UMESH

Urbana's people powered secure wireless text network

Brought to you by Mike and Maiko Lehman,

Friends, and Volunteers

goTenna Mesh powers UMESH Network

- 1 watt 900 MHz radio controlled by app on SMS text cell device
- Public sale began July 2017
- Independent of the internet and cell networks
- Unit cost from ~$58 to $90 (depending on quantity, discounts)
- No operating cost
- Gotenna plus adds topo maps, SMS relay, location autoshare, Trips ($10/year)
- Easy to use privacy and security features
- A socially and environmentally conscientious company
- A proven public safety asset in disaster relief in Puerto Rico and US Virgin Islands

How do wireless mesh networks operate?

▶ Decentralized, frequency hopping spread spectrum in 900 mhz ISM band

▶ Direct transmission – Unit to unit, like old school radios, PLUS

▶ Relayed transmission – multiple hops available to forward messages via mesh network

▶ Paired mode – Bluetooth links phone and radio, sends and receives text + Relays

▶ Important! All paired mode units continue to act as relays, more units = stronger mesh

▶ Relay mode – unpaired, Bluetooth off to conserve power, unit only relays messages

▶ Multiple paths for messages, they negotiate their way to recipient through max of 2 relays currently, 5.0 firmware to add additional relays

▶ Narrow bandwidth required for text means 1 watt radio makes more efficient use of spectrum, yields longer range than equivalent voice use would

UMESH network principles & features
in a local application of goTenna Mesh networking

▶ Decentralized, redundant, reliable, reasonably secure communication

▶ Operated for the common good as a public/private initiative

▶ Low cost, accessible: virtually no operating expense after purchase

▶ Solar-powered, available in emergencies, not subject to network meltdowns

Anonymity – as you like it

GUID – Choose open (cell #) or anonymous (random #s)

Location Sharing – Automated, manual, or none

Up to 10 person private groups, easy privacy controls

Shouts go out Direct to units within range, but no relays. Emergency Shouts are relayed via the mesh. Neither Shout mode is encrypted

Security: top secret level encryption*, users retain all data

* Private 1-to-1 and group messages sent over goTenna Mesh are end-to-end encrypted with 384-bit elliptic curve public-private key ciphering. SDK allows substitution of your own encryption scheme for default method.

Users of wireless mesh networks inherently more difficult to track

What about all the warnings in the goTenna Mesh app? Less sinister than they may seem at first, more about providing an honest range of privacy options
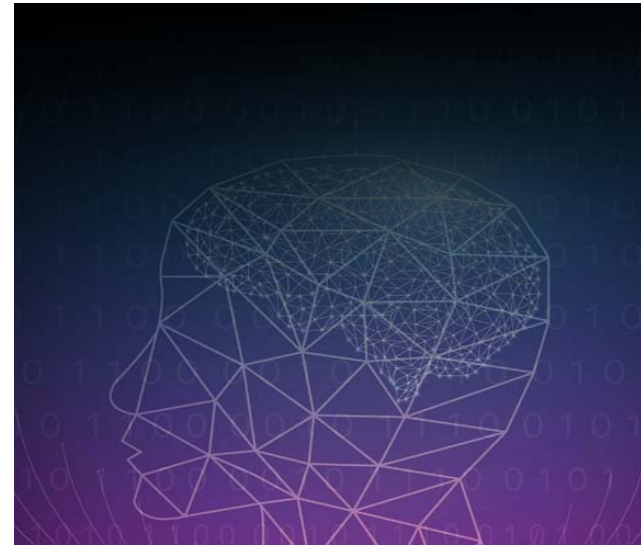
What goTenna Says About Security & Privacy*

- **What information does my goTenna Mesh device share with goTenna, the company?**

- None, though you can opt-in to share completely anonymized telemetry when you have a data connection, so that we can improve our service. Again, this is limited to basic data regarding battery life, device temperature, and so forth. No messages or contact list info are included.

- **Why should I believe goTenna Mesh cares about my privacy?**

- We feel you. It's hard to sort out who pays lip service to privacy and who really means it these days. The sad reality is both the government and tech companies have disrespected our privacy, time and time again. Well, we have this to say about goTenna: we set out to build a consumer-ready, completely decentralized, end-to-end encrypted communication technology, without a "back-door" for anyone, because it didn't exist yet, and we thought it should. We'll leave it at that.

- * from https://www.gotenna.com/pages/faqs-gotenna-mesh

We are not alone – you'll see goTenna Mesh in use when you travel, enjoy festivals, go on a cruise…
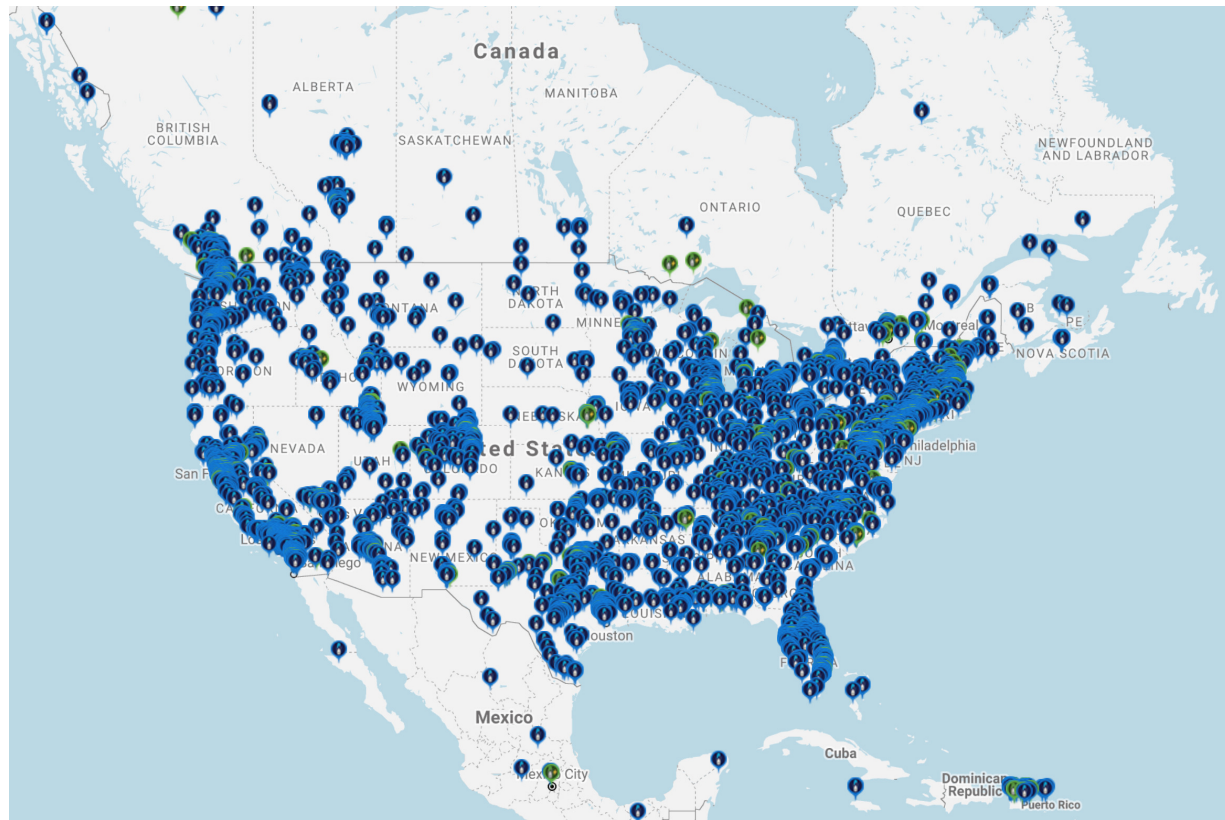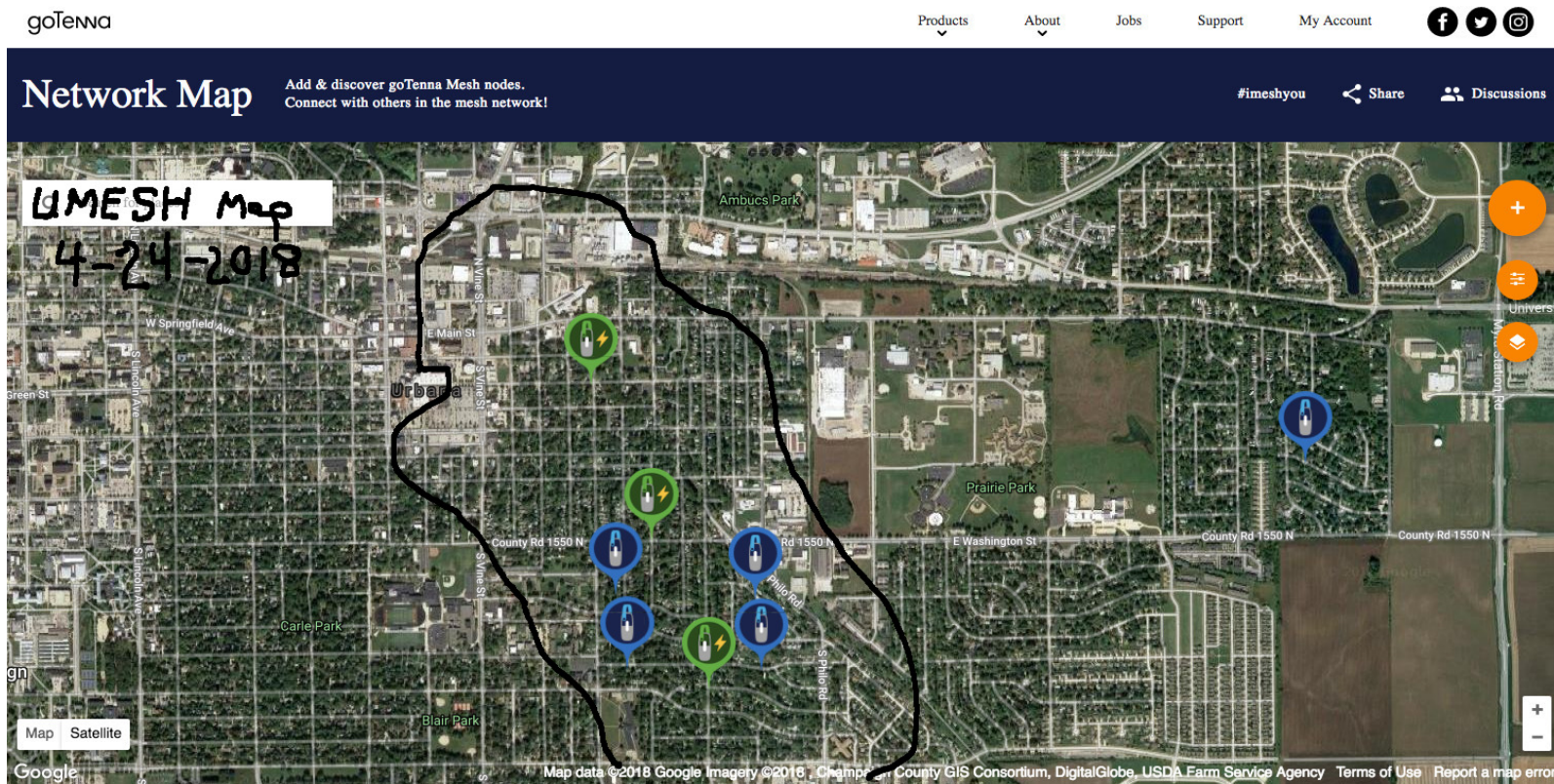
UMESH network so far
UMESH 1, 2, and 3, plus a few independents

See this interactive map & the Urbana thread @ imeshyou.com
Purple flags are stationary nodes in this view

https://www.imeshyou.com/
https://meshcommunity.gotenna.com/t/urbana-illinois/1660
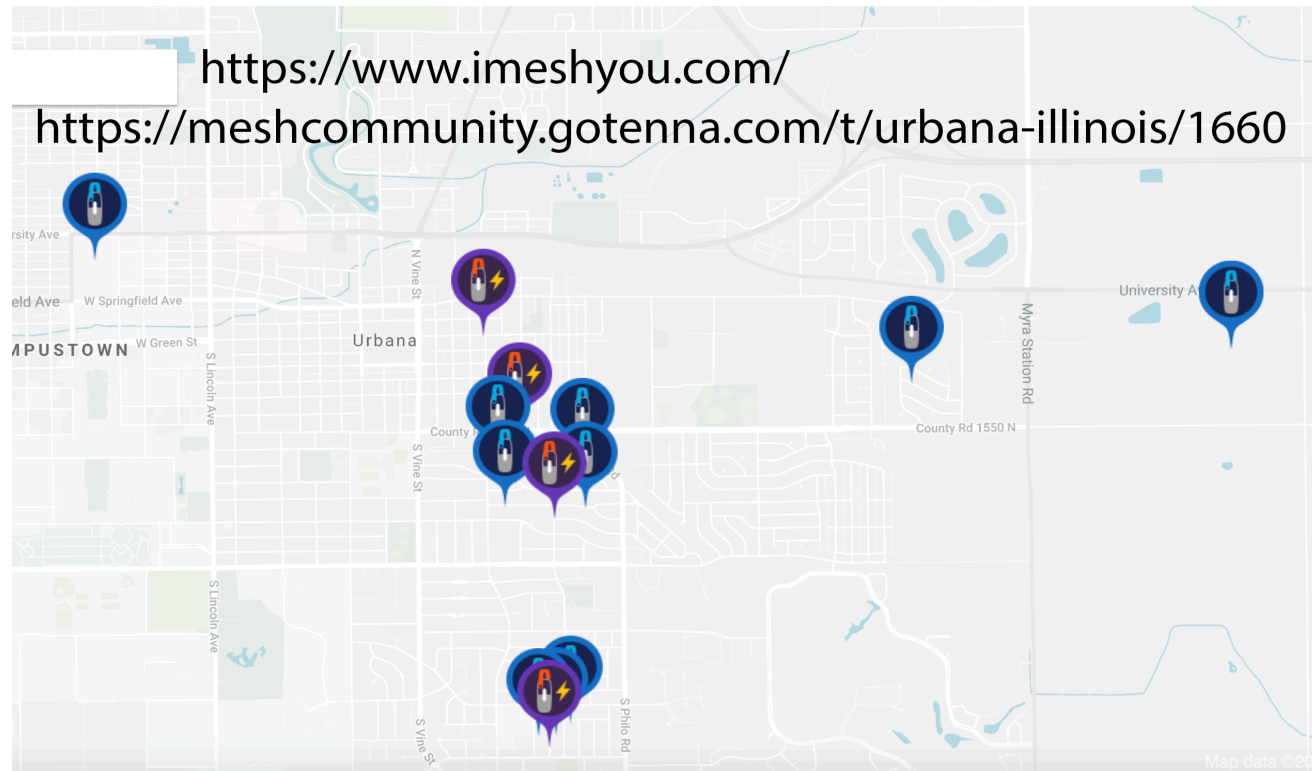
UMESH current coverage - with just 3 nodes!

Green flags are stationary nodes in this view

Who uses/might use UMESH?

- Anyone who needs reliable, secure dedicated group communications
- Off-cell grid needs: hiking, hunting, camping, fishing, gliders, snowmobiles, etc
- For tight group coordination: families, clubs, gamers, security, R&D testing
- Public safety: disaster preparedness, neighborhood groups, *see goTenna Pro (5 watts)*
- Business: delivery, operations, security; can be used as messaging system
- Software developer kits provide easy access to code
- **What You Need to Install goTenna Mesh App**
- iOS (9.0 & above) or Android (4.3 & above) device
- Bluetooth-LE (a.k.a. BLE, Bluetooth Smart or Bluetooth 4.0)

Typical performance
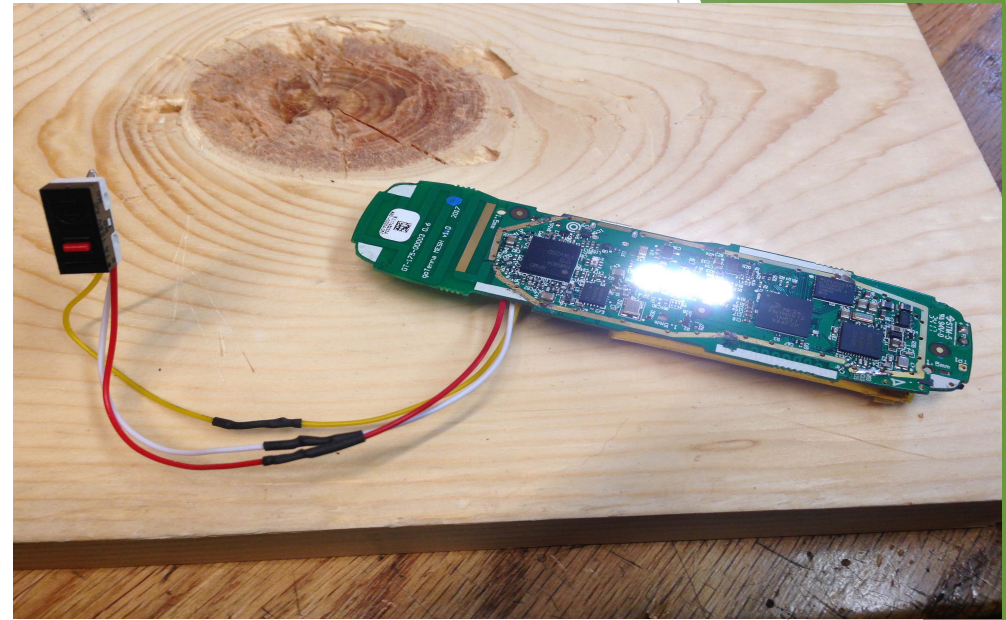
▶ The crashTenna: run over by Land Cruiser, still sorta works

▶ Unit to unit, from 0.25 to 4 miles (record is 61 miles!), mesh extends range

▶ On-board battery lasts 24 hours, recharge via micro USB

▶ Fractal antenna built into top half of case

▶ Don't forget it IS a radio. Hold upright (polarity), keep out of pockets

Stationary Node
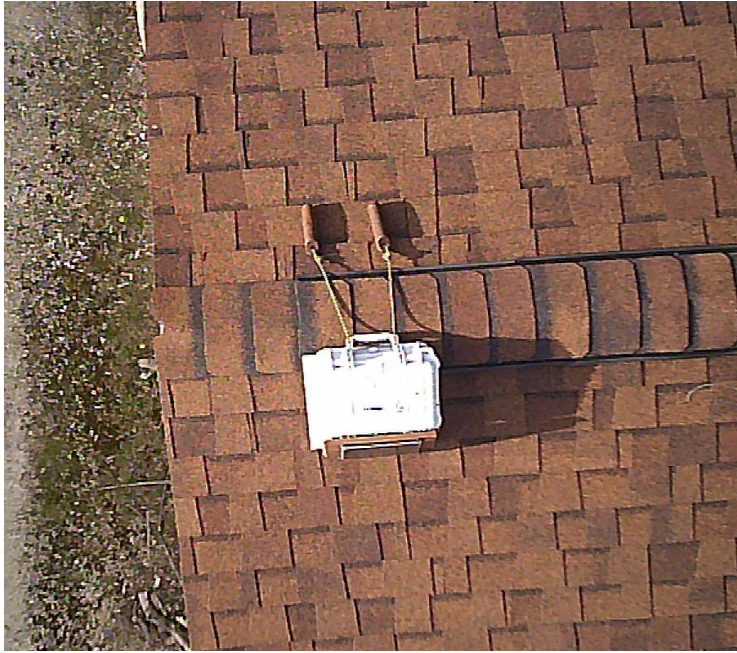
Solar-powered by 6 watt panel and "Always On" capable battery pack

The case is weighted to stay in place, so no holes in roof necessary

Stationary nodes are spaced from ¼ mile to ½ mile apart in urban areas.

UMESH buildout

- goTenna committed to covering Urbana with mesh service

- Most likely, the 5.0 firmware will likely stay in place after testing

- goTenna seems willing to supply devices for stationary nodes to cover the city, but up to us to supply solar power; plus discounts on units for users, etc related to Neighborhood Ambassador Program.

- Current backbone of 3 nodes provides support for expansion in all directions

- Nodes 4 & 5 ready to install in downtown Urbana and at S. Race and Washington

- Priority to extend service to north of University and west to campus

- Software Developer Kits (SDK)

- What you can do to help: location, funding, use the network, spread the word

- If interested in hosting a node, please let me know where you are located. Node hosts on the upper, east-facing floors of the campus high-rises are especially needed right now! However, any location that has the advantage of safely accessible height could be very helpful.

Outreach: just a start
Also Needed: Social Media Gurus, Second-Story Operators, Programmers

Thanks for reading along