

The Partnership



PROJECT

Bug Tussel is a proud partner of Marathon County through a 2021 bond and a 2022 grant in Leathercamp. The projects, R.O.A.D. to Digital Equality and B.E.S.T. Program, will equip Marathon County with wireless internet access, a fiberoptic backbone network, and additional last-mile connections and creating additional capacity to support future projects.



PRODUCT

Bug Tussel will use fixed wireless sites to facilitate rapid expansion, followed by fiberoptic cable. These fiber projects will cover more than 200 miles throughout Marathon County and will provide a catalyst for future last-mile expansion. Standard packages for fiber will range from 300 Mbps to 1 Gbps download and upload speed. Standard packages for wireless will be 25 Mbps download and 5 Mbps upload speed.



TIMELINE

Bug Tussel has 3 fixed wireless sites throughout Marathon County, with 21 additional site in progress. Fiberoptic backbone/middle mile network construction is underway and will be online later next year.

BUG TUSSEL UNIVERSITY

Bug Tussel University Taught an Internet Safety Class this September!

Bug Tussel University taught an Internet Safety class at the Marathon County Public Library Mosinee Branch on September 13th!

Attend a Class This Fall!

Registration Recommended. Call (920) 940-0158 or visit our [webpage](#) to sign up!



Fun With Photos: How to Save, Share, and Edit Photos with your Smartphone

| 10/11 | 2:00 p.m. | Marathon County Public Library - Mosinee Branch

Your sales representatives



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SALES & MARKETING

Ads

- Bug Tussel ran Facebook ads targeting the county during the month of September.

Canvassing

- Bug Tussel representatives gave away door hangers advertising Bug Tussel services to residents throughout the county.

Meetings

- Representatives from Bug Tussel attended the Marathon County Broadband Task Force Meeting at the Marathon County Courthouse in Wausau on September 26.

Sponsorships

- Bug Tussel is sponsoring the Wausau Cyclones Ice Hockey team from July of 2022-June of 2023.
- Bug Tussel sponsored the All of Us Research Program luncheon hosted at the Mosinee Brewing Company on September 15.
- Bug Tussel sponsored the Whelen World Crate Asphalt Latemodels Championship at the Marshfield Motor Speedway on September 16.

Subscriptions

- Over 350 interested in fiber.



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GET IN TOUCH

Customer Service

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TOWER STATUS



On Air: 3

- Tower construction and installation complete.
- Internet is live and operational.



Under Construction: 9

- Establish tower foundation.
- Construct tower by stacking from bottom to top.
- Install antenna, lines, and integrate network.



Zoning: 6

- Submit permits and receive approval from local and federal agencies.



Site Acquisition: 6

- Search for and determine tower site.
- Obtain lease from landowner.

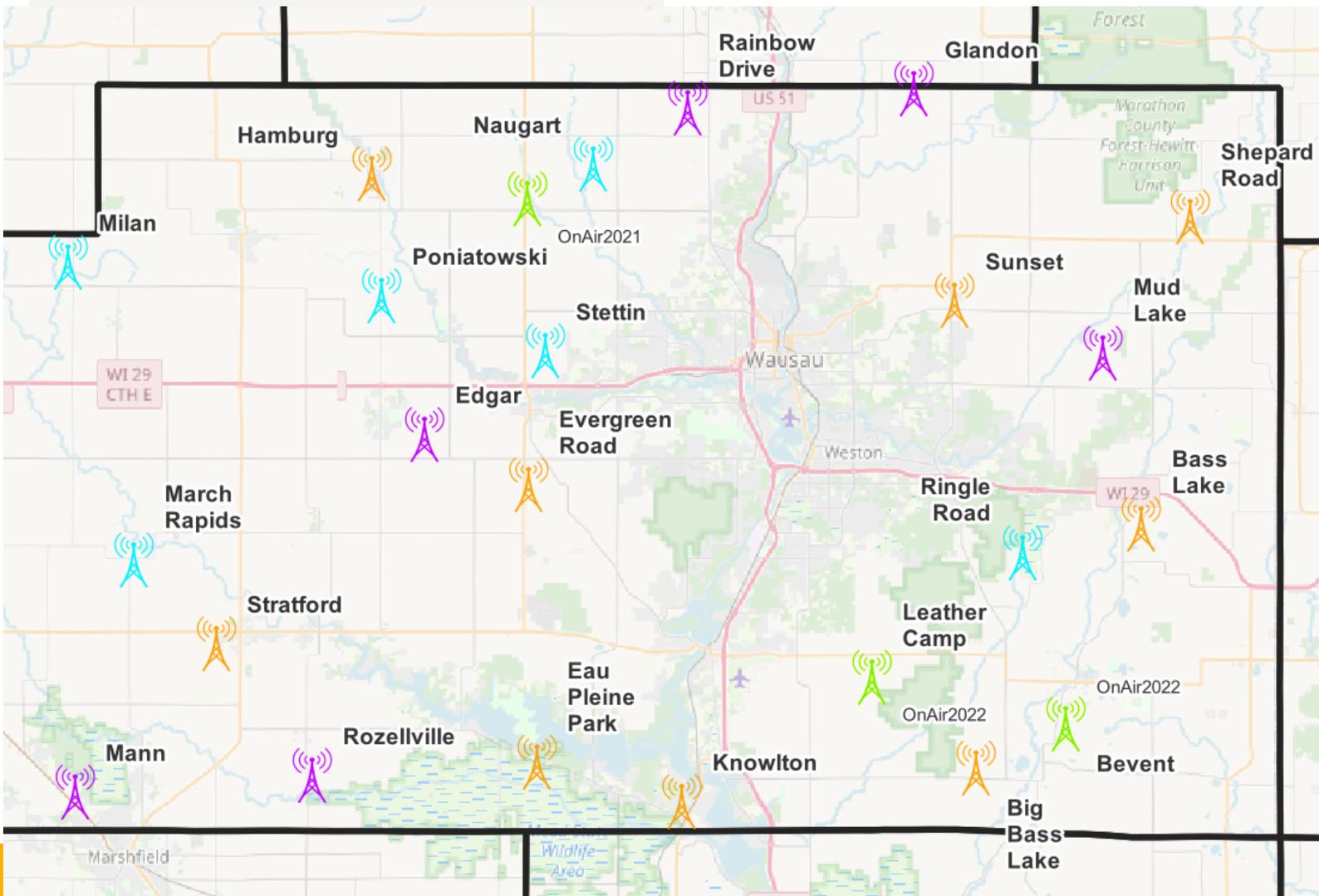
TOWER PROGRESS

Construction In Progress

Civil construction (which focuses on the planning and designing of infrastructure) is in progress for Cumberland Ave, Cary Rock, Glandon, and Eau Pleine Park.

Construction on Bass Lake (latitude 44.864479, longitude -89.339294) has started. The tower is being stacked (built from bottom to top).

Stacking of towers Stratford, Hamburg, Sunset, Evergreen Road, and Big Bass Lake is complete. Next steps include placing equipment on the towers and hooking up internet connections.



*This map includes a rough estimate of site locations and may not accurately reflect actual tower placement.

Site Acquisition Timeline



6-12 MONTHS

BOND EFFORT

Meet with county and municipalities, plan funding, provide due diligence, plan county network (towers and fiber). Several votes with different county committees. Final county board vote (often requires supermajority).



1-3 MONTHS

SEARCH

Connect with property owners within a search ring (about 1 month). Evaluate properties, choose preferred location (about 1 month).



1-3 MONTHS

LEASING

Work with landowner to agree to tower layout, lease terms, address title issues, etc. Often requires attorney review.



6-12 MONTHS

GOVERNMENT APPROVALS

Obtain local permits (driveway permit, address, zoning/conditional use permit, etc). Often requires public notice and hearings.

Obtain federal regulatory approval, including from FAA, FCC, EPA, and other entities. Requires on-site soil, archeological, geologic, historical, etc. studies.

FIBER NETWORK

43 Miles Fiber Installed

Contractor, M.J. Electric, is making progress deploying conduit and installing fiber along the route. Conduit has been installed along the northern part of the route. Forty-three miles of fiber have been installed from Athens to the Brokaw water tower. More fiber will need to be installed, spliced, and connected to other networks before fiber goes live.

Progress Slowed Due to Utility Locators

While moving steadily, progress is slowed due to delays from USIC: Underground Utility Location and Damage Prevention. USIC is currently overwhelmed with work and staff scheduling difficulties. This causes a challenge for USIC locators to cover areas early enough before the construction crew catches up.

Completion of the Middle Mile (backbone) and Last Mile (distribution) in the county is anticipated in late summer 2023.

FIBER STATUS



Connected

- Internet connections are complete.
- Internet is live and operational.
- Customers are connected.



Fiber: 43 miles installed

- Fiber is sent through the conduit via Fiber Blowing, a technique using a machine on wheels that blows air to push the fiber through the cable.
- Sections of fiber are connected to each other via Splicing, the fusion of fiber with an optical laser.



Conduit: 80 miles installed

- Conduit, the protection cable that will house the fiber, is installed via Boring (with a drill) or Plowing.
- Handholes, Flowerpots, and Cabinets, access hatches that house utilities and connections, are installed.



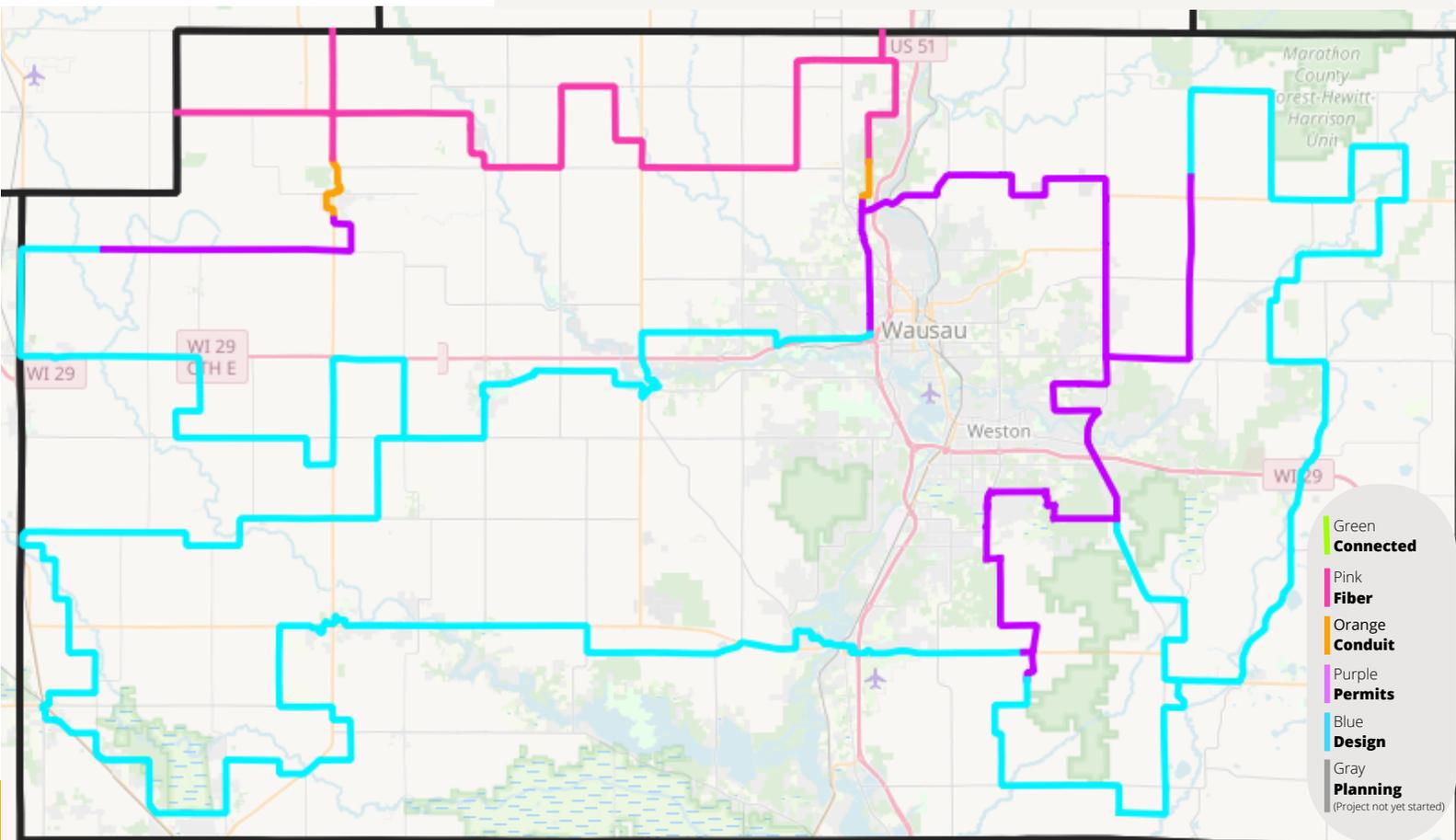
Permits: 145 miles approved

- Permits for work in areas along the route are submitted.
- Permits are approved by appropriate parties.



Design: 168 miles complete

- Fiber route is mapped.
- Route is traveled to determine equipment and landscape needs.
- Sections are Re-designed as needed.



*This map includes a rough estimate of the fiber network and may not accurately reflect final route.

How is a Fiber Network Created?

Did you know? A fiber network is like a highway system. 

Long Haul Fiber is like an *expressway* connecting main points across very large areas together. This is the *core* network that hooks up internet connections from state to state and, on a larger scale, country to country.

 The **Middle Mile** is like a *highway* connecting cities together. This is the *backbone* that connects cities, counties, and states and creates a national network.

The **Last Mile** is like a *road* that travels from the highway to individual neighborhoods, including FTTH (fiber-to-the-home), FTTP (fiber-to-the-premises), etc. This is the *distribution* that connects the internet network to customer's homes, businesses, and government agencies. This is often the costliest and most challenging part of the network to create.

**Bug Tussel specializes in building Middle Mile and Last Mile networks.*

Installing a fiber network requires 4 major steps:

DESIGN THE ROUTE, OBTAIN PERMITS, INSTALL FIBER, AND CONNECT TO CUSTOMERS.

DESIGN THE ROUTE *(Engineering)*

Map the Route

Determine the best route for the network and outline in advanced mapping software.



Travel the Route

Travel the route to determine equipment and route needs based on the landscape. For example, areas with hard rock conditions will require specialized equipment such as a directional drill.

Update Design

Route design is then updated as needed based on landscape requirements, permit needs, etc.

OBTAIN PERMITS *(Zoning)*

Submit Permits

Submit permits to local and federal agencies in order to obtain authorization before beginning installation.

Await Approval

Await approval and re-submit or re-design if approval is denied.



INSTALL FIBER *(Construction)*

Deploy Conduit

Install conduit (a protective cable that will house the fiber) into the ground via plowing or boring (with a directional drill).

Install Access Hatches

Place access hatches in areas (often underground) where intersections will be made, the route changes direction, or fiber will be dispersed. These hatches (which include handholes, flowerpots, and cabinets) will act as utility boxes where fiber connections can be made.

Insert Fiber

Run fiber through the conduit. The most common way to insert fiber is through a process called fiber blowing, which uses a machine to move the fiber through the cable via bursts of air. This reduces friction and the risk of damage to the fiber.

Connect Fiber

Connect sections of fiber to one another by splicing, the process of fusing pieces of fiber together with an optical laser.

Connect to the Internet

Connect the fiber route to the internet, often by hooking up to the larger worldwide network via connection to a switch, a mobile tower, or another connecting point.



CONNECT TO CUSTOMERS *(On Air)*

Connect to Customer

Install fiber from the closest access point (a handhole) to customer's ONT (optical network terminal, which converts light signals to electrical signals) in their home or business.

Set Up Internet

Customer sets up home network system through router and ONT connections.

