



SPRING REPORT

March - May 2023

btussel.com

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PROJECT SNAPSHOT

For a more detailed report of project status, see pages 4-5 and 8-9.

WIRELESS NETWORK



FIBER NETWORK



COMMUNITY ENGAGEMENT



EVENTS

Total People Reached: 600

HEART OF WISCONSIN CHAMBER MEMBERS

March 3, Marshfield
Bug Tussel representatives attended meeting.

COCINA ON THE SQUARE
March 17, Athens

EXPO MARATHON COUNTY
April 20, Rothschild
Bug Tussel representatives attended and hosted a booth.

MARSHFIELD EVENT BUSINESS AFTER HOURS
April 27, Marshfield

HOSTING TOWER LUNCHEON MOSINEE CHAMBER
May 9, Mosinee

Technology Classes

Community members learned basic technology skills attending Bug Tussel University classes at the Marathon County Public Library Mosinee and Stratford Branches.

3/21
**Keep Your Tech Appy:
How to Install and
Uninstall Apps**

3/25
**Fun With Photos: How
to Save, Share, and
Edit Photos With Your
Smartphone**

4/18
**Stop Reading CRAAP:
How to Spot Unreliable
Information Online**

4/29
**Virtual Doctor Visits:
Learn How to Visit
Your Doctor Online**

5/16
**Remove the Hassle
From Passwords**

WIRELESS NETWORK PROJECT

Sites: 20

Funding Type: Bond

Minimum Timeline: 3 years

Approval Date: December 2021



KEY STAGES

Includes 20 project-funded sites and other sites. Subject to change.



LIVE

7 Sites Complete

Towers are live and customers can be hooked up to the wireless network.



CONNECTIONS

7 Sites Complete | 2 Sites In-Progress

Connections to appropriate utilities, power, and network are made and broadcast signals are tested.



CONSTRUCTION

9 Sites Complete | 9 Sites In-Progress

Site is prepared, foundation, road, and tower are built, and utilities and equipment are installed.



APPROVALS

18 Sites Complete | 4 Sites In-Progress

Permits are submitted to and approved by government and partner organizations.



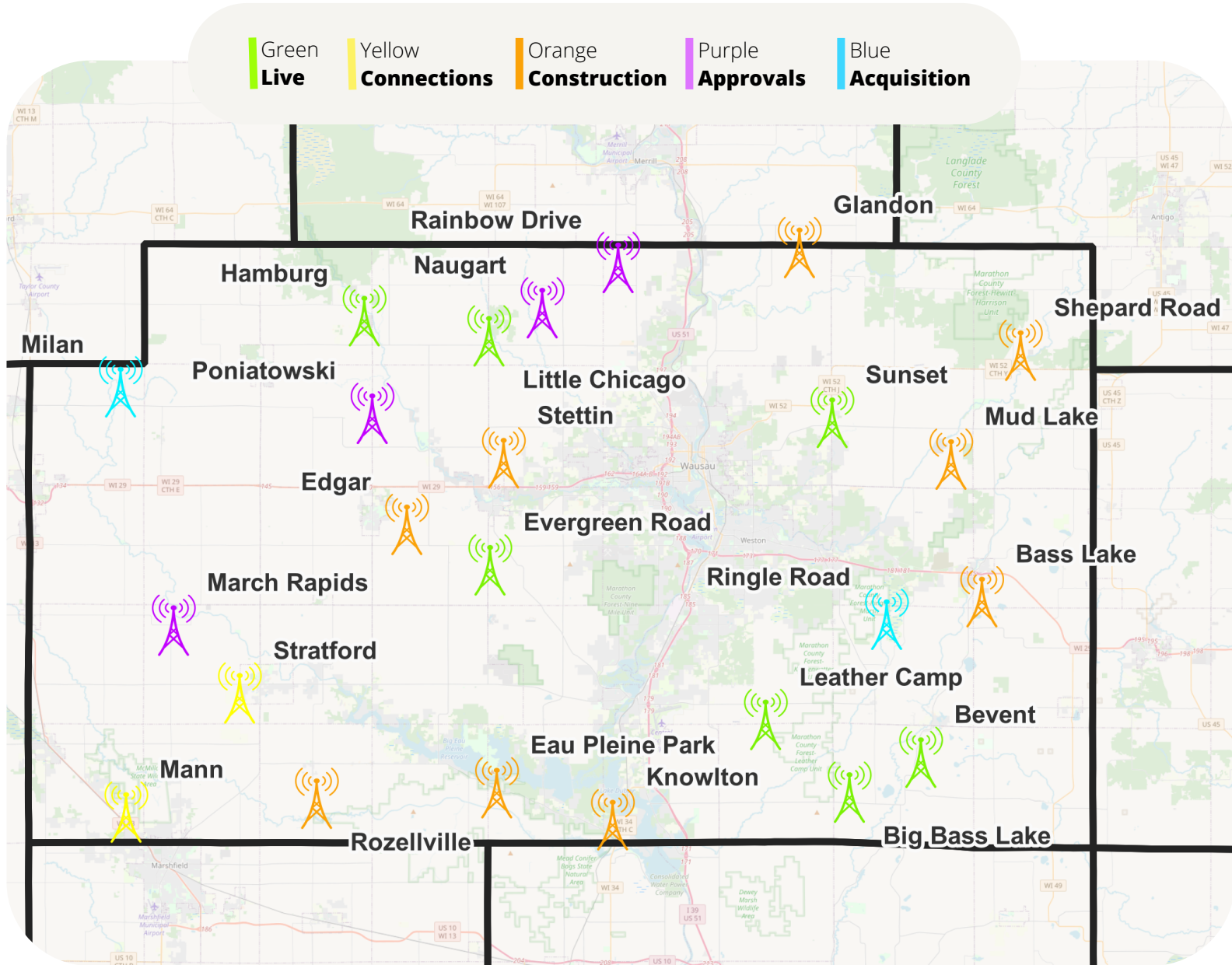
ACQUISITION

22 Sites Complete | 2 Sites In-Progress

Location for the site is scouted and, once a suitable site is found, a lease agreement with the landlord(s) is negotiated.

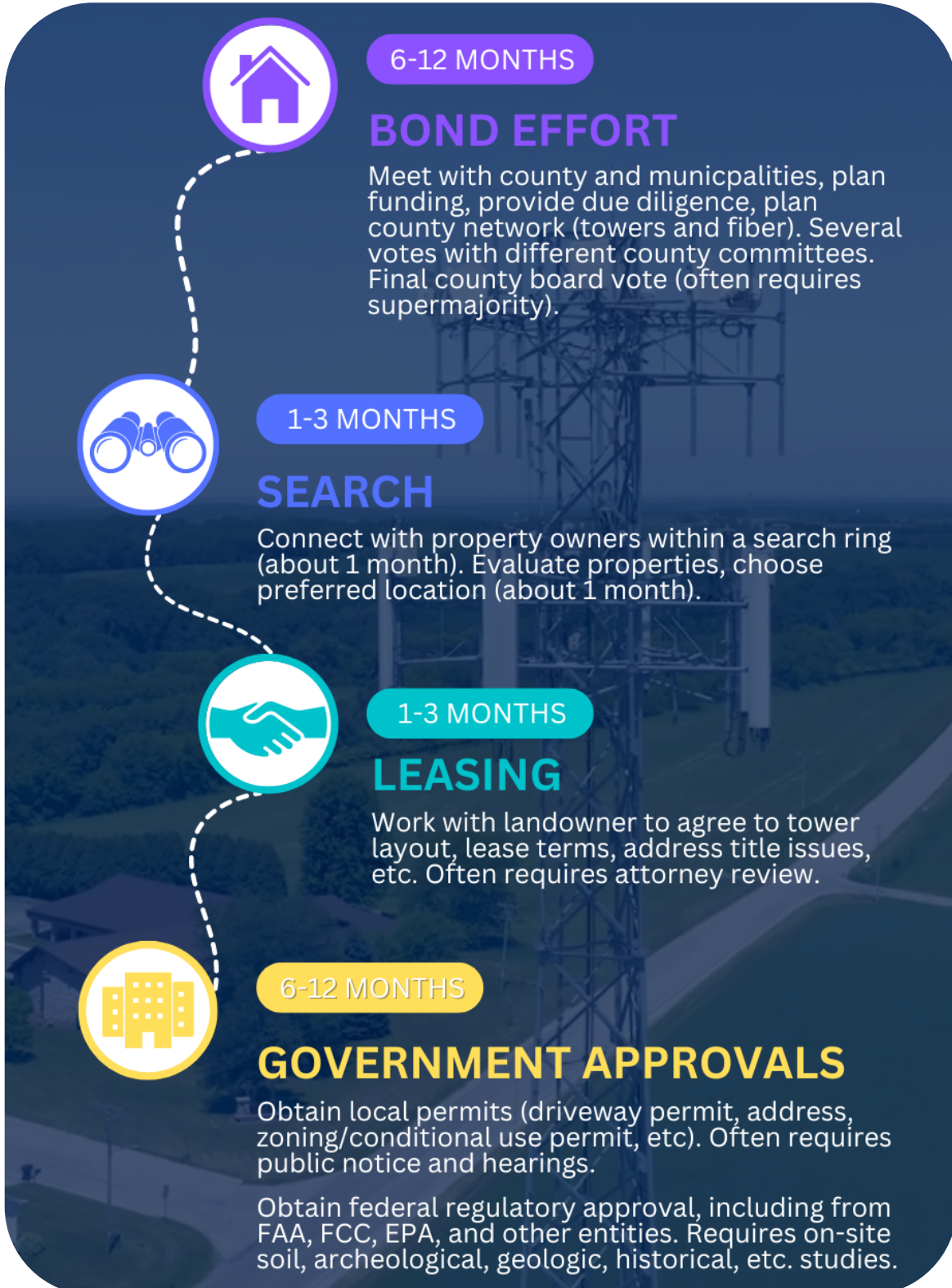
MAP - WIRELESS NETWORK

Representation of project-funded sites and other sites. Subject to change.



SITE ACQUISITION TIMELINE

btussel.com/about-us/partnerships



CUSTOMERS

FIXED WIRELESS

Pre-Sold Customers: 67
Total interested in fixed wireless service, including prospective customers and sales leads.

FIBER

Potential Customers: 3,012
Total homes within 100 feet of planned fiber route.

Pre-Sold Customers: 44
Total interested in fiber service, including prospective customers and sales leads.

New Installation
39%

CUSTOMER SUPPORT

Total Customers Assisted: 82
Total Bug Tussel customers assisted.

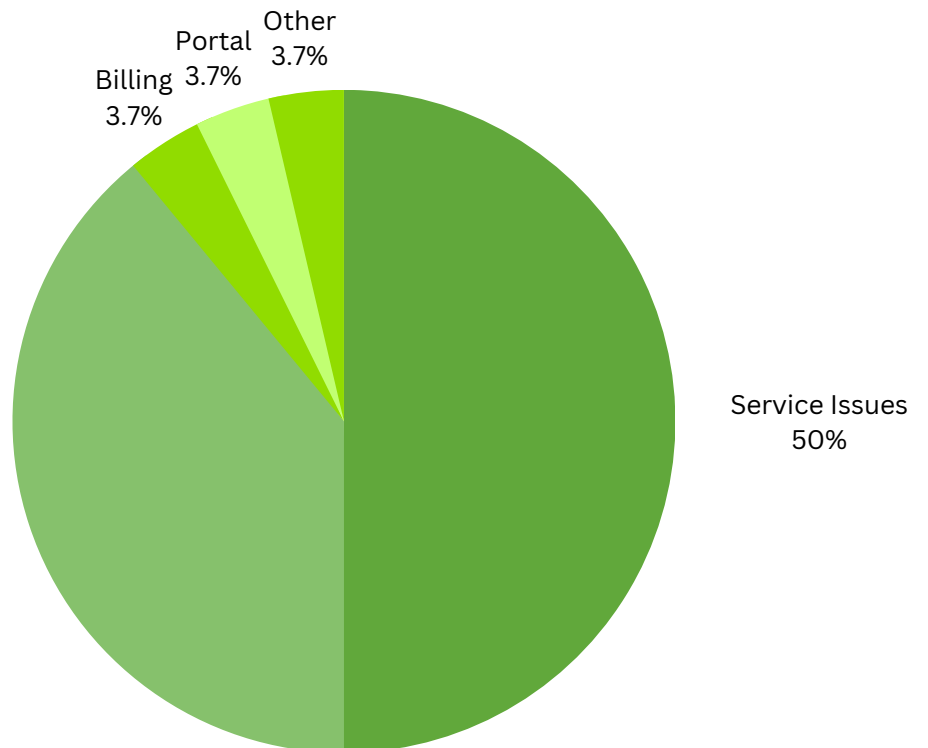
TOP CUSTOMER SERVICE REQUESTS:

SERVICE ISSUES
Slow Wi-Fi, internet service interruption, other individual service issues.

NEW INSTALLATION
Customer is set up with new service.

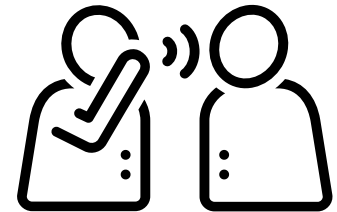
BILLING
Assistance with billing information, making payments, etc.

PORTAL
Questions about Bug Tussel's web portal, including settings, access, etc.



FIBER REPORTING UPDATES

DID YOU KNOW?



It's no secret that building a fiber network is a complicated process! To keep things simple, we are making the following changes in these reports!



NO MORE DISTRIBUTION COVERAGE

To help provide a clearer and broader picture of route updates, these reports will no longer cover the portions of the route that connect the backbone to customer's homes, businesses, and government agencies. While this route will still be built according to original agreements, these reports will not include progress or mileage on these areas.

What does this mean?

It might look like mileage totals have decreased compared to previous reports. Don't worry, we are making more progress than ever! Keep in mind that mileage totals reflect backbone only, allowing a clearer picture of progress.



ADDED ROUTE "OLT" SECTIONS

Fiber routes have been categorized into individual "OLT" (optical line terminal) sections. With this change, focus can be placed on one OLT section at a time, in many cases allowing smaller sections to be lit up one at a time.

What does this mean?

You may notice that larger sections of the route change color together. With these OLT sections, you'll be able to see specific changes in progress for larger, more clearly defined sections of the route.

FIBER NETWORK PROJECT

Mileage: 340

Funding Type: Bond

Minimum Timeline: 3 years*

**Not all 340 miles will be completed in this phase*

Approval Date: December 2021

Mileage: 90

Funding Type: Last Mile Grant & Bug Tussel contribution (Leathercamp Project)

Minimum Timeline: 2 years

Approval Date: July 2022



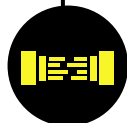
KEY STAGES

Includes backbone for all projects and phases. Subject to change.



LIVE

Fiber is live in select areas and customers can be hooked up to the network.



CONNECTIONS

44 Miles In-Progress

Fiber is connected to appropriate sections, utilities, and power and network signal is tested.



FIBER

44 Miles Complete | 27 Miles In-Progress

Fiber is placed in conduit and sections are spliced together.



CONDUIT

71 Miles Complete | 66 Miles In-Progress

Conduit cable and other utilities are installed.



APPROVALS

137 Miles Complete | 55 Miles In-Progress

Permits are submitted to and approved by government and partner organizations.



DESIGN

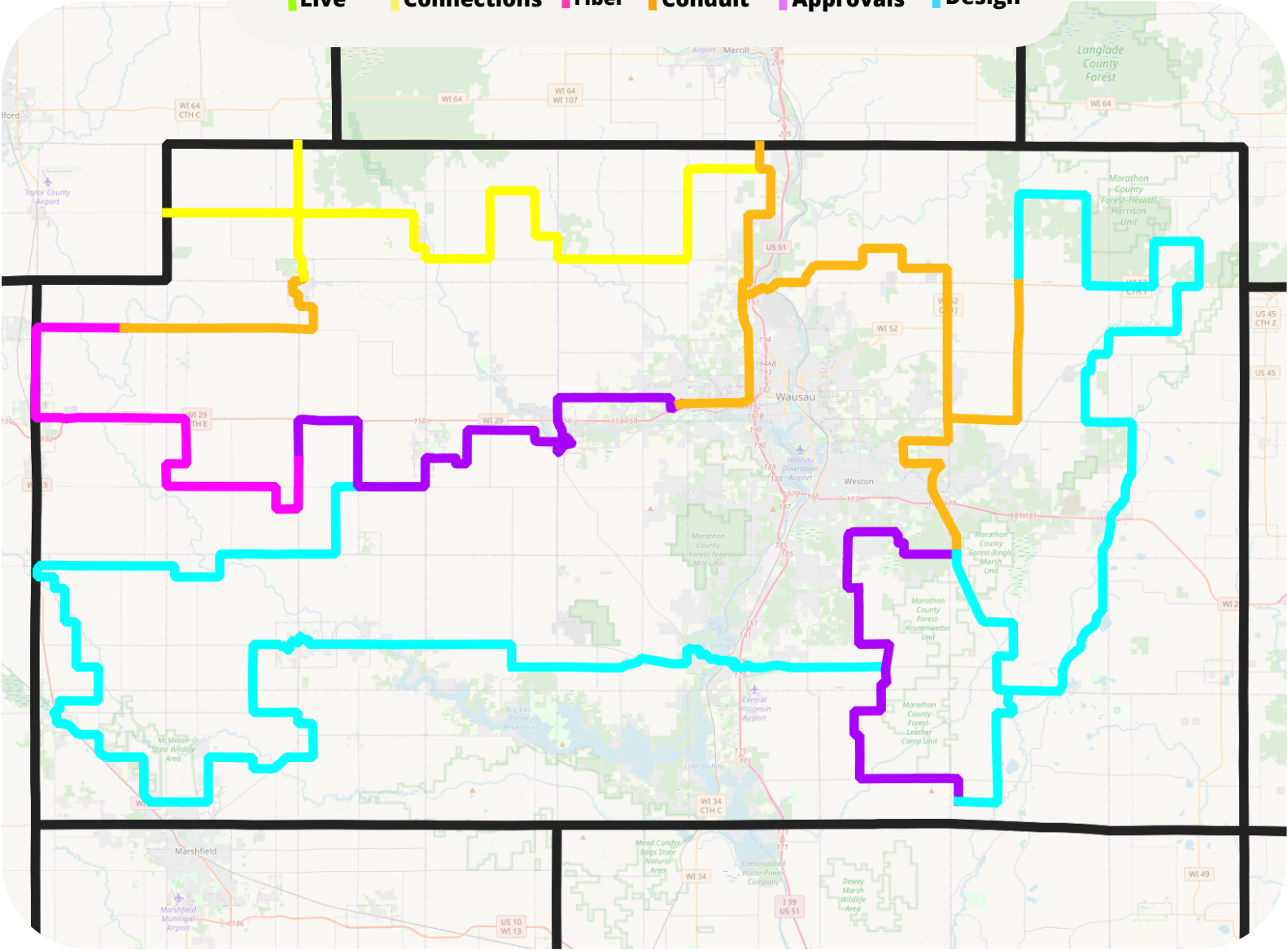
192 Miles Complete | 152 Miles In-Progress

Route is designed, planned, and engineered.

MAP - FIBER NETWORK

Representation of backbone for all phases and projects. Subject to change.

Green **Live** Yellow **Connections** Pink **Fiber** Orange **Conduit** Purple **Approvals** Blue **Design**





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.

INSTALLING A FIBER NETWORK REQUIRES 4 MAJOR STEPS:

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.



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

OBTAIN PERMITS (*Zoning*)

Submit Permits

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.