



# Five Steps to Building Your Broadband Network



# Contents

Contents:

Introduction:

Where do You Start?:

How Do You Start:

Broadband Network Step by Step:

**Step 1:**  
Feasibility Study

**Step 2:**  
Financing

**Step 3:**  
Engineering and Design

**Step 4:**  
Construction

**Step 5:**  
Operations and Managed Services

Closing



# Introduction

Fast, affordable broadband is essential to the long-term success of communities and their citizens, giving them access to the global economy.

Yet the United States continues to lag in establishing access to high-speed internet in all areas of the country.

To remedy this gap in coverage, an increasing number of municipalities, cable companies, telcos, and co-ops are investing in building or expanding local infrastructure to serve public facilities, local businesses, and residences.

Unfortunately, there is no simple 'one size fits all' solution for tackling the project as every community and its needs are unique.

Finding the optimal way to bring high-speed broadband to a community is the goal, whether it's a municipality, electric co-op or cable company.

# Where Do You Start?

**Identify Goals** - First think about what problems you're hoping to solve with broadband access. Approach your strategy for investing in broadband with end goals in mind. Start by asking, "What pain points can we eliminate if high-speed internet is available?"

## Does your community have these issues?

1. The need to work from the local library or drive around town to find WiFi internet access.
2. Limited broadband choices and affordability issues.
3. Residents can't sell their homes.
4. Students can't complete homework.
5. Young people are leaving the community to find jobs.
6. Grandparents can't video chat with grandchildren.
7. Telehealth applications are not available.
8. Limited communication available for public safety personnel.
9. Local businesses are leaving or closing down and new ones are not locating in the community.

After your goals have been established, next organize information about your community's current needs.

**Measuring Demand** - It's vital to have an accurate assessment of resident and business demand for broadband before a new project is begun.

### Consider:

- Who in your community is online?
- Who wants to be online and is not?
- Who needs better bandwidth?
- Is cost preventing residents from connecting?
- Is there enough bandwidth available for residents, businesses, and anchor institutions such as schools, libraries, and healthcare organizations?

After determining current and future demand, building an inventory of assets already in place may present new possibilities for a network build.

**Asset mapping** - Collecting information on public and private infrastructure assets scattered across the community can reveal fiber, conduit, towers, and more.

Does the community already have available conduit in place? Is there rooftop and tower access available? Also to be considered are the rights of way across bridges or railroads that will be necessary for the network build. Where are assets located and what are the options for sharing, leasing, or using those assets to support broadband builds or expansion?

Asset mapping has often shown that some fiber optic cable is already in the ground and is not being used to its full potential.

Tools like ESRI GIS and VETRO FiberMap can help with the mapping and planning that can set the direction of your strategy.



# How Do You Start?

Even after determining the real need for a broadband network or expansion of an existing one, it can be hard for community leaders to know how to approach the complexity of a broadband network.



If broadband is new to you or your leadership team, here are the planning steps to consider before committing any resources.

- Feasibility Study
- Financing
- Engineering and Design
- Project Plan and Construction
- Operations and Managed Services

It's important not to make the mistake of ignoring the feasibility study.

This vital study should come before everything else and can determine if moving forward is worthwhile and your goals are attainable.



# Broadband Network Step by Step



## STEP ONE

# Feasibility Study

A feasibility study aims to provide communities with estimates of different network costs and recommendations for a plan to build or expand.

This study is most useful at the beginning of the planning stages and to prepare for the stages of the network build that follow.

The study will cover overall broadband strategy planning and identify potential funding sources. A thorough study will include more than one scenario and multiple design options and outline an implementation plan.

It will also include multiple finance and funding options with cost estimates and revenue streams to implement each of the options identified in the study.

The business case for building a broadband network in rural markets can be difficult. It's a tough business and requires expertise and knowledge.

A lot of rural municipalities and companies like electric co-ops and telephone cooperatives might not have the needed experience to navigate the process.

A feasibility study can better position an organization to proceed with the community's specific goals and circumstances in mind.



## STEP FOUR

# Financing

## Explore the Financing Options

There is no single best way to finance your broadband network, and each community should explore the best fit for their project. Financial decisions should begin early in the process to have informed conversations with decision makers.

A major mistake many communities make is not considering financing options and not involving the financial managers early in the planning.

Financial forecasting can be started in conjunction with the feasibility study that includes market penetration and service offering information that can be built into that study.

- Bring your Finance Director or CFO into a project as early as possible
- Explore available financing mechanisms early in a project's life
- Consider your community members' willingness for public investment
- Determine if anchor institutions in your community are already receiving grants or loans from federal broadband programs
- Determine your community's and anchor institutions' eligibility for existing federal and state programs





# Engineering & Design

## Understand the Connectivity Options

In a perfect scenario, everyone would be served by a fiber network delivering minimum speeds of 1 gigabit/sec. However, when only 2% of the world's population is within 5 miles of fiber, most communities need other options to compete in the digital economy.

This means being able to model out comparisons across the different technologies such as pure fiber to each premise, pure fixed wireless, private LTE or a mix of technologies. There is no single “correct” way to connect a community.

Many different models have successfully brought broadband to underserved communities. Experienced design engineers will present multiple connectivity options for communities and can set a project up for success.

Understanding the business structures and financial models for these delivery models will provide insight for projects to increase the availability of affordable broadband service



- **Municipal Networks**
- **Public-Private Partnerships**
- **Open Access Networks**
- **Institutional Only Networks**
- **Electric Co-ops**
- **Working with Small Incumbent Providers**

## STEP FIVE

# Construction

Once the network is designed and engineered, you are ready for the construction phase. Often this will be done by a contractor, who will proceed based on the plans developed in the previous steps.

Make sure you are working with a company with the right experience and a reputation for completing projects on time.

### **Dig Once**

Installing high-speed infrastructure is incredibly expensive, with the average cost of deploying fiber-optic cable at about \$27,000 per mile.

Yet, a Federal Highway Administration report detailed that 90 percent of this cost is tied up in actually digging up roadways, not the physical fiber lines.

The “Dig Once” policy is a practical method of reducing the cost of communications infrastructure by placing conduit in the ground any time the road is dug up for a public works project.

Proactive placement of conduit can save anywhere from \$30,000 to \$100,000 per mile compared to the costs of digging up streets again.



### **One Touch Make Ready (OTMR) or Climb Once**

One Touch Make Ready (OTMR) is similar in concept to Dig Once in that it streamlines the deployment of new infrastructure.

Typically, for a new provider to attach wires to a pole, each owner of the currently attached wires must be asked to assess and move their wires — a process called “make ready.”

OTMR replaces this practice with one that is much more streamlined. OTMR allows pole-owner approved contractors to conduct all new make ready work. The benefits of this practice include faster and safer work and decreased cost.

Fortunately, most local governments have authority over the public rights of way, including the utility poles. Communities can use this power to create policies that would make them the best partners possible for the deployment of fast, affordable, and reliable broadband access in their communities.

## STEP FIVE

# Operations and Managed Services



Operating a network requires different skill sets than what community leaders may possess and the use of outside expertise for critical management services should be considered.

Partnering allows the project leaders to focus on building the broadband network while leaning on the expertise and capabilities of partners to deliver key services.

In so doing, communities can avoid costly network expenses, lessen network management headaches, and get to market more quickly with a competitive offering.

### Consider Partnering for these services:

- OSS integration
- Network Operations
- Monitoring and Diagnostics
- Subscriber Customer Service
- Marketing



# Closing the Digital Divide Together

Today it's clear that networks are essential infrastructure. Not every community will build a perfect network or should immediately invest in fiber-to-the-home. What is right for one community may not be right for another. Ultimately, the community itself must decide what is important and how to proceed.

Contact us to answer your questions around broadband network projects, including assistance with your feasibility study, overall broadband strategy planning, and identifying potential funding sources for a community network.



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