Planning a MeshCore Community Network

Deploying a MeshCore network for a community requires planning beyond simply placing repeaters - you need to think about coverage, redundancy, operator coordination, and long-term maintenance.

Phase 1: Define Coverage Goals

Before placing a single node, answer these questions:

- **Who are the users?** - Community members, emergency responders, ARES team, public? Each has different requirements.
- **What is the geographic target area?** - City, county, neighborhood, trail corridor? Define the boundary on a map.
- **What quality of service is needed?** - Best-effort casual use vs. mission-critical emergency communications have different reliability requirements.
- **What is the budget?** - A hobbyist community network might rely on volunteer-hosted nodes; a professional deployment might have a funded infrastructure budget.

Phase 2: Identify Candidate Sites

For each site, evaluate:

1. **Elevation** - Higher is almost always better. Use topographic maps or USGS terrain data to identify hilltops, water towers, or tall buildings that have commanding views of the target area.
2. **Power availability** - Mains power is most reliable; solar works at most outdoor sites; battery-only is acceptable for temporary or low-priority nodes.
3. **Accessibility** - You will need to access this site for installation and maintenance. A perfect hilltop that requires technical climbing is impractical for most operators - and it is a real safety and liability hazard, not just an inconvenience. High sites that require climbing carry genuine fall and legal risk: use professionals for tower work, get written permission, and never climb without proper fall-protection gear and authorization.

4. **Permission** - Property owner permission is required. Start with sites where you have existing relationships: your own roof, a cooperating business, a friendly landowner.

Phase 3: Coverage Analysis

Before installing, verify coverage using tools:

- **HeyWhatsThat.com** - Enter your proposed repeater coordinates and height; generates a viewshed map showing where has line-of-sight to that point.
- **Radio Mobile Online** - More detailed propagation modeling including terrain, frequency, and antenna parameters.
- **Field testing** - Place a temporary node at the candidate site and drive/walk the intended coverage area while monitoring packet reception. This is ground truth.

Phase 4: Deployment Sequence

1. **Deploy the backbone first** - Install your 2-3 highest-coverage repeaters before deploying fill nodes. The backbone provides the largest coverage gain per node installed.
2. **Test between backbone nodes** - Verify each backbone node can reach at least TWO other backbone nodes by independent paths, so the loss of any single node does not partition the network. Avoid daisy-chain topologies for emergency-grade networks - a chain that looks tested can still split in two when one node drops.
3. **Add fill nodes for dead zones** - Use coverage testing to identify gaps; deploy targeted fill repeaters.
4. **Recruit community members** - Once basic coverage exists, recruit nearby property owners to host additional nodes. Their rooftops fill gaps and add redundancy.

Documentation and Handoff

Create documentation before deploying each node:

- Physical address or GPS coordinates of the site
- Property owner name and contact information
- Equipment installed (board type, firmware version, power system)
- Configuration (name, channel, advertisement settings)
- Access procedure (how to reach the installation for maintenance)
- Emergency contact (who to call if the node is causing problems)

Store this documentation somewhere accessible to all network operators - not just one person's laptop.

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