

The Partnership



PROJECT

Bug Tussel is a proud partner of Calumet County through a bond originating in December 2021. The project, **R.O.A.D. to Digital Equality**, will equip Calumet County with a fiberoptic backbone network and wireless internet access.



PRODUCT

Per the agreement, Bug Tussel will install 3 towers and 75 miles of fiberoptic backbone/middle mile network within 1-3 years, with options for expansion available as agreed upon by Bug Tussel and the county. 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

The project will primarily take place during the fiscal year 2022, with Bug Tussel's goal to have towers completed and online by January of 2023 and fiber connections to follow.

BUG TUSSEL UNIVERSITY

Bug Tussel University Taught 3 Classes in September:

- **Using the Internet to Keep Your Brain Healthy** on September 8 at New Holstein High School.
- **Smartphone Basics** on September 20 at the Brillion Public Library.
- **Search Smarter: Improve Your Internet Searching Skills** on September 22 at New Holstein High School

Attend a Class This Fall!

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

Facebook for Beginners | 10/18 | 6:00 p.m. | Brillion Public Library
Email Basics | 10/20 | 4:00 p.m. | New Holstein High School

Request a class in your area by calling us at **920-940-0114** or emailing us at bugtusseluniversity@btussel.com



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GET IN TOUCH

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SALES & MARKETING

Ads

- Facebook ads targeted the county during the month of September.
- Bug Tussel ran ads in Insight on Business Magazine (both print and online editions) during the month of September.
- Bug Tussel ads will run on country music radio station, WPKR from July 2022-June 2023.

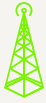
Sponsorships

- The Calumet County Fair in Chilton from September 2-5 was sponsored by Bug Tussel.

Subscriptions

- Over 600 fixed wireless subscriptions.
- Over 200 interested in fiber.

TOWER STATUS



On Air: 7

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



Under Construction: 0

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



Zoning: 2

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



Site Acquisition: 1

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

TOWER PROGRESS

Permit Approval Expected This Fall

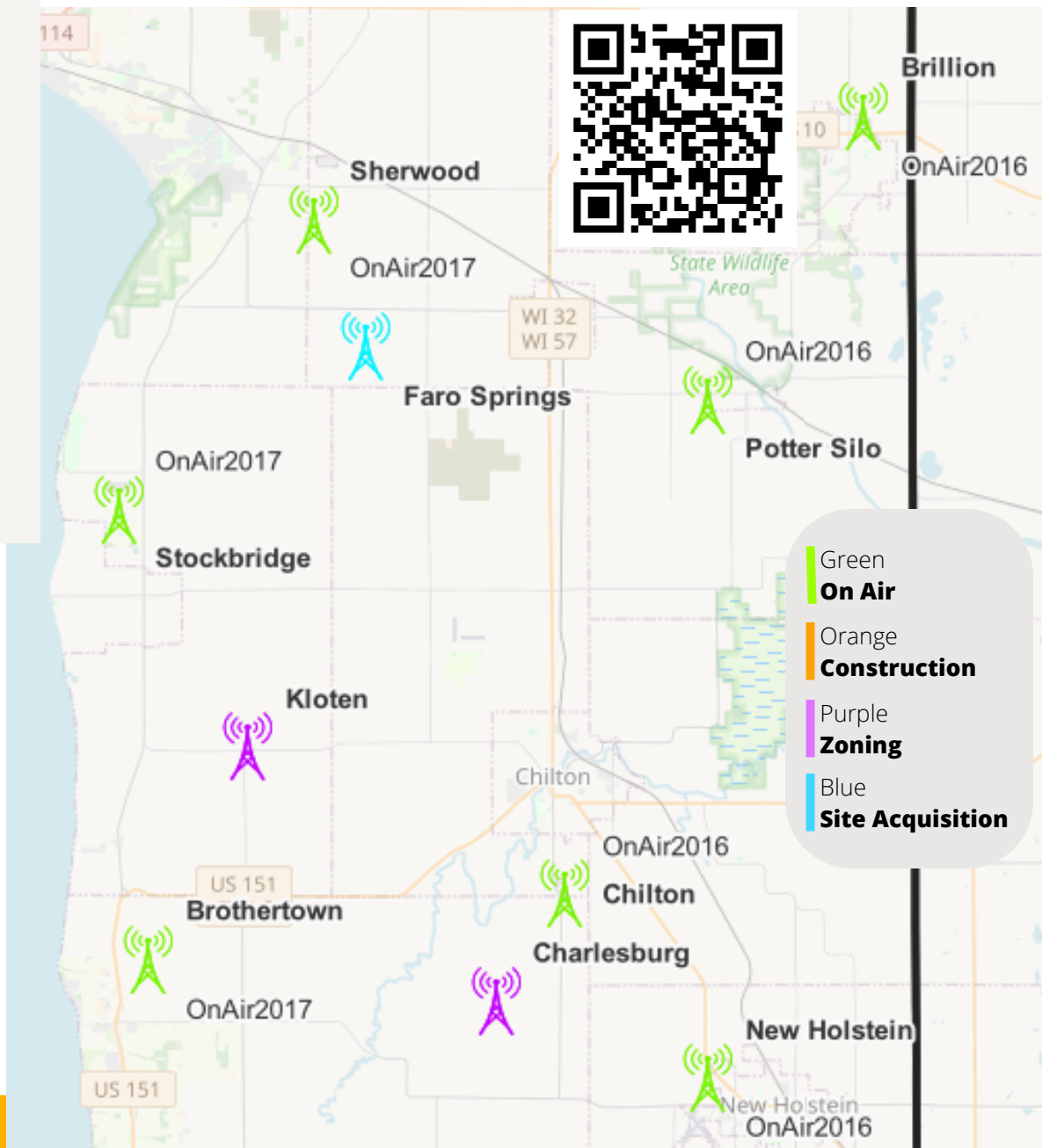
Two tower sites, Charlesburg (latitude 43.975846 and longitude -88.182734) and Kloten (latitude 44.03659 and longitude -88.2653), remain in zoning status while final regulatory steps are completed. Zoning status is the process of submitting permits and awaiting approval from various local and federal government agencies. The projected date when approval will be received to move forward with construction on these towers is early October.

Lease Agreements In Process

The leasing team has begun its search for an alternative site for Faro Springs (latitude 44.11406 and longitude -88.22602) this September due to leasing challenges. Bug Tussel staff will determine new site candidates and move forward with lease agreements with the landowner once a site is selected.

Interested in hosting a tower near Faro Springs Road?

Get in touch at <https://btussel.com/plans/host-a-tower/>.



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 STATUS



Connected

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



Fiber

- 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

- 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

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



Design: 150 miles complete

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

FIBER NETWORK

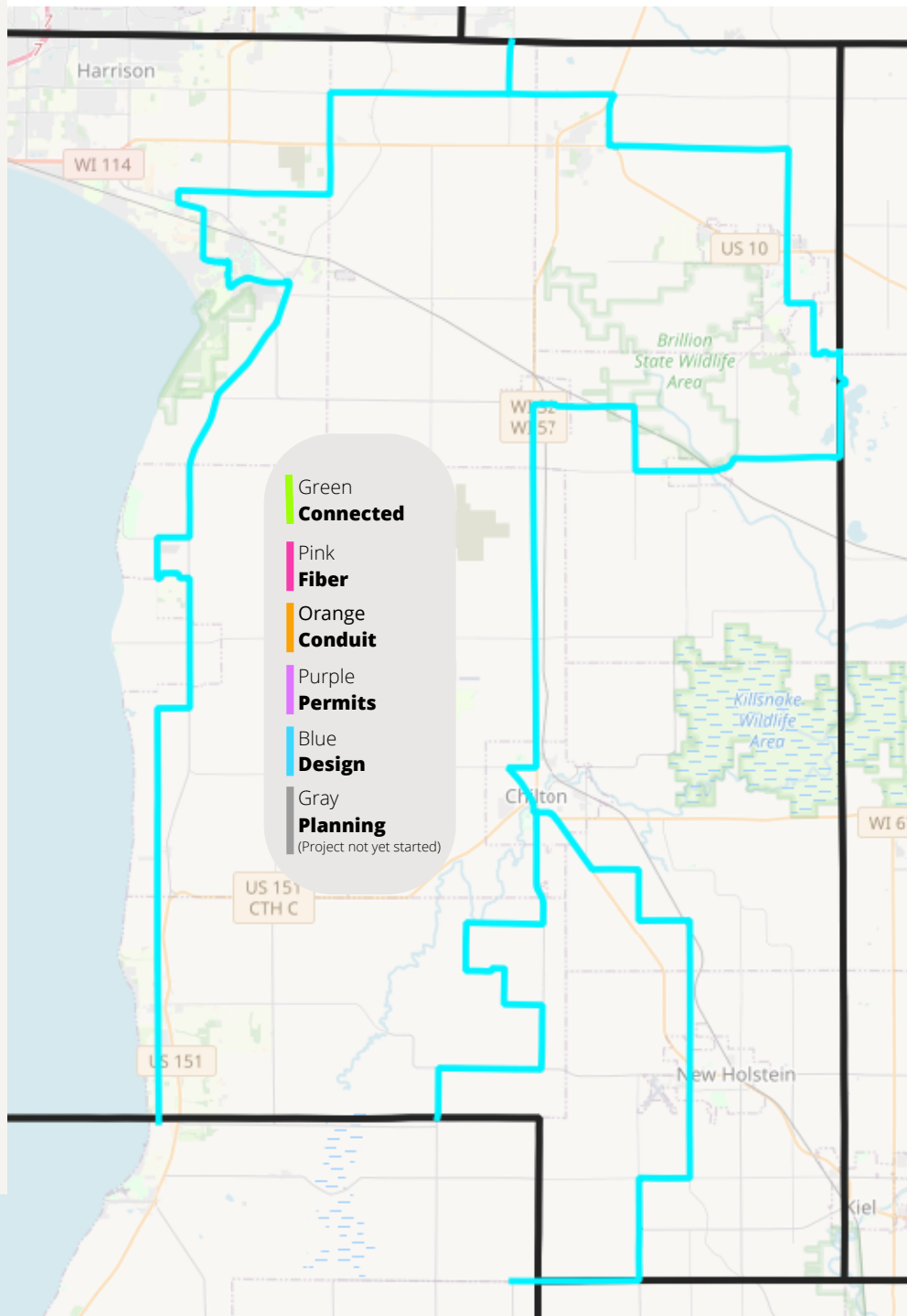
Engineering Progress

Engineering firm Millennium Geospatial continues to make progress engineering the route. Engineers map the route, determine the best installation methods for each section of the land, plan locations for where sections of the route will split off, and decide the best location for utility and access hatches, such as cabinets and handholes.

Construction Delayed

Construction is expected to begin in late October. H & H Utility Excavating Inc. is lined up as contractor for this project once construction starts.

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



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), FTTN (fiber-to-the-neighborhood), 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.