

Broadband Assessment Study Executive Summary

This document is a summary of the Marathon County Broadband Assessment and Plan. The full report (142 pages) provides an analysis of the current state of broadband infrastructure and services in Marathon County, examines future broadband uses and needs, and proposes a series of improvements in broadband infrastructure, including a fixed point broadband wireless tower network and a county-wide fiber network.

Large portions of Marathon County county qualify as “unserved” or “underserved” by the FCC definitions of broadband service. Conversely, there are very few areas of the county that meet the FCC standard of 25/3 Megabits as “served.” Residential and business use of Internet bandwidth continues to increase by approximately 30% per year. Marathon County will fall farther and farther behind other areas of Wisconsin and the Midwest without a strategic plan to develop modern broadband infrastructure.

RECOMMENDATIONS

Broadband is a community and economic development issue, not a technology issue. The essential question is not, “What system should we buy?” or “Is wireless better or cheaper than fiber?” Instead, the question is:

“What do businesses and residents of Marathon County need to be able to compete globally over the next thirty years?”

Obtain Support for Report Recommendations – Formal letters of support for the recommendations contained in this report should be obtained from major businesses, County Board of Supervisors, and towns in the county.

Set Project and Funding Goals – The broadband project team should review the recommendations in this report and set one-, two-, and three-year project and funding goals. The project and funding goals document should be reviewed and updated twice yearly. One recommended goal is that by 2023, 50% of the residents and businesses within Marathon County should have access to symmetrical 100 Mbps service.

Invest only in Basic Telecom Infrastructure – Town and county government should not engage in retail Internet service delivery. Government investments should be focused on basic infrastructure like wireless towers, conduit, and fiber that can be leased out to the private sector for its use.

Develop a long term funding strategy – The State of Wisconsin is providing grant funds to support fiber and wireless infrastructure, and some other Wisconsin counties have successfully partnered with Internet providers to obtain substantial funding. Federal grant programs from USDA and HUD can also be important sources of funding. Grants will not provide sufficient funds to reach the county’s long-term goals and some local funding sources will be needed to achieve the County’s long term broadband goals.

Improved and Affordable Fiber and Wireless is Needed – Residents and businesses outside of communities with cable Internet service rely on poor DSL internet access and need an alternative. Making county-owned towers available to Wireless Internet Service Providers (WISPs) and provisioning new towers in underserved areas will support improved Internet service. Business parks, industrial parks, and the downtown areas of smaller communities in the county will all benefit from a strategic broadband initiative with appropriate funding. Affordable and available fiber in economic growth target areas can increase property values, make commercial and industrial building spaces more attractive, and help attract and retain jobs and businesses.

Support Middle-Mile Fiber Efforts – While improved broadband wireless service is going to be a critical part of any plan, the county needs some middle-mile fiber. Bandwidth needs for residents and businesses are

Symmetric service (same speed for uploads and downloads) is critical to support work from home, telemedicine services, and business start ups.

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increasing 30% each year, so fiber will be needed to ensure that wireless broadband is able to provide the needed performance. Some fiber is also critical to any economic development efforts to attract jobs and businesses to the county. The proposed network would connect hundreds of public and private facilities with Gigabit Internet, and over time, could take Gigabit Internet services to most homes and businesses.

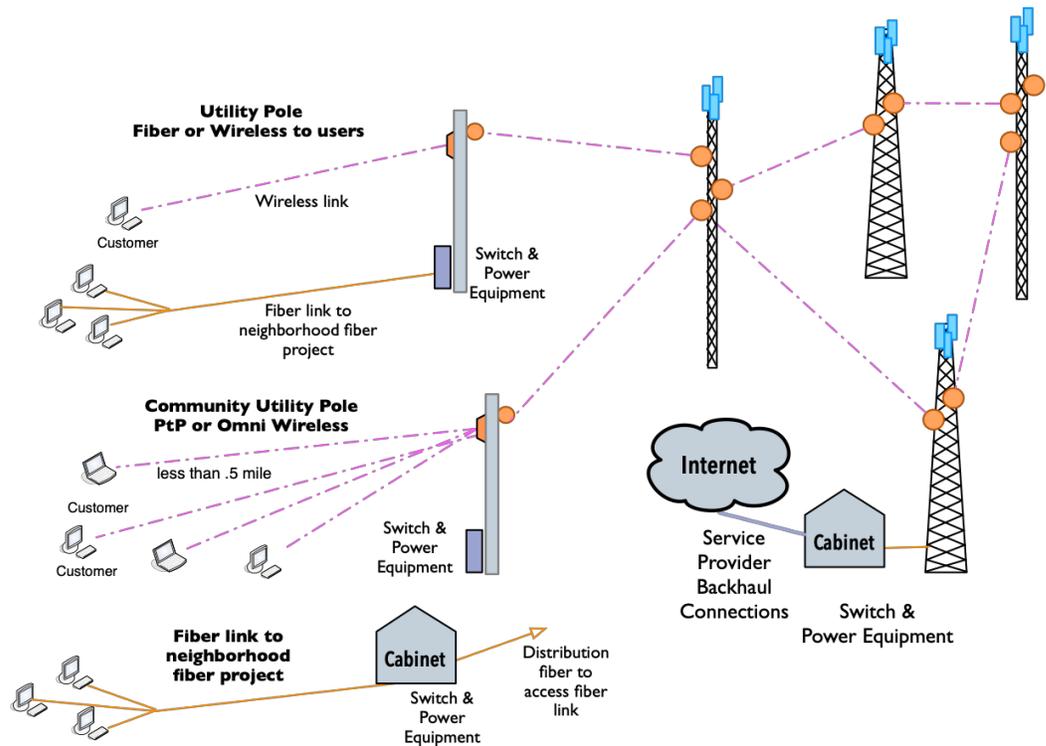
Fund for Success – Successful expansion of broadband in the county will be most successful by recognizing that funding will come from a range of funding sources rather than a single source. Grants, public/private partnerships, some local funds, and other sources may all be needed to achieve success. Grants should be used carefully as one-time cash injections to support very specific goals.

Attract Service Providers – Once an initial plan is in place to make broadband infrastructure improvements (conduit, handholes, fiber cable, wireless towers), Internet Service Providers (ISPs) should be invited to meet to discuss making use of the planned infrastructure.

Public Safety Partnerships – The availability of public-safety towers and/or new towers can enable new services and applications for police, fire, and rescue in the county. Grants are available for public-safety voice and data communications improvements, including new towers and upgrades to existing tower facilities, that could also support the broadband initiative. Any public-safety tower or communications expenditure should be analyzed to determine if the expenditure can also support expanded broadband access in the region.

FIBER AND WIRELESS TECHNOLOGY OVERVIEW

Fiber Networks – Fiber technology provides a “future proof” investment because the capacity of fiber networks can be increased by simply changing the electronics on each end of the fiber cable. Once installed, fiber cable does not have to be upgraded to expand capacity. Current fiber to the home networks provide Gigabit (1,000 Megabits) service, and a new generation of network electronics delivering 10 Gigabit service is being deployed in many communities. A properly designed fiber network can support all current and future residential, business, and institutional needs in Marathon County, including support of a robust broadband wireless network for rural residents and businesses.



Broadband Wireless Networks – Broadband wireless networks distribute Internet service from towers and poles to customers typically within one-half mile to several miles. Different frequencies are used to meet local

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conditions (e.g. heavy tree cover, hills, and other terrain that can block the wireless signal). A clear line of sight or near line of sight is needed between the customer and the tower or pole to achieve the best performance. Current broadband wireless radios can deliver the FCC recommended 25 Megabits/second download, 3 Megabits/second upload speeds, and higher speeds are possible at somewhat higher costs.

GOVERNANCE AND OWNERSHIP OPTIONS

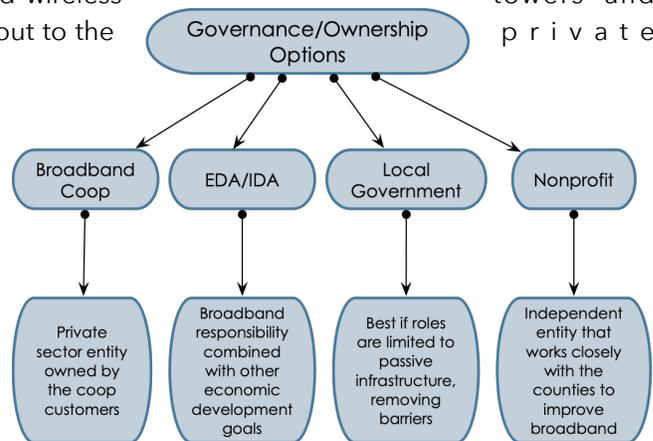
For whatever infrastructure improvements that may be made by Marathon County, there will be a limited number of essential roles. Community and county government investments in telecom improvements can be a mix of passive infrastructure like dark fiber, conduit, and wireless towers and some network electronics. These assets can be leased out to the private sector.

If the improvements are owned directly by the **county government**, many of the routine responsibilities could be managed by existing locality staff and departments that might include IT, Public Works, and Planning.

An **EDA** or **IDA** (Economic Development Agency, Industrial Development Agency) as a nonprofit, could also own and manage telecom assets.

Another option is to form a **nonprofit**, which would not be subject to the state level restrictions on local government. A number of communities have formed a nonprofit (typically a 501(c)(4) to provide the governance and ownership roles for a community broadband effort.

In the county, a **broadband coop** may also be a useful option to consider. Coops are typically formed as a 501(c)(12) and are owned by the members (who are also the customers of the coop). Coops can receive membership fees in advance of providing the service, which can help raise the funds needed for infrastructure. There can also be more than one type of membership (e.g. residential, small business, large business, government, institutional, etc.), and each membership type can have a different membership fee associated with it.



THE PROPOSED FIBER AND WIRELESS NETWORK

To meet the needs for higher performance and more affordable broadband in Marathon County, both a fixed point wireless broadband network and a Gigabit fiber network are recommended. The county-wide fiber backbone could provide improved service at less cost to county facilities, wireless towers, including cellular towers, and could be expanded over time to provide Fiber To The Home (FTTH) services to many of the smaller towns and communities in the county. These facilities would be leased out to private sector service providers—the County government should not become an Internet Service Provider (ISP). The wireless and fiber infrastructure has been separated into six phases.

- The fiber and wireless portions of the network do not have to be built out together. That is, Phase One wireless is not dependent upon the Phase One fiber.
- The phases (both fiber and wireless) do not have to be built out sequentially. This is especially true of the wireless phases. Depending on local demand and political considerations, the Phase Six wireless (or any other phase) could be constructed before the Phase One wireless.

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- Plans for the wireless phases should be developed in close consultation with local Wireless Internet Service Providers (WISPs). The WISPs will be leasing space on the new and existing towers, and their advice should be solicited to ensure that there is at least one WISP who wants to place equipment on planned towers.
- The fiber network design utilizes the existing WCAN fiber route in the Wausau area to reduce some of the construction costs. Phases One, Three, Five, and Six all are connected to the WCAN fiber, which would allow demand and political considerations to drive the actual build out schedule.
- The fiber network design creates three redundant fiber rings, which increases network reliability. As some wireless towers are connected to the fiber network, additional redundancy and network resiliency is achieved.
- If all six wireless phases are constructed, an estimated 89% of households in the county could receive service if they have clear line of sight or near line to site to one of the proposed towers.

This map provides an overview of all six proposed phases of both the fiber and wireless network. As noted previously, the wireless and fiber portions of the network do not have to be constructed at the same time.

