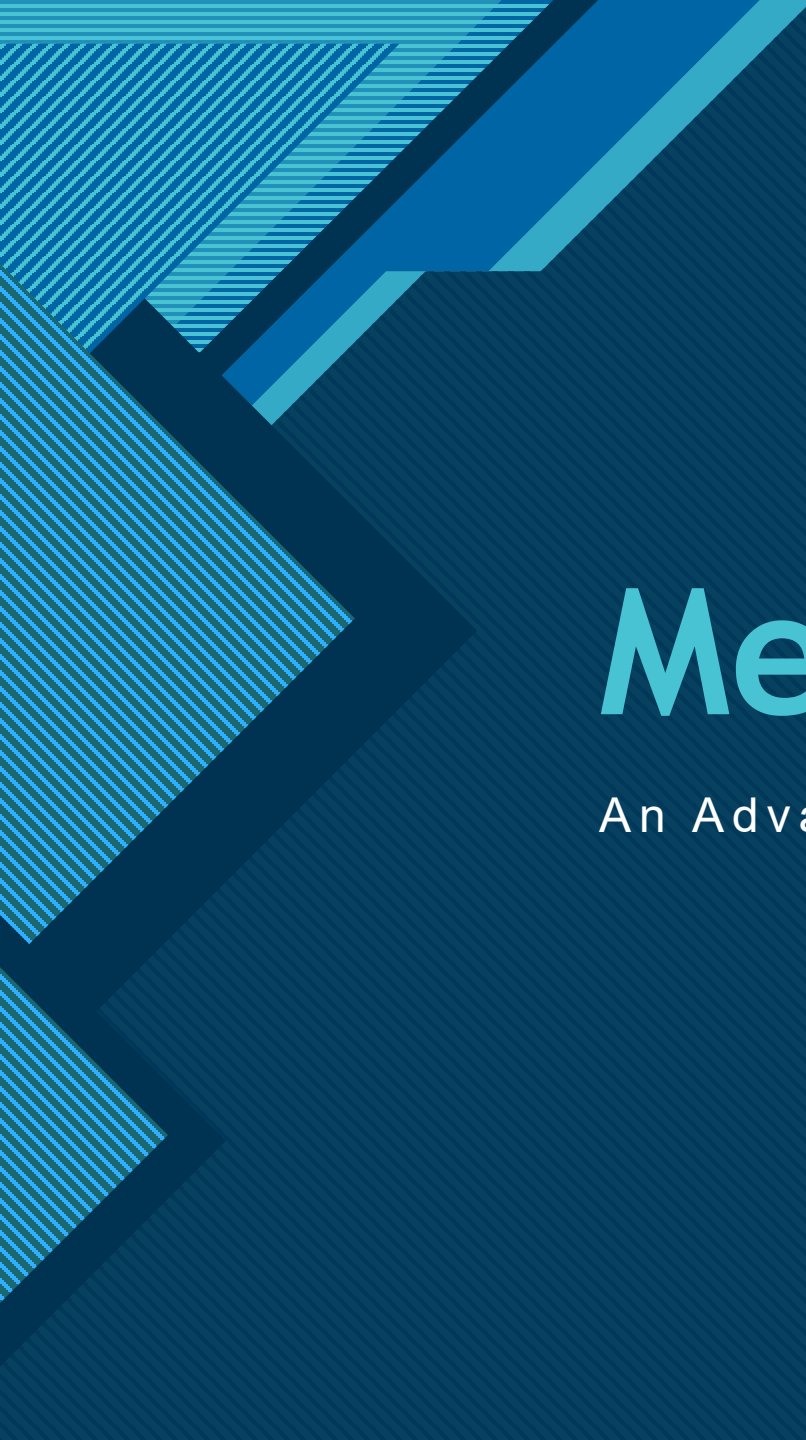




Meshtastic

An Advanced Look – Part 2

Radio Configuration

User	The user config options are: <i>Long Name, Short Name, and Is Licensed</i>
Channels	Channels config options are: <i>Index, Role and Settings.</i>
Device	Device config options are: <i>Device Role, Serial Output, Debug Log and Factory Reset.</i>
Position	Position config options are: <i>GPS Enabled, GPS Update Interval, GPS Attempt Time, Fixed Position, Smart Broadcast, Broadcast Interval and Position Packet Flags.</i>
Power	Power config options are: <i>Charge Current, Power Saving, Shutdown after losing power, ADC Multiplier Override Wait Bluetooth Interval, Light Sleep Interval and Minimum Wake Interval.</i>
Network	Network config options are: <i>WiFi Enabled, WiFi SSID, WiFi PSK, WiFi Mode and NTP Server.</i>
Display	Display config options are: <i>Screen On Duration, Auto Carousel Interval, Always Point North, and GPS Format.</i>
LoRa	The LoRa config options are: <i>Region, Modem Preset, Max Hops, Transmit Power, Bandwidth, Spread Factor, Coding Rate, Frequency Offset, Transmit Disabled and Ignore Incoming Array.</i>
Bluetooth	Bluetooth config options are: <i>Enabled, Pairing Mode and Fixed PIN.</i>
Security	The security config options are: <i>Public Key, Private Key, Admin Key, Is Managed, Serial Console, Debug Logs, and Admin Channel.</i>

Device Config Values

Device Role	Description	Best Use
CLIENT	App connected or stand alone messaging device.	General use for individuals needing to communicate over the Meshtastic network with support for client applications.
CLIENT_MUTE	Device that does not forward packets from other devices.	Situations where a device needs to participate in the network without assisting in packet routing, reducing network load.
CLIENT_HIDDEN	Device that only broadcasts as needed for stealth or power savings.	Use in stealth/hidden deployments or to reduce airtime/power consumption while still participating in the network.
REPEATER	Infrastructure node for extending network coverage by relaying messages with minimal overhead. Not visible in Nodes list.	Best positioned in strategic locations to maximize the network's overall coverage. Device is not shown in topology.
ROUTER	Infrastructure node for extending network coverage by relaying messages. Visible in Nodes list.	Best positioned in strategic locations to maximize the network's overall coverage. Device is shown in topology.
ROUTER_CLIENT	Combination of both ROUTER and CLIENT. Not for mobile devices.	Devices in a strategic position for priority routing that need to also serve as a standard CLIENT.

Router/Repeater

- So generally in the radio community a relay/repeater/router is a device that is setup in a premier location (generally high up) and with a gain antenna.
- You can do this with a Meshtastic node, but it does not need to be in repeater/router mode to do so.

Router/Repeater

- In Meshtastic, when a node receives a message, it checks if there are any hops left, if there are, it then checks what the Signal to Noise Ratio of the sending node is and if the signal is STRONG, it WAITS a little bit.
- This makes it so nodes FURTHER away from the sender will repeat the message BEFORE nodes closer to it.
- Nodes will NOT repeat a message they've heard twice.

Router/Repeater

- When you set a node to be a repeater/router it tells that node to transmit quicker than a client node would, given the same SNR.
- This has the byproduct of prioritizing transmission over router/repeater nodes.

Repeater

- Infrastructure node for extending network coverage by relaying messages with minimal overhead.
- Not visible in Nodes list.
- Best positioned in strategic locations to maximize the network's overall coverage.
- Device is not shown in topology.

Router

- Infrastructure node for extending network coverage by relaying messages.
- Visible in Nodes list.
- Best positioned in strategic locations to maximize the network's overall coverage.
- Device is shown in topology.

Router-Client

- Combination of both ROUTER and CLIENT.
- Not for mobile devices.
- Devices in a strategic position for priority routing that need to also serve as a standard CLIENT.

Client

- App connected or stand alone messaging device.
- General use for individuals needing to communicate over the Meshtastic network with support for client applications.

Client-Mute

- In this modes the device does not forward packets from other devices.
- Situations where a device needs to participate in the network without assisting in packet routing, reducing network load.
- A Client-Mute would be good for mobile nodes as they are always moving and would not provide a good device for forwarding packets.

Client-Hidden

- Device only broadcasts as needed for stealth or power savings.
- Use in stealth/hidden deployments or to reduce airtime/power consumption while still participating in the network.

Channels

- A "Meshtastic channel" refers to a dedicated communication pathway within a Meshtastic network.
- Essentially a channel is a virtual group where only devices configured to that specific channel can send and receive messages with each other.
- This allows for private communication within a larger mesh network.
- They are often used to separate different groups or activities within a single area where multiple Meshtastic devices are operating.
- It's like a private chat room on a mesh network.

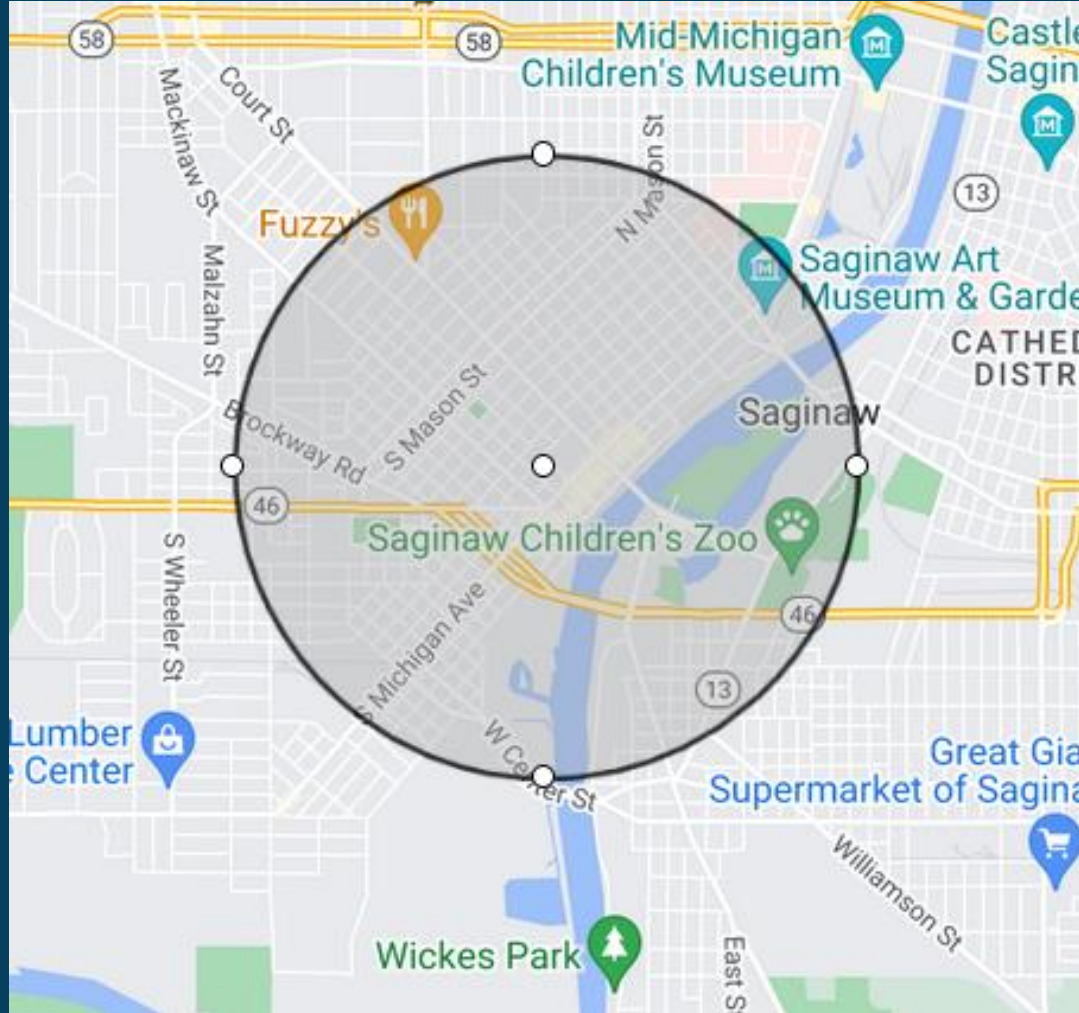
Channels

- To add a Meshtastic channel, access the channel settings within your Meshtastic app, and share the channel details with other users to join the same network.
- You can also edit existing channels where you can modify the channel name, encryption key (PSK), and other parameters.
- If you change a channel, all devices within the network need to update to the new channel settings to maintain communication.
-

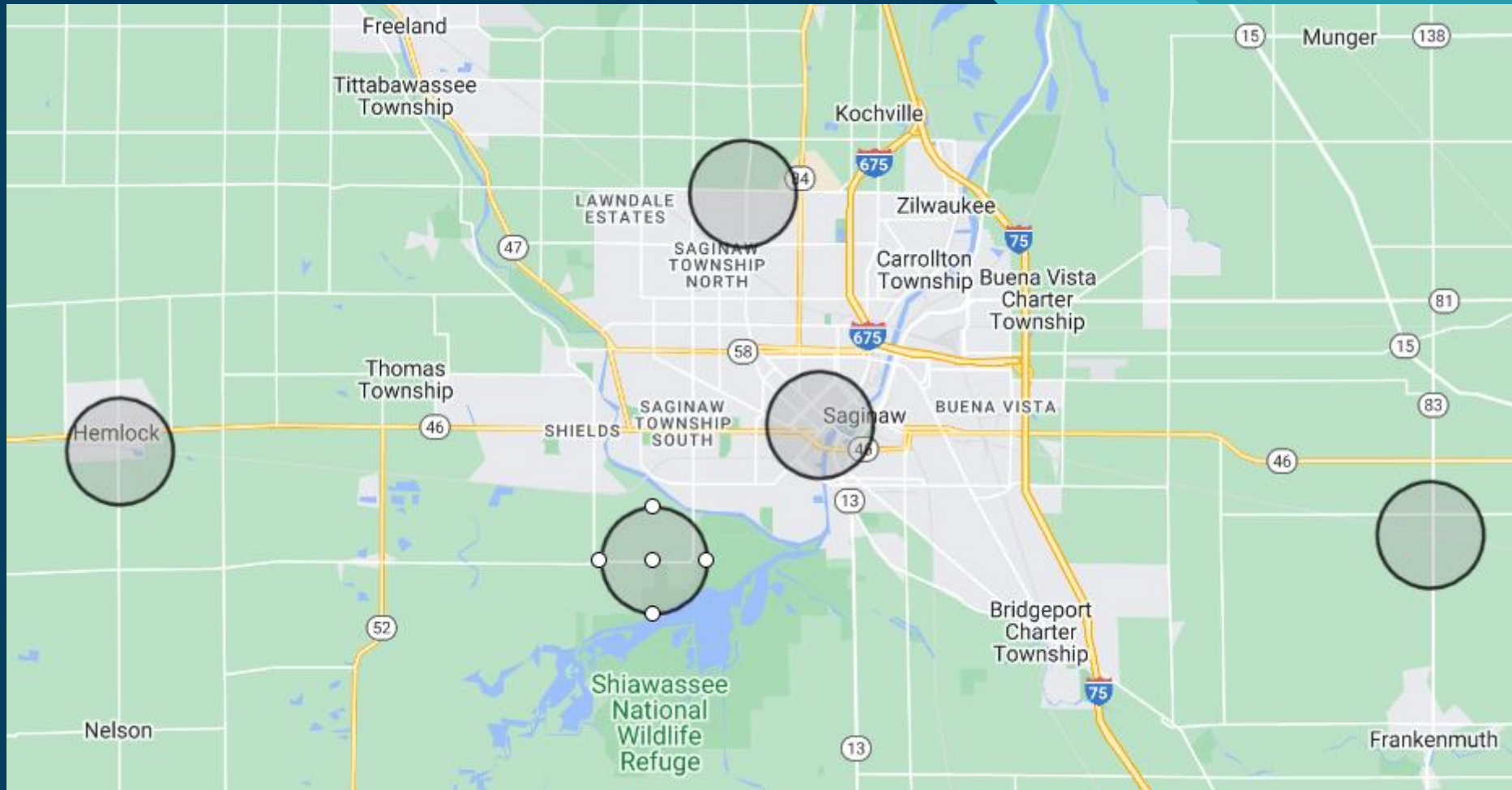
Coverage Range

Single Node at Rosien Towers

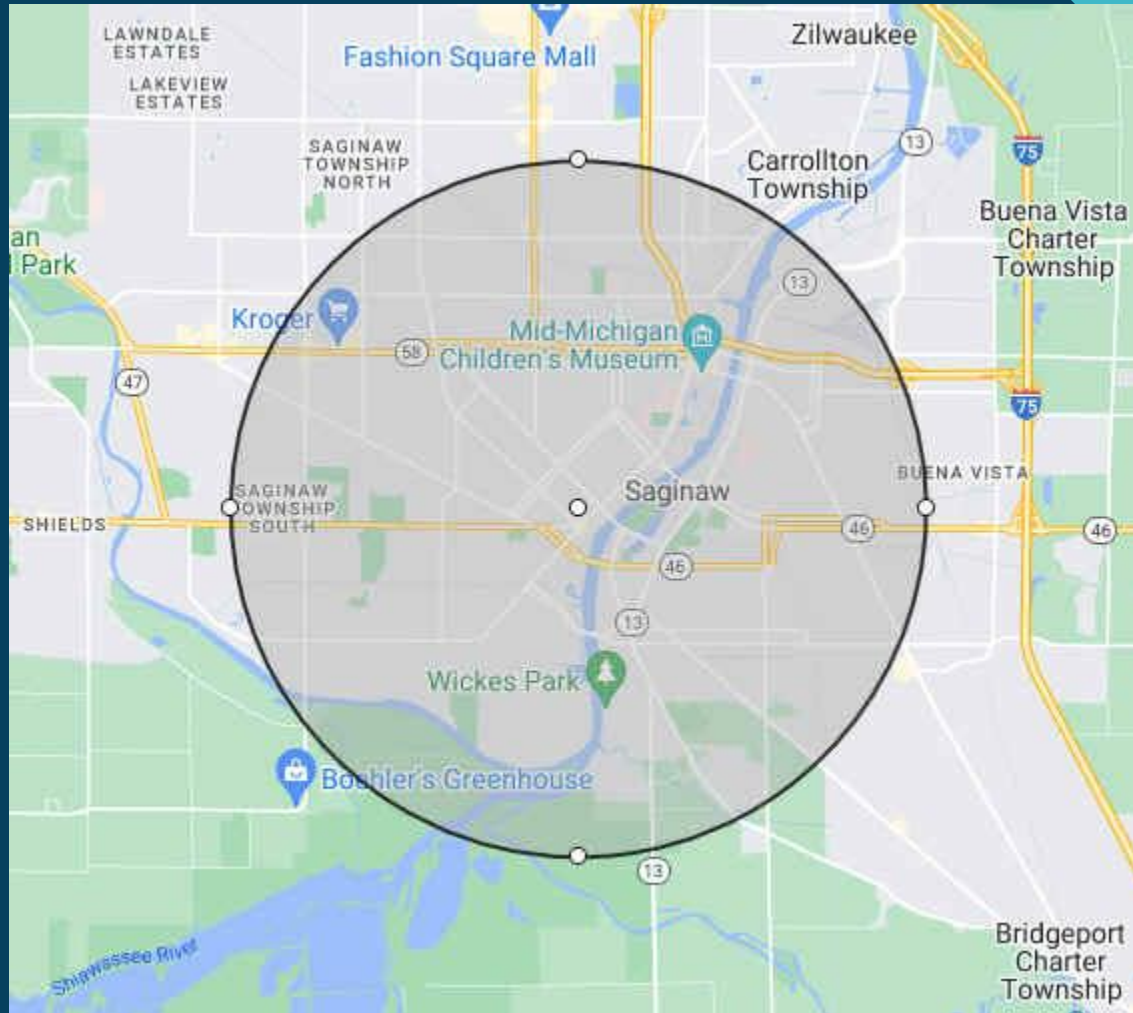
1-Mile Range



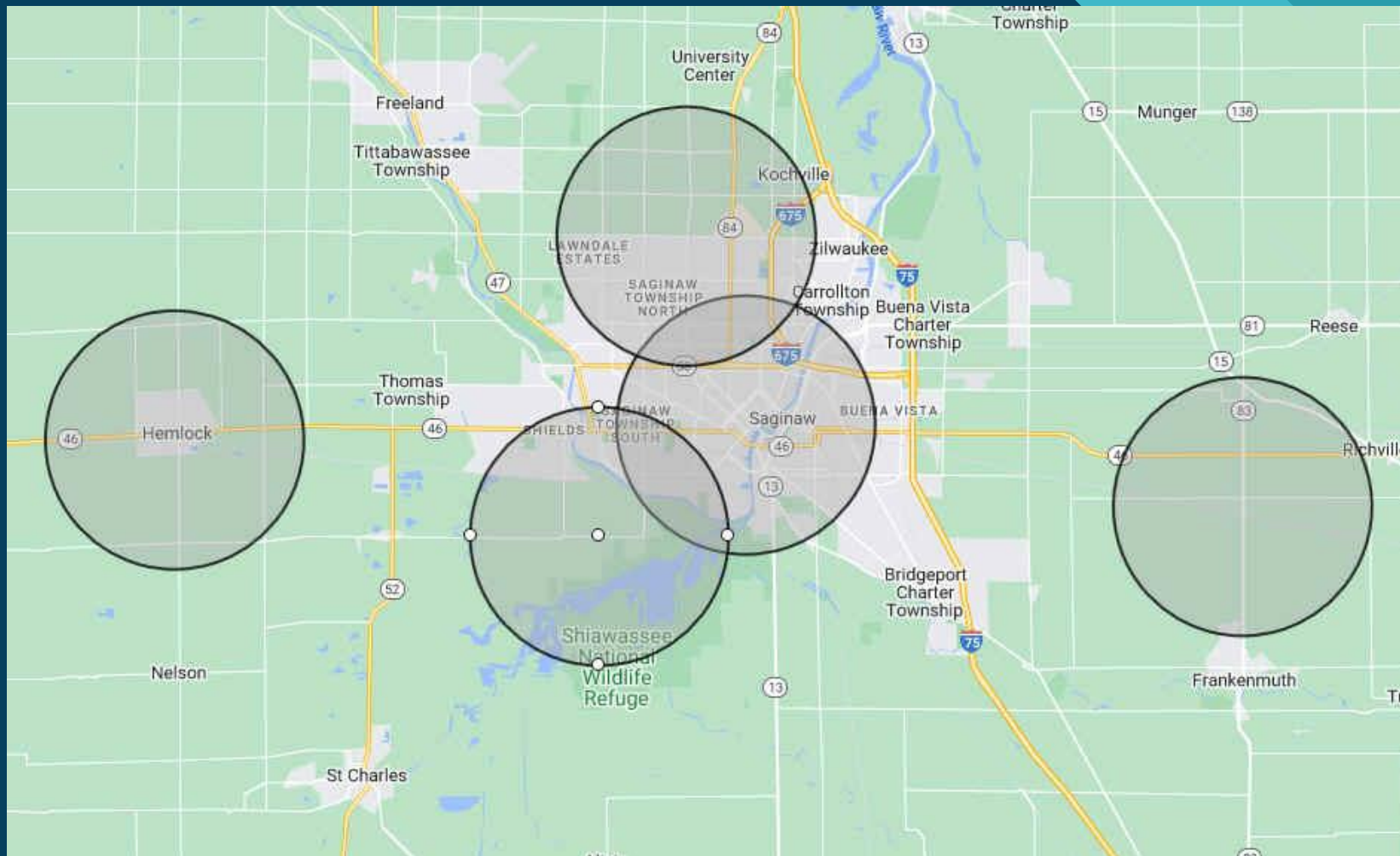
Receive Site 1-Mile Range



3-Mile Range

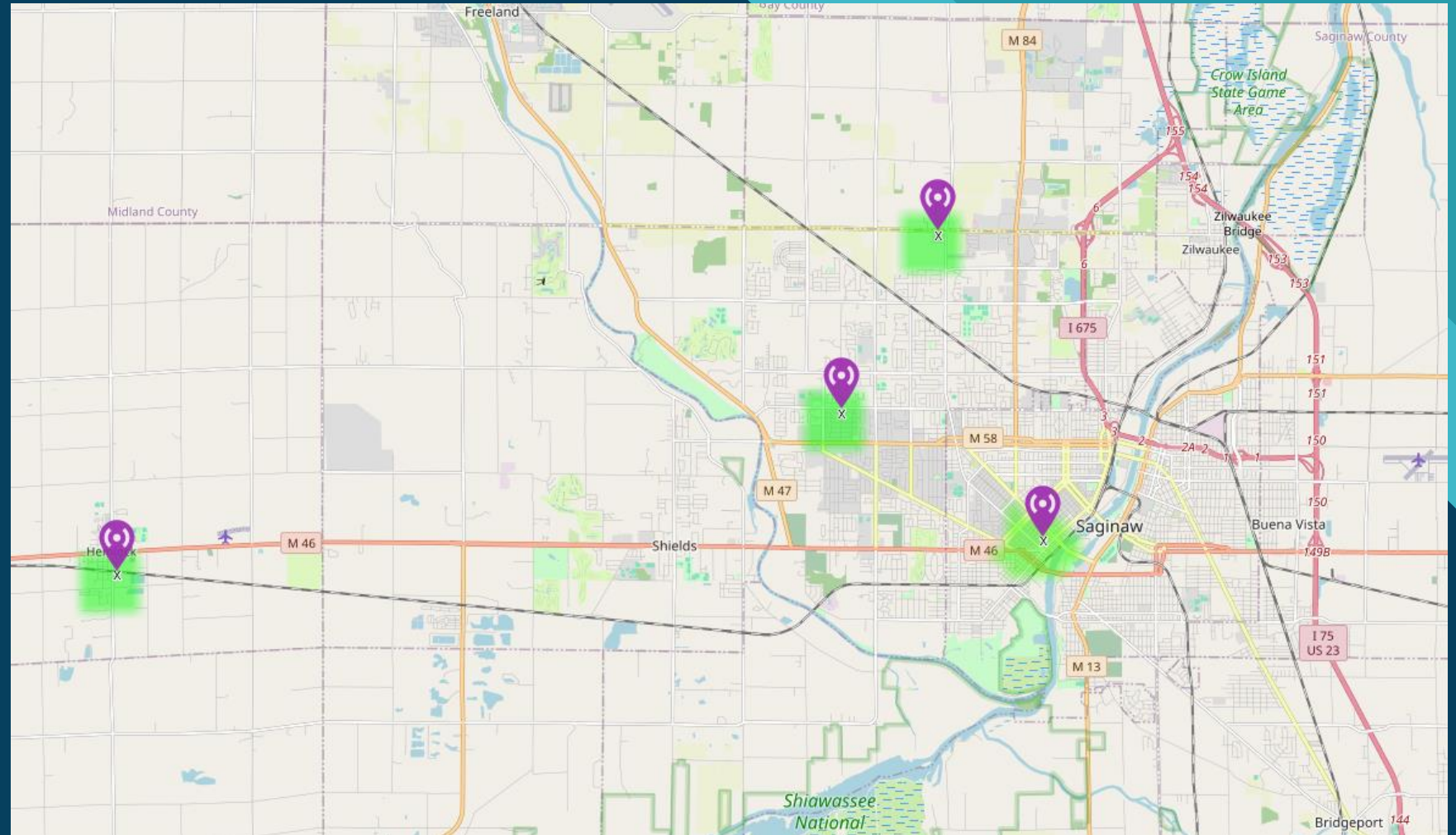


Receive Site 3-Mile Range



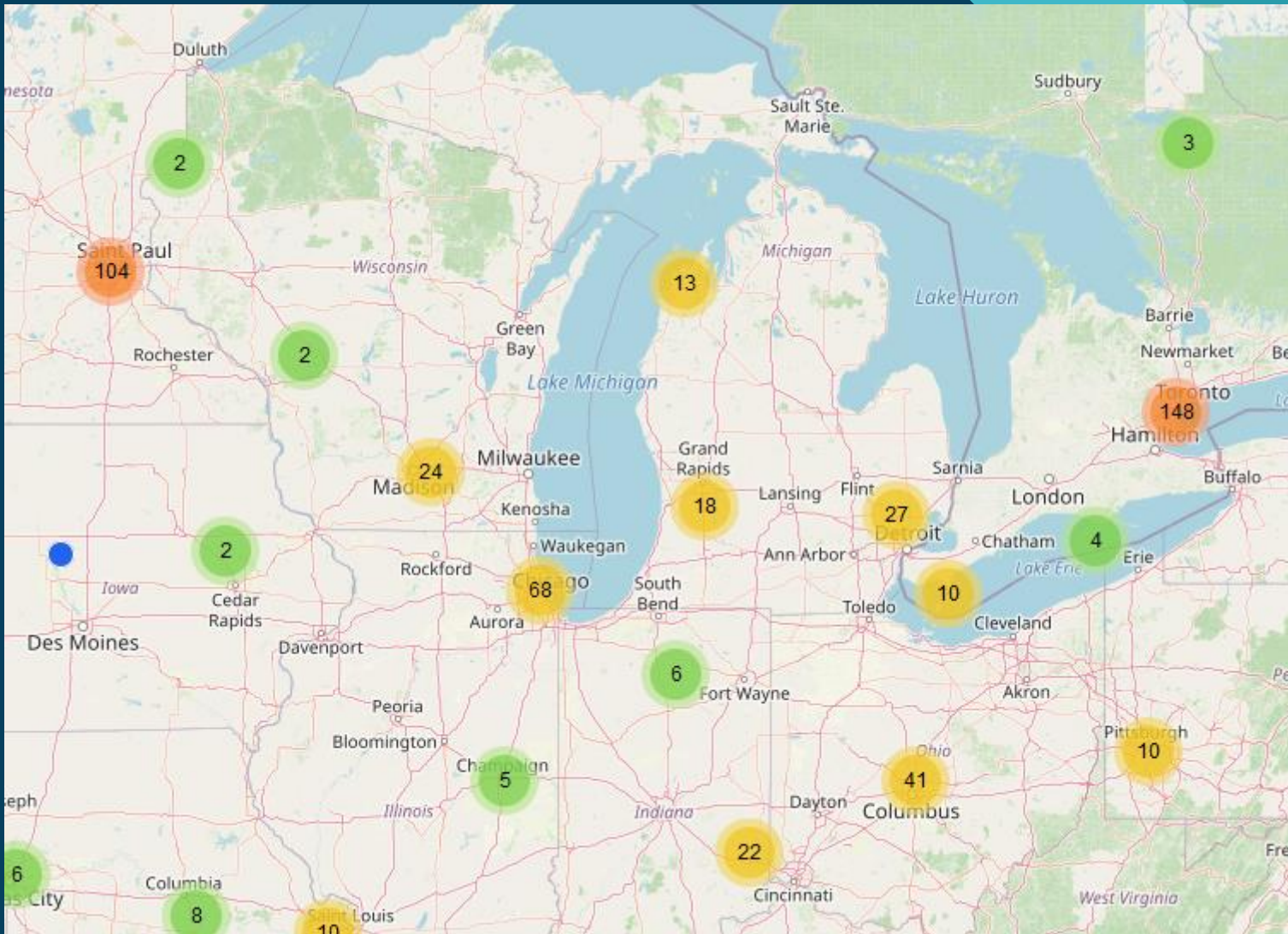
Radio Mobile Map

- Radio Mobile map based on power, height, antenna gain, and elevation
 - Rosien
 - Hemlock
 - Covenant North
 - Ron's home

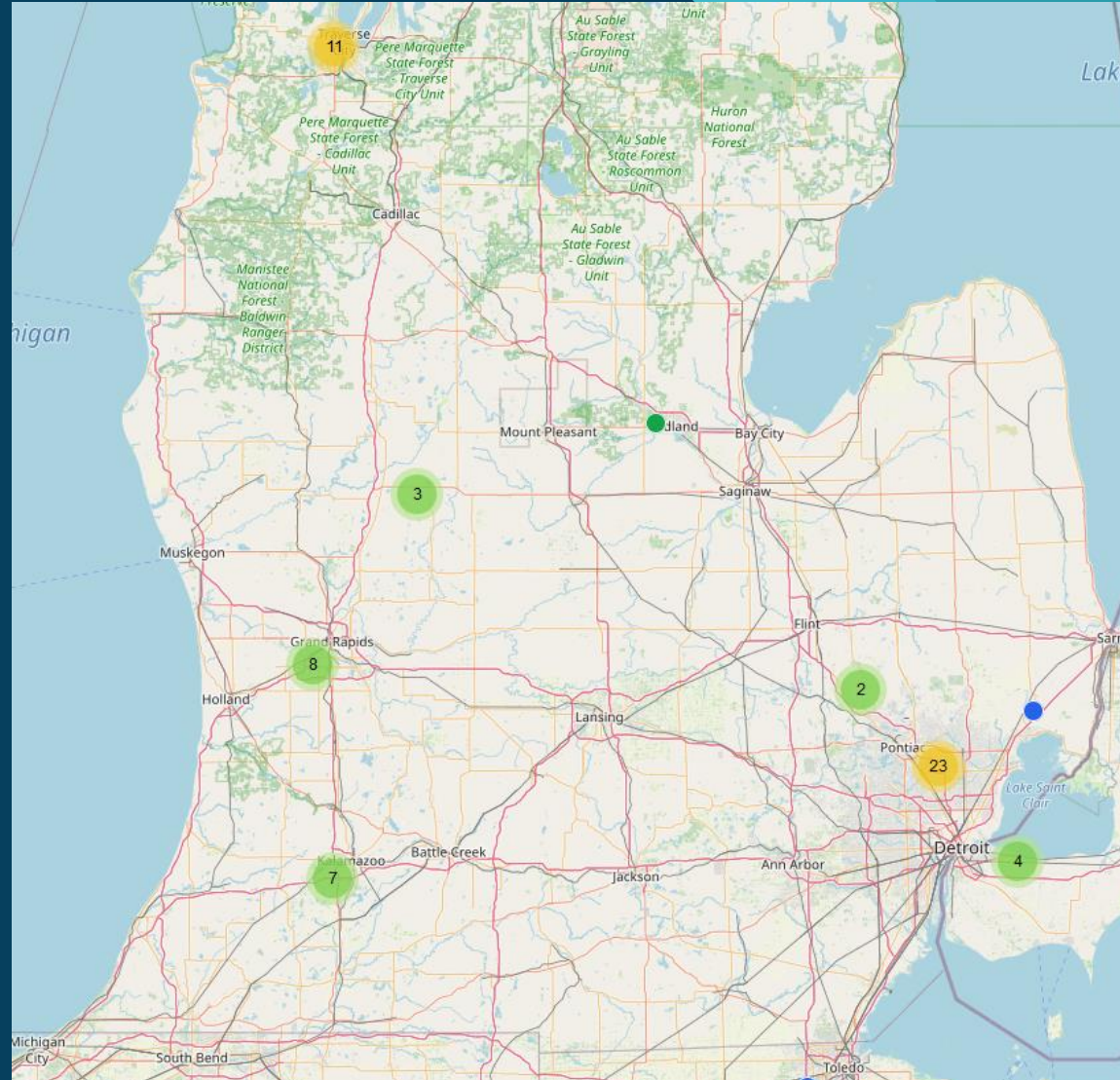


Meshtastic Map

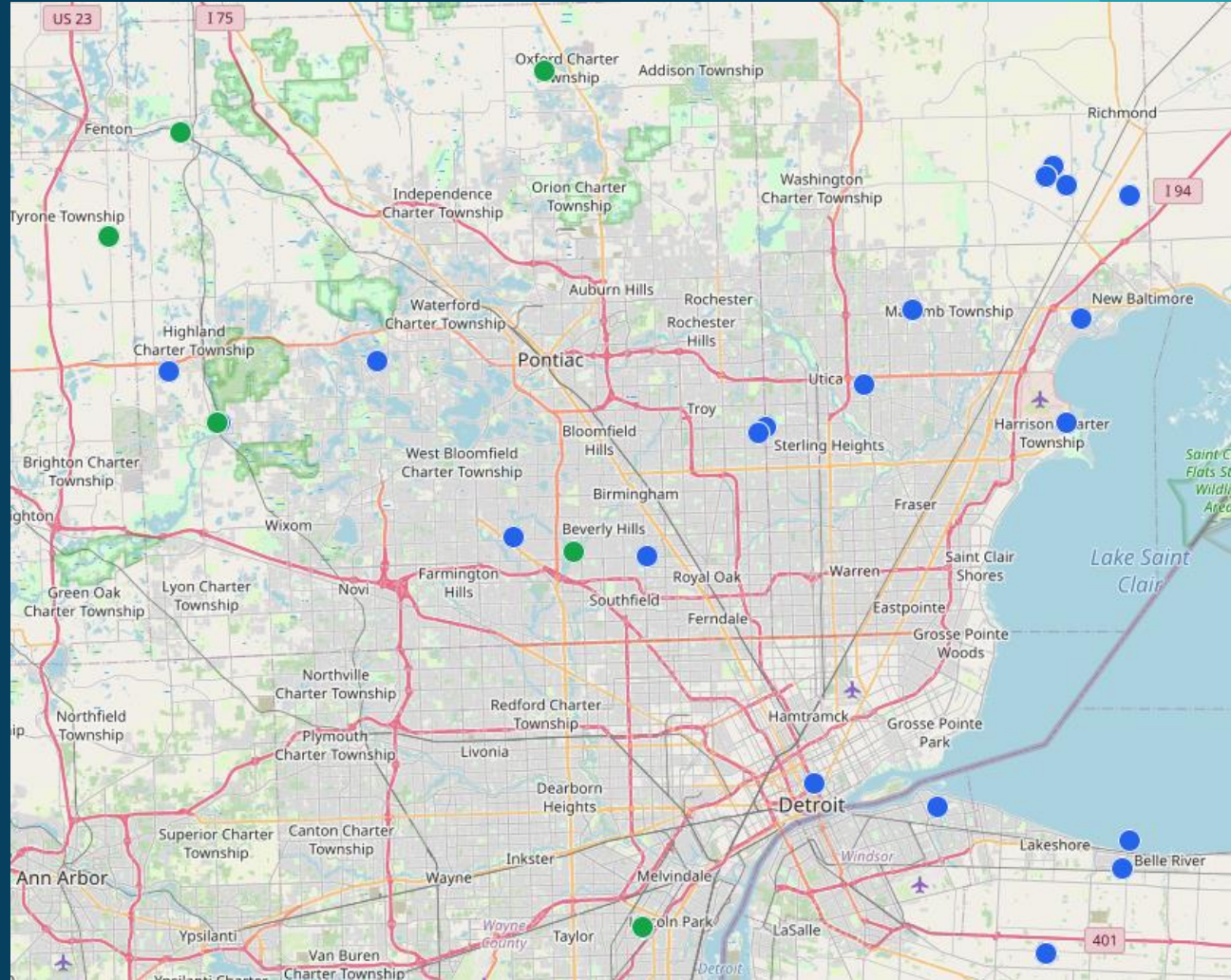
Meshtastic Map - Great Lakes Area



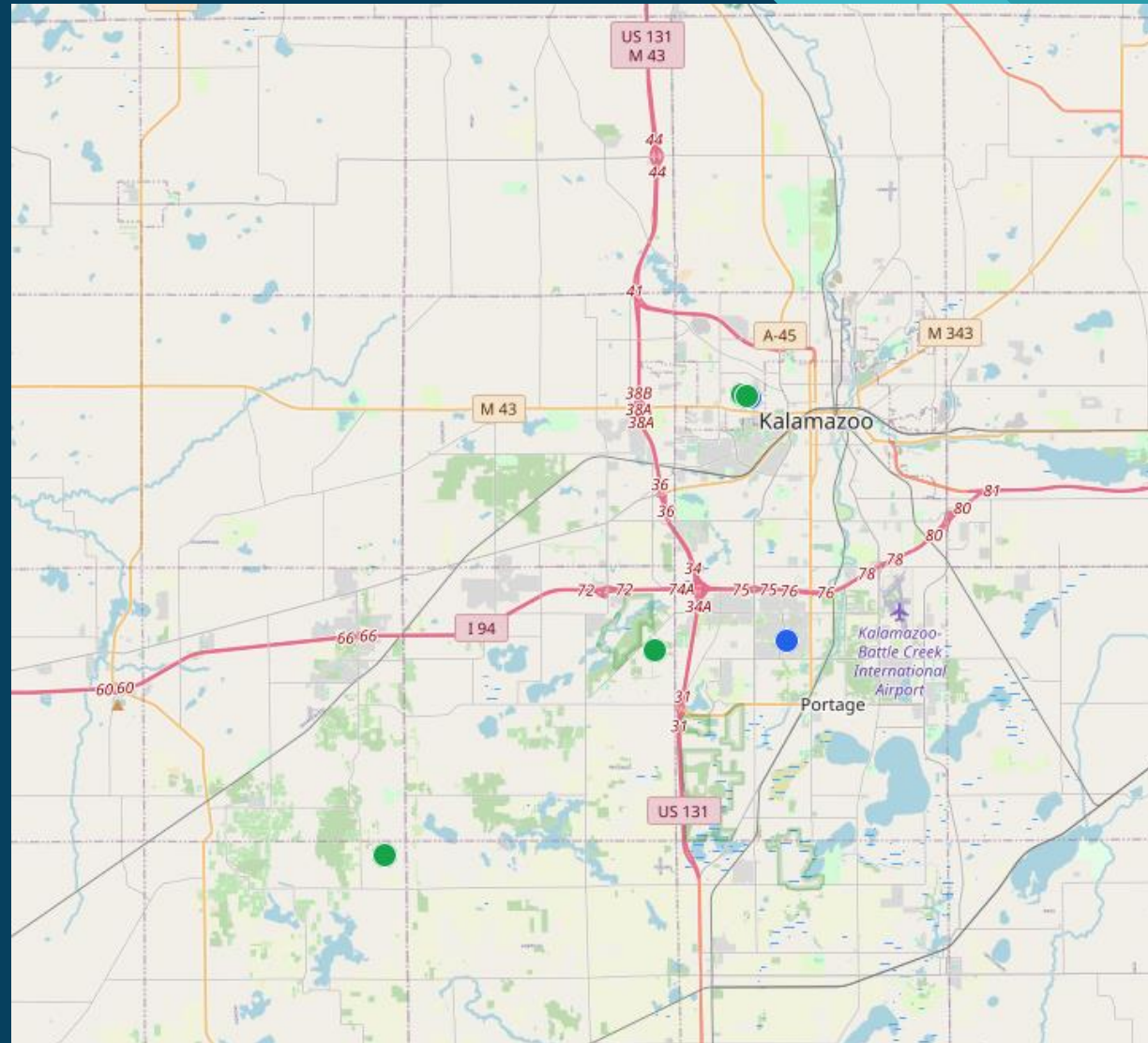
Meshtastic Map - Michigan



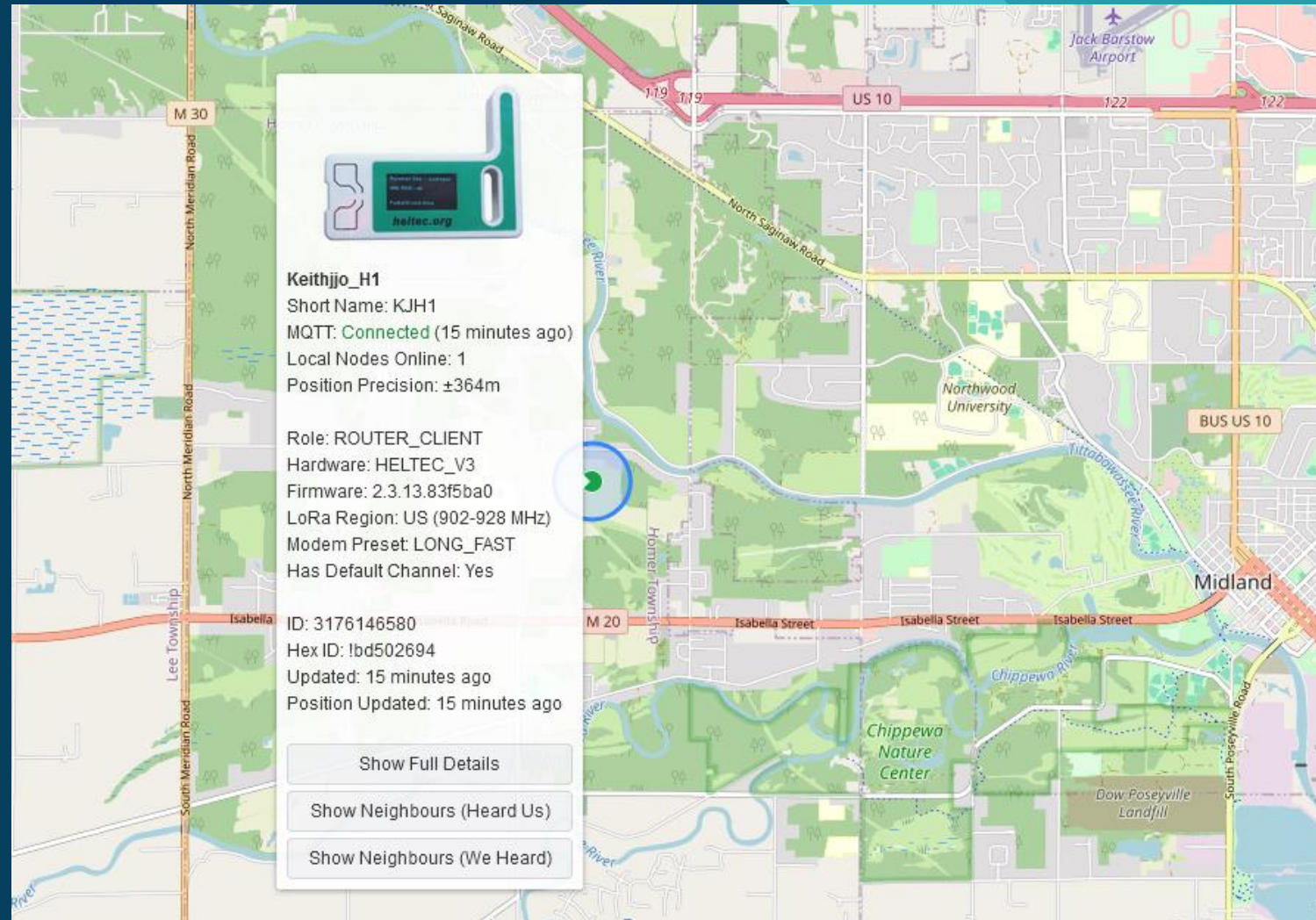
Meshtastic Map - Detroit



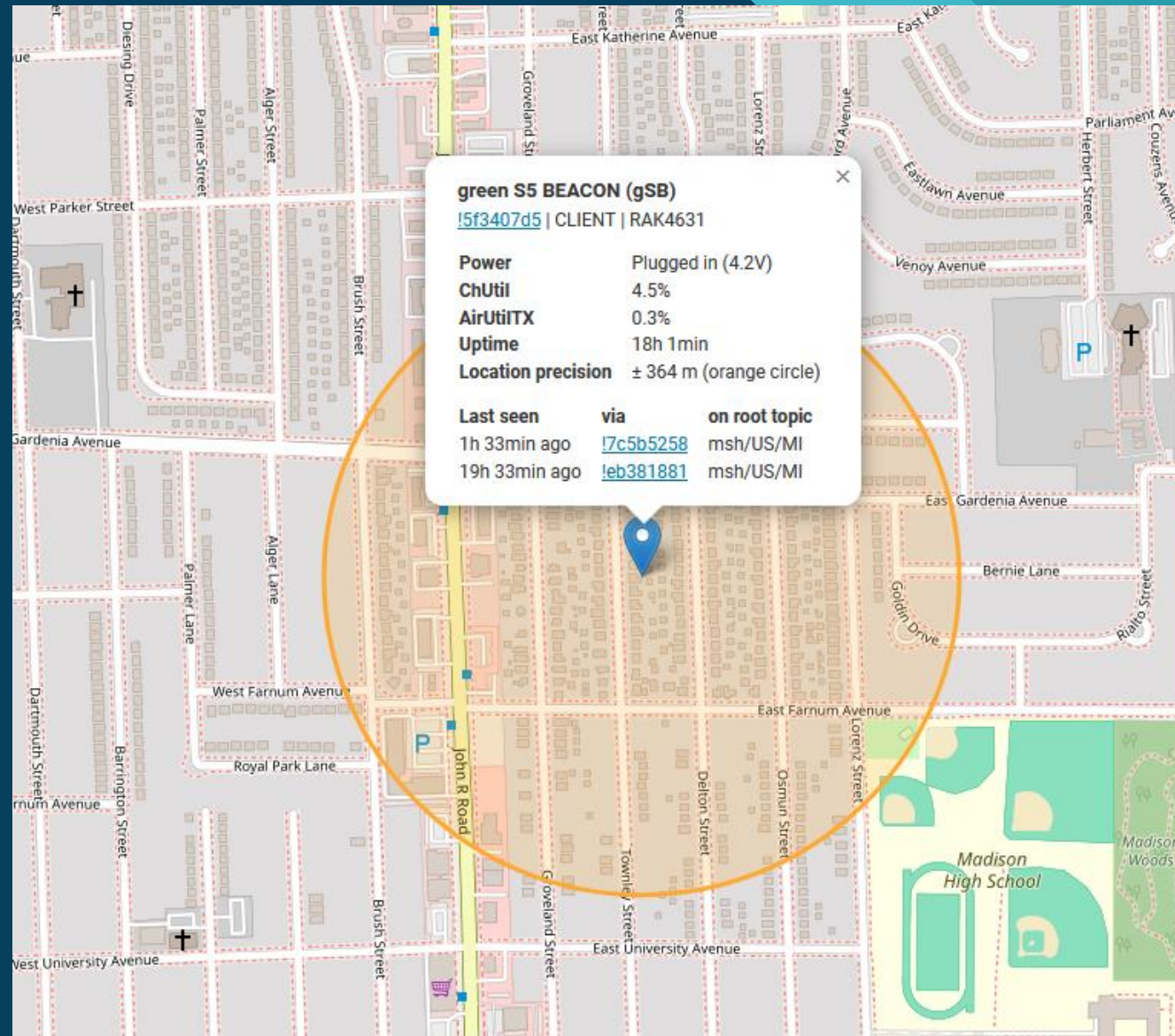
Meshtastic Map - Kalamazoo



Meshtastic Map - Midland



Meshtastic Map - Madison Heights



References

- Circle Map - <https://mapdevelopers.com/draw-circle-tool.php>
- Mestastic Node Map - <https://meshmap.net/>

The background features a diagonal split. The upper-left portion is a light blue color with thin, closely spaced horizontal lines. The lower-right portion is a solid dark blue. A thin, dark diagonal line separates the two sections.

Questions?