

## The Partnership



### PROJECT

Bug Tussel is a proud partner of Jackson County through a 2021 bond and a 2022 grant and bond. The project, **R.O.A.D. to Digital Equality**, will equip Jackson 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 multiple phases of fiberoptic cable. These fiber projects will cover more than 150 miles throughout Jackson 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 16 fixed wireless sites (including AT&T only sites) throughout Jackson County, with 7 additional sites in progress. Fiberoptic backbone/middle mile network construction is underway and will be online later next year.

## BUG TUSSEL UNIVERSITY

### Attend a free tech class this fall!

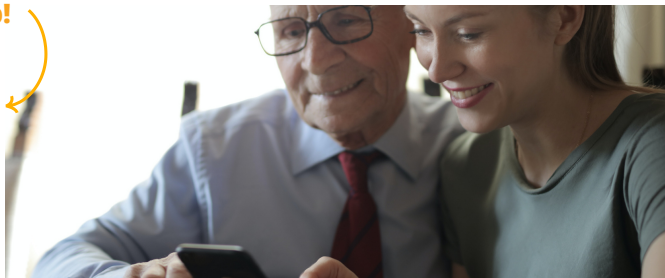
Bug Tussel University is coming to Jackson County this October! We offer free basic technology classes on how to use Facebook, how to stay safe on the internet, and using the internet to keep you brain healthy, and more! Keep an eye out for classes this winter!

**Request a class in your area by calling us at 920-940-0114 or emailing us at [bugtusseluniversity@btussel.com](mailto:bugtusseluniversity@btussel.com)**

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

10/13 | 1:30 p.m. | ADRC of Jackson County

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



## Your sales representatives



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## SALES & MARKETING

### Ads

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

### Subscriptions

- 22 wireless subscriptions
- 1 wireless activation this month
- 61 interested in fiber

# TOWER STATUS



**On Air: 16\***

*\*Includes AT&T only towers*

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



**Under Construction: 6**

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



**Zoning: 1**

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



**Site Acquisition: 0**

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

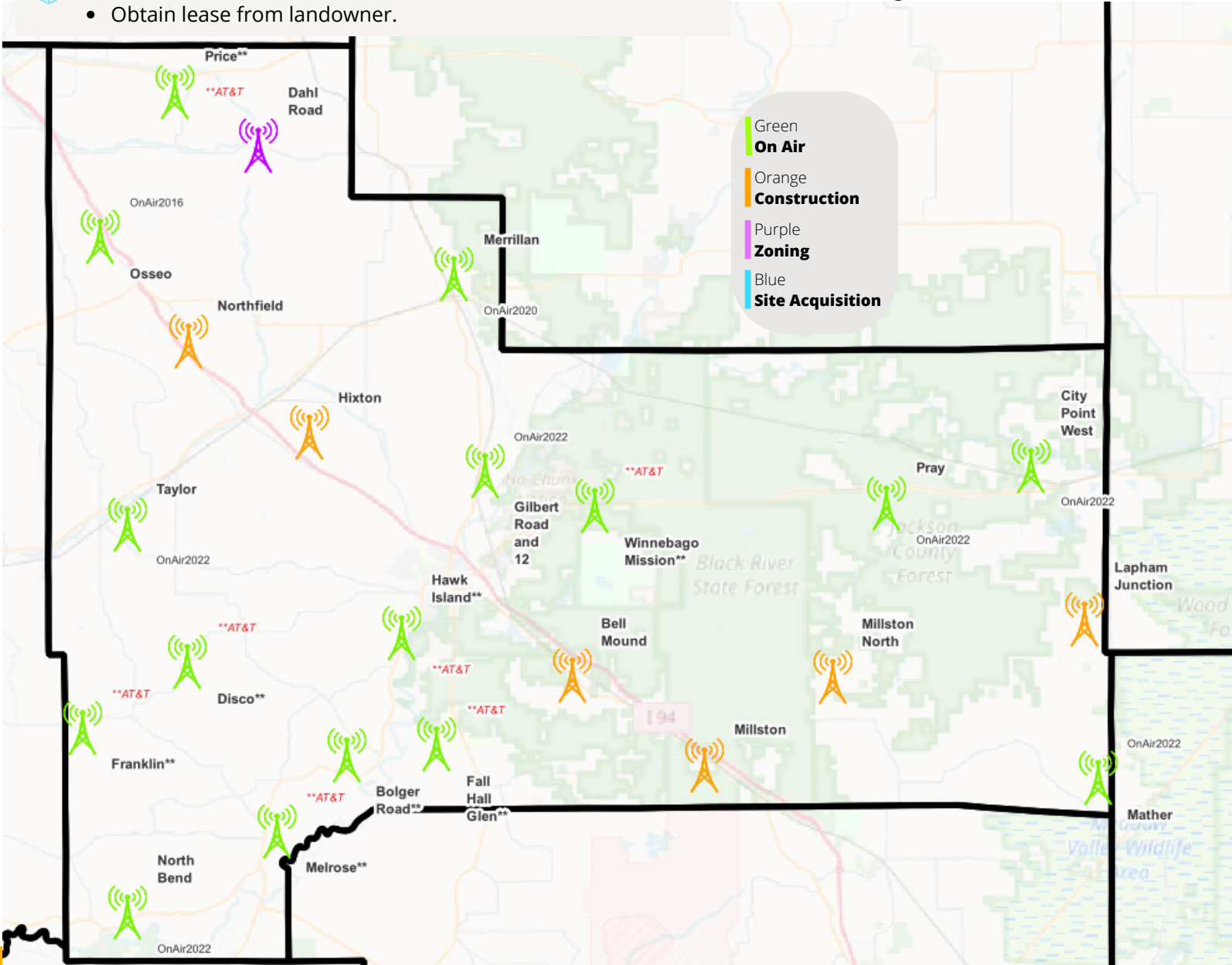
# TOWER PROGRESS

## Awaiting Approval for Dahl Road

Dahl Road (latitude 44.539807, longitude -91.004269) remains in zoning status while awaiting final approval.

## Awaiting Equipment for Lapham Junction and Millston North

Construction continues for two sites, Lapham Junction (latitude 44.267903, longitude -90.335224) and Millston North (latitude 44.23542, longitude -90.53816), as crews await the delivery of equipment. Crews are still awaiting the arrival of equipment, which was expected to arrive by the end of August.



*\*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

## 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.

## Permit Permits

The team is currently working to submit permits to areas along the route. Once permits are approved, the team must await approval before moving forward with construction.

## Construction

Construction is expected to begin in late October. Five Star Energy Services 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.**

# 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

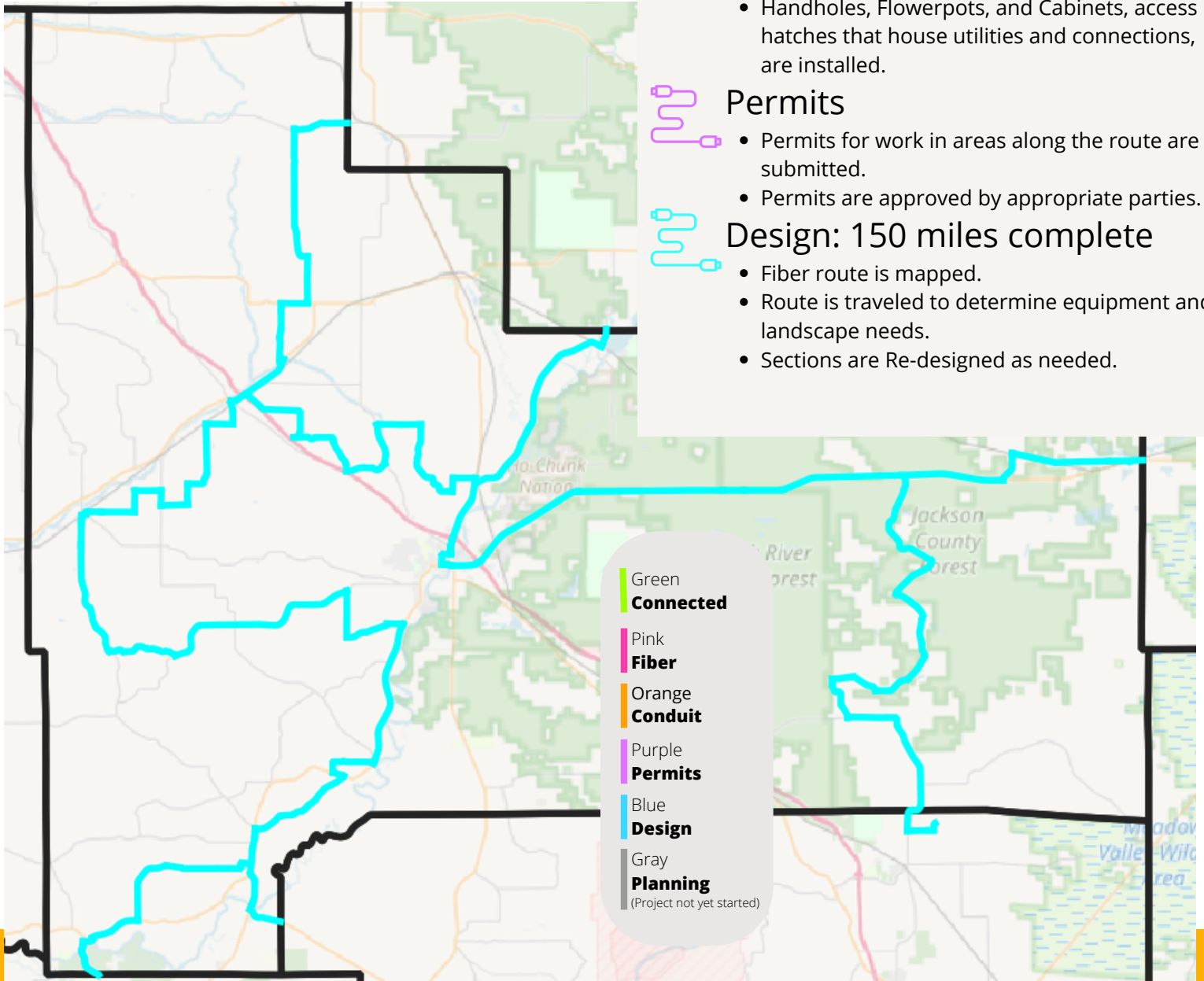
- Conduit, the protection cable that will house the fiber, is installed via Boring (with a drill) or Plowing.
- Handholes, Flowerpots, and Cabinets, access hatches that house utilities and connections, are installed.

## 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.




\*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.

