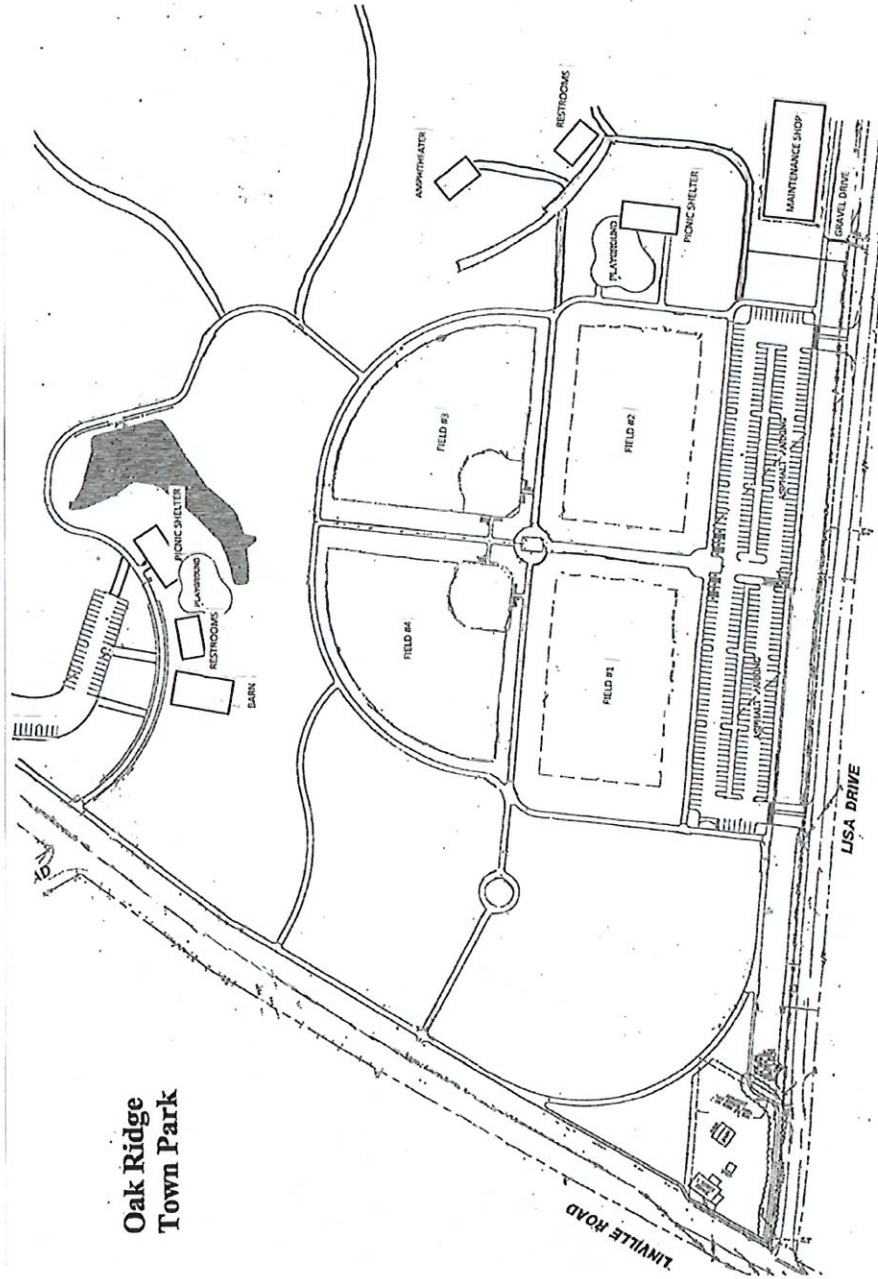




Town of Oak Ridge, NC

Town Park WiFi Study
December 2021



**Oak Ridge
Town Park**

Oak Ridge Town Park



Basic Requirements / Assessment:

1. Concession stand:
 - Entry point for Spectrum internet
 - 200 Mbps / 15 Mbps
 - Need WiFi to cover bleacher area
2. Amphitheater:
 - Need WiFi coverage here to live stream events
 - 553' from concession Stand
3. Pavilion:
 - WiFi coverage for the pavilion area and as much of the parking lot / grass area as possible
 - 672' from concession stand

General:

- Each circle is 250' radius
- 1 <-> 2 line of sight has elevation difference and fencing
- 1 <-> 3 Trees between points

Need to Quote:

- Wireless bridge – point to point connection between:
 - 1 <-> 2
 - 1 <-> 3
- Network equipment needed to provide WiFi coverage
- WiFi authentication system for public use
- Light firewall / DNS protection
- Ongoing maintenance cost

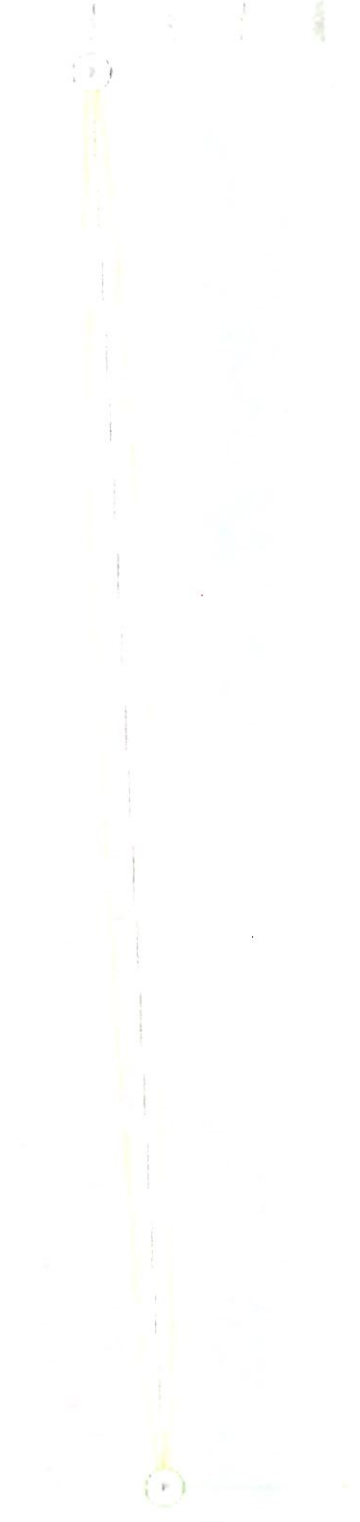
Poi Poi Wir Lin



305 Mbps

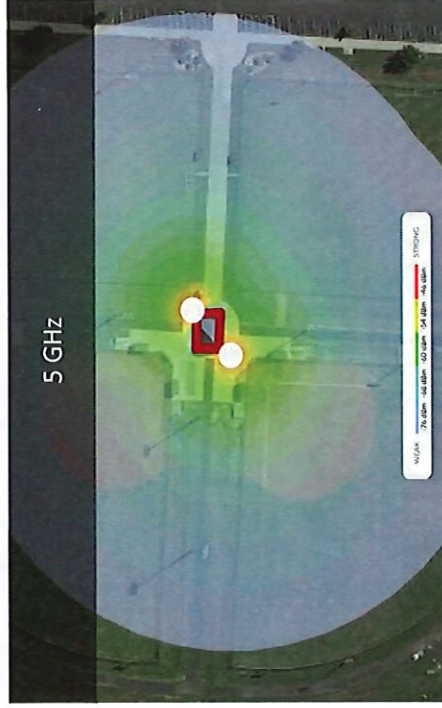
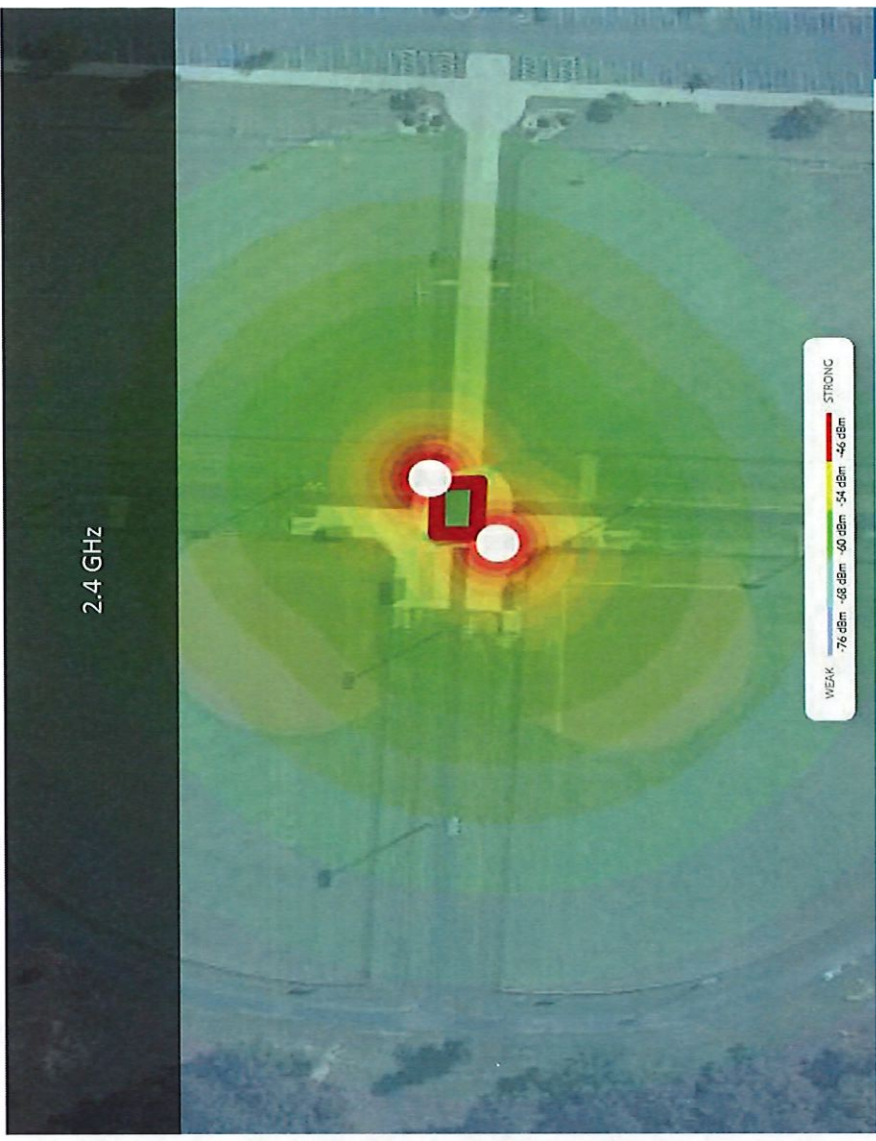
305 Mbps

202.97



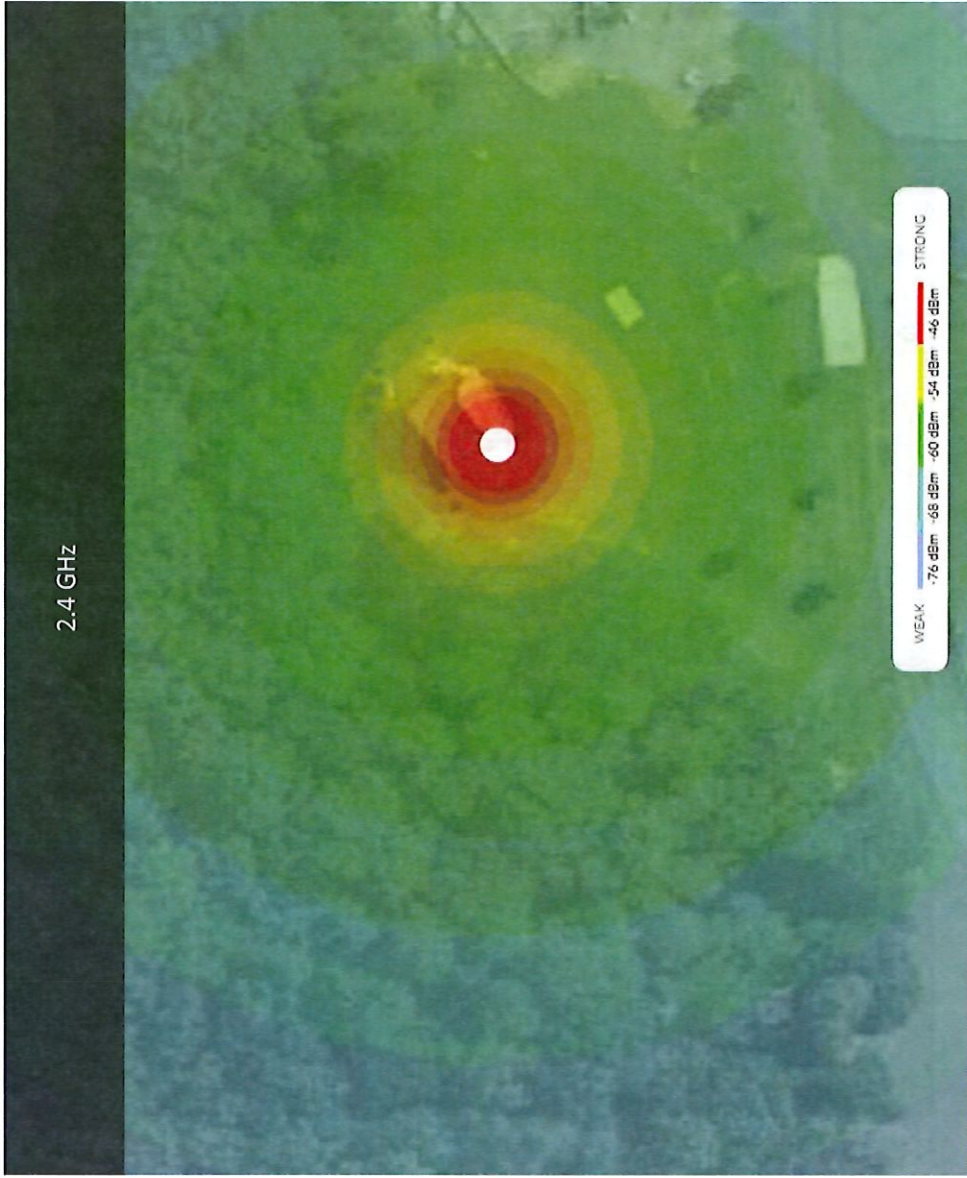
CMIT Solutions - Confidential Wireless Study for the Town of Oak Ridge, NC

Concession Stand Coverage

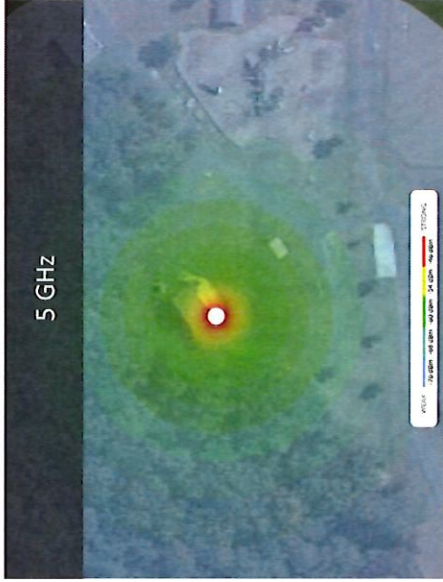


Amphitheater Coverage

2.4 GHz



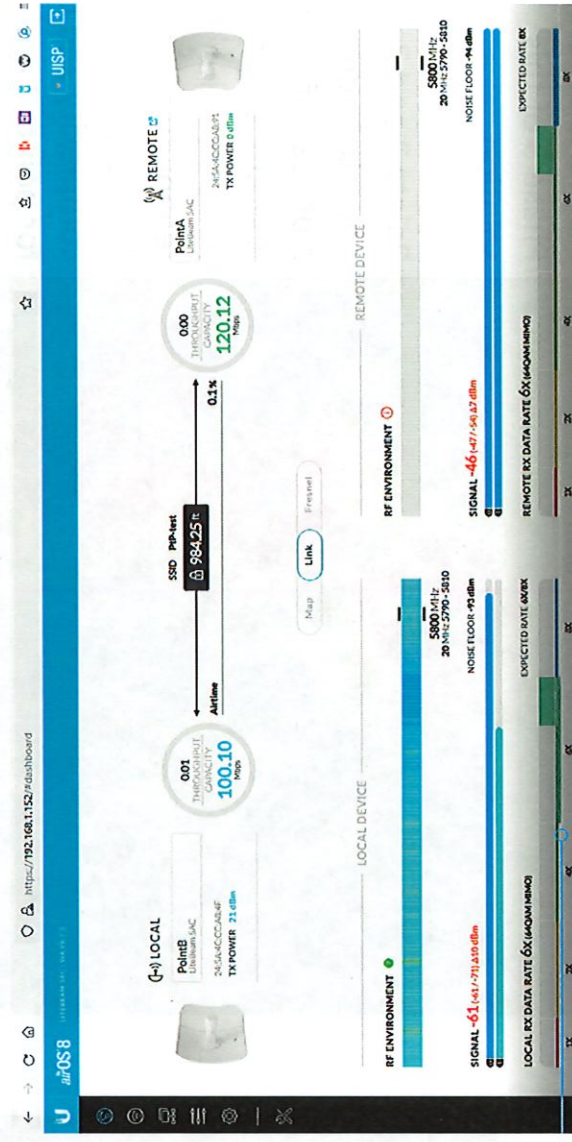
5 GHz



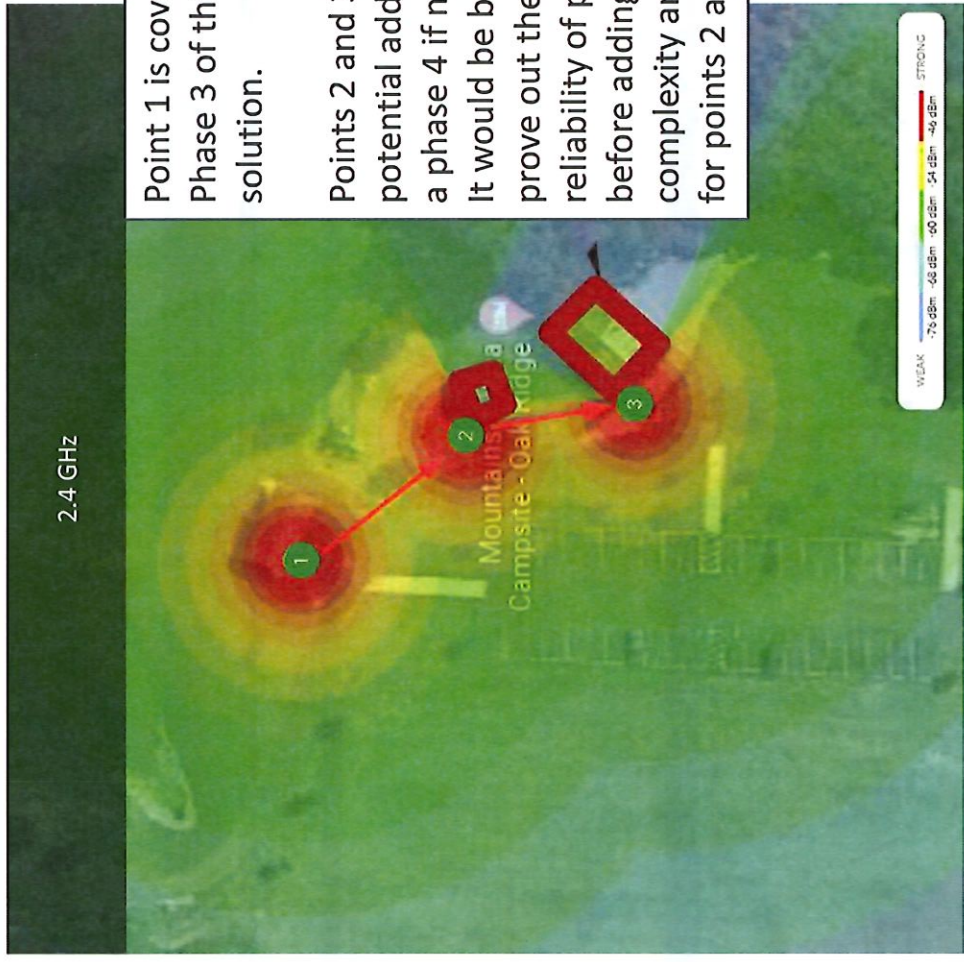
Point to Point (PtP) Amphitheater Test

PtP Test Results:

- Concession stand antenna on roof, below ridge
- Amphitheater antenna about 9' above the roof
- Connection was very good speed was consistent at 100 Mbps



Pavilion Coverage



Point 1 is covered in Phase 3 of this solution.

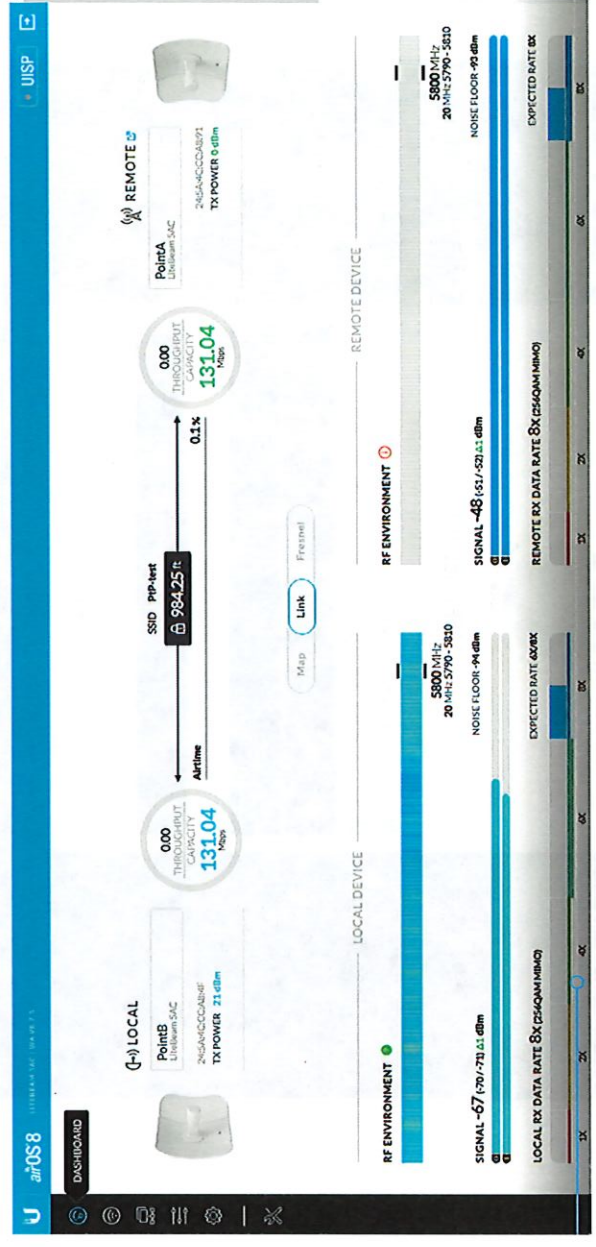
Points 2 and 3 are potential additions if needed. It would be best to prove out the reliability of point 1 before adding complexity and cost for points 2 and 3.



Point to Point (PtP) Pavilion Test

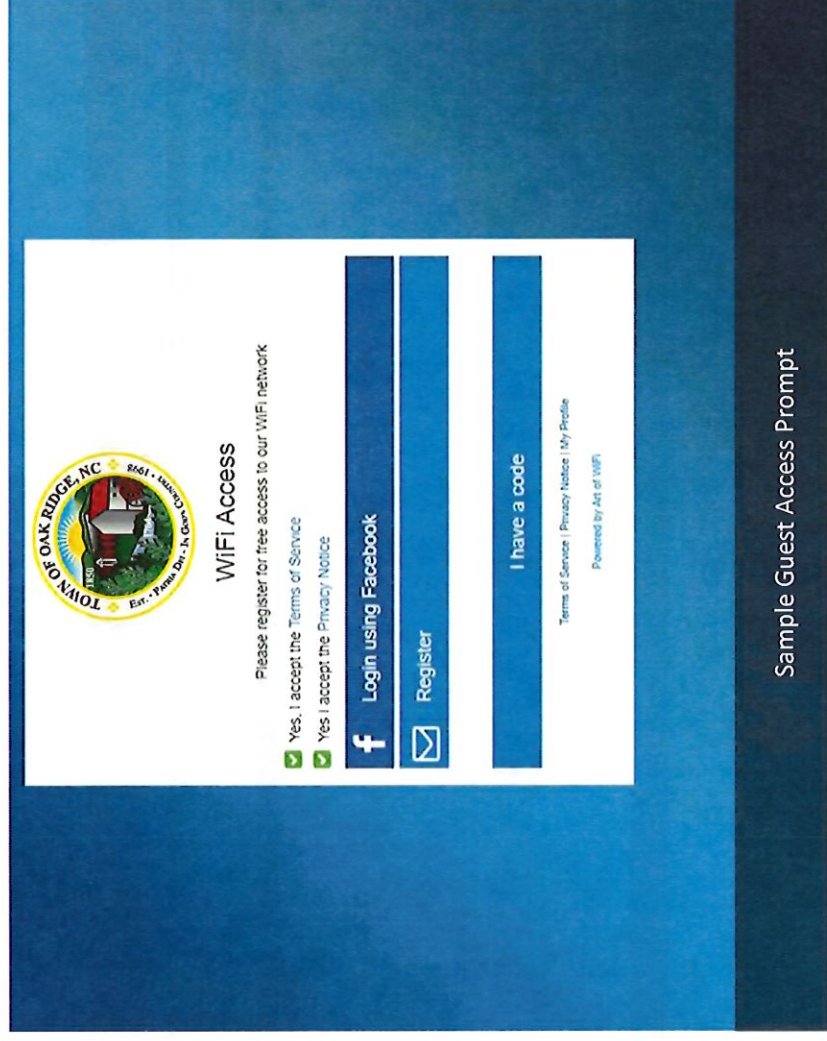
PtP Test Results:

- Concession stand antenna on roof, below ridge
- Pavilion antenna on roof, below ridge
- Connection was very good speed was consistent at 130 Mbps



Guest Access

- Guest access register with email or Facebook
- Access for X hours
- Light content filtering
- Guest availability during park hours
- No connection to other Town systems



The image shows a sample guest access prompt for the Town of Oak Ridge, NC. The prompt is displayed on a blue background. At the top left is the Town of Oak Ridge logo, which features a house, a tree, and a sun, with the text "TOWN OF OAK RIDGE, NC" and "1961 - Building the Good Life" around it. Below the logo, the text reads "WiFi Access" and "Please register for free access to our WiFi network". There are two checkboxes, both of which are checked: "Yes, I accept the Terms of Service" and "Yes, I accept the Privacy Notice". Below these are two buttons: "Login using Facebook" and "Register". At the bottom, there is a text input field with the placeholder text "I have a code". At the very bottom of the prompt, there is a link for "Terms of Service | Privacy Notice | My Profile" and a note "Powered by Act of WiFi".

Sample Guest Access Prompt

Risks

- PtP mounting height not in line with park aesthetics
- Pavilion full parking lot coverage
- Rain and frost will temporarily degrade wireless bridge through trees
- Weather damage to outside equipment
- Weather moving antennas and degrading wireless connection
- Supply chain chip shortage could impact equipment delivery

Phased Approach

1. Concession Stand
2. Amphitheater
3. Pond Shelter (maybe break out basic coverage and expanded coverage)
4. All phases if there is some economy to doing it all at once.



Implementation Timeline – Phase 1

Equipment Lead Time:

- As of November 16th, all equipment is in stock
- As of December 7th, most equipment is in stock, some is on backorder.
- Typical lead time is 5 – 8 days to receive equipment
- Current supply chain issues have impacted projects

Roughly 4 weeks to complete after contract is executed.

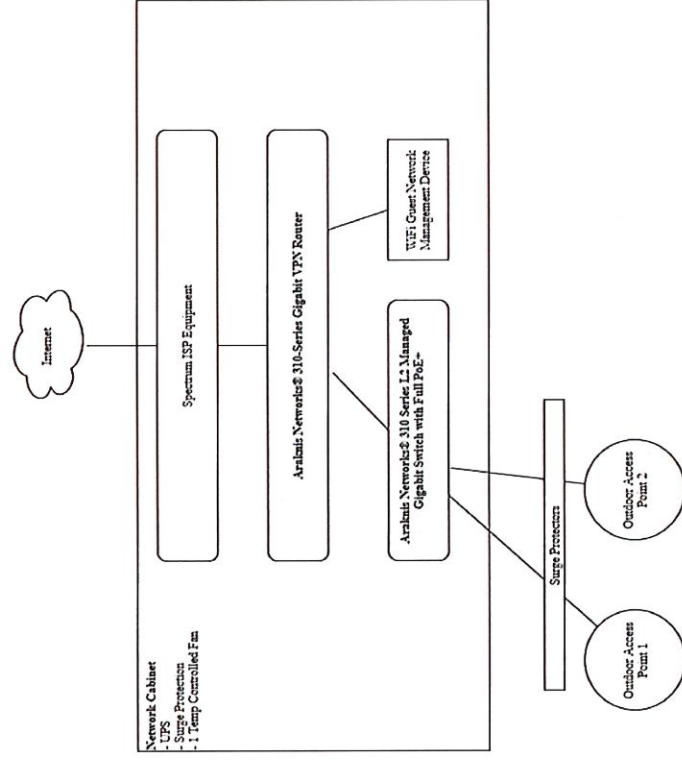
Configuration: 1 – 3 weeks

Installation: 1 Day

Equipment Diagram – Phase 1

Oak Ridge Town Park - WiFi Project

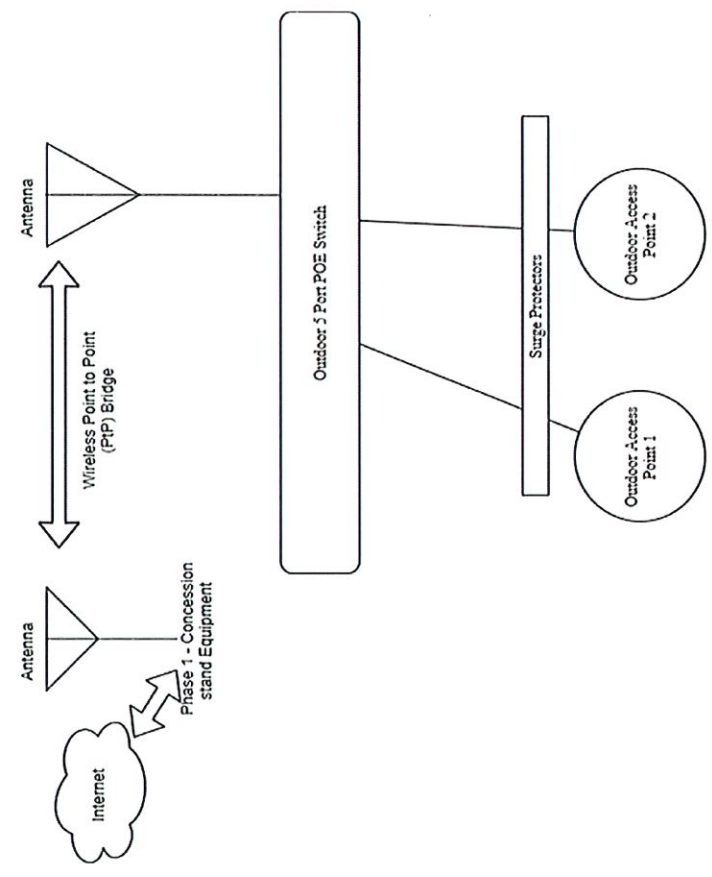
Diagram for base network and WiFi coverage at the concession stand.



Network Equipment – Phase 1: Core equipment + Concession stand WiFi coverage

- Spectrum ISP equipment
- 1 x Router / Firewall
- 1 x 8 Port POE Switch
- 1 x Uninterruptable Power Supply (UPS)
- 2 x Outdoor Wireless Access Points (WAPs)
- 2 x Surge protectors for WAPs
- 1 x Cabinet
- 1 x Temperature controlled fan for cabinet
- 1 x WiFi Management Appliance

Equipment Diagram – Phase 2 & 3



Network Equipment – Phase 1: Core equipment + Concession stand WiFi coverage

- 2 x Point to Point Antennas
- 2 x Wireless Access Points
- 1 x Outdoor 5 port POE switch
- Installation labor

Phase 2 and 3 use the same equipment. A Point-to-Point bridge and then 2 access points.



