Proposal to Establish a Toronto Community Network

Draft Submitted by Toronto Mesh
June 12th, 2020

> *Community networks are networks collectively owned and managed by the community for non-profit and community purposes. They are constituted by collectives, indigenous communities or non-profit civil society organizations that exercise their right to communicate, under the principles of democratic participation of their members, equity, gender equality, diversity and plurality. The information on the network design and operation is open and accessible, allowing and favoring the extension of the network by the users. Community networks promote local services and content, promote net neutrality and free interconnection and transit agreements with networks offering reciprocity.*
>
> – Cumbre Latinoamericana de Redes Comunitarias, Argentina 2018

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Background and Introduction

Over the past six years, Toronto Mesh has gained extensive knowledge and experience regarding community and mesh networking, along with the myriad non-technical, socio-economic issues involved in fostering digital literacy and citizen inclusion. Toronto Mesh collaborates with technologists, artists, activists, civic-tech enthusiasts, network operators, and many other stakeholders around the globe, working together to secure rights of equity, privacy, security, diversity, inclusion, transparency, resiliency and accountability in the realm of digital information.

Here in Toronto, we've convened hands-on instructional workshops at Toronto Public Library, and in 2019 we were invited by The Internet Archive to design and deploy a temporary mesh network for participants of DWeb Camp at their remote location on the California coast. Our open source experimental mesh-node software is being used and extended by developers from around the world[1]. With an emphasis on open source software and hardware, community mesh networks, and peer-to-peer software, we engage individuals and communities in the reflection and learning necessary to understand alternative digital infrastructures, their democratic governance, and many other pathways toward greater digital inclusion for more equitable and sustainable communities.

Scope and Objectives of this Proposal

In collaboration with project partners and community members, Toronto Mesh proposes to initiate and foster a community-operated mesh network that will serve as the focal point for experimentation, learning, participation, and capacity building toward widespread digital literacy and self-determination. In addition to redundant Internet access, the proposed network from its early phase will provide a rich variety of local services and content, and serves as a basis for citizens to engage creatively and also practice the democratic governance that is essential for the sustainability of resilient local infrastructure.

As Torontonians continue to navigate the challenges presented in the COVID-19 pandemic, we are inspired by locally organized mutual aid efforts that have sprung up in communities to support vulnerable peoples—many with specific needs—that are often excluded by centralized planning. This further validates our critical need for resilient digital infrastructure, supported by capable local communities that can quickly mobilize to serve urgent needs in the face of crisis.

The ongoing pandemic has also surfaced long-standing social issues around digital equity and motivated several groups to act, thus enabling a window of opportunity for essential collaborations that we will detail in this proposal. In particular, The City of Toronto is working with commercial partners to provision temporary networking infrastructure to extend Internet connectivity for tenants of several high-needs residential buildings (referred to as towers). A primary objective of our proposal is to ensure

[1] https://github.com/tomeshnet/prototype-cjdns-pi

that advances made during the pandemic will result in lasting benefits for some of these communities, as long-term plans have not been made since all focus has focused on rapid temporary deployments. Toronto Mesh is engaged in discussions with groups involved, and this proposal will lay the groundwork where temporary emergency measures will be superseded by a permanent community network through widespread civic participation.

Toronto Mesh has long found common cause with the Toronto Public Library, as reflected in our prior network literacy engagements. We share the Library's aspirations for equitable and inclusive access to technology, digital literacy, life-long learning, and better web and mobile services that enrich community connections and cultures. In this proposal, we imagine a digital public space that fosters community trust through skillbuilding, supported by commonly-owned infrastructure that is democratically managed. We hope to involve TPL as a key partner and contribute our specialized skill sets to enable expanded access to TPL's learning resources and collaboration spaces. We hope to anchor the proposed network through interconnection and cooperation with this ambitious, value-aligned, and established institution in the renewal of Toronto's urban environment, and in turn, the proposed infrastructure and community network sustainability plan will serve to accelerate the progress of TPL's digital equity and inclusion strategy. Through this and similarly complementary partnerships, we believe that the proposed network can serve Torontonians well beyond the horizon of the present pandemic.

Local Infrastructure in Commons

This innovative urban infrastructure represents a new set of capabilities, resources and affordances upon which to build new kinds of alternative economic opportunity and participation. Success of this proposal in seeding, nurturing and fostering the growth of an ecosystem of Community Networks in Toronto lays the groundwork for exceptional learning opportunities across a range of disciplines and professions in public, private and non-profit sectors, alike. This could be pointed to as a potential long-term benefit back to the city - but must not be in any way taken to compete with or undermine the primary objectives and benefits for the communities involved.

"Technology subsumes citizen democracy by replacing informed choices with behavioral modification in the service of profits and capitalism. Without a major shift toward community-owned and-controlled platforms, society will become increasingly split into controllers and the controlled."

[Paul Lindner, co-creator of Gopher protocol, Technical lead and Manager of Machine-Learning Fairness, Societal Context research, in Google's Trust and Safety organization - as quoted in, Pew Research Center, February 21,2020, "Many Experts Say Digital Disruption Will Hurt Democracy"]

Digital Inclusion and Literacy

Toronto Mesh specializes in supporting communities to practice the design, acquisition, deployment, and operation of technologies relating to computer network access and interconnection. We also have expertise in digital coaching and stewarding safe spaces, both socially and digitally, that enable effective open work cultures. The community network we establish will be a digital home to diverse communities of Torontonians, as well as a hub for many digital applications and services, provided by established institutions and citizens alike, the way the Internet was originally envisioned.

> "*A sustainable city needs the option of an organic Internet. One whose infrastructure is built, owned, controlled, and maintained by local communities… Just as living organisms can be threatened by the lack of biodiversity, our digital sovereignty and self-determination will be more and more endangered, the less net-diversity is made available to us. Moreover, net-diversity is not only important for reasons of democratic governance and independence. It is also a matter of social, economic, and ecological sustainability*"[2]

We hope that through a partnership with TPL, Toronto Mesh members can help support its immediate needs that arise due to the pandemic, and co-imagine a common digital future where the community network may fit into further its organizational goals. Some near-term possibilities include access to digital library content, local services that aid in facilitation of virtual workshops, ongoing collaborative spaces accessible to the public, and local-first social networking opportunities.

Citizen Participation in Public Space

Toronto Mesh envisions the community network to be one large public space, where although participants may be geographically distant, digitally it is a public space for Torontonians to build communities and steward collectively. The sense of community cannot be built on a service model, but rather through participation and practice, and these are the essential components that make the network sustainable and scalable.

We will focus on engaging people reached by this network, through infrastructure set up at our partner locations. We can design posters to engage with residents at the towers to build network understanding, host virtual sessions in project areas, and form building committees informed about digital accessibility and data privacy so they can make collective decisions about digital futures.

"We'll see further fragmentation of internet cultures, away from the consolidated streams and toward more niche community spaces that are independently moderated, like early internet or cable TV. Self-moderating, self-organizing cultures will provide a basis for demographic-focused advertising without the anti-social consequences of targeted advertising, allowing the internet to self-organize a healthy diversity of cultural and normative frameworks. I believe this will ultimately strengthen public education and democracy."

[Daniel Estrada,digital humanities and ethics lecturer at New Jersey Institute of Technology, as quoted in Pew Research Center, February 21,2020, "Many Experts Say Digital Disruption Will Hurt Democracy"]

The community network is also grounds for network experimentation, and we will engage with institutional partners in areas of art, technology, and education to co-imagine creative initiatives and progressive networking projects.

[2] Antoniadis P. (2018) The Organic Internet: Building Communications Networks from the Grassroots. In: Giorgino V., Walsh Z. (eds) Co-Designing Economies in Transition. Palgrave Macmillan, Cham

Strategy

It is important to acknowledge that the proposed community network represents the first of its kind in the City of Toronto. As such, the ongoing viability, long-term success, and sustainability of the network will depend on iterative and incremental experimentation and learning that is both creative and disciplined in its approach to timely problem solving. The experience gained early in the project and beyond will be applied to affect course-corrections and continuous improvement in subsequent planning, design, and operations. This element of our strategy is reflected in the iterative and interactive approach to network planning and design, as well as our attention to measurement and evaluation.

Also central to our overall strategy is the ongoing identification, mitigation, and resolution of risks and uncertainties, as well as an open transparent and highly collaborative approach to working with partners and participating communities. Plans and designs proposed always reflect our current best efforts for meeting the needs and serving the interests of the communities participating in and utilizing the network. Detailed plans and designs are continuously updated and refined as we balance this central objective with consideration of those risks, uncertainties and those other contingent events, and decisions which remain beyond our control.

This proposal is a tool facilitating knowledge exchange and discussion with project collaborators - where it serves to express and illustrate our plans, we may point to specific locations, equipment choices, design decisions or other elements; while on other occasions, we may elect to express our intentions with reference to general design principles or planning considerations. In all cases, these details remain open to revision until finalized with the project partners and asset owners, as suited an iterative, learning-driven strategy.

Project Plan

We organize our planning over a 24 month period and propose several general phases of the project, as outlined below. The 24 month period is selected to align with the maximum project term conceived by The Internet Society's Beyond The Net grant, which is being sought in support of the work. A major transition in project operations is anticipated at such a time as the participating commercial operators cease emergency provision of free internet to the selected buildings. Our present understanding is that commercial operators will offer this service for a period of 1 year, in which case, this transition toward an entirely community-provisioned network coincides with Phase III. Nevertheless, experimental design and deployment begins immediately as best informs our later decisions and planning.

Phase	Time-period	Anticipated areas of focus
I	Jun. 2020 - Oct. 2020	Assembling and organizing team resources and project management processes and tools. Establishing productive relationships with project stakeholders, sharing plans and coordinating expectations and actions. Discovering and mapping out assets, resources and relations within the selected area(s). Planning and resourcing community outreach and peer learning workshops. Setting up experimental roof deployments with the aid of partners.
II	Nov. 2020 - Mar. 2021	Undertake community outreach and convene peer-learning workshops. Update planning and project operations to reflect developing appreciation of the emerging priorities and potentials of the community network and the developing community partnerships and collaborations.
III	Apr. 2021 - Sept. 2021	Handover of any available commercial provider assets and operations to Toronto Community Network. Finalize network design and deployment and Initiate community network operations and support. Convene community social events for expanding the mesh network, based on community interest, opportunity and demand.
IV	Oct. 2021 - Aug. 2022	Develop more complete and efficient operational and support processes and build local capacity for sustaining a resilient community network. Expand the content, services and infrastructure available on the network.

Project Preparation, Configuration and Launch

- Send out call for participation for different roles
- Orientation and training team-members on tools, methods and governance

Community Outreach

Fundamental to our project processes are the principles of "Responsible Research and Innovation[3]", briefly summarized by early proponents as:

> "a transparent, interactive process by which societal actors and innovators become mutually responsive to each other with a view to the (ethical) acceptability, sustainability and societal desirability of the innovation process and its marketable products (in order to allow a proper embedding of scientific and technological advances in our society)"

Successful deployment and operation of the Community Network, and the realization of significant positive impact within the community, will not be achieved through technology alone. Our approach for advancing responsible research and innovation, entails ongoing, iteratively co-created and refined processes that succeed in engaging the energy and imagination of community members and translate this into meaningful and valuable network content and services.

Task: Communicate plans to deploy and sustain a Community Network, inviting participation.

- Preparation and dissemination of communications media articulating Toronto Mesh's intention to foster and sustain a community network in the selected area and explaining the available contact points, channels and events for further learning and participation.
    - Author content suitable to the audience and the mediums being utilized
    - Design graphics and layouts suitable to the audience and the mediums being utilized
- Discovering affected stakeholders and consulting with the community
- Developing essential knowledge among stakeholders
- Develop shared understanding of essential requirements and measures of success
- Assuring project planning and operations reflect the community participation

Task: Convene one or more outreach and consultation events

- At all events - improve access and inclusion for all community members - for instance, children and families through provisions for child-care during consultation events; also, ensure that selected venues are fully accessible.
- Ascertain and accommodate the range of languages spoken by community consultation participants

[3] Von Schomberg, Rene (2013). "A vision of responsible innovation"

Network Deployment

Pilot Network Deployment

Our pilot deployment will consist of a small concept network to urgently address the COVID-19 crisis. This network will consist of two nodes, one with the support of Cisco and their backhaul partner, and another with the support of the TPL or other partners.

The first node will be co-located with Cisco's deployment on the roof of 200 Woolner Avenue. This node will consist of a Point-to-Point (PTP) long distance 5GHz antenna, and several Point-to-Multipoint (PTMP) 5GHz sector antennas, this location will have internet access provided by Cisco's backhaul partner. This pilot network should allow anyone within a 2.5km radius of the tower, with line of sight to the top of the tower, and in possession of prescribed Customer Premise Equipment (CPE), to access the mesh network. The mesh network will provide internet access at no additional cost to end users for 6 months as we urgently address the crisis.

We will continue to take lead from our partners as we look for other opportunities to replicate the success of this network alongside their future plans. And, as it is difficult to precisely determine or predict the complex pathways along which these networks propagate, we will use the pilot program to map and analyze the effective range in which our equipment can operate in the city.

Production Network Deployment

The goal of the production network is to convert the Pilot Network that was built out of urgency into a sustainable community-driven model. We will work with our partners to source a more permanent internet connection, and take over maintenance and support of any infrastructure that would be left over from the COVID-19 networking initiative. From the lessons we have learned from the pilot network we will begin to expand the scope of the network by deploying additional nodes and covering larger areas.

Growth of the network will be a key component to long term survivability. By selecting strategic locations for our antennas we will work together with our partners and the community to reach more of Toronto. As an example, TPL locations, although not usually tall, could act as physical spaces to host local servers and be a point of presence for service installation. We can gain access to larger buildings by working with the City of Toronto, through whom we may be able to gain access to the roof of Toronto Community Housing buildings. Through introductions by the City and other relationships independently developed, over time, we expect to gain permission to access the rooftops of large towers to deploy antennas. Tall buildings such as 10 Sanromanoway in North York dwarf the nearby developments and can be seen from quite a distance are of particular interest for extending the network. As the mesh grows, we will look into extending our reach into other parts of the Greater Toronto Area.

Network Operation and Services

The goal of our project is to create a network that will be open to all who wish to participate. Respecting the principle of net-neutrality while providing a fair distribution of network resources to users will be a challenge. The network operations group of Toronto Mesh will take on the responsibility of maintaining the core infrastructure that will be used to deliver backhaul connections to communities, and other critical systems. The initial network's targeted level of functionality will be in line with the city's aim to provide enough coverage and strength to read news, submit online forms, use messenger apps, but not stream media, or play games. Over time as the network grows, and we better understand the needs and patterns of the community, we hope to be able to scale our network to provide a better experience.

Toronto Mesh will work with multiple parties to set up and maintain the network, reach out to communities in need, and assist their connection to the network through documentational, workshop, chat support channels, as well as hardware assistance programs for those in financial need. To support the viability and sustainability of the infrastructure, a suggested monthly donation option will be advertised and available to all participants. The amount of money donated will have no effect on the user's quality of service.

Over time local community groups will be formed to address and plan issues of their surrounding area. They will be responsible for continuing growth, and support for their local parts of the network. The network operations groups will in turn support and guide them as needed, and with their help plan out any further core mesh network expansion.

In addition to the internet, the mesh will also be a means of providing local services to its participants. Unlike traditional services that exist on the internet, these services will exist within the confines of the mesh, ideally close by in proximity to the participants. To prevent exclusivity to these services a plan to provide VPN access into the mesh from outside of the network will be considered.

Continuing with the values and principals Toronto Mesh has been built upon, the goal of all Toronto Mesh operations and services is to be transparent and reproducible. This will include documentation, decisions, and other such knowledge to be published and available to the public for free. Further to the values of Toronto Mesh, only abstract data will be collected for the sole purpose of maintaining and planning the network.

Network Maintenance and Support

The core networking hardware will be monitored and reported on around the clock. Toronto Mesh's existing monitoring systems will be expanded to provide timely notifications, and troubleshooting resources for the active network. This will also provide key information for planning future deployments and resource allocation.

Once established, local community groups will be the first level of support for mesh participants. In this model of neighbours helping neighbours, these groups who understand the network can provide education and solutions. Support will also come from community platforms like forums, chats, meet-ups, and workshops which will all be targeted at helping community members gain the knowledge

to understand and resolve the issues themselves. These community groups and programs will lessen the maintenance load on core Toronto Mesh members, and increase the sustainability of the network in the long term.

Creating a Cooperative Environment

In order to ensure that cooperation is considered among network participants we plan to implement the Pico Peering Agreement (PPA) in order to ensure that expectations are established from the beginning of a user's interaction with the community network. The PPA has been used successfully as an ideological basis for Freifunk and is a required agreement for participants to ensure that everyone is on the same page.

Risk Management

As with all projects involving the deployment of hardware and software there are risks involved. While we anticipate the possible risks associated with this project are far outweighed by the benefits, we have tried to cover our bases and mitigate risks where possible to ensure that everything will go smoothly. Our major issues of concern and plans for their mitigation are listed here.

Alternate Locations

So far we have no reason to believe that deployment of hardware at 200 Woolner will be a problem, however in the event that the location is no longer an option, there are other avenues that we can take to pursue roof space in different locations. The plans outlined in this proposal are not solely location-dependent as we hope to expand past the Woolner Avenue location using these methods in the future.

Bad Actors

One risk to the network is the potential for "bad actors", who will attempt to take advantage of the network and its community, by attacking or damaging it. We have reached out to established community networks like Freifunk and NYCmesh about this possibility, and they've informed us that bad actors have simply not been a problem for them, despite their network's size. We anticipate that bad actors will be rare, but if problems do occur, we will be able to contact the owner of the node. We also will attempt to make technological decisions that will minimize the effect of bad actors, by protecting users and routing around malicious nodes.

Safety

The safety of those participating in network deployments is of paramount concern. Safety and personal security measures will be developed, documented, applied and refined in an ongoing manner. We will also reach out to our allied networks in other cities to learn their experiences and apply their recommended good practices regarding safety. Proper equipment and procedures will be employed and volunteers will be instructed in their correct usage.

In addition to the physical wellbeing of all involved, Toronto Mesh has always operated with a code of conduct which establishes a set of shared guidelines to ensure that everyone feels safe and is treated with respect. As with all our past projects we plan to extend these guidelines to this deployment, and all future Toronto Mesh activities.

Liability

We allocate budget for necessary legal services and insurance, agreements, waivers, and coverage sufficient for limiting liability of the parties involved in deployment and operation of the network.

Partnerships and Alliances

Inaugural Project Partners

City of Toronto

Ongoing collaboration across a variety of City departments will help to sustain the resulting community network by expanding the resources available to address practical problems and barriers, as they arise, while also establishing the flows of communication and cooperation that will facilitate well-in-formed evolution of City policies and plans, concerning community networks, over the longer term.

Toronto Public Library

As a partner in the City of Toronto's joining the Cities Coalition for Digital Rights, TPL is committed to creating new, public and free programming to further digital safety and lit-eracy among Toronto residents. The Library embodies many of the values that inspire community networks, and offers a wealth of information and knowledge resources to the network. Likewise, the proposed communi-ty network advances the Library's strategic plans for digital inclusion, digital literacy, life-long learning, and better web services that enrich community connections and cultures, and a more informed and democratic society. TPL is committed to exploring and support-ing on-going community consultations and community network co-development programs and initiatives as part of the proposal to establish a Toronto Community Network

Internet Society

Based on discussions with the City and the collaborating firms and organizations, and agreement in principle and acceptance regarding our proposed community network, we will seek financial sponsorship and support through our local Internet Society Chapter, along with in-kind contributions and volunteers, as required to deploy, operate and support the network. As a global internet policy and technology leader, the Internet Society is an important, value-aligned, "anchor" partner having unique community network knowledge and experience, and with whom we will work to preserve essential

governance integrity and to maximize the freedom and self-determination of the communities served by the network.

Cisco Toronto Innovation Centre

As part of the COVID-19 support plan by the City, Cisco has volunteered to provide hardware, expertise and planning resources to support the deployment of the temporary network in Toronto. Our understanding is that, in the communities with which this proposal is concerned, Cisco, BAI, Beanfield, Bell and other commercial providers are offering up to 12 months of broadband connectivity. We believe that we can negotiate terms under which Toronto Mesh can take possession of the deployed assets and apply these in the proposed community network, thereby reducing our up-front costs and sustaining the productive life and usage of the deployed value forward for the benefit of the community.

Free Geek Toronto

Free Geek Toronto is an early and long-time supporter of Toronto Mesh and also serves as the physical venue where Toronto Mesh regularly hosts meet and greet sessions, which are open to anyone in the community. Launched in 2009, and initially operating from the Junction neighborhood as an entirely volunteer-run, non-profit organization; FreeGeek Toronto, in 2011, began operations as a not-for-profit employment social enterprise, and relocated to their present West Queen West location in2014. The two organizations collaborate on community events[4] and envision a variety of ways that they can lend each other mutual support in advancing complementary aims. For example, while Toronto Mesh has yet to acquire any significant volume of networking equipment, FreeGeek - as a technology recycler/refurbisher[5] - represents a cost-effective and environmentally sustainable supplier of computers, peripherals, networking equipment, and other ICT assets, to the communities served by the proposed network.

The Surrounding Community

Ongoing engagement with people living, learning and working in the areas planned-for-deployment and newly networked is essential for realizing the envisioned benefits for the connected community. Processes of community outreach, consultation, facilitation of peer learning and community participation in the open, transparent and democratic governance of the network are complex and demand on-going learning and dynamic adaptation in response to evolving conditions and capacities. In addition to the affected residents, we identify a variety of local institutions such as universities, colleges, and other innovation leaders as prospective future partners, able to offer unique assets and resources that will prove valuable in growing the impact and sustaining the success of the proposed community network.

[4] https://tomesh.net/2019-06-29/multicultural-mesh/
[5] https://www.freegeektoronto.org/pick-up/reuse-and-recycling/

Prospective Future Partnerships

The inaugural project partners identified above are expected to play key roles as we take the first steps for initiating and establishing community network governance and operations. In order to secure the long-term viability and vitality of the network, we anticipate partnerships, alliances and project-based collaborations with many other local organizations; and preview here some of the prospective future partnerships and the envisioned complementary potential value and opportunity such collaboration might entail.

York University, Seneca, and Other Post-Secondary Institutions

For purposes of illustration, we offer York University as an example, because it's main campus is located near some of the potential deployment locations. Other institutions can be expected to share some of these features and so, similarly, represent valuable prospective partnerships. We believe that a number of productive and mutually beneficial long-term outcomes and impacts can be achieved through ongoing participation of local learning institutions in the evolution of the proposed community mesh network. These schools offer numerous complementary resources, capabilities and also share many of the aspirations and interests embodied in our network plans. For example, York's Strategic Research Plan[6] and strategic priorities[7] speak to being: "*committed to making a difference in our community",* and to working, *"collaboratively with diverse community partners across all sectors on research, learning and service initiatives that result in mutual and societal benefit*."- and further emphasizes a commitment to, "*establishing York as an innovation hub that combines research translation and entrepreneurship with a focus on social justice and building community partnerships*".

The university also houses the York University-TD Community Engagement Centre(CEC), which is located in the York Gate Mall satellite office of York University (directly adjacent to one of the Towers identified in the City of Toronto's COVID-19 digital connectivity response plan - and also, a temporary Toronto Public Library operating location, while a nearby branch undergoes renovation). The CEC strives for academic innovation through *community building and experiential learning, post-secondary attainment for Black Creek Community, and fosters collaborative research and partnerships that inform the university's engagement in strengthening local communities and addressing societal issues, including and especially those concerned with digital literacy and inclusion, expanding educational and employment opportunity*.

Beanfield, BAI and Other Local Broadband Providers

We anticipate constructive relationships with local information and communications technology infrastructure and services providers. We believe such partnerships and collaborations represent valuable opportunities to explore and discover an effective balance of interests where commercial

[6] https://research.info.yorku.ca/files/2018/07/Final-SRP-2018-2023.pdf
[7] https://president.yorku.ca/strategicpriorities/

competition and profitability and social purpose and benefit are concerned. It is conceivable that such collaboration may introduce efficiencies and benefits that prove attractive for all stakeholders.

Local civic-tech, cooperative and non-profit organizations

We anticipate that many volunteers who presently participate in local civic-tech groups, technologist cooperatives, and like-minded associations will also contribute to the nurture and growth of this community network.

Local arts, culture and media organizations

In recent years, Toronto Mesh has collaborated with the Toronto Media Arts Centre, as well as Our Networks, a technology and art focused conference[8]. Rich engagement and exchange of ideas with these community members is a valuable resource in creatively exploring and constructively navigating the cultural and social complexity of such and undertaking—and in also promoting playful and imaginative interaction and problem solving among participants and with their local communities.

Measurement and Evaluation

While some measures of progress and impact may be anticipated reasonably well in advance, we propose to apply a developmental evaluation approach, as this suits the uncertainty and complexity inherent in the work of initiating, deploying, operating, fostering and sustaining a Community Network. A suitably lean, yet effective investment in measurement and evaluation will help in carrying forward and building upon the learning and experiences gained by the participating partners—as well as the community developments and impact proceeding from the effort. Our hope is that the proposed work serves to inspire and inform future civil society interventions for better community networks.

As none of the current team members are experienced practitioners of these methods, we will seek the assistance of local expertise who can support our correct and constructive application of this evaluation approach.

Preliminary measurement approach

Intended Outcome	**Anticipated Measurement Approach**
Increased access to the internet in the deployment areas.	Trends revealed in surveys and questionnaires

[8] https://ournetworks.ca/program/ , https://tomesh.net/2019-09-20/our-networks-2019/

Improved understanding, among project participants, regarding communications networking technologies, operations, governance and regulation.	Trends revealed in surveys and questionnaires Interviews and self-reporting. Participation of individuals form the networked communities in the ongoing growth, operations, services or support of the network.
Greater interest and/or participation in local production and use of valued content and services that can be advertised or delivered on the network.	Observation of new local content or service availability. Identification of facts denoting incremental progress toward production and availability of new local content or service availability.

Initial Project Budget

Expenditure Category	**Cash**	**In-kind**[9]
Cost of administering the grant and project planning.	$3,000	$3,000
Insurance, legal, related professional services	$2,500	$2,500
Office materials, meeting equipment and venue rental, and other project administration operating expenses (not including personnel)	$500	$500
Authoring, editing, translation, design and production of communications materials - including audio-visual and digital media	$2,500	$2,500
Costs directly associated with planning, provisioning and convening facilitated community consultations.	$1,500	$1,500
Engineering and Design services, along with any required evaluation and testing for regulatory compliance.	$3,000	$3,000
Device and equipment purchases - including tools and diagnostic and test equipment	$13,000[10]	$13,000[11]
Internet backhaul for after 6 months	$2,000	$2,000
Direct expenditures incurred in the course of deployment operations, maintenance, support and service provision (travel, meals, parking, tool & equipment rentals).	$1,000	$1,000
Total Budget (Cash component representing the amounts requested of ISOC and other funding sources, as identified)	**$29,000**	$29,000

[9] We anticipate a 50/50 ratio of cash to matching in-kind contributions.
[10] Represents purchases of new or used/refurbished networking equipment directly by Toronto Mesh so that pilot deployments and network extensions can be undertaken independently in parallel with the commercially subsidized and directed deployments.
[11] Reflects the value of equipment initially provisioned by the commercial partners and eventually transferred to the possession of the community network.

References

https://citiesfordigitalrights.org/

https://www.toronto.ca/city-government/accountability-operations-customer-service/long-term-vision-plans-and-strategies/smart-cityto/

https://www.toronto.ca/wp-content/uploads/2020/03/9493-DIP-CAG-Terms-of-Reference.pdf

https://s.cotsurvey.chkmkt.com/lib/48827/files/1548.pdf

https://s.cotsurvey.chkmkt.com/lib/48827/files/1552.pdf

https://s.cotsurvey.chkmkt.com/lib/48827/files/1541.pdf

Appendix A: Logic Model

Purpose: Initiate and complete the deployment of a sustainable community network in Toronto.

Resources / Inputs People, money, groups, organizations, other resources required for the project	**Activities** Processes, tools, events, technology, and actions.	**Outputs** Products and services produced and delivered by the project	**Intended Outcomes** Specific changes in capacity, knowledge, skills, etc. among project participants and affected individuals and communities
Resources and operating capacity of Toronto Mesh Networking equipment provided by partners Learning and skill-building tools and content Funding to convene consultations, research sites, design, deploy, maintain, service and support the network	Recruit and prepare team members Communicate and consult with participating partners and communities Design and deploy communications network Operate and maintain the communications network Provision network user services and support Measure and evaluate the project processes and impact	Operational community mesh network in Toronto. New, lower-cost alternatives for acquiring internet access and required ICT assets New, locally produced content and services Reports on the progress, perceptions, outcomes and impact of the community network.	Increased access to the internet in the deployment areas. Improved understanding, among project participants, regarding communications networking technologies, operations, governance and regulation. Greater interest and/or participation in local production and use of valued content and services that can be advertised or delivered on the network.