BROADBAND STUDY EXECUTIVE SUMMARY

Outagamie County, Wisconsin

new north ®

DESIGN NINE
broadband planners

MSA

A broadband study of Outagamie County began in early fall of 2021 and was completed in December, 2021. The study included meetings with stakeholders and interested parties in the county, interviews and meetings with businesses, meetings with county officials, and residential and business broadband surveys. The report has several key sections:

- **Asset Assessment** – Demographic data, tower and fiber assets in the county, underserved and unserved areas of the county, and geo-coded survey results.
- **Service Provider Analysis** – A review of current service provider service offerings, speeds, and prices for those services and what bandwidth is available.
- **Broadband Surveys** – In Outagamie County, both a residential broadband survey and a business broadband survey was distributed. A strong response was received.
- **Market and Gap Analysis** – How much bandwidth is enough for residential and business use, now and in the future?
- **Connectivity Solutions** – This section provides an overview of various technologies, including both broadband wireless and broadband fiber.
- **Planning for Broadband** – Design and estimates of a middle mile project to assist ISPs and WISPS with lower capital costs and faster deployment of high performance broadband in rural areas of the county.
- **Infrastructure Funding and Grant Opportunities** – A discussion of a variety of grant and funding strategies.

The survey data collected as part of this study indicates that residents and businesses are anxious for better Internet service. Because a very large number of comments were received, they have been included in a separate document.

- 92% of respondents are interested in faster and more reliable Internet service.
- 98% believe that local government should help facilitate better Internet access.
- 37% of residents report the quality of Internet service is affecting where they choose to live.
- Most businesses indicated that the Internet is important to the success of their business.
- Most businesses reported that they need employees able to work from home.

FUTURE-ORIENTED INFRASTRUCTURE

Affordable high speed Internet is essential to the future growth and prosperity of Outagamie County. Over the past twenty years, Internet access has evolved from a luxury to a necessity. School students need Internet access to complete homework and to study. Online shopping can save energy and make it easier for the elderly and homebound to obtain the needs of every day life. Telemedicine and telehealth services and applications is revolutionizing health care, reducing costs, and allowing older citizens to live independently longer.

More and more workers and business people are working from home, either on a part time or a full time basis, and the Covid crisis has highlighted the critical need for reliable high performance Internet service for work, learning, and access to health services.   New work from home job

opportunities are growing rapidly, but most of those jobs require reliable, symmetric Internet service to qualify.

Many business employees are already trying to work more from home more often (e.g. one or two days per week) to reduce travel costs. Some major businesses in other parts of the U.S. are actively planning to have 20% of their workforce work full time from home to reduce employee travel costs and office energy costs. Corporate employees working from home require high bandwidth services to be connected to the office network and to use corporate videoconferencing systems. These corporate network services often require 10-50 Megabit *symmetric* connections.

Broadband has become essential infrastructure.

Just as communities had to take on the task of building and maintaining roads in the early twentieth century, communities now need digital road systems as a matter of community and economic development.

The communities of Outagamie County, with the right broadband infrastructure, can be attractive to an emerging new group of businesspeople and entrepreneurs that typically are well-educated, own their own businesses or work for large global corporations, and are making choices about where they lived based on family needs and interests, rather than business interests. This new breed of entrepreneurs and workers place a high value on the kinds of amenities that contribute to a good quality of life–traditional neighborhoods, vibrant downtown areas, a wide range of cultural and recreation opportunities, good schools, and a sense of place. These businesspeople and their families make relocation decisions based on quality of life only where there is abundant and affordable broadband, because broadband is the enabler of this new approach to personal and work life.

The Governor's Task Force on Broadband Access has set aggressive goals for the state:

- By 2025, all homes and businesses should have access to 25 Mbps download and 3 Mbps upload speeds.
- By 2028, all homes and businesses should have access to 50 Mbps download and 10 Mbps upload speeds.
- By 2031, all homes and businesses in the state should have access to 100 Mbps download and 50 Mbps upload.

Given that the Covid crisis has created increased attention to fiber Internet service, these goals are modest. If Outagamie County can use ARPA funds, other grant opportunities, and some local funds to make carefully targeted passive infrastructure investments and to develop constructive public/private partnerships, most homes and businesses in Outagamie County could have Gigabit fiber service within the next four to six years.
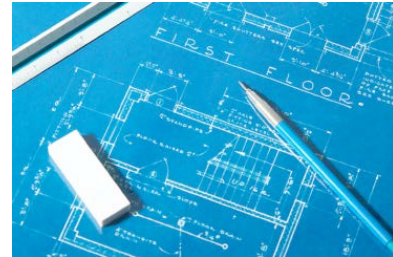
RECOMMENDATIONS

Recommendation	Description	Expected Outcomes
County-wide broadband strategy	A long term strategic plan is needed to bring affordable high performance broadband to all homes and businesses.	This will require a multi-year effort, using a variety of funding resources. While increased funding will be available in 2022, it will take several years to permanently address needs in unserved and underserved areas of the county.
Public/private partnerships	Telecom is inherently a public/private partnership when telecom firms use public funding and/or right of way.	Faster expansion of high performance broadband services when local governments provide funding and support.
Dig Once policies	The County should encourage joint trenching and and shared conduit construction where feasible and practical.	Better use of public right of way (a scarce resource). Lower costs for construction for new broadband infrastructure.
Grant funding	2022 represents a significant one time opportunity for Outagamie County to leverage ARPA, BEAD, and other state and Federal funds for broadband.	Well-planned public/private partnerships and broadband infrastructure expenditures should provide substantial improvements in broadband service in under-served and unserved parts of the county.
Distributed ownership	Some county or regional ownership of broadband infrastructure.	Some public ownership of broadband infrastructure (e.g. fiber middle mile) will lower capital costs for ISPs and WISPs, create more competition, and lower the cost of Internet service.
Regional collaboration	Networks span political boundaries and require a regional approach to maximize use of grant funds to create maximally efficient networks.	A shared vision of broadband in the New North region will lead to universal access to high performance broadband at affordable prices. Regional collaboration will also be a key driver of economic growth and jobs creation.

County-wide Broadband Strategy

Use the findings and recommendations in this report to develop a multi-year set of goals that can be realistically achieved using a basket of local, state, and Federal funding. Commit to providing the grant writing resources needed to pursue every possible grant opportunity.

The County government should not become an Internet provider. Instead, it should focus on developing public/private partnerships by making targeted investments in passive broadband infrastructure like towers and dark fiber.   These assets have long life spans of fifty years or more.

Ownership of those assets can be retained by the County and can be leased out to private sector ISPs (passive infrastructure leasing is not a telecommunications service), or ownership can be gradually transferred to the private sector partner over a period of several years. While the revenue from the lease agreements will be modest, the funds generated can be used to support maintenance of this infrastructure.

Many residents and businesses rely heavily on poor DSL Internet access and need an alternative. Improving service provider access to more towers in the rural and underserved areas of the county will support improved Internet service.   Expanded fixed point broadband wireless service is a critical strategic short term goal in the county, but widespread access to high performance fiber connections to homes and businesses—throughout the entire county—is critical to the long term economic growth of Outagamie County.

Managing expectations will be an important part of the county's broadband strategy. The current deficiencies in Internet access in the county took decades to develop, and planned improvements should be approached as a multi-year process, with an expectation of some improvements in affordability and availability in twelve to eighteen months.

Recommendation: The County should convene a permanent broadband committee of County staff, grant writers, K12 and higher education representatives, and health care representatives to provide guidance on broadband strategy and to assist with grant proposals.   ISPs and WISPs should participate only in a non-voting or adjunct capacity. The County should complete the application/approval process for participation in the State of Wisconsin Broadband Forward! program.

Recommendation: County staff from Planning, GIS, Planning Commission, and Engineering departments should evaluate how and where County policies should be adapted to better support broadband infrastructure improvements. These activities could include Dig Once formal or informal policies, putting all broadband infrastructure (e.g. underground conduit/fiber cable, towers) into the County GIS system, annual allocations to the Capital Improvement Fund, and broadband infrastructure updates to the County Comprehensive Plan.

Public/Private Partnerships

Telecom has always been a public/private partnership; in the twentieth century, local governments gave private companies access to right of way to deploy telecom infrastructure. Throughout the U.S., many ISPs and WISPs are aggressively pursuing Public-Private Partnerships (PPPs) with county governments. Ideally, a public/private partnership combines government oversight, some public funding, and private sector expertise to improve broadband infrastructure in a locality.

A typical partnership is a long term contract between a government entity (e.g. Outagamie County) and a private sector telecom firm, in which the private partner assumes much of the business risk and management responsibility in return for public funding.

The advantage of a PPP is that the ISP or WISP typically is responsible for most of the day-to-day management of the network assets, as opposed to county or regional responsibility for assets.

These partnerships may include a variety of strategies:

- Collaboration on a grant opportunity,
- Shared costs of developing a new tower site,
- Revenue sharing,
- Fee waivers, and other kinds of cost and revenue sharing.

Selected providers should be evaluated carefully. Prospective partners must be able to show technical competency and have a demonstrable track record of managing substantial fiber and/or wireless builds on time and within budget.

It will also be important for any public/private partnership agreement have a claw-back agreement. When public funds are transferred to a private company, the County should have the ability to "claw back" the built infrastructure for a minimum of five to ten years.

Conditions for a claw back could include bankruptcy of the ISP, sale to a third party (where substantial profit taking leverages the public funds), poor service, unreasonably high cost of service, and/or poor service reliability.

Recommendation: Outagamie County can pursue public/private partnerships with technically qualified and financially stable ISPs and WISPs. Where appropriate, the County can channel grant funds to providers who will use the funds to build and manage new broadband infrastructure.

Recommendation: Any public/private partnership agreement should have a well-defined claw back section that provides protection of the public funds from mis-use, business failure, or early asset sale.

Dig Once Policies

According to the Federal Highway Administration, "90 percent of the cost of deploying broadband is when the work requires significant excavation of the roadway."

The National Broadband Plan has recommended that Congress consider creating "dig once" legislation applying to all future federally funded projects along rights-of-way (including sewers, power transmission facilities, rail, pipelines, bridges, tunnels and roads).

Deploying a mile of fiber can easily cost more than $100,000. The largest portion of construction costs is not the fiber cable itself, but the labor costs associated with burying the fiber in the ground (or attaching it to poles in an aerial network design). These construction costs can account for up to 75% of the total cost of fiber deployment.

Local governments improve the efficient use of public rights-of-way by creating Dig Once ordinances and/or encouraging shared trenching and shared conduit. Running a fiber cable through an existing conduit is 3–4 times cheaper than constructing a new aerial build.

Similarly, it can be extremely expensive to add telecom conduit to a bridge after it has been built. It is much less costly to plan to install a conduit bank on a new or refurbished bridge project, with enough conduit installed to support access and use by multiple broadband providers.

Dig Once ordinances facilitate the laying of necessary infrastructure, namely fiber and conduit, to expand broadband service. On the local level, Dig Once would work as follows: whenever there is street construction planned on locally owned roads and/or highways, the county would inform all private providers in the area in an effort to coordinate the laying of fiber and conduit as part of the construction project. That is, once there is a plan for street construction, there would be a second plan to incorporate the laying of fiber and conduit before the construction begins.

In addition to reducing the cost of broadband deployment, the strategic investment in broadband infrastructure at the time of construction also reduces the damage and disruption to rights-of-way in the future.

Recommendation: County Engineering and Planning departments should receive training and information on telecom conduit and fiber installation and management best practices.

Recommendation: County Engineering and Planning departments should be directed to evaluate all new road and road improvement projects for suitability for coordinated installation of telecom conduit.
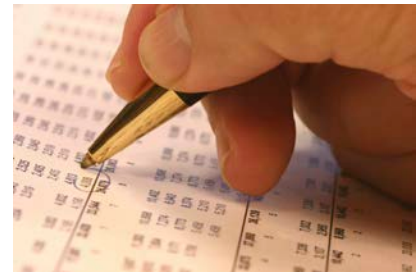
Grant Funding

The Federal government has been steadily increasing the amount of grant funding available for broadband infrastructure, with USDA and HUD both having programs that are designed to help underserved and unserved areas construct new broadband infrastructure.

Some Federal grant applications will be due in mid-spring of 2022, so planning for submitting grant proposals should begin in early January 2022. Covid relief funding (ARPA, American Rescue Plan Act) should also become available in early 2022.

Because ARPA funding is expected to exceed the previous Covid funding program (CARES), Outagamie County's share of ARPA funds should be substantial and a portion of it could cover a large part of the needed broadband infrastructure improvements via public/private partnerships with ISPs and WISPs. The NTIA IIJA BEAD (Broadband Equity Access Deployment) program represents an additional and substantial funding opportunity.

Grants may not provide sufficient funds to reach the County's long-term goals. Evaluate longer term funding strategies, like using a special assessment, or implementing a very small increase in property taxes. Revenue would be earmarked exclusively for broadband improvements. Expansion of broadband in Outagamie 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 can be extremely important in the early stages of an effort to support planning activities and/or to fund a first-phase build-out initiative. However, grants rarely allow spending on operational expenses. Grants should be used carefully as one-time cash injections to support very specific goals. Communities that have relied too heavily on "the next grant" as a key source of expansion or operational funding usually experience severe financial problems.

Recommendation: Assemble a broadband grant team. Some grants, like the USDA ReConnect program, require a significant effort to assemble the required forms, letters, and supporting information needed for the grant application. All grants will require a well-structured technical and operational plan. Team members should have grant-writing experience and should also have a good understanding of the basics of broadband infrastructure.

Recommendation: For grant requests that are focused on public/private partnerships, coordination with the private sector partner is critical. While the private partner may be responsible for developing some or most of the technical detail, many ISPs and WISPs have little or no experience writing grant applications and managing the paperwork required by a grant program. The broadband grant team should be careful not to delegate too much responsibility for developing the grant application to the private partner.

Distributed Ownership

Where cable Internet service is available in the county, download speeds are generally considered adequate, although upload speeds tend to be much lower (as much as 10x to 20x slower). In more rural areas of the county, homes and businesses are struggling with inadequate service, including mediocre DSL, expensive satellite service, and fixed point wireless broadband Internet service.

This bifurcation of service has perpetuated the digital divide. At one time, people usually discussed the digital divide in terms of who could afford broadband location. Some areas of the county have adequate broadband and internet access, and other areas do not. This new digital divide is leading to unanticipated consequences. The availability of broadband (or the lack of it) is beginning to drive land use decisions, including where people want to work and where they want to live in the county.

Regardless of where broadband is deployed, both fiber and wireless providers are carving up service areas to create mini-monopolies. In the fiber business, the rule of thumb is that whoever builds fiber into an area first "wins" because building two fully duplicated fiber networks to compete for the same customers is simply not economical.

The effect could be called the balkanization of American broadband. The main effect of telecom deregulation has been to break up large service area monopolies into many smaller service area monopolies. Though there has been some limited progress in terms of competition, the on-the-ground reality for many broadband users, both residential and business, is a continued lack of service alternatives and ever-increasing prices.

Distributed ownership helps level the playing field in telecom by giving communities, residents, and businesses more control over their community and economic development future. When incumbent and competitive providers do not own all of the infrastructure, everyone benefits, even providers—regional or county-owned broadband infrastructure—leased at fair prices to providers, lowers their capital costs and allows them to expand their service territories more rapidly. ISP and WISP access to shared infrastructure also creates more opportunities for true competition for customers, lower prices, and better service.

Recommendation: Evaluate the potential for some regional and/or county-owned infrastructure, especially in underserved and unserved areas of the county, where public investments would allow faster expansion of fiber to the home and fixed point wireless services by ISPs and WISPs.

Regional Collaboration

Networks do not recognize political boundaries. Indeed, the fundamental design of the Internet was driven by the principle that any computing device, no matter where it was located, could be connected to the larger network of networks. Inter-networking, or the Internet for short, has collaboration baked into it.

Because networks do not stop at political boundaries, regional networks, designed and developed specifically to connect multiple local government and political sub-divisions (e.g. towns, cities, counties) have much greater utility than networks isolated to a single political entity.

While many Federal and state funding opportunities are disbursed to a single locality, many grant programs will rank multi-jurisdictional grant applications higher than single locality applications, precisely because of the recognition that a wide area network can more effectively leverage grant funds.

Regional collaboration can take many forms:

- Public/private partnerships with ISPs and WISPS that offer service in more than one county in the New North region.

- Collaboration on shared meet-me points and co-location facilities to help lower costs for private sector service providers.

- Shared infrastructure, including networks of fixed point wireless towers, shared conduit and fiber middle mile routes, and other telecom facilities.

- Regional digital literacy and training programs for low and moderate income families and the elderly.

- Shared procurement of certain kinds of computing equipment (e.g. laptops, tablets, desktop computers, etc.) that can lower the cost of those items to individual localities.

Recommendation: The local governments continue to work with New North (thenewnorth.com) to provide a long term regional broadband strategy.