Proposed Partnership: Toronto Mesh and the Campus Co-op

Developing Mesh Network Infrastructure for Resilience, Education, and Other Benefits

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About Toronto Mesh 1/2

- Based in Toronto, we are a grassroots and decentralized group of volunteers who started Toronto Mesh at CivicTechTO in early 2016. Through building community-owned infrastructure using off-the-shelf hardware and open-source technology, we are hoping to address barriers to internet access in our city.
- Since January 2016, Toronto Mesh has been working to build a community network using peer-to-peer, decentralized mesh network technology. A mesh network consists of routers (or 'nodes') spread throughout the city with no single internet service provider or central servers. All nodes cooperate in the distribution of data, serving as a separate and redundant network.
- For more see: https://tomesh.net/about/
- Or get to know us on: https://chat.tomesh.net/#/room/#tomesh:tomesh.net

About Toronto Mesh 2/2

The internet is currently not open and inclusive for all people. We are building a community-owned infrastructure that gives us:

- **open**, lower-cost access to the World Wide Web
- a **resilient** and redundant network
- agency to make important decisions about **privacy**
- **autonomy** to access information in a free manner
- an opportunity to develop technical **literacies**

Mesh and the Campus Co-Op
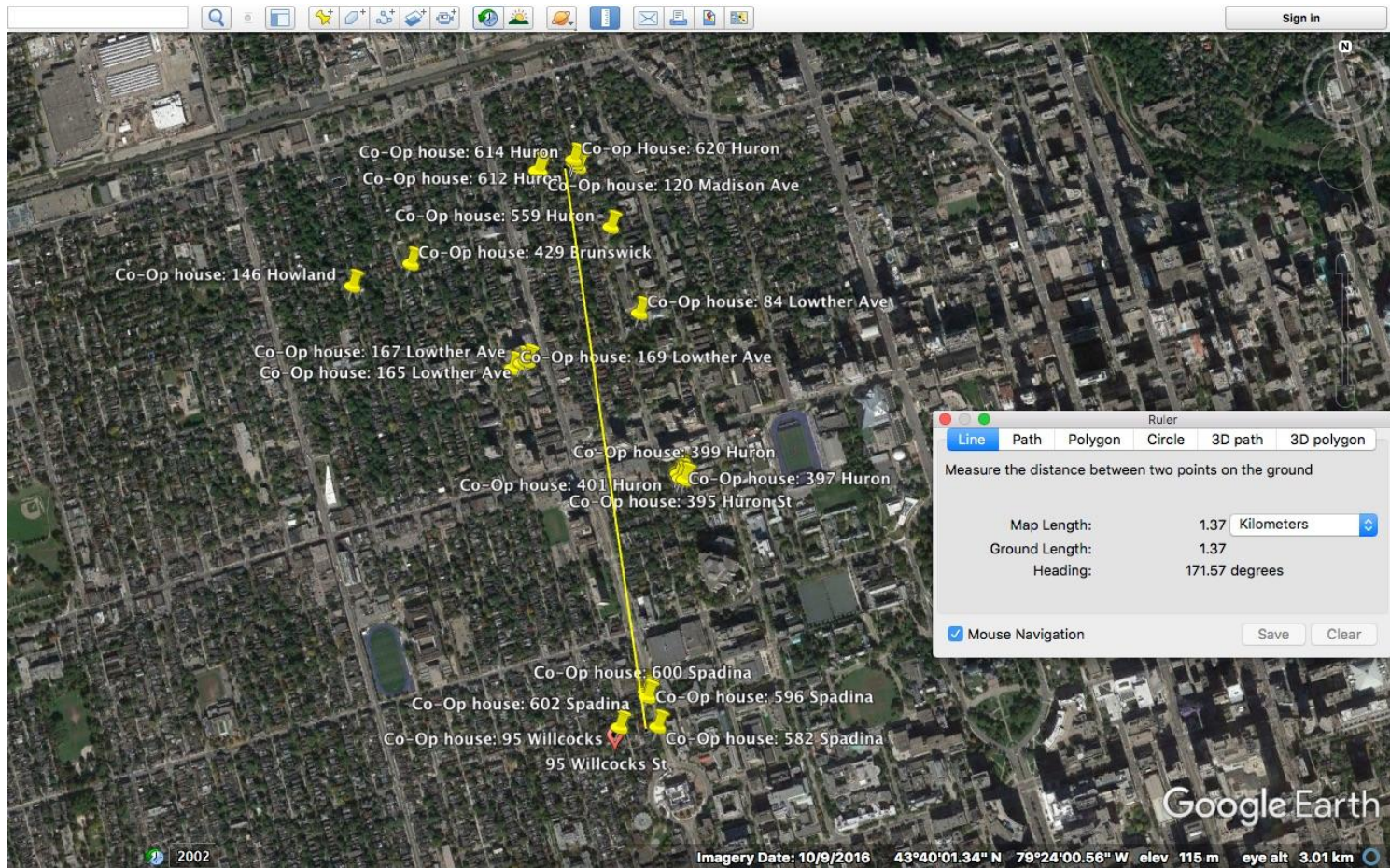
The close proximity of Co-Op houses could make it an ideal test environment

Rationale

Mesh network technologies are making it possible to build communications networks which can operate independently from corporate-controlled networks like the telephone system and commercial ISPs

Mesh technologies are being developed collaboratively world-wide by people who see the potential of the technology to build resilience, resist surveillance, and protect community autonomy.

Toronto Mesh volunteers are developing the expertise to deploy a large-scale network here in Toronto and the Campus Co-Op would be an ideal partner to experiment with sustainable deployment options and serve a test bed for various technological options.

Ultimately, a robust and sustainable mesh network may be able to serve as the connection to the internet, providing for all internet access needs of tenants

Hardware

A central part of this project concerns configuring single-board computers (e.g., Raspberry Pis) to act as nodes, paired with antennas capable of providing a network in a localized area or of connecting with distantly-situated directional radio communicators

These computers are widely available and affordable and used for all kinds of computer and robot development projects. Likely, members of the Co-Op will have an interest in taking part in software development as well as hardware testing.

Stage 0: Community Involvement

The Co-Op could send an email to all members, outlining the aims of the project and requesting volunteers.

Representatives from Toronto Mesh could routinely brief any interested Co-Op members on the development of the project.

Throughout the proposed collaboration, all equipment would be owned and retained by the party that bought it.

Stage 1: Network Deployment

1. Advertise the project to members of the Co-Op; find people interested in the software and hardware development sides; decide which houses it makes the most sense to partner with initially
2. Work with Co-Op members to improve the Toronto Mesh's existing technology. Continue with field trials like the recent Toronto Reference Library test
3. Test but do not install long-range directional nodes at two or more Co-Op houses. Verify that the system can work under ideal conditions
4. Develop and deploy long-range links designed to be installed on a long-term basis (test weatherproofing, etc)

Possible Stage 2: Providing Internet

1. Characterize the needs of Co-Op members in terms of bandwidth, privacy, services (printer sharing, VOIP sharing, file servers, streaming), etc
2. Investigate options for upstream internet access not reliant on home level telecom companies
3. Pilot project in one house

Note: Even if we never get to this stage within this partnership, we will be helping develop the capability for others to do it elsewhere.

For an example of how a mesh network doing this is working, see:
https://nycmesh.net/faq/
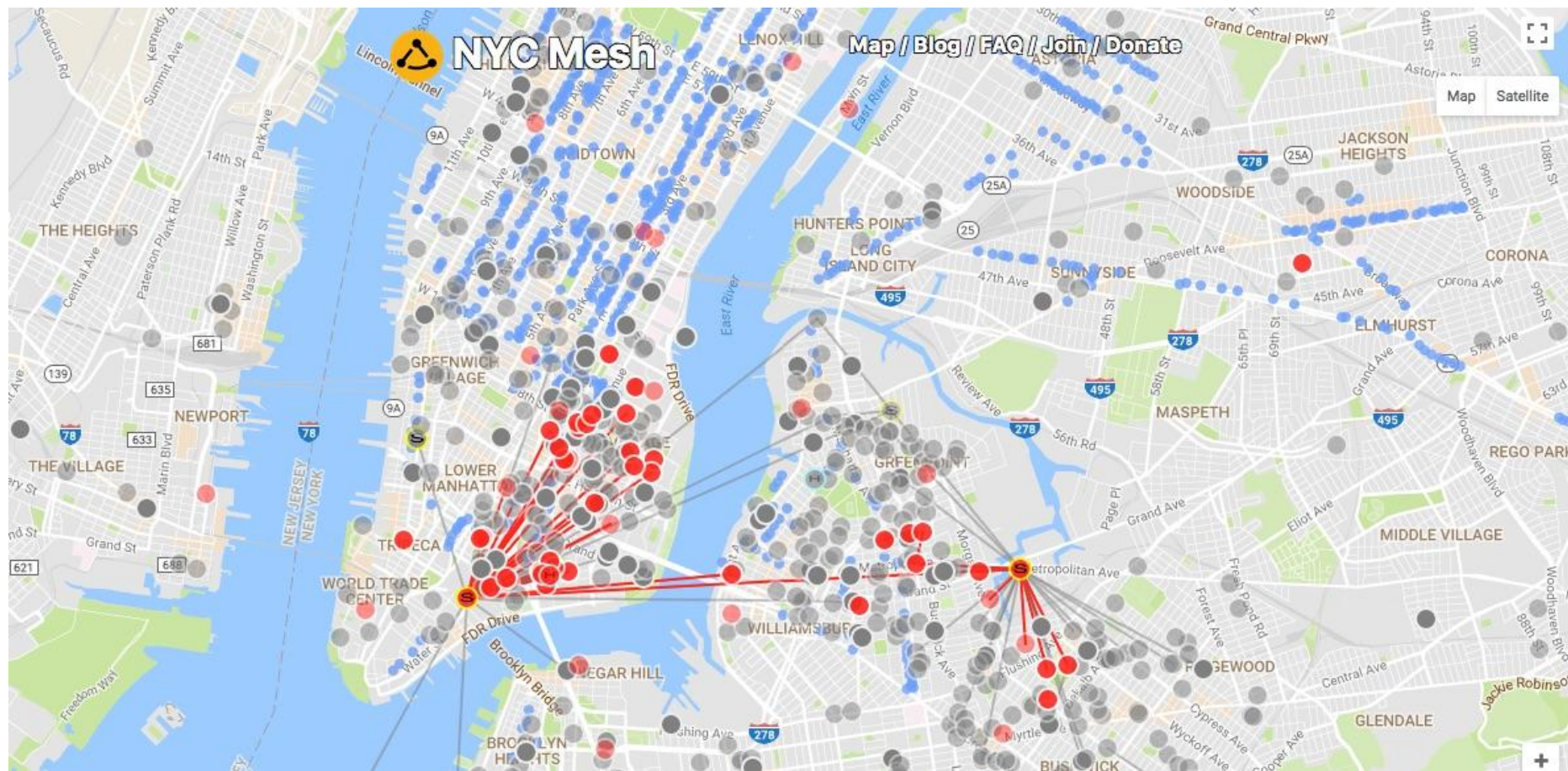
The NYC Mesh is at a Phase 2 level, with long-range links connected to an internet exchange point

Timeline with estimated costs

Stage 0: Community Involvement

- Could begin immediately - target date February 15th
- Cost: Nothing to the Co-Op, though individual members may want to buy inexpensive $30-100 node hardware: https://tomesh.net/build-a-node/

Stage 1: Hardware Development

- Initiated following successful field tests by Toronto Mesh
- Cost: For a pair of long-range radio transceivers, including Raspberry Pi hardware, radios, and antennas [TK - estimate]. Could include solar power, battery storage, or other extras.

Possible Stage 2: Providing Internet

- After pilot hardware has been proven in all Toronto conditions, and after the internet needs of Co-Op tenants have been studied

Learn More: Toronto Mesh

Get in touch with the proponents of this collaboration

- Milan Ilnyckyj, milan@sindark.com
- Dawn Walker,
- [add yourself if you wish]

Talk online with Toronto Mesh volunteers

- https://chat.tomesh.net/#/room/#tomesh:tomesh.net

Email Toronto Mesh

- hello@tomesh.net

Come to an In-Person Meeting

- https://tomesh.net/events/

Learn More: Campus Co-Op

A Regional History of Student Co-operative Living

- https://docs.google.com/document/d/18JjxNd5PpR-W8Qtoyp6y3qIc154EZDtS-y7cJdnAdME/edit

Campus Co-Operative Residence website

- http://www.campus.coop/