Attachment 3C: Research descriptions, initial findings, and biographies/qualifications of principal investigators from Ryerson University, University of Toronto, Seneca College, Humber College, and York University

1. Scope of overall research work

The digital divide is the gap that exists between individuals who have access to modern information and communication technology and those who lack access. Lack of access is influenced by many factors including cost of living, broadband affordability, access to (and performance of) technology, number of devices per household etc. The Digital Access: Who is underserved and why project is a partnership project with the City and Ryerson University, University of Toronto, York University, Humber College and Seneca College (Higher Education Institutions). It will focus on populations residing in the City of Toronto who are impacted by the digital divide, and includes both quantitative and qualitative components:

a. The quantitative component of this research project will lead to an understanding of which residents or communities do not have access to the CRTC prescribed minimum broadband internet service speeds of at least 50 megabits per second (Mbps) download and 10 Mbps upload. Specific issues to be addressed through this analysis include:
    - Where are underserved communities located? (Mapping digital exclusion / digital access to show where underserved communities are located, and ideally, include the download and upload numbers, where home internet is present).
    - What can we learn from the location of these underserved communities? What are the relationships between this data, and other social indicators?
b. The qualitative component of this research project will lead to a clearer understanding of the barriers faced by these communities which result in the digital divide, as well as an understanding of the impact that the digital divide is having on affected communities. Specific issues to be addressed through this analysis include:
    - Who is underserved? What are the reasons (barriers) these communities are underserved (cost and relative cost, choice, infrastructure availability etc.).
    - Why are they underserved? What are the reasons (barriers) why these communities are underserved (cost and relative, choice, infrastructure availability etc.)?
    - What is the dominant house form of underserved communities? What type of accommodation do our underserved communities live in (house, walk-up, apartment building low rise, apartment building low rise etc.)?

2. Overall deliverables and initial findings.

The Scope of Work and deliverable for each Higher Education Institution is as follows:

2.1. All Institutions

a. All Higher Education Institutions Partners, through review and analysis of related data, will provide advice, commentary and/or recommendations on, but not limited to, the following:
    1. Recommendations to help address the digital divide in Toronto, through analysis of contributing factors such as socioeconomic determinants, equity implications, and the regulatory landscape.
    2. All other things being equal, are home internet costs the same across the City? If they vary, what are the patterns (map, costs etc.) Are programs like Rogers' Connected for Success "successful"? Do eligible customers know about it?
b. All Institutions will work collaboratively with other project teams, sharing data and findings through their own work with the larger group.
c. Each HEI is working at their own pace and have varied deliverable timing.

2.2. Ryerson University

Ryerson Leadership Lab; Brookfield Institute for Innovation + Entrepreneurship

This Institution will:

- Conduct a 2,500 respondent (2,000 online and 500 by phone) survey of City residents aged 16 or older in November and December 2020, to collect up-to-date detailed data on Internet access in the City – where and how they connect, how fast the connection is, devices used to connect, and how much they pay for the service, as well as:
    - first three digits of postal code
    - income range
    - age
    - gender
    - number in household under/over 18
    - race/ethnicity
    - house form
    - years in Canada

- The phone survey will target areas of the City where the digital divide is likely to be greatest.
- Produce a map(s) of survey responses, with accompanying analysis, demonstrating trends and other key findings related to broadband infrastructure and the digital divide.
    - Map(s) will, to the best degree possible, be arranged by postal code, neighbourhood, or Forward Sorting Area (FSA).
    - This work will integrate and consider other related data sets that have been made available, such as those provided by the Toronto District School Board (TDSB); the Toronto Catholic District School Board (TCDSB); and the Toronto Public Library (TPL).
- Make findings of this analysis available to other Higher Education Institution Partners, for further analysis.

Initial outcomes/findings:

See: "Mapping Toronto's Digital Divide" (Attachment 3A)

Ted Rogers School of Information Technology Management; Ryerson Diversity Institute

This institution will:

- Identify and synthesize existing data on digital exclusion in urban centres generally and Toronto specifically. Data sources to examine include but are not limited to CRTC Communications Monitoring reports, reports submitted to CRTC consultations, Statistics Canada surveys, City of Toronto research, academic literature, and data provided by the school boards (TDSB and TCDSB) and the Toronto Public Library.
- Overlay digital exclusion data on other indicators of social exclusion

Initial outcomes/findings:

Initial outcomes are contained in the following draft report, Dimensions of Digital Inclusion: An Initial Review of Research and Practice:

Dimensions of Digital Inclusion: An Initial Review of Research and Practice (Draft)

Kevin Hudes
Ryerson University

November 2020

Prepared for the City of Toronto Research Project
Digital Access: Who is underserved and why?

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Introduction

1.0 What does urban digital inclusion look like in Toronto?

Broadly, the digital divide is defined as, “the gap between those who have access (through service availability, but especially affordability) to information and communication technology and those who do not” (Toronto Broadband Study, 2017). This general definition of the digital divide is widely accepted, yet efforts towards fostering digital inclusion vary widely. This is because efforts towards digital inclusion are highly contextual, and as a result what might work somewhere in bridging gaps in technological disparity might not work somewhere else. Nevertheless, it is an important exercise to explore the various framings of digital inclusion that attempt to remedy or lessen the digital divide.

In relation to Toronto, digital inclusion refers to, “residents having access to a high-speed internet connection, internet-connected devices, software, emerging technology and workspaces, as well as the skills required to use technology to address their needs” (Toronto Broadband Study, 2017). Furthermore, affordability is viewed as the “new

catalyst for the evolution of the digital divide in Toronto from access to affordability, as the predominant influencing factor" (Toronto Broadband Study, 2017). However, the City of Toronto recognizes that, due to the exclusive federal jurisdiction over wired and wireless telecommunications, their role in fostering a competitive and affordable market, is limited to influence and leverage (Toronto Broadband Study, 2017). It follows from this recognition that the City of Toronto should prioritize digital inclusion efforts in which they have a greater degree of control (digital literacy programs, the hot spot lending program, open source data catalogue etc.), thereby addressing affordability concerns outside of the traditional marketplace.

1.1 What does urban digital inclusion look like elsewhere?

The National Digital Inclusion Alliance (NDIA), a grass-roots non-profit organization in the United States, identifies 5 elements that are essential to digital inclusion: 1) affordable, robust broadband internet service; 2) internet-enabled devices that meet the needs of the user; 3) access to digital literacy training; 4) quality technical support; and 5) applications and online content designed to enable and encourage self-sufficiency, participation and collaboration (NDIA, 2015).[a] Many major urban centres have digital inclusion or infrastructure plans that have been developed through community consultation, and are buttressed by strong municipal support. These plans are useful to provide a unifying framework and central coordination for digital inclusion efforts in large cities with complex digital ecologies.

Digital inclusion takes many different forms based on contextual objectives, in Seattle for example, digital inclusion is framed as digital equity. Within this equity framework, Seattle envisions a city "where technology's opportunities equitably empower all residents and communities–especially those who are historically underserved or underrepresented" (Digital Equity in Seattle, 2018). Seattle's digital equity plan is mobilized through a series of four interrelated strategies: skills training, connectivity, devices, and applications and online services (Digital Equity in Seattle, 2018). San Francisco also frames digital inclusion through the lens of digital equity. San Francisco's conception of digital equity is founded on four guiding principles. First, equity as opposed to equality, which entails prioritizing "residents and communities in need of the most support to be fully connected" (Digital Equity Strategic Plan, 2019). Second, deep community engagement through a meaningful partnership with the communities they serve (Digital Equity Strategic Plan, 2019). Third, staying agile in order to address current digital equity needs while also actively seeking out emerging technology and trends (Digital Equity Strategic Plan, 2019). Fourth, being inclusive, by accounting for the diverse needs of residents, including language, disability and historical barriers (Digital Equity Strategic Plan, 2019). Like San Francisco and Seattle, Vancouver's digital inclusion strategy is grounded by four interrelated pillars (engagement + access, infrastructure and assets, economy, and organizational digital maturity) that aim to enhance the "multidirectional digital connections amongst citizens, employees, business and the government" (Vancouver's Digital Strategy, 2013).

[a] https://www.digitalinclusion.org/definitions/ The NDIA also offers definitions of digital equity, digital literacy and broadband adoption.

In contrast to these more holistic approaches to digital inclusion, New York City frames digital inclusion as an issue that can be remediated in large part through infrastructure development. As evidenced in its Internet Masterplan, New York City promotes a universal broadband objective which calls for, “an open access to fibre optic infrastructure built out to nearly every street intersection with an aggregation point in every neighbourhood” (The New York City Internet Masterplan, 2020). Underpinning this logic is the recognition that the “private market has failed to deliver the Internet in a way the works for all New Yorkers” (The New York City Internet Masterplan, 2020). To achieve this lofty infrastructure goal, New York City estimates that full roll-out of end-to-end fibre will cost 2.1 billion USD (utilizing a mix of City investment and Private Public Partnerships) (The New York City Internet Masterplan, 2020).

The various approaches to framing digital inclusion serve to illustrate the multifaceted nature of attempts to remediate urban digital disparities. These distinct formulations highlight how successful digital strategies must recognize the interrelated issues of infrastructure, engagement and governance that are necessary to produce meaningful broadband adoption and enable digital equity. The definition of digital inclusion put forth by the Institute of Museum and Library Services, an independent agency of the United States federal government, integrates the various perspectives outlined above, “Digital Inclusion is the ability of individuals and groups to access and use information and communication technologies. Digital inclusion encompasses not only access to the Internet but also the availability of hardware and software; relevant content and services; and training for the digital literacy skills required for effective use of information and communication technologies” (Building Digital Communities, 2012).

Digital Inclusion Initiatives

2.0 National Initiatives in Canada and the United States

In the United States and Canada, national digital inclusion programs, a mix of private and federally funded initiatives, seek to foster digital inclusion in myriad of ways. Private digital inclusion programs such as *Comcast Essentials*[b] in the United States and Rogers *Connected for Success* in Canada[c], mobilize a blend of digital literacy training, low cost devices (Comcast Essentials specific) and affordable Internet options, thereby offering those on the fringe of being left behind, in particular low-income families who qualify for other social programs (e.g. public housing assistance), alternative ways to connect. However, programs of this nature, in particular Comcast Essentials, have been under-utilized within ethnic groups, as Fernandez et al., explains, “the underutilization of services within ethnic minority groups may be partly explained by a perceived lack of outreach and a fear of being stigmatized by service providers” (Fernandez et al., 2019). Federally funded digital inclusion projects include the Lifeline program[d] in the United

[b] https://www.internetessentials.com
[c] https://about.rogers.com/giving-back/connected-for-success/
[d] https://www.fcc.gov/general/lifeline-program-low-income-consumers

States and the Connecting Families Initiative [e] (which includes partially subsidized broadband and fully subsidized refurbished computers) in Canada.

These nationally available subsidization schemes provide low-income individuals and families the opportunity to access more affordable broadband, however based on the sheer scope of these initiatives, community-specific problems arise and often detract from the overall goal of mass digital inclusion. Despite these concerns surrounding scope, the data generated from these federally funded initiatives still represent a useful and substantial resource. To this end, an updated report from the Connecting Families Initiative is anticipated in the near future. Looking at national digital inclusion outside of North America, Australia generates an annual digital inclusion index which provides valuable year over year insights on progress in addressing digital divides. Commissioned by Telstra, Australia's largest incumbent telecommunications provider, the index highlights the need for a more granular approach in which telecommunications providers, institutions and the government work in tandem to prioritize digital inclusion in a cohesive way.

2.1 Local Initiatives (Toronto, San Francisco, Ottawa and Philadelphia)

The case studies presented in this section are intended to represent an interesting mix of models and initiatives aimed at enhancing digital inclusion. Locally focused, municipally governed initiatives emerge to correct or bridge the apertures left by nationally funded programs. The Toronto Public Library (TPL) system is the focal point of Toronto's overall digital inclusion strategy, hosting, on a daily basis in 2017, 10,000 connections throughout its 100 branches (Toronto Broadband Study, 2017). The TPL system provides free, always-on, Wi-Fi to community members, and over half of its 100 branches have gigabit Internet connections (Toronto Broadband Study, 2017). The TPL's network is administered separately from the City, meaning that the TPL is not bound by the same security and privacy restrictions that structure access in City-run employment centres (e.g. users must retrieve a new Wi-Fi password ever hour), ultimately affording the TPL a greater degree of flexibility with respect to access (Toronto Broadband Study, 2017). Furthermore, the TPL's hot spot lending program—which focuses on communities with large numbers of low income households—allows these individuals and families to access an additional 10 GB of data a month for up to six months (Toronto Broadband Study, 2017). Alongside the TPL's digital inclusion strategy, Toronto has expressed a significant interest in expanding its open source data catalogue (Toronto Broadband Study, 2017). Through this expansion the City hopes to forge partnerships with post-secondary institutions and businesses, who will be able to mobilize the open source data catalogue to create digital solutions for the city to adopt (Toronto Broadband Study, 2017). It is important to note that the initiatives outlined above are not meant to be an exhaustive list, but rather these initiatives represent areas that are low-risk, high reward options for improvement.

[e] https://www.ic.gc.ca/eic/site/111.nsf/eng/home

Outside of Toronto, San Francisco, recognizing the importance of finding new and innovative ways to fill gaps in digital literacy training and technology support services, is experimenting with a community-driven innovation program that seeks “to test, evaluate and sustain effective solutions for addressing digital literacy and support gaps” (Digital Equity Strategic Plan, 2019). The program is modeled after San Francisco’s Startup in Residence (STIR) program, and consists of a three step process: source challenges within communities, identify a sponsor for each challenge, and select an organization to pilot the program (Digital Equity Strategic Plan, 2019). Pilot projects are funded by digital equity innovation grants, and successful pilots are sustained indefinitely (Digital Equity Strategic Plan, 2019). The combination of community sourcing and subsequent sponsorship (e.g. through city departments, philanthropic organizations or private sector collaboration) ensures that high priority issues within the most vulnerable communities, including online safety, education, disability and workforce development, are identified and remediated through sustained sponsorship (Digital Equity Strategic Plan, 2019).

With respect to data analysis and data visualization, Ottawa’s Neighbourhood Equity Index (NEI) provides a “holistic, systematic and defensible data tool” that “identifies inequities and prioritizes neighbourhoods that are struggling with the essentials of life” (Neighbourhood Equity Index, 2020). The NEI is an adapted variation of Toronto’s Urban Heart methodology, combining research evidence, organizational data and community knowledge to assess urban equity in five distinct, yet interconnect domains: economic opportunity, social and human development, physical environment, population health, and community and belonging (Neighbourhood Equity Index, 2020). Ottawa has mobilized this abundance of interconnected data to create a user-friendly digital equity map that explicitly delineates Ottawa’s most vulnerable communities (Neighbourhood Equity Index, 2020). In essence, this equity map uses a number of indicators (e.g. Ottawa Community Housing, the locations of collective senior dwelling establishments, and low-income youth with mental health related disabilities aged 15-29 etc.) to aid in the process of identifying the most appropriate locations for Wi-Fi hub deployment (Neighbourhood Equity Index, 2020).

Between 2010 and 2013, an innovative digital inclusion workshop series was conducted by the Media Mobilizing Project (MMP), a community-focused media organization that “uses strategic communication to bring attention to human rights issues impacting poor and working people in the Philadelphia area” (Wolfson et al, 2019). The MMP was federally funded by the Broadband Technologies Opportunity Program (BTOP), and through this funding the MMP ran a series (usually about three a year) of intensive weekend long workshops called the Movement Media Institute (MMI) (Wolfson et al, 2019). The key differentiation between the MMI and more traditional digital literacy programs is that they promote emancipatory broadband adoption, “their vision was to give people the skills to tell and share their stories in an effort to build political power, and in the process, participants could also gain basic digital literacy skills” (Wolfson et al, 2019). The overarching contention that guides these workshops is that digital literacy training would be more impactful if it was linked with social and political empowerment (Wolfson et al, 2019). Moreover, connecting digital literacy with concrete, media-

orientated ways to construct collective power leads to deeper engagement, and by process the potential for meaningful broadband adoption (Wolfson et al, 2019).

Framing Digital Inclusion

3.0 Access, Affordability and Hardware

It is widely recognized that there are three predominant levels of digital divides. The first level divide refers to access to essential infrastructure, the quality of service provided by this infrastructure and the affordability of services offered to end-users. The second level revolves around differences in skill, motivation and cultural norms. The third level has to do with the benefits that users get from their engagement with the physical hardware and the Internet more broadly (Valenzuela-Levi, 2019). Access, in Toronto context, is primarily influenced by affordability rather than access to physical infrastructure. Low-income populations are usually very budget conscious and price sensitive, often planning their finances weeks if not months in advance. The unreliable nature of Internet billing, and perhaps less obviously the unreliable nature of hardware, can bring about unexpected expenses at inopportune times. As such, “policy-makers continue to focus on providing initial access to low-income communities, which, though valuable, may miss more insidious and persistent disparities” (Gonzalez, 2015). The concept of technology maintenance predicts that as lower-income families increasingly have access to initial hardware, and in-home and public broadband, the digital divide will begin to diminish their ability to maintain that access (Gonzales, 2015). This diminishing relationship to maintenance occurs because low-income communities, who already have a more fragile economic ecosystem, must choose to continuously maintain Internet access, and as time progresses, this group is forced to navigate a variety of potential service disruptions (Gonzales, 2015). There are three primary reasons for service disruptions: temporarily disconnected services (i.e. cannot pay the bill), malfunctioning or broken hardware (i.e. mainly cheap or refurbished hardware) and logistic limitations of public access (e.g. tenuous transportation to public Internet hubs) (Gonzales, 2015). This sub-section of the low-income population that is unable to maintain their in-home broadband connection are classified as “broadband un-adopters”, and this population represents approximately 3 to 4 percent of all households in the United States (Whitacre & Rhinesmith, 2016). It is important to note that broadband un-adopters are often still able to use the Internet regularly outside their homes (e.g. via open networks, public or work access etc.). For example, in the context of Detroit, broadband un-adopters and non-adopters were found to be both “knowledgeable and creative about the ways they access the Internet even when lacking at home services” (Reisdorf et al., 2018).

Alongside the aforementioned device affordability and reliability concerns, is the notion that certain types of devices and multiple points of access allow for a more enriched and meaningful online experience. This line of inquiry is interested in the ways in which “devices and public access points enhance the status of their users” (Fernandez et al., 2019). The breadth of online engagement is significantly higher for computer and tablet users, however low-income households are disproportionately more likely to use mobile

phones as their primary or only access point (Fernandez et al., 2019). For this population of mobile-only or mobile-dominant users, personally beneficial activities including job searching or creating a resume, are decisively more challenging (Fernandez et al., 2019). These findings have major implications for strengthening digital inclusion initiatives. For example, participants that qualify for the TPL's hot spot lending program should already have access to computer or tablets at home, or they should have these types of devices provided to them through the hot spot lending program.

3.1 Some Demographics of Digital Exclusion

Digital divides reproduce pre-existing socioeconomic and sociocultural inequities based on a lack of resources and opportunities with low-income, non-white, the elderly, and inner-city and public housing residents among the groups most disadvantaged by the digital divide (Fernandez et al, 2019). A 2019 study conducted by Pew Research Center indicates that, in the United States, 23 percent of Americans who identify as black and 26 percent of those who earn less than $30,000 USD a year are mobile-only users, meaning they do not subscribe to an at-home broadband Internet service (Fernandez et al, 2019). Comparatively, only 10 percent of white residents are mobile-only users (Fernandez et al, 2019).[f] Affordability is a primary driver of this disparity in device access in the United States, however another possible explanation is the prevalence of digital redlining. The origins of digital redlining harken back to the housing market during the Great Depression, wherein the Home Owners Loan Corporation was meant to disburse funds intended to provide homeowners with short term relief (Friedline & Chen, 2020). The dispersal of these funds was not equal, as black and brown communities were deemed as a hazardous investment denoted by a red-line (Friedline & Chen, 2020).

The concept of redlining has been abstracted to include the unequal deployment of telecommunications infrastructure. Most recently, AT&T has been criticized for prioritizing network upgrades in wealthier neighbourhoods, thereby leaving poorer communities with outdated broadband technology (Brodkin, 2020). The underdevelopment of broadband networks in poorer communities could push these individuals towards mobile-only access. In Toronto, access to underdeveloped infrastructure is not thought to be a significant issue, however there are still some cases where end-users may be limited in the choice of provider (e.g. those who live in apartment buildings where Internet service providers have negotiated an exclusive arrangement with building management). In this light, it may be worthwhile to explore public housing arrangements to ascertain whether a variation of redlining is happening in Toronto.

Research from Australia has shown that older populations, within the context of the pandemic, are at increased risk for social isolation and loneliness (Australia Digital

[f] Comparable data is not available in Canada, but these differences highlight the need for research that addresses racial disparities in access.

Inclusion Index, 2020). The Internet affords digitally included demographics the opportunity to dampen the social impact of physical distancing guidelines, but the elderly, with generally lower than average incomes and technological skills, are largely excluded from the socially ameliorative impact of the Internet (Australia Digital Inclusion Index, 2020). The Digital Inclusion Index data reveals that around one in five older Australians do not use the Internet at all (Australia Digital Inclusion Index, 2020). Within the pandemic, older aged populations are not the only socially excluded demographic based on these barriers to access, but they are the most at risk for two reasons. First, the elderly are more much more likely to live alone when compared to other demographics (Australia Digital Inclusion Index, 2020). Second, based on their heightened vulnerability, the elderly have been instructed to be hyper-vigilant in reducing their social contact (Australia Digital Inclusion Index, 2020).

3.2 Methodological Inferences

The mix of academic literature and white papers discussed in this report have revealed three important methodological inferences. First, those who do not have a contract with an Internet service provider still find a way to get online. This is important because survey questions that dichotomize access at home (i.e. Do you have access at home? yes or no), may obscure the experiences of participants who do not have a stable and reliable at-home connection. By framing survey questions in relation to the "presence of an ISP contract", researchers will be able to delineate between at home broadband and other forms of at-home connection (mobile tethering, mobile-only, shared Wi-Fi) (Gonzalez, 2015). Second, when presented with more affordable at home Internet options, broadband un-adopters who cite lack of interest as their reason for discontinuing their Internet service contract, concede that at-home broadband does actually interest them. In other words, "reports that the Internet is irrelevant or unusable may really reflect a lack of time and money rather than a true disregard for the Internet" (Gonzalez, 2015). Having this knowledge could inform survey and interview strategies while helping to prevent misdirected campaigns to increase broadband adoption (Gonzalez, 2015). Third, when conducting research on digital disparity it is important to have a mix of both surveys and interviews (see Appendix A for potential interview questions). In-depth interviews provide contextual insights, but are not generalizable, whereas surveys are needed to understand the breadth of the issue, but may miss more community-specific and unanticipated reactions.

Conclusion

4.0 Potential Ways Forward

It is clear that inequalities in access are an amalgamation of deeply entrenched socio-economic, demographic and cultural disparities. Admittedly the City of Toronto does not have much influence in the telecommunications marketplace with respect to pricing. Hence, it is increasingly essential to strengthen alternative points of access over which the City does have direct influence. The TPL's hot spot lending program could be strengthened by ensuring that its participants have access to laptops and tablets, and are not just using the mobile hot spot to boost their mobile data plans. Moreover,

locating, understanding and engaging with households that suffer from persistent technology maintenance issues (i.e. broadband un-adopters) may represent a path of least resistance for digital inclusion efforts given that this population has previous experience with broadband technology. Looking towards more innovative digital inclusion programs, the emancipatory framework provided by the Media Mobilizing Project could be reappropriated to meet the needs of low-income and Indigenous communities in Toronto. Demographically, the pandemic has exacerbated the processes that socially exclude certain at-risk populations, in particular the elderly. The pandemic has highlighted the importance of the Internet for older-adults, and should be used as catalyst to spur adoption outside of the pandemic context. Furthermore, in order to lessen the impact of digital exclusion within the pandemic, organizations should simplify online learning tools and introduce alternative telephone services. Lastly, public-housing developments with exclusive arrangements with Internet service providers should be critically examined to ensure that digital redlining is not present, in any form, within these vulnerable populations.

References

Brodkin, J. (2020, October 5). AT&T's DSL Phaseout Is Leaving Poor, Rural Users Behind. Retrieved from https://arstechnica.com/tech-policy/2020/10/life-in-atts-slow-lane-millions-left-without-fiber-as-company-kills-dsl/2/

City and County of San Francisco. (2019). Digital Equity Strategic Plan 2019-2024. Retrieved from https://sfmohcd.org/sites/default/files/SF_Digital_Equity_Strategic_Plan_2019.pdf

City of New York. (2020). The New York City Internet Masterplan. Retrieved from https://tech.cityofnewyork.us/wp-content/uploads/2020/01/NYC_IMP_1.7.20_FINAL-2.pdf

City of Seattle. (2018). Digital Equity in Seattle 2018 Annual Report. Retrieved from https://www.seattle.gov/Documents/Departments/Tech/DigitalEquity/2018%20Digital%20Equity%20Annual%20Report.pdf

City of Toronto. (2017). Toronto Broadband Study. Retrieved from https://www.toronto.ca/legdocs/mmis/2017/ed/bgrd/backgroundfile-108897.pdf

City of Vancouver. (2013). City of Vancouver Digital Strategy. Retrieved from https://vancouver.ca/files/cov/City_of_Vancouver_Digital_Strategy.pdf

Institute of Museum and Library Services. (2012). Building Digital Communities Retrieved from https://www.imls.gov/assets/1/AssetManager/BuildingDigitalCommunities_Framework.pdf

Fernandez, L., Shillair, R., & Reisdorf, B. (2019). Building Our Own Bridges: How a Distressed Urban Neighborhood Bridges the Digital Divide. *Quello Center Working Paper.* Retrieved from http://dx.doi.org/10.2139/ssrn.3427438

Friedline, T., & Chen, Z. (2020). Digital Redlining and the Fintech Marketplace: Evidence from U.S. Zip Codes. *Journal of Consumer Affairs,*54 (3), 1-42.

Gonzales, A. (2015). The contemporary US digital divide: From initial access to technology maintenance. *Information, Communication & Society,*19(2), 234-248.

NDIA. (2015). Definitions. *National Digital Inclusion Agency.* Retrieved from https://www.digitalinclusion.org/definitions/

Neighbourhood Equity Index. (2020). Digital Inclusion Ottawa. Retrieved from https://neighbourhoodequity.ca/digital-inclusion-ottawa/

Telstra, Centre for Social Impact & RMIT University (2020). Measuring Australia's Digital Divide: The Australian digital inclusion index. Retrieved from https://apo.org.au/sites/default/files/resource-files/2020-10/apo-nid308474.pdf

Valenzuela-Levi, N. (2019). The written and unwritten rules of internet exclusion: Inequality, institutions and network disadvantage in cities of the Global South. *Information, Communication & Society,*1-18.

Whitacre, B., & Rhinesmith, C. (2016). Broadband un-adopters. *Telecommunications Policy,40*(1), 1-13.

Wolfson, T., Crowell, J., Reyes, C., & Bach, A. (2017). Emancipatory Broadband Adoption: Toward a Critical Theory of Digital Inequality in the Urban United States. *Communication, Culture & Critique,10*(3), 441-459.

Appendix A- Potential Interview Questions
Potential Questions (end-user)

- Are you currently subscribed to an at home Internet package? If no, why not? If yes, are you satisfied with your current Internet service provider? Can you explain what makes you satisfied or dissatisfied?
- How would you describe your service quality and what makes you say that? Is this level of service quality constant or does it change according to the time of day or week?
- How would you describe the download and upload speed that you get in your home? Do you have an unlimited data plan at home? If no, how do you monitor your data? Please share some strategies for monitoring your data (i.e. do you ever have to access the Internet through other points of access when you are at or approaching the data cap).
- What physical hardware (i.e. tablets, desktop, laptop, mobile-only) do you use to access the Internet? What types of activities do you engage with on each of these devices?
- Is there ever any disruption in your at home Internet service (i.e. has your service ever stopped due to health, service affordability, or other financial issues)?
- Do you access the Internet through multiple points of access (e.g. using friends or relatives connection, public library or other community spaces, at work etc.)? If yes, please share your strategies for accessing the Internet through multiple points of access? What types of activities do you engage in when accessing the

Internet outside of the home? If no, what are some of the reasons that you are unable to access the Internet outside of the home dynamic?

- Have you ever participated in any digital literacy or grass-roots media programs? Are these programs the predominant way you access the Internet? How else do you access the Internet? Is your Internet or hardware currently subsidized through any Federal initiatives? If yes, how have you found these programs?
- Before the hot spot lending program, how many points of access did you have? How about after the you received the hot spot device? (Hot spot lending program specific).

Potential Questions (Institutions)

- What kind of information is collected about participants? How is this data mobilized to improve future iterations of the program?
- How are participants chosen? Is it a first come first serve basis? If not, what does the qualification process entail? (Hot spot lending program specific).
- How is the length of lending time determined? Should the length of time be based on context or should there be a fixed length? (Hot spot lending program specific).

2.3. University of Toronto

Media Ethics Lab

This Institution will:

- Focus on synthesizing what can be learnt from the location of these underserved communities.

- A small team of upper-year undergraduate students will be the core research team. Additional students from one of Leslie Chan's class (September to December) may be involved with different aspects of the research.
- Additional students from the Media Ethics Lab will be developing Mapping Tool that emphasizes how Toronto's Digital Access activities can contribute to the UN Global Goals related to Sustainable Development.
- Based on overall Project Deliverables and Knowledge Equity Lab's research findings, the **Media Ethics Lab** will create a white paper to leverage the potential of digital access to accelerate progress on the United Nation Sustainable Development Goals.

Initial outcomes/findings:

See: "SDG Digital Inclusion Framework" (Attachment 3B)

Knowledge Equity Lab

This Institution will:

- Examine the digital divide in Scarborough (in particular West Hill, Rouge, Morningside, and Highland Creek). The primary reason of this focus is because of the many well known socio-economic challenges facing vulnerable communities and populations in these neighbourhoods.
- In addition to quantitive data from multiple sources (some existing and some to be collected), the Institution will collect qualitative data of individual citizens and their experience with digital access and the diverse factors that contribute to the nature and quality of the access.
- Take a system approach to map the actors/stakeholders, the socioeconomic composition, ethnic background, housing conditions, and their dynamic relationships that contribute to the differential qualities of access.
- Conduct a landscape analysis to understand the current access providers, both primary and secondary, and the options they provide. These will include business, government agencies, non-profit and community agencies, and efforts that may not be generally known.
- Based on findings, conduct a gap analysis to see how current efforts could be joined up or improved. Multiple actors will be included in the analysis.
- The gap analysis will form the basis of policy interventions to be proposed.

Initial outcomes:

Our extensive literature review and ongoing deliberation on appropriate methodologies affirm our initial intention to take a structural mapping approach to examine the issue of digital inclusion and exclusion in selected Scarborough neighbourhoods. Our initial findings are that indeed, access to the internet or barriers to access is not a simple economic or technical problem, but that it intersects with multiple factors, including race, culture, gender, age, and disabilities. These factors are embedded in different contexts

across neighbourhoods. Our social and participatory mapping approaches should allow us to better make visible some of the hidden barriers to digital inclusion, to envision a more contextualized theory of change, and to subsequent policy recommendations.

2.4. Seneca College of Applied Arts and Technology

This Institution will:

- Identify and synthesize existing data on digital exclusion in urban centres generally and Toronto specifically.
- First Level: Data sources include CRTC Communications Monitoring reports, reports submitted to CRTC consultations, Statistics Canada surveys, City of Toronto research, academic literature review on most recent studies focused on older adults and internet access, adoption, and literacy globally, Nationally, regionally. Literature review on other countries' responses to the global pandemic and internet access for older adults.
- Second Level where participants are involved: primarily targeting the Community Senior Support Services Agencies in Toronto and will divide the area up based on the 1998 amalgamation of Toronto, when the six different boroughs– (Etobicoke, North York, Scarborough, York, East York and Toronto) became one city. Each research assistant (student) will be given a borough and contact the agencies that service seniors in this borough following a letter and flyer to the Director and Managing Case Worker regarding this project. Students will work with the primary case workers to determine estimated quantitative aggregate data.
- The rationale for choosing the community agencies and their case workers over working with LHINs Coordinators is, that these case workers tend to manage the services of entire buildings and have more frequent interactions with its residents than LHINs Coordinators. These agencies often have Meals On Wheels (MOW) departments that make door-to-door deliveries and are more aware of the residents' individual access to the internet and usage.
- In addition, the LTCs and Retirement Home Administrators and Social Workers can provide answers to their respective questionnaires with no invasion into a resident's privacy and no need for direct contact.
- 3rd Level of data collection requires qualitative information on the experiences since COVID19 and access to the internet. The institution will look to understand older adult's direct experiences in all 3 settings (Community, LTC, Retirement Home). Experiences collected include the case workers experiences in these community agencies and institutional settings when working with their clients with or without internet access, and families of these seniors and their experiences when their elders have or do not have internet access or digital literacy. Because of the qualitative method being used, interviews will be recorded and transcribed in order to analyse the responses.

<u>Initial outcomes/findings:</u>

No preliminary findings at this time.

2.5. York University

This Institution will:

- Supplement existing data and research with interviews and other forms of qualitative research to provide life experience stories to illustrate the challenges youth face of digital exclusion in the Jane Finch community.
- Focusing on specifically the youth in the Jane Finch neighbourhood, this Institution will supplement existing data and research with interviews and other forms of qualitative research to provide life experience stories to illustrate the challenges youth face of digital exclusion in the Jane Finch community.
- The main priority in this research is telling the stories, translating these lived experiences on paper and collaborating together to present their own narratives.
- Design a small research project that works with young people in having them give voice to their own experiences on the digital divide.
- Collate these experiences into a report or document that can be utilized by the wider project team.

Subproject Activities

- Liaise with community youth groups to work on the project.
- Train 5 youth to run discussion groups and interviews with other youth on digital access and collate the data from these discussions.

Initial outcomes:

No preliminary findings at this time

2.6. Humber College Institute of Technology and Advanced Learning

This Institution will:

- Contribute the strength of their community development expertise for the collaborative development of community surveying tools, deployment strategy in underserved communities with underrepresented individuals, working in partnership with local agencies, as well as acting as a connector within our networks to aligned digital tech access initiatives already ongoing in North & South Etobicoke and supported by the college.
- Work closely with Seneca's research team to help them advance data collection from senior serving organizations.

Initial outcomes:

No preliminary findings at this time.

3. Principal Investigators, Short Biographies/Qualifications

3.1. Ryerson University

Diversity Institute

Dr. Wendy Cukier, MA, MBA, PhD, DU (Hon) LLD (Hon) M.S.C. (she/her), Professor, Entrepreneurship and Strategy, Ted Rogers School of

Dr. Wendy Cukier is one of Canada's leading experts in disruptive technologies, innovation processes and diversity. She has written more than 200 papers on technology, innovation and management and is coauthor of the bestseller "Innovation Nation: Canadian Leadership from Java to Jurassic Park". She is the Founder of Ryerson University's Diversity Institute, which she founded in 1999 and has led projects aimed at promoting the participation and advancement of underrepresented groups. Dr. Cukier has assisted organizations in becoming more inclusive through innovative programs such as DiversityLeads funded by the Social Sciences and Humanities Research Council, which tracks the progress, impediments and evidenced-based strategies for promoting diversity in organizations. The results helped inform Canada's new comply or explain legislation - Bill C-25: an act to amend the Canadian Corporation's Act – designed to advance women on boards. Wendy also leads the new Women Entrepreneurship Knowledge Hub – a network of organizations aimed at developing an inclusive innovation ecosystem – funded as part of Canada's Women Entrepreneurship Strategy. She is also the research lead for Canada's new Future Skills Centre, led by Ryerson University with the Conference Board of Canada and Blueprint in collaboration with more than 150 organizations and a network of more than 50 researchers. Wendy serves as an ex officio member of the Minister's Expert Council on Entrepreneurship as well as on the expert panel for Canada-UK Economic cooperation and is a member of the interim advisory council of the Future Skills Centre.

Dr. Mohamed Elmi, Ph.D., Director Research, Diversity Institute, Ryerson University.

Dr. Mohamed Elmi is the Interim Director of Research at the Diversity Institute, Ted Rogers School of Management, Ryerson University. The Diversity Institute conducts and coordinates multi-disciplinary, multi-stakeholder research to address the needs of diverse Canadians, the changing nature of skills and competencies, and the policies, processes and tools that advance economic inclusion and success. Mohamed hold a PhD in Information Systems at University of Cape Town. Prior to this, Mohamed completed his thesis Masters of Arts in International Development Studies at Saint Mary's University in Halifax, Nova Scotia and an Honour Bachelor of Arts in Political Science from the University of New Brunswick.

Ted Rogers School of Information Technology Management

Dr. Catherine Middleton, Director and Professor

Dr. Middleton held a Canada Research Chair, external link in Communication Technologies in the Information Society (2007-2017) and was named to the inaugural cohort of the Royal Society of Canada's College of New Scholars, Artists and Scientists, external link, opens in new window in 2014. Her research focuses on the development and use of new communication technologies, with specific interests in mobile devices and fixed and wireless broadband networks. She is also interested in how Canadians use (or don't use) the internet in their daily lives.
Dr. Middleton's research has been funded by SSHRC, Infrastructure Canada, Institute for a Broadband-Enabled Society, the Networks of Centres of Excellence, Statistics Canada and Ryerson University. Her research projects have investigated the use of ubiquitous communication technologies (like Blackberries) in organizations, the development of next generation broadband networks (including Australia's National Broadband Network), competition in the Canadian broadband market, and Canadians' internet use. She was the Principal Investigator for the Community Wireless Infrastructure Research Project, external link and is the Co-Investigator on the Canadian Spectrum Policy Research Project, external link. She is a member of the Ageing + Communication + Technologies, external link research team.

Ryerson Leadership Lab

Sam Andrey, Director of Policy & Research, Ryerson Leadership Lab

Sam Andrey has led applied research and public policy development for the past decade, including the design, execution and knowledge mobilization of surveys, focus groups, interviews, randomized controlled trials and cross-sectional observational studies. He also teaches about public leadership and advocacy at Ryerson University and George Brown College.

Brookfield Institute

Nisa Malli, Workstream Manager, Innovative + Inclusive Economy
Brookfield Institute for Innovation + Entrepreneurship

Nisa leads research at the intersection of technology, labour, economic growth, and inequality. She brings a social policy and social services lens to the institute, having worked on employment and training, poverty reduction, and other issues for the federal and municipal governments and the nonprofit sector. Nisa was part of the team that started the Privy Council Office's Impact and Innovation Unit, a policy lab at the heart of the federal government, and was an advisor to the Deputy Ministers' Committee on Policy Innovation. In 2016-2017 she was a City of Toronto Urban Fellow, working on skills training and job-readiness programs for social assistance recipients and improving access to housing. Prior to joining the public service, she

ran digital literacy programming for seniors, newcomers, and job seekers. She holds an MA in Public and International Affairs from the University of Ottawa, researching open government and digital citizen engagement, and a BFA in Writing from the University of Victoria.

Sarah Doyle, Director of Policy + Research
Brookfield Institute for Innovation + Entrepreneurship

Sarah leads a research agenda focused on informing Canada's innovation policy landscape, and on working across sectors to build a more inclusive, equitable and resilient economy. Previously, Sarah led impact investing initiatives at the MaRS Discovery District and worked in Canada's Privy Council Office, where she developed advice for the Prime Minister on a range of policy issues. Sarah serves on the board of The Neighbourhood Group and is an alum of the Action Canada Fellowship. She holds an MSc in International Relations from the London School of Economics and Political Science, where she was a Commonwealth Scholar, and is a graduate of the McMaster University Arts and Science program.

3.2. University of Toronto

Knowledge Equity Lab, Centre for Critical Development Studies

Leslie Chan, Associate Professor

Leslie Chan is an Associate Professor and Associate Director of the Centre for Critical Development Studies, University of Toronto Scarborough. His research centers on the role of openness in the design of inclusive digital infrastructure, and the implications for the production and flow of knowledge and their impact on local and international development. He has served as Director of Bioline International, an international collaborative open access platform since 2000. Leslie was the principal investigator for the Open and Collaborative Science in Development Network (OCSDNet), the PI of the Knowledge G.A.P project, and the director of the Knowledge Equity Lab. He has published widely on access to knowledge, open science, knowledge inequalities and scholarly communications.

Media Ethics Lab

Paolo Granata, Visiting Lecturer

Paolo is a leading scholar in the field of Media Ecology, exploring connections between Print Culture, McLuhan Studies, and Media Ethics. For more than 15 years, he has been teaching at the University of Bologna. More recently, he has been a Visiting Professor at the Faculty of Information in the University of Toronto (2015-2016), and an Assistant Professor and Academic Coordinator of the Book & Media

Studies Program at the University of St. Michael's College in the University of Toronto (2017-2020). He is currently affiliated to the University of Toronto School of Cities and the Faculty of Arts and Science. In 2019 he founded the Media Ethics Lab, a research hub that studies the ways that digital media practices and emerging technologies are marked by ethical issues and decisive political, societal and cultural questions.

3.3. York University

Department of Communication Studies

Natalie Coulter, Associate Professor

Natalie Coulter is Associate Professor and Director of the Institute for Digital Literacies (IRDL) at York University, Canada. Her research explores the promotional ecologies of children's media and entertainment. She is co-editor of Youth Mediations and Affective Relations, with Susan Driver (2019, Palgrave Macmillan) and author of Tweening the Girl (2014, Peter Lang). She has been published in the Journal of Consumer Culture, Girlhood Studies and the Journal of Children and Media and is a founding member of the Association for Research on the Cultures of Young People (ARCYP).

3.4. Seneca College of Applied Arts and Technology

Faculty of Community Services

Caroline Grammer, Professor

Caroline Grammer is a full-time Professor at Seneca College in the Faculty of Applied Arts & Sciences, Department of Community Services, cross-appointed to the Social Service Worker Gerontology dipl. Program and the Bachelor in Therapeutic Recreation program since 2005. Over the past 25 years her research has focused on gerotechnology. As the Principal Investigator, she has presented her work internationally and published in the ISARC journal of robotics and technology, *Engaging Isolated Seniors and Reducing Caregiver Burden* (2012) a beta test project on Mon Ami™ interfacing technology with older adults funded by FedDev of South Eastern Ontario grant, *Combined Low Level Laser and Light Therapy (LLLLT) for Knee Osteoarthritis in Older Adults: double-blind clinical trial with 6 month follow-up (2019)*, (awaiting publication in AJPT) also funded by FedDev of SEO. She also published a brief presented for the BC government on "The cost of Chronic Care to individuals and families" (2000) in an effort to raise awareness of the lengths to which Social Workers will go to fill the funding gaps created by the government short-falls, and "It's not Quite Like Home: an institutional ethnograpy on how insittutional policies impact older adults in long term care settings" (2002).

6.5 Humber College Institute of Technology and Advanced Learning

Community Outreach and Workforce Development

Nivedita Lane, Manager, Community & Partnership Development, Community Outreach & Workforce Development

Nivedita Lane is an adult educator, community developer and enthusiastic supporter of post-secondary access, workforce readiness, and student success. She has over 14 years of experience working locally and nationally in support of community and workforce development, specifically around access for those who are outside of traditional pathways to education, training, and the increasingly skilled Canadian workforce. For years, Nivedita has acted as a passionate advocate for the advancement of digital fluency, with an especial focus on creating accessible opportunities for learning and engaging with technology for under-represented and equity seeking groups.

Nivedita works at Humber College as the Manager, Community & Partnership Development, in a role where she leads the development of projects and initiatives that enable greater access to education, training, and the workforce for those who face barriers to participation in these areas. Nivedita is instrumental in developing collaborative education-community-industry partnerships with local organizations and industry leaders that are beneficial for each stakeholder, focused on authentic community voice, and which lead to successful outcomes for long-term economic and social development.