![BroadbandUSA — Connecting America's Communities]

Sustaining Broadband Networks:
A Toolkit for Local and Tribal Governments

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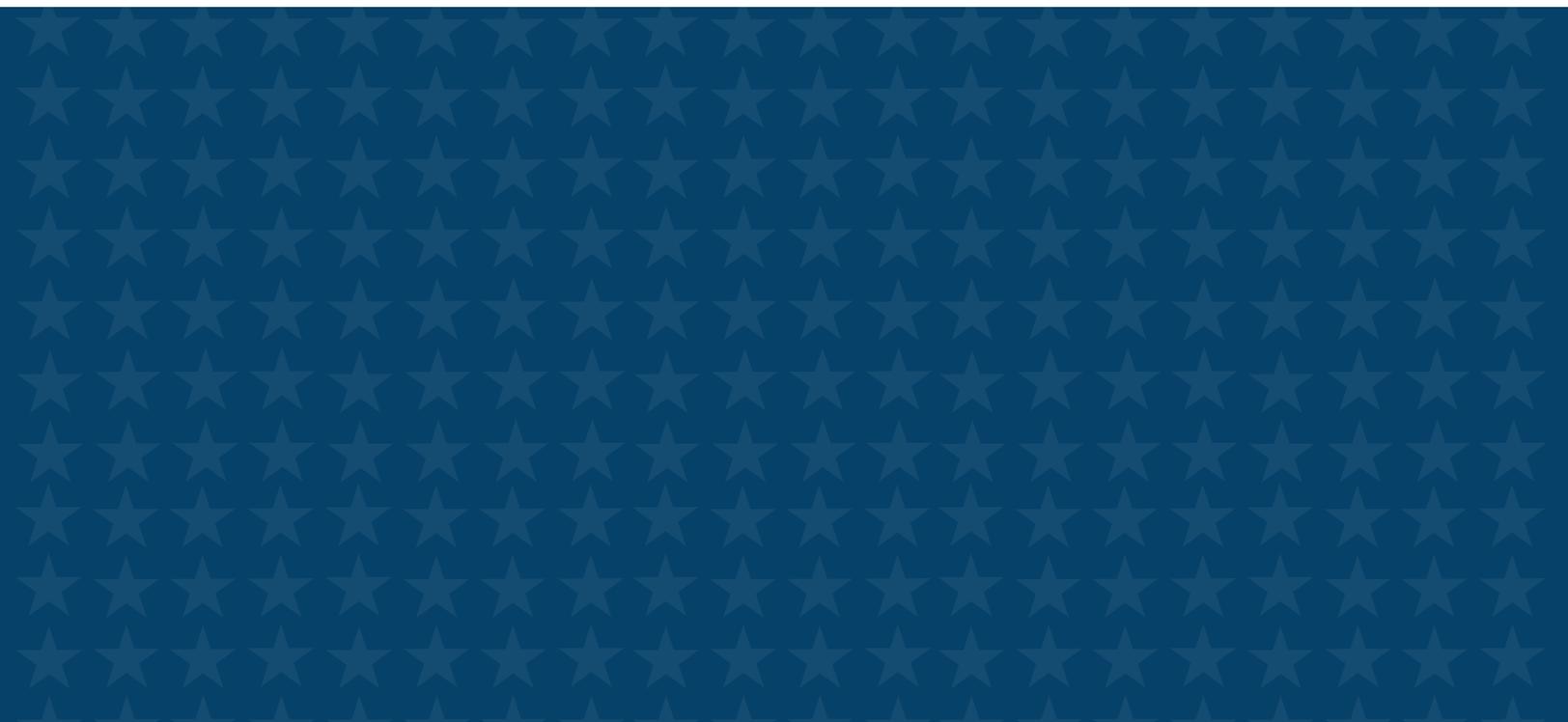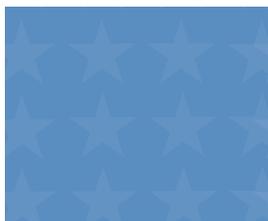
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FOREWORD

The National Telecommunications and Information Administration (NTIA), in the U.S. Department of Commerce, is the Executive Branch agency principally responsible for advising the President on telecommunications and information policy issues. NTIA's BroadbandUSA program is an initiative to promote innovation and economic growth by supporting efforts to expand broadband access and promote digital inclusion for all Americans.

NTIA launched BroadbandUSA in January 2015 after recognizing that while communities may understand that broadband access and use are vital to their economic development, innovation, education, health care, and public safety needs, they often lack the resources and expertise to seize those benefits. BroadbandUSA assists, educates, and convenes government, community, and industry leaders working to advance broadband initiatives and policy. BroadbandUSA serves as a trusted and neutral strategic advisor, working with public and private sector partners to assess local broadband needs and gaps; identify possible funding and other resources; and plan network infrastructure projects and digital inclusion programs.

Leveraging years of hands-on private sector experience along with expertise gained from its administration and oversight of broadband grants, BroadbandUSA is publishing a series of guides and toolkits for communities determined to take steps to secure the robust broadband services and digital literacy skills needed to compete in today's global economy. These publications provide practical advice for developing programs that will successfully meet the current and future broadband needs of communities. This Toolkit, Sustaining Broadband Networks: A Toolkit for Local and Tribal Governments, discusses five actions that local and tribal governments should take to sustain broadband networks over the long-term.

If you are interested in receiving assistance from BroadbandUSA, please contact us at *broadbandusa@ntia.doc.gov* or at 202-482-2048. For more information about BroadbandUSA, visit our website at *http://www2.ntia.doc.gov/new_BroadbandUSA*.

SUSTAINING BROADBAND NETWORKS OVER THE LONG-TERM

Sustaining Broadband Networks: A Toolkit for Local and Tribal Governments presents an action plan for local or tribal governments to maintain and sustain a broadband network. Sustaining a broadband network means that the local or tribal government, alone or with partners, has acquired the funds, resources and assets to launch services to end users, offer network capacity to wholesale customers, operate the network, expand the customer base, and refresh technology over the long-term.

Governments Need a Sustainable Broadband Plan

Local and tribal governments should first discuss the issue of network sustainability in the early stages of developing their broadband project plan, as explained in BroadbandUSA's Toolkit, *Planning a Community Broadband Roadmap*. If a local or tribal government intends to take an active role in building new or additional broadband network infrastructure, they, and any organizations they partner with, should plan how to sustain network operations over the long-term, taking into account the amount of capital and labor that will be needed for the project.

BroadbandUSA's Toolkit, *Implementing a Broadband Network's Vision* described three courses of action that local and tribal governments may take to activate or expand broadband networks in their jurisdictions, as shown in Figure 1.

Option 1: In the first option, local and tribal governments support the expansion of the broadband network but are not actively involved in its construction or implementation. In this option, local and tribal governments may incentivize existing broadband providers to build or extend their networks in several ways: They may streamline permitting and rights-of-way approval processes to accelerate broadband deployment; they may contribute or lease assets for use in the broadband network; or they may aggregate demand from one or more community anchor institutions in their jurisdictions to demonstrate that there is sustainable demand from an existing customer base.

Figure 1. Broadband Implementation Strategy Options

Choose broadband implementation strategy		
OPTION 1	**OPTION 2**	**OPTION 3**
• Encourage providers to build or extend network	• Run network on another provider's broadband network	• Encourage providers to build or extend network

Options that require significant understanding of broadband implementation process
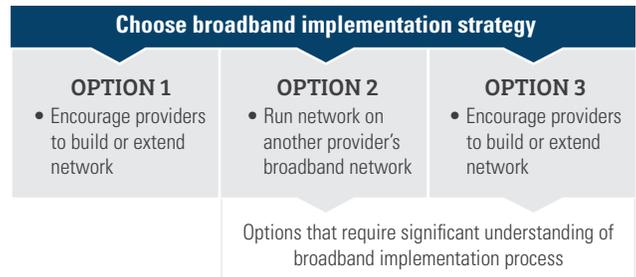
In the other two options, local and tribal governments take a more direct role in the construction and implementation of the broadband network, including planning for network sustainability.

Option 2: In the second option, the local or tribal government runs its own network on another broadband service provider's network to connect public facilities or city-owned institutions. In this option, a local or tribal government will need to assemble the financial resources to enter into a commercial broadband service contract and the staff to carry out day-to-day network management functions. With this option, local and tribal governments should determine how to fund the required number of Information Technology (IT) staff dedicated to network management, pay for equipment, pay for any broadband capacity contracts required and generate sufficient funds from the budgets of the government departments and institutions taking broadband service from the network.

Option 3: In the third option, the local or tribal government uses its resources to build broadband infrastructure — alone or with partners, as described in BroadbandUSA's Toolkit, *The Power of Broadband Partnerships*. They may take responsibility to fund network management, broadband service development, customer support operations and network maintenance activities. In some cases, their financial plans may assume that all operating expenses would be covered by revenue generated by the broadband operation itself. In other situations, the government or the partners may decide to fund network operations and cover related expenses directly from their budgets.

Any local or tribal government that operates broadband infrastructure itself, leases and manages broadband capacity from another broadband provider or participates in a broadband network partnership may benefit from the observations and lessons in this Toolkit. This Toolkit answers the fundamental question facing these governments: After network construction is completed and the first phase of implementation is achieved, what can the local or tribal government do to ensure the broadband network thrives over the long-term?

How to Use the Toolkit

This Toolkit provides tips and advice on how to sustain broadband networks. NTIA developed this publication based on the strategies its broadband infrastructure grantees employed to ensure network sustainability and the best practices that it observed through its management and oversight of these projects.

This Toolkit explains how to keep broadband networks on solid financial footing by expanding revenues and services, keeping systems running efficiently and creating new strategies for success.

Each section below contains:

✦ Advice on sustaining broadband network operations

✦ Best practices

✦ Online Resources

Five Action Points: Creating Broadband Networks with Staying Power

Each local and tribal government will take a unique approach to sustaining its broadband network. This Toolkit explores five action points, shown in Figure 2, that local and tribal government officials, working with broadband network operators and other project partners, can use to create a sustainable environment for their broadband networks.

This Toolkit uses the term "management" to refer to local and tribal governments and the partners they have engaged to help them deploy and operate the broadband network.

Management should consider taking the following five actions to support a broadband network's operations well into the future:

1. **Stabilize revenue.** The funds necessary to keep a network operating are significant. Network operations need revenue streams that generate predictable income and achieve a level of predictable costs.

Figure 2. **Creating a Sustainable Environment for Broadband Infrastructure**

2. **Regularly evaluate operational efficiency, effectiveness, and expenses.** To ensure a long-lasting broadband operation, management should review expenses frequently, update expense statements regularly, reduce unnecessary expenses and boost operational efficiency.

3. **Observe and analyze what customers want.** Management should use customer and market analyses to estimate broadband demand more accurately in their financial projections and network development plans, thereby strengthening their business plans.

4. **Expand customers and service offerings.** Management's business plan may assume that the broadband network will generate sufficient revenue from paying customers to cover operating expenses. Developing a range of additional services can help fund network operations over a prolonged period of time. At a minimum, management should annually review service offerings and the potential for expansion.

5. **Update the strategic business plan to meet evolving needs and mitigate risk.** Management should regularly update financial pro formas to see how its decisions affect income, cash flows and costs, as well as to assess the need for capital outlays for future technology upgrades. Making strategic adjustments to the business plan enables management to avoid or mitigate risks to the broadband network's continued operational and financial health.

ACTION 1: STABILIZE REVENUE

ACTION 1
Stabilize revenue

ACTION 2
Evaluate Operational Efficiency, Effectiveness and Expenses

ACTION 3
Observe and analyze what customers want

ACTION 4
Expand customers and service offerings

ACTION 5
Update strategic plan to meet needs and mitigate risks

Revenue Generation and Service Offerings. Whether a broadband infrastructure project derives revenues from a grant, a line item in the budget of a local or tribal government, a project partner, or paying customers, management should stabilize the network's financial support by generating its own income streams and pursue different financial strategies to keep the network operations funded for the long-term.

Management should strive for broadband network operations to generate baseline revenue that does not fluctuate wildly from year to year. Smooth, gradual growth in the income section of the financial pro forma indicates revenue stability.

To stabilize funding and income for the broadband network, management should:

✦ **Develop a business plan relying on multiple sources of revenue and leveraging the financial strengths of partners:** Management should explore new opportunities for income and other financial support to ensure the project has staying power. Broadband

infrastructure projects are more resilient when they derive revenue from diverse sources and leverage the expertise and capabilities of broadband partners involved in the initiative to improve operational efficiencies and customer service.

✦ **Track the budget cycles of partners and customers upon whom revenue depends:** Community foundations, federal agencies, corporate clients, local governments, community anchor institutions and other organizations may be sources of grants, funding or customer contracts, which generate revenue for the broadband network. Management should take action to secure next year's financial support, at a minimum, two to three months before grant application deadlines or annual departmental budget request deadlines.

The most common ways that management stabilizes revenue and other sources of funding for broadband networks are discussed below.

Basic Fees for Broadband Service

The broadband network provides a core service – access to high-speed broadband to connect local end users with an on-ramp to national and international broadband backbone networks. There are three types of broadband networks:

✦ **Middle-mile open access networks** provide wholesale services or capacity to third parties who retail broadband service to other end users and provide broadband service or capacity to community anchor institutions. Prime customers are last-mile providers, wireless service providers using the network for tower backhaul and transport services, and community anchor institutions.

✦ **Institutional networks** typically provide broadband services directly to community anchor institutions, such as tribal, city, state, and county governments, federal government offices, educational institutions, hospitals, libraries, schools, nonprofits and public safety operations.

Definition: Pro Forma

A pro forma financial statement is a collection of financial statements that are based on certain assumptions and projections. An organization prepares pro forma financial statements in an effort to provide a "big picture" view of its overall financial situation.

Generally, the prepared statements include projected balance sheet, income statement and cash-flow statement; collectively, these projected financial statements are referred to as "pro formas." Pro formas do not follow Generally Accepted Accounting Principles (GAAP) and there are no guidelines for the assumptions used in pro forma statements and projections; therefore, organizations must define the assumptions they use in preparing these statements and provide the assumptions as part of the pro forma package.

✦ **Last-mile networks** bring broadband to end users, delivering a suite of broadband-based data services that often includes voice and video services. Typical customers are household residents, occupants of multiple-dwelling units, and local businesses.

Customers pay monthly fees for packages of broadband services, including wholesale transport and/or capacity and retail service.

Basic service revenue is the revenue baseline of the broadband network's business plan. The business plan should reflect the costs associated with sustaining basic service revenues month after month, year to year. Revenue projections for future years reflect expected income from basic service plus revenue generated from additional services and capacity leases over time, as discussed below.

Long-Term Customer Contracts

Entering into multi-year service agreements with broadband customers has several benefits. Locking in customer contracts reduces revenue uncertainty and frees up marketing staff to pursue agreements with other desirable customers. Longer contract terms allow for a greater understanding of customer requirements and how their needs change over time. They instill community confidence in management's commitment to build and operate the network continuously over the long-term – a perception that will likely generate additional referrals.

> **Definition: Open Access**
>
> Broadband facilities are made available to all requesting parties at reasonable rates and on reasonable terms and conditions.

Demand Aggregation

Demand aggregation is another strategy that management uses to ensure stable revenue from key customers. In this approach, discussed at length in BroadbandUSA's Toolkit, *Implementing a Broadband Network's Vision*, management identifies customers with multiple locations across town, throughout the region, state, or across state lines and offers them an opportunity to combine their total broadband usage in exchange for a discount on the price of broadband service. This demand aggregation offer often assumes that the group agrees to take service under a multi-year broadband contract.

Leased Assets

Management may use revenue from leased assets to stabilize its business plan over time. Implementing the Community's Broadband Network, provides more details on how local and tribal governments can offer long-term leases on government assets.

Revenue from long-term leases derives from the following:

✦ **Capacity** on unused network optical fiber ("dark fiber").

✦ **Conduit** along highways or under city streets through which other broadband operators can run fiber.

✦ **Real estate** where other broadband providers or partners can locate towers, antennas, hubs or other network equipment.

✦ **Public buildings** or other structural space that other broadband operators might use to house facilities, such as network operations centers.

Ten- to twenty-year leases may stabilize revenue flowing to the broadband operation if the local or tribal government channels it into their budgets for this purpose rather than into a general revenue fund.

Broadband Grants, Loans and Subsidies

Grants or loans from federal sources, such as federal agencies, states, banks or economic development-oriented community foundations, may play a major role in funding broadband infrastructure deployment and planning.

Grants are often used to begin a broadband planning initiative and stimulate capital investment. However, NTIA does not recommend relying primarily on grants to stabilize broadband network revenue, because the availability of grant monies may fluctuate and the funding priorities of awarding agencies or foundations may change.

Exceptions include the funding and subsidy programs offered by the Universal Service Administrative Company (USAC), an independent, not-for-profit corporation designated by the Federal Communications Commission (FCC) as the administrator of the universal service fund. Wireline and wireless carriers are eligible for financial reimbursement in exchange for providing service to remote and underserved communities and to low-income areas. In these cases, USAC programs provide a steady stream of revenue (e.g., Connect America Fund (High Cost), Lifeline, Rural Health Care, and E-rate for schools and libraries). Network operators in tribal areas find these funds essential for stabilizing their revenues.

Resource:

@ BroadbandUSA's publication, *Guide to Federal Funding of Broadband Projects*, provides an overview of funding opportunities through a number of agencies across the federal government as of June 2017.

Self-Funding and Other Government Support

Some local and tribal governments may have the capability to self-fund broadband network deployment and operations and to implement economic development and tax policies to help finance the project. They may incorporate ongoing financial support for the broadband network within their annual budgeting processes.

Additional categories of government assistance include:

✦ **Tax Increment Financing (TIF) or Business Incentive District (BID),** in which a government establishes an economic development taxing district and uses the revenue for economic development within the taxing areas.

✦ **Bond revenue,** such as general obligation, revenue or double-barreled bonds to provide multi-year support for broadband operations.

✦ **Loans** are paid back within a timeframe specific to the project. Local banks, the U.S. Department of Agriculture's Rural Utilities Service, equipment and construction companies, and state entities have all originated broadband loans.

✦ **Utility fees or property taxes** can be used to fund network capital and operating costs.

✦ **Capital Leases** are another financing option. A municipal capital lease is a tax-exempt financing vehicle for schools, police, fire departments, and municipal governments in which interest paid to the lessor may be exempt from federal income tax.

✦ **Tax Incentives,** typically offered at the local or state level, can offset project costs projects and non-public partners. In addition, communities in states that do not provide specific broadband tax incentives may be able to use general infrastructure tax credits to help offset the costs of telecommunications projects.

The local or tribal government should develop sets of policies and practices related to each of these options. Policies should identify funding options for capital financing and operations for broadband. Local and tribal governments should articulate the public benefits and strategic vision clearly so that the public understands the rationale for developing and applying these policies and practices. They should establish a general framework that allows flexibility in the application of the policies.

Tools

✦ The final section of this Toolkit contains a *checklist* of the most common revenue sources for local and tribal government broadband networks.

✦ The final section of BroadbandUSA's Toolkit, *Planning a Community Broadband Roadmap*, includes a template for a financial pro forma that can be used to project broadband network revenue.

ACTION 2: REGULARLY EVALUATE OPERATIONAL EFFICIENCY, EFFECTIVENESS AND EXPENSES

ACTION 1
Stabilize revenue

ACTION 2
Evaluate Operational Efficiency, Effectiveness and Expenses

ACTION 3
Observe and analyze what customers want

ACTION 4
Expand customers and service offerings

ACTION 5
Update strategic plan to meet needs and mitigate risks

Management can take action to reduce unnecessary costs and boost the efficiency of network operations. Conducting a comprehensive operational assessment on a regular basis provides management with crucial data upon which to make strategic decisions to help keep costs down and the network running smoothly. This section describes how to conduct an operational assessment for a broadband network and provides examples of management considerations.

Consider the following best practices for management on integrating operational assessments into everyday practice:

> **Sustainability Tip:**
> ✔ Continually assess operational efficiency and whether dollars are being spent wisely.

✦ **Make cost savings and efficiency a top management objective.** Simply stabilizing revenues (Action 1) will not be sufficient to sustain a broadband network. Management should also examine how efficiently the broadband network functions.

✦ **Conduct regular operational assessments to provide a comprehensive view of how well the network is functioning.** This step also provides management with data to determine whether there should be changes to core components of partnership agreements, vendor contracts, staff plans or other arrangements that directly affect the network's financial health.

✦ **Use detailed operations data to gain insights on where to make improvements.** As discussed in *Implementing a Broadband Network's Vision*, developing an operational implementation plan defines transparent processes for all functional areas of the project, including how data is collected to evaluate each component. Data collection and reporting begins in the construction phase of the project and continues as the network is activated as part of weekly, monthly and annual operational

reporting. This data is a key input into the operational assessment described below.

✦ **Monitor staffing levels.** A capital-intensive infrastructure project should keep its staff lean to minimize labor expenses and keep cash flows positive. Management should compare evaluations of employee performance and customer satisfaction to guide decisions on appropriate staffing levels. As discussed below, outsourcing some operational activity is one strategy that may improve the bottom line.

Conduct the Operational Assessment

During the implementation phase — when the operation is new — management takes all actions to activate the network and network operations center, become familiar with how the business systems function, troubleshoot and provide service to customers.

After initial implementation, management begins to conduct regular monthly or bi-monthly operational assessments to understand the extent to which staff, the infrastructure and customer service are functioning efficiently and effectively. The purpose of this assessment is to ask whether improvements to equipment, personnel or procedures can reduce expenses or make operations easier without compromising the quality of the service provided to customers.

NTIA recommends the following three steps for conducting regular network operational assessments:

1. **Map operational segments according to their associated expenditures:** Management should ensure that it receives financial reports that break out expenses into totals for these key operational areas — network operations, plant and equipment management, purchasing and inventory, sales and marketing, and administration. Reviewing these expenses provides management with an understanding of each expense category's relative size and importance in sustaining the network's ongoing operations.

2. **Assess the capacity of facilities, equipment, personnel and operational systems to meet the network's financial and operational goals:** Management uses the data presented in the bi-monthly or monthly operational reports to determine whether each operational category is meeting, exceeding or falling short of its objectives. Some goals, specified in the operational plan, are performance-related (e.g. equipment operating standards, customer service level agreements); others, specified in the financial pro forma, are expressed as either income goals or budget targets on the expense side (e.g., staff sales targets, network maintenance budgets). Management determines long-term sustainability by evaluating whether current capacity will meet future goals, or if adjustments are required to decrease expenses and increase efficiency.

3. **Determine if a partner or outside supplier can provide better customer service, equipment or facilities at lower cost.** BroadbandUSA's Toolkit, *Implementing a Broadband Network's Vision*, discusses instances in which local and tribal governments rely upon internal staff and engage outside contractors to build a broadband network. After the network is activated, management should undertake an annual evaluation: asking whether outsourcing any of the broadband network operations will improve the financial and operational outlook in the coming years, including such activities as network management, plant maintenance, customer billing and support, and marketing broadband services.

The following sections further discuss the types of evaluation and management guidance to maximize efficiency and keep expenses controlled in three critical operational areas for broadband networks — network operations and plant management, sales and marketing, and customer care and billing.

Evaluate Network Operations and Plant Management

To evaluate the operational efficiency of the physical network and its maintenance, management begins with an understanding of how much is currently budgeted for network monitoring and the network operations center, leasing fiber from another broadband supplier, leasing land and other assets, equipment replacement, and other maintenance activities.

Management's regular operational assessment of the network's current capacity and performance includes:

✦ Data showing network performance and availability to customers (i.e., downtime/uptime).

✦ Whether data traffic is being throttled or delayed.

✦ Status of software performance and whether major upgrades are scheduled.

✦ Status of updates to network security and firewalls.

✦ Maintenance activities.

✦ Schedule for upcoming equipment replacement, if any.

To assess whether the current plant and operations facility can meet future needs in the community or region, management evaluates the network's future expansion plans and determines if and when upgrades are required. For example:

✦ **Middle-mile/Institutional networks:** If the system plan shows an increased number of interconnections with regional carriers, management should estimate the cost of additional staff or equipment necessary to achieve this. New equipment may be available to reduce the expense of stringing fiber on poles. Management should evaluate peering opportunities. Over time, management may be able to renegotiate software licenses for operational support systems to reduce network operations expense.

✦ **Last-mile networks:** Both fiber and wireless residential broadband networks must maintain significant amounts of equipment installed in homes and on buildings. Management needs to understand if the installed base of equipment is operating within manufacturers' guidelines, if it is functioning well for customers and if maintenance costs remain within expectations. If deployed equipment is creating a problem in any of these areas, management must devise strategies to cut maintenance costs and find cost-effective replacements. Understanding the per-home cost of last-mile network maintenance is a useful and necessary metric for sustainability.

If network or plant management costs are too high relative to revenues to generate positive cash flows or are projected to increase over the next few years, management should determine whether outsourcing network operations or maintenance can reduce expenses in this area. Entering into a partnership or a long-term, fixed-price contract with another broadband provider, network-management firm or regional utility to perform these services may reduce costs. These arrangements are discussed in detail in BroadbandUSA's publication, *The Power of Broadband Partnerships*.

Evaluate Sales and Marketing

The expense categories used to assess the operational efficiency of the sales and marketing team include staff salaries and commissions, expenses to host public events, local travel, awareness campaigns, advertising, printed marketing literature, websites and attendance at professional conferences.

Management's regular operational assessment of the sales and marketing team's capacity and performance should include:

✦ Marketing and promotion channels being used to reach current and potential customers.

✦ Quantification of the marketing and outreach activities accomplished in the last quarter.

✦ Status of service offering and pricing.

✦ Status of customer contracts and renewals.

✦ Marketing plans and sales targets for the next three to four quarters.

If management is operating the network as an open-access network, its sales and marketing staff should have the expertise and marketing experience to sell wholesale service.

To assess whether the current sales and marketing staff can meet the sales targets specified in the business plan, management should routinely ask whether the staff requires further training and whether providing the marketing team with operational data can boost their overall effectiveness. For example:

✦ **Middle-mile/Institutional networks:** Leveraging network performance data can be a major selling tool for customers, particularly for broadband resellers. The sales team should communicate price structures and offers clearly to customers. Proposing to bundle broadband billing for similar community anchor institutions (e.g., libraries, schools) may be a successful marketing strategy that can result in lower operational costs.

✦ **Last-mile networks:** Providing the marketing team with the number of wireless customers according to census tract often illuminates which areas require improved marketing. Management should challenge the sales and marketing staff to devise ways to increase customer loyalty and reduce monthly churn, a perpetual issue for last-mile broadband network operators. Management may want to consult longitudinal data to yield information on consumer trends to use in targeted marketing efforts.

If sales and marketing costs are too high relative to revenues or projected to increase beyond expected levels over the next few years, partners and outside contractors in the community can be engaged to help out, lend expertise and add reach. For example:

✦ **Middle-mile/Institutional networks:** Sales and marketing team productivity can be increased by recruiting partners or hiring part-time relationship managers, who speak the language of key customers in specialized needs groups, such as educational institutions, telemedicine participants, and public safety professionals.

✦ **Last-mile networks:** Management may want to seek opportunities to co-market services with local utilities, nonprofits or other businesses to boost awareness among residents and minimize expenses.

Evaluate Customer Care and Billing

The expense categories used to evaluate the operational efficiency of customer care and billing include staff salaries, on-site customer activation and service and software-supported systems, such as billing and customer care.

Every broadband operation needs a well-defined process to turn up service for new customers. Management's regular operational assessment of the efficiency of its customer care operation should include:

✦ The number of recent service installations.

✦ The average time customers wait for service installation.

✦ The number of service requests and need for on-site visits.

✦ Response time for customer-site repairs and requests for maintenance.

Customer disconnections should be tracked with customer-service metrics, including service calls and response times. To assess whether the customer care staff has the capacity to satisfy customer expectations of broadband service, management should probe customer satisfaction levels by analyzing operations through the customer's eyes, including:

✦ Whether quality customer support and service is delivered effectively.

✦ Whether the staff responds quickly by tracking repair times, installation times and call waiting times.

✦ Whether billing and customer support systems are working well.

✦ Whether the process for handling consumer complaints is sufficient.

✦ Whether there is a process to measure customer satisfaction.

The following actions may reduce customer care costs and boost operational efficiency:

✦ **Middle-mile/Institutional networks:** Standardizing end-user equipment should reduce maintenance and equipment repair costs. Billing and customer care costs may be minimized by aggregating billing for groups of similar institutions in the service area (e.g., government facilities, schools).

✦ **Last-mile networks:** If the in-house staff is handling customer installations for a residential last-mile network, management should track whether demand is outstripping the pace of installations.

If customer care costs are too high relative to revenues and projected to increase in the coming years, using existing marketing or billing resources from other governmental departments or project partners for the broadband network operation may be a good cost-reduction strategy.

Tools

✦ The final section of this Toolkit contains a *list of questions* to assist a local or tribal government in evaluating its operational efficiency.

✦ The final section of BroadbandUSA's Toolkit, *Planning a Community Broadband Roadmap*, includes a financial pro forma template for projecting broadband network expenses.

ACTION 3: OBSERVE AND ANALYZE WHAT CUSTOMERS WANT

Management can promote a sustainable broadband network environment by keeping a close watch on customer needs, buying preferences and the overall competitive environment in which it delivers broadband services.

Customer behavior and demand form the basis of revenue and expense assumptions in the business plan. Management should strive to gather data periodically on whether customer demand for particular broadband services is declining, growing or staying the same and incorporate these findings into its assumptions about revenue and expense trends.

Sustainability Tip:
✔ Conducting ongoing market analysis serves as a continual reality check to direct enhancements to your broadband project.

Management can use the following best practices for customer requirements and satisfaction:

✦ **Pay attention to loyal customers and avoid taking them for granted.** Marketing, sales and technical teams should keep lines of communications open with customers to know whether they are satisfied with the service, whether their needs are changing or if new services should be offered to serve them better.

✦ **Ask staff members who have direct contact with customers for input on what customers value and what they need.** Installers, outreach staff and customer-service personnel continually receive information on customer needs and have valuable insights to offer management about changes in market demand for new broadband services, products or capacity.

✦ **Monitor broadband market pricing.** Broadband prices and offers do not remain static. Broadband network operations should be rooted in market reality to retain customers and keep them satisfied.

✦ **Strategize how to meet demand from last-mile customers for new devices and content.** Changes in consumer trends and behavior dramatically affect both the demand for broadband services and the sustainability of the last-mile broadband network. For example, future financial projections should reflect the associated demand for broadband speeds and new in-home devices such as game consoles, smart-home devices as other broadband-driven applications proliferate.

This section discusses three factors that help management decide whether it should adjust marketing materials, outreach approaches and financial assumptions to reflect changing conditions:

✦ The value drivers of important customers.

✦ The major trends affecting the broadband market.

✦ Population growth and other regional economic factors.

Each section discusses how local and tribal governments and their partners incorporate these insights within the financial pro forma to ensure broadband network sustainability.

Know the Value Drivers of Important Customers

Knowing what motivates a customer to seek broadband service or to choose a particular set of services is the building block upon which the most effective marketing materials, sales approaches and future financial projections rest. "Value driver" means the top motivation that pushes the customer to acquire the particular broadband service.

How to Determine the Value Driver

✦ What underlying factors drive the customer to seek a particular service?

✦ What motivates their purchase decision?

✦ How does the broadband service offering meet this customer's need?

For example:

- A value driver for public safety broadband users might be network redundancy, network reliability and ease of interoperability.
- A value driver for high schools might be quick access to technical experts who can troubleshoot and answer questions right away when broadband disruptions occur during the school day.
- A value driver for residential subscribers may be a remote diagnosis of home equipment problems versus waiting for a service technician to arrive.
- A different subscriber's value driver may be having a choice among multiple pay TV tiers.

Broadband network planners, sales teams and marketing teams should conduct research and hold meetings to determine the value drivers of their prospective customers during the planning and implementation phases, as described in BroadbandUSA's Toolkit, *Planning A Community Broadband Roadmap* and *Implementing a Broadband Network's Vision*.

Over time, however, a customer's motivation to buy broadband services can change. To sustain the viability of the broadband network over the long term, management must assess whether customers' value drivers are changing and continue to analyze how these changes might affect the set of services offered, the network infrastructure, customer-premises equipment or other critical factors that will affect revenue and expenses in the future. For example, as consumers adopt "Internet of Things" devices in their homes, the requirements for broadband connectivity, speed and capacity will increase. Management should strive to understand how emerging demand presents opportunities to increase both customer satisfaction and revenue in future years.

Management should stay informed on changes to their customers' value drivers and customer opinions about the general level of broadband service via direct communication with and feedback from customers and periodic market-research initiatives. The objective is to create a series of procedures and guidelines to encourage management, marketing staffs, and sales staffs to keep in close contact with customers and accurately anticipate their future needs:

- **For middle-mile and institutional networks:** Sales teams should understand the motivations and concerns of important clients by reaching out to the individual at each institution or retail/last-mile broadband provider who makes the broadband purchase decision. Holding periodic discussions with these clients will provide indications on whether their broadband demands will increase in the future, whether they should develop new services and solutions and if their institutional clients' budgets are growing or shrinking.
- **For last-mile networks:** To gain the greatest accuracy as they make future assumptions about last-mile customer demand, management should periodically survey customers, hold focus groups or carry out consumer market studies to gauge attitudes about customer service, repair response times and perceived value for the price paid.

The *Strategic Sustainability Self-Assessment* at the end of this Toolkit contains a list of questions to help management understand if it is using the right mix of inputs to assess customers' changing needs as it projects levels of future demand. This list prompts management to think creatively on such issues as:

- How relationships with important customers are being maintained.
- The process for investigating whether customer value drivers are changing.
- The frequency with which customer assessments are made.

Monitor Broadband Market Trends

Beyond speaking with current customers, management should be aware of overall trends in the market for broadband services that might affect the financial health of its network operations in future years. For example:

- **Broadband competition:** When the broadband network was built, it might have been the only source of connectivity for institutions or homeowners, but management should remain alert to situations in which current customers find other sources for broadband and modify demand projections accordingly.

✦ **Broadband pricing:** Management should know if the current broadband pricing structure is equal to or widely different from offers being made by other broadband providers. Keeping track of what is happening in the market enables management to stay current with trends in service pricing and bundling (i.e., packaging) broadband services and equips them with the data to create and offer competitive packages, if necessary.

✦ **Technology and consumer trends:** Management should develop processes to identify trends, which could affect a network's long-term financial outlook. If trends suggest that there will be shifts to new technologies or other changes to consumers' need for broadband, this understanding will help management assess whether network upgrade plans are affected or if other factors are likely to cause maintenance or equipment-replacement expenses to increase.

The objective is to have a process to evaluate the factors affecting the national and regional broadband market and determine which could increase or decrease demand, revenue or expenses in upcoming years.

Incorporate Population Growth, Economic Indicators and Other Factors

Local and tribal governments should be aware of the population and economic trends affecting their jurisdictions. Adjustments to projections of revenue, operating expenses and capital requirements should be based upon facts known to local and tribal governments about population growth, economic and education trends in the broadband network's footprint.

For example, if economic activity and population trends are both on the upswing, broadband revenue projections will likely increase over time. On the other hand, broadband network expenses often accompany increases in demand, since the nature and scale of this demand will often require network expansion or upgrades to satisfy customers.

Tool:
✦ The *Strategic Sustainability Self-Assessment* at the end of this Toolkit contains a *list of questions* to assist a local or tribal government in evaluating whether it has the procedures in place to understand customers' needs and changes to the broadband sector over time.

ACTION 4: EXPAND CUSTOMERS AND SERVICE OFFERINGS

Many broadband network business plans assume that customer revenue will cover the expense of keeping the network operating. Management can sustain broadband network operations by finding new customers and expanding the list of services offered.

As noted in the previous section (*Action 3*), customer requirements, technology, markets, and economic factors evolve and change, making it possible that customer and revenue assumptions drafted in Year 1 may change significantly by Year 5 or even sooner. This section explores how management can take its recurring market and customer analyses and transform this information into action plans for its sales and technology teams.

To promote broadband network sustainability, management should:

✦ **Add services and innovative applications that appeal to new groups of customers.** Maximizing new opportunities results in significant revenue expansion. Some examples include providing managed cloud and industry-specific services.

✦ **Speak with local and tribal governments operating similar broadband networks to gain insights from their experiences.** Management can gain valuable insights and generate creative ideas on broadening its customer base, expanding applications and adding services from networking with other local and tribal governments and their partners.

The business objective is to:

✦ Increase revenue by broadening the base of customers.

✦ Ensure financial stability by offering a wider range of revenue-generating services.

Sustainability Tip:
✔ Expand broadband project offerings to increase revenues, paying customers, or people's access to services in the community.

Broaden the Customer Base

Entities operating open access middle-mile networks offer their facilities to requesting parties, including last-mile networks, at reasonable rates and on non-discriminatory terms and conditions. Open access enables local customers to interconnect with larger, high-speed regional, state and national data networks.

From the periodic customer and market analysis (*Action 3*), management knows if its broadband service is reaching the desired set of customers and can strategize about how to increase revenue from suggesting that customers enter into long-term contracts:

✦ **Middle-mile/Institutional networks:** The table below lists the different types of customers using broadband services. Knowing the number of wholesale, retail and last-mile provider customers served informs management about what steps it should take to expand this number, such as entering into strategic partnerships with other service providers or industry leaders, working with local or regional economic development organizations and raising their network's visibility by participating at conferences and user forums.

✦ **Last-mile networks:** Management can analyze whether it is possible to add to its potential base of customers by leveraging a middle-mile network to expand the local service footprint. For last-mile networks that provide broadband to underserved populations, reaching out to the community at public computer centers may increase awareness among local users, providing another point of contact with underserved groups.

Widen the Range of Service

If new customer needs emerge from the ongoing research described above (Action 3), management should assess the feasibility of adding additional services and redesigning its service package. For example, determining whether:

Potential Customers for Middle-Mile Broadband Service

- National carriers
- Incumbent Local Exchange Carriers (ILECs)
- Internet Service Providers (ISPs)
- Cable companies
- Research and education networks
- Utilities
- Community anchor institutions
- Wireless companies
- Competitive Local Exchange Carriers (CLECs)
- Wireless Internet Service Providers (WISPs)
- Non-profit networks
- Government networks
- Data centers
- Businesses with multiple campuses

- The scale and mix of services should change to appeal to new customers.
- Prices and service fees are set appropriately in light of what other providers offer.
- A new strategic partnership should be pursued to jointly market and provide new services.

BroadbandUSA's Toolkit, Implementing the Community's Broadband Network Vision contains detailed information on developing service plans:

- **Middle-mile/Institutional networks:** Open access networks have a potentially long list of services to be offered, including backhaul for wireless carriers, tiered speed offerings, smart-grid connectivity, dark fiber IRUs and cloud services. Institutional networks can gain expertise in E-rate to respond to RFPs and provide service to schools and libraries.

- **Last-mile networks:** By having a middle-mile provider provide backhaul from a network point-of-presence (POP) or a cable head end, a residential service provider may be able to offer additional television programs to subscribers.

Potential Middle-Mile/ Institutional Network Service Offerings

- Virtual Private Network
- Voice
- Cloud
- Licensing program (virtualization licenses)
- Colocation
- Service for mobile telephone switching offices or mobile switching center's utility service
- Smart-grid connectivity
- Tower space
- Microwave and fiber backhaul
- Roaming
- Network planning and consultation
- 24x7 network monitoring and performance e-measuring
- Wholesale offerings, individually negotiated
- Peering agreements usage
- Ethernet, Wavelength-division multiplexing (WDM) technology
- Tiered speed offerings
- Network Operation Center (NOC)
- Data center
- Engineering support

Tool:
- The *Sustainability Self-Assessment* at the end of this Toolkit contains a *list of questions* to help a local or tribal government assess whether it is implementing processes to reach out to new customers and to expand services.

ACTION 5: UPDATE STRATEGIC BUSINESS PLAN TO MEET EVOLVING NEEDS AND MITIGATE RISK

Management can promote network sustainability by updating the broadband network's business plan on a regular basis, specifically to:

✦ Reflect changes in the expenses associated with adding services to drive revenue and generate new customers.

✦ Determine how well the operation is achieving or falling short of its financial goals.

✦ Assess the likelihood that revenues will fall short of projections or unforeseen circumstances will affect the plan.

Update the Business Plan

Each time the financial plan is adjusted, management should set new revenue and expense targets that reflect how the broadband initiative will grow, expand and meet the evolving needs of the community.

> **Sustainability Tip:**
> ✔ Keep updating the business plan and anticipate the unexpected.

Consider using the following best practices for management to rework financial projections and update the network's strategic business plan:

✦ **Anticipate cost overruns, particularly in large infrastructure projects:** The operations and expense budgets should reflect significant flexibility. Performing a sensitivity analysis demonstrates the financial impact of different events and scenarios. Changing the pro formas' assumptions shows management how cost overruns or revenue shortfalls impact different portions of the plan.

✦ **Maintain a conservative fiscal outlook in financial projections:** The business plan should not incorporate overly optimistic assumptions. Reasonable numbers should be used to forecast revenue, operations and capital expenditures for the total life of the project.

For example, the business plan for a last-mile network should assume sufficient revenue to fund operations after the construction phase, as service to consumers is activated and income from subscribers grows.

✦ **Build in expenses to replace network components and refresh technology:** The budget projections should incorporate replacement costs and new capital expenditures, particularly if future network expansion is planned. If a certain piece of equipment seems to have either a shorter or longer useful life than stated by the manufacturer, the plan should be updated with more realistic technology cost estimates. Residential and institutional customers expect to be provided with up-to-date equipment and services, and expense projections should include replacement costs for new end-user devices over the long term.

✦ **Plan for ongoing staffing:** Projections should include ongoing staffing costs and salary increases in all areas, such as project management, technology and systems management, training and customer outreach.

✦ **Anticipate drops in technology costs over time:** Often technology becomes less expensive over time due to economies of scale. If amounts projected for technology are less than the projected amount, management should determine other areas in which to invest the savings to sustain the network and increase its value.

As an ongoing reporting process, management should generate operational data and metrics to indicate whether they are meeting expense, revenue and operational targets.

✦ Management may use dashboards depicting the major metrics, such as cost, revenue, market penetration and customer satisfaction ratings. The dashboard should present the operating ratio (i.e., operating expenses as a percentage of revenue) and per-mile plant maintenance cost.

✦ In addition to the above, last-mile network dashboards reflect whether subscriber growth, revenue-per-customer, and cost-per-install metrics were on target and identify where new residential or business zoning occurred.

Management should decide how financial projections are adjusted by:

✦ Comparing the forecast to actual performance and assessing whether changes are needed to manage cash flow and keep the network operating.

✦ Identifying the greatest challenges to the outlook for the broadband network's continued operation.

✦ Asking whether changes to service offerings, price structures or institutional services are reflected in the pro forma projections.

How to Update a Pro Forma Realistically

✦ Incorporate growth trends when calculating revenue, operating expense, and capital requirements.

✦ Adjust projections to reflect technology changes, different industry standards, and new customer behaviors

✦ Drive projections by carrying out interviews, surveys, focus groups, and market studies to gauge whether services and prices are hitting the mark.

Conduct Risk Assessments

An effective risk management program provides insights for adjusting the business plan. Management should create a standard, routine process to identify risks to the network's sustainability and take action.

Strong risk assessment incorporates a cross-functional approach and involves all segments of the operation, including network security, safeguarding customer records and drafting policies for guidance. Management identifies worst-case scenarios that affect the system's financial and operational health and takes corrective action when "warning signs" emerge. For example:

✦ **Middle-mile/Institutional networks:** Many prospective customers could be committed to long-term contracts with other suppliers. If management and sales teams find this is the case with local institutions, they should adjust their sales and income projections to delay revenue from these projected customers until these in-place contracts expire. Management should track contract end dates since they present potential future sales opportunities. Management should find out which state and national broadband network customers desire interconnection and determine the infrastructure improvements and business agreements or partnerships they should develop to stay competitive.

✦ **Last-mile networks:** Before building out to a new area, management should solicit advance commitments from potential customers to minimize the risk of building out broadband networks to residential neighborhoods where subscription might be low. This approach is particularly useful to mitigate the financial risk in building networks to serve tribal and rural areas.

Once management has identified areas of potential risk, it should monitor each risk closely so that it can make adjustments to the network's financial, marketing, or operational projections according to the level of risk.

Tool:
✦ The *Sustainability Self-Assessment* at the end of this Toolkit contains of a *list questions* to help a local or tribal government adjust its financial projections, update its strategic plan and reduce risk to the business.

THE BROADBAND NETWORK SUSTAINABILITY CYCLE

The ultimate goal of local and tribal governments that embark upon broadband network expansion is to ensure their broadband project is strong financially and operationally. As noted in this Toolkit, taking action to stabilize revenue in future years (*Action 1*) anchors the forward-looking financial plan. Management's continuing evaluation of operational efficiency, effectiveness and expenses (*Action 2*) ensures a healthy balance between revenue and expenditures. Continually listening to customers and understanding how changes in technology and buying patterns influence the demand for services (*Action 3*) informs management on where to seek additional customers and develop revenue-generating services (*Action 4*). Regularly updating the strategic business plan to adapt to changed circumstances and mitigate risks maintains the broadband network for the long-term (*Action 5*).

Figure 3. Network Sustainability Cycle

These separate actions should be implemented in the context of the network sustainability cycle, depicted in Figure 3. Customer analysis informs the marketing and sales approach. When the network is activated and begins to generate revenue, management should look at revenue in light of operating expenses and analyze whether the broadband network has sufficient operating capital.

Network sustainability cycle best practices include:

✦ **Continue to update business and operational plans:** Even projects that start out well require enhancements to their business plans over time. Management should spend significant time updating the project plan to reflect on-the-ground realities and risks, such as lower-than-expected market penetration or staffing shortfalls.

✦ **Continue market and consumer research:** Conditions change and management should be keenly aware of changes around them to respond to the competitive environment, community needs and consumer preferences.

✦ **Carry out ongoing risk assessments:** Management should design a standard process to identify risks to the network's sustainability from all segments of the operation.

✦ **Reach out to other governments, tribes, broadband project leaders and state and national organizations for help, ideas and inspiration:** If the broadband network project hits a roadblock, management will need to brainstorm sustainability strategies. Management may find it helpful to reach out to other cities, counties and tribal governments working on similar projects. State and national government, industry and technology organizations may have resources and experiences that they can share.

RESOURCES FOR BROADBAND NETWORK SUSTAINABILITY

- Form 477 Broadband Deployment Data, providing data on fixed residential broadband services of at least 25 Mbps download and 3 Mbps upload at the census block level: *https://www.fcc.gov/maps/fixed-broadband-deployment-data/*

- Form 477 Broadband Subscription Data, which State regulatory commissioners can obtain, contains provider-specific fixed broadband and fixed voice subscribership data at the tract and state level. This information helps identify service providers in your community and associated subscription rates: *https://www.fcc.gov/general/process-state-regulatory-commissions-obtain-state-specific-fcc-form-477-data*

- NTIA's publication, Recipient Toolkit: Stakeholder Outreach and Sustainability includes strategies for mapping a network of possible stakeholders and including them in program planning and implementation: *http://www2.ntia.doc.gov/files/btop_tookit_2_122110_final.pdf*

- BroadbandUSA's The Power of Broadband Partnerships is a toolkit publication that provides best practices for local and tribal governments on how to form successful partnerships to expand broadband infrastructure in their communities: *https://www2.ntia.doc.gov/files/powerbroadband_070517.pdf*

- BroadbandUSA's publication, Introduction to Effective Public-Private Partnerships, Partnerships, explains how to develop successful partnerships and offers best practices NTIA has observed through overseeing $4 billion in broadband grants to public, private and joint-venture projects across the country: *http://www2.ntia.doc.gov/effective_public-private_partnerships*

- BroadbandUSA's Toolkit, Implementing a Broadband Network's Vision, describes the steps that local and tribal government should take to deploy broadband network infrastructure in their communities: *https://www2.ntia.doc.gov/files/implementingnetworkvision_081717.pdf*

More About BroadbandUSA

- The centerpiece of BroadbandUSA is its technical assistance team, which provides individualized and group technical assistance to state, local, nonprofit, and industry leaders interested in planning, funding, and implementing broadband initiatives. BroadbandUSA's experts know that there is no one-size-fits-all approach to expanding broadband access and adoption and its works with communities to tailor solutions that best address their unique challenges.

- BroadbandUSA also organizes events that bring together state, local, and federal officials, industry, community leaders, and other stakeholders to share broadband success stories and lessons learned.

- BroadbandUSA connects communities to other federal agencies and funding sources and improves coordination among federal agencies and state and local officials on broadband issues.

- If you are interested in receiving assistance from BroadbandUSA, please contact us at *broadbandusa@ntia.doc.gov* or at 202-482-2048. For more information about BroadbandUSA, visit our website at *http://www2.ntia.doc.gov/new_BroadbandUSA*.

TOOLS FOR LOCAL AND TRIBAL GOVERNMENTS

Revenue Sources

This list summarizes a potential range of revenue sources for broadband infrastructure projects.

List: Checklist of Broadband Network Revenue

Basic Fees for Broadband Service

- ✔ Fees for retail and wholesale service or capacity
- ✔ Interconnection and transport fees (open-access model)

Long-Term Customer Contracts

- ✔ Aggregating demand from community anchor institutions
- ✔ Local community anchor institution service

Leased Assets

- ✔ Rights-of-way
- ✔ Real estate
- ✔ Towers, water towers, poles
- ✔ Conduit
- ✔ Fiber

Financial Assistance

- ✔ Federal (e.g., RUS, USAC, HHS) funding
- ✔ State grants
- ✔ Corporations
- ✔ Local foundations

Strategic Sustainability Self-Assessment: Observing and Analyzing Customer Needs

This worksheet assists local and tribal governments, working with their broadband network operator partners, to evaluate whether they are taking all necessary steps to understand what customers want from their broadband service and to analyze whether their needs are changing.

	Evidence/ Comments	Area of Concern?
Customer Knowledge		
To what extent is the network and/or system performance meeting customer expectations?		
What is the frequency with which customer feedback, operations and customer support are assessed?		
Are customer interactions, repair response times and other customer-facing engagements being adequately documented?		
Value Drivers		
What processes and procedures are in place to identify the customer's value drivers?		
Has the marketing team developed materials to reflect the value propositions it has identified? Have the materials been tested with focus groups to evaluate their effectiveness?		
Has the marketing team identified the customer decision-makers who influence the decision to purchase broadband services?		
Are contract expiration dates for potential customers being tracked?		
Middle-Mile Networks		
To what extent are customers asking for managed cloud or other new services this network can offer?		
Is the per-megabit price of broadband service lower than last year?		
How are relations with wholesale carriers being maintained? How are they being expanded?		
What is the frequency with which assessments are conducted? How frequently do meetings with broadband network partners occur to ensure that network service quality, provisioning and performance meet customer expectations?		
Institutional Networks		
What processes are in place to understand the needs of CAIs served by the network?		
How are CAIs supported to implement programs that meet their strategic and client needs?		
What is the current cost for services received? What are the cost saving and service increases if building the institutional network?		
Are CAI's willing to contribute capital to fund the network?		

	Evidence/ Comments	Area of Concern?
Last-Mile Networks		
Are the prices and offerings competitive?		
Are the service tiers structured and priced properly?		
Do customers believe they are getting good value from their service packages?		
What is the take rate for residential, business and institutional customers?		
Is the per-megabit price of the last-mile service lower than last year? If so, by how much?		
Broadband Market Knowledge		
What is the ongoing process to identify consumer or technology trends that could affect the long-term outlook of network operations?		
What new uses of broadband technology are coming to the market?		
Do residential, institutional and business customers in the service footprint have sufficient retail options to purchase broadband services?		
Has the residential market for broadband service changed? If so, how?		

Strategic Sustainability Self-Assessment: Expanding Customers Sustainability and Service Offerings

This worksheet assists local and tribal governments, working with their broadband network operator partners, to evaluate whether they are taking all necessary steps to maximize their base of customers and expand the range of services offered.

	Evidence/ Comments	Area of Concern?
General Offering		
Is the service reaching the desired customers? If not, have the barriers to adoption been identified?		
Is there a plan to address adoption barriers?		
What changes have been made to service offerings, prices or services to institutional customers?		
Have the changes had the desired results of increasing take rates or enhancing customer satisfaction?		
Middle-Mile Networks		
How many retail, wholesale and/or last-mile providers are leveraging the network?		
What steps are being taken to increase the number of last-mile providers?		
If additional partners are needed, what marketing plan is in place to obtain them?		
How is the network marketing team working with local or regional economic development organizations to seek new business development?		
Institutional Networks		
Are there forums to promote information sharing among institutional customers on how they are using the broadband network? Are there regular conferences or user forums for this purpose?		
Is there an outreach plan in place to reach additional institutions and acquire them as customers?		
Does the organization have a trained E-rate coordinator or expert on staff?		
How is the team working with schools and libraries to support their E-rate applications? Will this be done in conjunction with last-mile providers?		
If there are E-Rate contracts, is the per-megabit price lower than last year?		
Are any institutions pursuing other funding sources to help sustain the network?		
Last-Mile Networks		
What adjustments are needed to support additional service roll-out and customer acquisition?		
Can a middle-mile network be leveraged to extend the service footprint or receive broadband or cable programming?		
Are public computing centers serving as an on-ramp for new users or to reach underserved populations?		
Are discounted service offerings provided to low-income families or individuals?		

Strategic Sustainability Self-Assessment: Updating the Business Plan and Mitigating Risk

This worksheet assists local and tribal governments, working with their broadband network operator partners, to evaluate whether they are regularly adjusting their strategic business plans and financial projections and undertaking a periodic risk assessment.

	Evidence/ Comments	Area of Concern?
Adjusting Financial Projections		
When comparing actuals to forecasts, what changes are needed to maintain and manage cash flow and long-term sustainability?		
What changes have occurred that could affect the broadband network's outlook? Changes in operating expenses? Capital expenses? Revenue? Funding?		
What unique challenges do you face in specific service areas or markets? What competitive products or changes in pricing are affecting your project's sustainability? What are your plans to address them? How do your pro forma projections reflect this?		
What recent market analysis or competitive price analysis have you carried out? How are you changing service offerings, price structure or services to institutions as a result? How do your pro forma projections reflect this?		
What studies have you completed to aggregate demand with your state, a larger economic development group or a national organization? What were the findings?		
Risk Analysis		
How will you mitigate problems and/or take advantage of positive changes?		
What is your process to identify risks and challenges? What is the frequency?		
How frequently do you conduct security assessments?		
How are you protecting confidential information? Where have you published your privacy and security policies?		

	Evidence/ Comments	Area of Concern?
Middle-Mile and Institutional Networks		
To what extent are prospective customers committed to other network suppliers in contracts?		
What steps are you taking to attract last-mile investment?		
To what extent are you connecting last-mile providers with interested institutions, businesses or other customers?		
To what extent are you able to reach additional towers with a network extension?		
Are institutional customers located along the route and can you use revenues from them to justify this extension?		
What additional peering or interconnection agreements do you need to remain competitive?		
Last-Mile Networks		
Are you meeting targets for subscriber growth, revenue-per-customer and cost-per-install?		
What processes are in place to identify and track future customer interest or demand?		
Are you reducing risk by obtaining service commitments from one or more customers in advance of building out to a new area?		

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BroadbandUSA hopes this toolkit provides communities with practical information, tools and guidance to improve partnership outcomes for broadband programs. BroadbandUSA welcomes feedback and requests for other guidance as part of our ongoing support to communities that are advancing the important work to increase broadband access and adoption.

CONTACT US

The National Telecommunications and Information Administration (NTIA) is the Executive Branch agency principally responsible for advising the President on telecommunications and information policy issues.NTIA's programs and policymaking focus largely on expanding broadband Internet access and adoption in America, expanding the use of spectrum by all users, and ensuring that the Internet remains an engine for continued innovation and economic growth.

NTIA's BroadbandUSA program is dedicated to helping communities achieve their broadband missions. NTIA can offer assistance to communities as they plan for broadband efforts, including stakeholder outreach activities. If you have additional questions about the information contained in this guide, please contact us at *BroadbandUSA@ntia.doc.gov* or 202-482-2048.