district upgraded from a 1 Gbps to a 10 Gbps connection for three of 15 schools and is paying 86 percent less per Mbps.
- Households report that they save $70 per month ($54 for 75 Mbps symmetrical with the Ammon fiber system versus $125 for 100 Mbps/3 Mbps from the incumbent after the data cap), for a total savings of $115,000 in 2017 and $1.9 million annual savings when 50 percent of Ammon households are on the system – but actual savings are even higher than they appear to be because a portion of household monthly costs represents debt service on household investments in the network.

In summary, Ammon's fiber system investment improved bandwidth tenfold from 1 gigabit to 10 gigabits while reducing telecommunications and internet service costs to taxpayers. Overall cost reductions are expected to more than offset network investments within 25 years. In addition, the increased economic activity that better broadband enables and the greater engagement in the digital economy are estimated to create a net benefit of more than $10 million a year.

Ammon is just one example of many that communities and regions can learn from. With local ownership of broadband infrastructure (municipal or regional, co-op, utility, etc.), a community can bridge gaps in broadband infrastructure and choose among options for managing broadband services – leasing the network, providing services directly or providing lit infrastructure. In the end, such local ownership of broadband infrastructure enables service providers to have access to customers without having to build the last-mile infrastructure.

For those many communities that struggle between recognizing the need to improve broadband and the inability to address it, there is a path forward that is sustainable and beneficial:

- Take local ownership of your economic future with broadband as an essential service – assess and choose the best model for your needs and situation.
- Develop an economic case for investing in broadband using cost-reduction financing, broadband improvement districts and increased economic impacts from business retention and expansion (increases in gross domestic product and tax base).
- Connect anchor institutions first to provide core services that need to be connected to the internet backbone. They are key stakeholders that can raise awareness and drive meaningful use of internet applications to help boost local economic growth and workforce development. ❖

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