



Part of the **CREATING DIGITAL OPPORTUNITY FOR CANADA** Partnership Project

EXPANDING DIGITAL OPPORTUNITY IN CANADA?

DIGITAL INCLUSION AND INTELLIGENT COMMUNITIES

Allison Bramwell, Ken Coates & Neil Bradford

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The background is a solid blue color with a complex, abstract pattern. It features several interlocking gears of various sizes, some of which are semi-transparent. Overlaid on these gears are numerous thin, white lines that form a network or circuit-like structure, with some lines ending in small arrows. The overall effect is a sense of digital connectivity and mechanical precision.

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Creating Digital Opportunity is a national research partnership funded by the Social Sciences and Humanities Research Council and based at the Innovation Policy Lab in the Munk School of Global Affairs. The mission of the project is to identify strengths in current and emerging digital sectors, by examining the place of Canadian corporations, products and services in the global economy. The project is also investigating the extent to which digital technologies are being adopted and diffused across a wide range of other sectors— from advanced manufacturing to natural resources and business services – which are crucial for the future competitiveness of the Canadian economy. The project addresses the question whether we are taking full advantage of the opportunities on offer.

The Innovation Policy Lab (IPL) at the Munk School of Global Affairs is committed to applying novel methods and disciplines to the study and teaching of innovation and its impact on economic opportunity and society. The IPL focuses on core questions in a number of areas including innovation and growth, innovation and inequality, globalization and innovation, social innovation, new technologies and their impact on society, innovation in traditional industries, and arts and innovation. Since our aim is also to effect change, we pay particular attention to the role of public policy in nurturing innovation, while at the same time enhancing its positive impacts on society and limiting its negative consequences.

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OVERVIEW

THE PACE AND PERVASIVENESS OF CHANGE driven by the digital economy is no secret. The ubiquitous use of digital platforms for commerce, major advancements in robotics and artificial intelligence, additive manufacturing, and the Internet of Things, along with big data, new algorithms, and cloud computing are anticipated to alter not just the nature of employment but the entire structure of the global economy, shaping the digital opportunity that goes with it. Post-industrial economic advantage in knowledge-intensive sectors requires the capacity to develop and apply digital technologies, and tends to concentrate in large, economically secure urban regions with abundant employment opportunities. In other words, economic advantage in the 21st century tends to go to those who are already advantaged.

As the 'digitization of everything' accelerates, we know much less about the implications for those less well positioned to benefit. Particularly problematic is the potential for digital innovation to deepen, perpetuate, and entrench existing socio-economic, socio-technical, and socio-spatial divides. Presenting complex policy, and political, challenges, these digital divides represent deep fault lines that threaten to exacerbate growing 21st century inequality. Creating digital opportunity also necessitates expanding digital opportunity to people and places – and to people in places - on the 'wrong side of the digital divide'.

The CDO research projects under the theme of Digital Inclusion and Intelligent Communities aim to advance our understanding of the equity implications of the digital economy in Canada. This included work on Smart Cities, rural and remote communities, ride-hailing and the platform economy and economic restructuring in mid-sized manufacturing cities. Asking whether and how digital opportunity is being created and for whom, each researcher explored the challenges, opportunities, and policy prospects for expanding digital opportunity to more people and places.

This report synthesizes the key findings across these five research projects that reflect on three questions:

- How can we best describe Canada's digital divide(s)?
- What challenges & opportunities emerge in your research?
- What policy & program areas have the potential to expand digital opportunity to more people & places?

CANADA'S DIGITAL DIVIDE(S): CHALLENGES, OPPORTUNITIES & POLICY IMPLICATIONS

THE CDO RESEARCHERS FIND that, at present, the challenges for expanding digital opportunity in Canada far outweigh the prospects. Taken together, the concentration of digital economy benefits in a few globally competitive urban regions, the lack of infrastructure and skills in other places, and disconnects between those who develop and apply digital technologies and those who don't, reveal deep and growing digital divides in Canada. Clearly market solutions alone will not redress these inequities. Other, more intentional forms of intervention are required.

Much digital opportunity is powerfully shaped by factors beyond local control such as city size, industrial specialization, and geographic location.

Two intersecting themes cut across these research projects. First off, the negative implications of the digital economy are highly localized. In one way or another each study investigates the question of local capacity, examining what can plausibly be done at the urban scale to filter, mitigate, and adapt to these pressures. Uncovering a complex conundrum, they all find that while the local is a crucial locus of intervention, it is also the scale at which the ability to adapt to digital economy pressures is weakest. Much digital opportunity is powerfully shaped by factors beyond local control such as city size, industrial specialization, and geographic location. Small and rural communities and mid-sized manufacturing cities each face distinct disadvantages in terms of digital innovation and the skills and human capital to support it. Public service delivery is also fraught with divides between those who provide and those who use digitally delivered services.

This gap implies an essential role for informed public policies at the national scale. Governments everywhere have an interest in supporting digital economy transformations that are socially sustainable and politically viable, yet the challenge of expanding opportunity to people, places, and sectors less able to keep pace is not adequately reflected in existing research, policy, and practice. It remains an open question whether policy can better align economic and social goals, and better expand digital opportunity to bifurcated labour markets, restructuring local economies, disadvantaged neighbourhoods, and rural regions and remote communities, or if structural and market challenges will overwhelm policy potential. The researchers reflect here on the challenges and prospects for Canada.

Digital Underdogs: Economic Opportunity and the 'Ordinary' City¹

Undertaking comparative research of urban policymaking for digital innovation and inclusion in four mid-sized restructuring cities in the US, Canada, and Europe, the research investigated whether and how local actors coordinate strategically to encourage economic transformation to the digital economy. The results indicate that some urban policy innovation is evident in most places, but that it tends to be fragmented and ephemeral, indicating that strategic economic governance is difficult to sustain under these conditions. Insufficient policy capacity suggests that these types of cities are not 'resilient' to digital disruption.

Of relevance to expanding digital opportunity in Canada, the Ontario case demonstrates the weakest performance of the four on local policy capacity. Political conflict over resources and local development agendas compromises strategic economic planning in London. This is significant because of the province's unique position in the national political economy. Much national digital advantage is concentrated in Southwestern Ontario, but so is much mature manufacturing and the province has many deindustrializing 'ordinary' cities. We cannot accurately generalize from a single case study, but if London is any indication of local development capacity, left to their own devices these places could be in danger of permanently hollowing out.

Weak local capacity intersects with public policy gaps to compromise the expansion of socio-technical and socio-spatial digital opportunity in Canadian cities.

Exploring the conundrum emerging at the nexus between local capacity and public policy in mid-sized restructuring cities that lack advantages of size and specialization, places on the 'wrong side of the digital divide' cannot be left to their own devices. Yet place-based policies intended to support the local knowledge networks essential to digital innovation will fail without careful attention to local context and the political challenges to capacity-building in these places. Public, private, and nonprofit actors genuinely want what's best for their city, but often compete to get their ideas on local policy agendas. With net out-migrations of the very investment and human capital assets they need to restructure, 'ordinary' cities juggle multiple policy challenges with insufficient institutional resources, including development expertise.

"Ride-Hailing: Economic Geography and Canada's Opportunity"²

"Creating Digital Opportunity: Digital Ride-Hailing in Canada"³

Examining the economic geography of ride-hailing and how it shapes urban economic and employment in Canada's emerging platform economy, this CDO research finds that the platform economy is contributing to growing socio-economic divides at inter- and intra-urban scales. With the potential to reduce congestion and emissions and improve multi-modal access, ride-hailing has some positive implications for mobility in Canadian municipalities but these vary widely by geography. The rise of ride-hailing coincides with the continued decline of automotive manufacturing in southern Ontario. As innovation accelerates in electric, autonomous, and shared vehicles, Canada's advantages in digital technology and the automotive sector position Toronto, Waterloo, and Montreal to participate as secondary players in the global platform economy while disruption to employment in

taxi services and automotive manufacturing are evident in most other parts of the province with “deep, negative and likely long-lasting spinoff effects”. This study concludes that the digital platform economy, and ride-hailing in particular, expands global digital opportunity for a select group of cities and a select cohort of talent, but has little positive economic impact for most other places. The economic geography of ride-hailing is “emblematic of the twenty first century: highly concentrated, highly uneven, driven by talent and innovation, dynamic and challenging.”

Another study on the platform economy with the same focus on digital ride-hailing, asks more specific questions about the impact on Canadian municipalities, finding that it has been uneven across cities, neighbourhoods, social classes, and ‘digital communities’. Though there has been some improvement over time, major municipal regulatory gaps remain. The absence of enforceable rules alongside ambiguity about whether the costs of enforcement will match projected municipal revenues, means that ride-hailing services “operate in a grey zone” with little oversight to govern passenger safety, or provider insurance.

Noting the concentration of platform economy benefits in a small number of large Canadian cities, the researchers are dubious about the capacity of municipalities to manage the local economic implications of ride-hailing. Upper level governments not only play key regulatory roles but can also fund “pilot projects, investment attraction efforts, partnerships, investments in infrastructure, data collection, and research”. Yet the scope for policy intervention extends well beyond ride-hailing to larger implications for urban mobility. Canada’s lack of globally competitive headquarters and lag in research and investment in the multi-modal implications of ride-hailing relegates us to passive consumers rather than active producers. As our largest cities struggle with congestion and uneven economic advantage, this CDO research concludes that public policies to facilitate mobility investments are now more important than ever.

“Rural and Remote Regions on the Wrong Side of the Digital Divide?”⁴

With a particular focus on indigenous communities, this CDO research project examined how small towns and rural areas in Canada are responding to the digital opportunities and challenges in the 21st Century. Not surprisingly, there are major digital divides between larger urban centers and rural, remote and Indigenous communities, making these communities less prepared for 21st century digital engagement. Lack of capacity and weak infrastructure with limited, expensive and unreliable digital connections inadequate for most contemporary and high-end digital applications are particularly acute.

Digital disruptions have accentuated the vulnerabilities and challenges facing most of these communities. Most towns have experienced a sharp decline in local services such as banking, public service delivery, and access to consumer goods as businesses and government agencies migrate their operations to digital platforms. Though there have already been substantial local job losses tied to technological innovations in the resource, agriculture and other sectors, a major dislocation of retail services due to e-commerce usage signals a general weakening of the local economies that lack the scale to attract investment.

The social and economic challenges of the digital divide for these communities and small towns in northern Canada are exacerbated by the lack of even rudimentary awareness of the implications let alone the capacity to redress them. This makes even more problematic the absence of systematic policy attention in Canada to ‘bringing in’ these communities to the digital economy. The research suggests that responding to growing

employment and economic development gaps requires a rural, small town and northern digital strategy that makes national commitments to providing uniform infrastructure standards, high quality regional education and training programs, and targeted policies for small town and rural economic development. Yet rather than passively accepting digital economy effects, the research also suggests the need for policy activism from within disadvantaged communities themselves to “move to the forefront of small-town focused research and development”.

“Smart Cities”⁵

Research examining ‘smart city’ developments in Canada investigated competing definitions of ‘smart cities’ in the Canadian context, whether and how Canadian municipalities are using digital infrastructure for public service delivery, and how local stakeholders interact to shape ‘smart city’ practices. The primary rationale for the adoption of smart city technology is the same across communities; enhanced quality of life for residents and sustained community health. However, there is evidence of significant divergence between the types of ‘smart city’ services being put in place by local governments and the relative importance the public places on such services. Differences in the views of residents and government officials regarding the type and form of delivery of these services suggests that city officials need to pay more careful attention to public opinion for smart city implementation. In their study of rural and remote communities, these researchers find that collaboration is essential for smart city development.

Echoing the need both for supportive national public policies and local policy action ‘from within’, the research examined the local institutional dimension and how weak local capacity intersects with public policy gaps to compromise the expansion of socio-technical and socio-spatial digital opportunity in Canadian cities. From a public service delivery perspective, more effective public engagement and inclusion practices are needed without which the digitization of local services may have dire consequences for those without the necessary digital literacy or access to technology.

Along with improved transparency, outreach, and consultation with residents about ‘smart city’ developments, better “connecting the unconnected” to digital technologies involves improving access to broadband, building digital skills in low income communities, and implementing procurement programs for secure data collection and storage. Yet consistent with the other studies, this projects finds that weak municipal capacity to regulate the privacy, data governance, and intellectual property rights challenges that accompany ‘smart city’ developments suggest the pressing need for a “national data governance framework.”

KEY TAKEAWAYS: DIGITAL INCLUSION & INTELLIGENT COMMUNITIES

DIGITAL INCLUSION IS A TOP PRIORITY of the Government of Canada. Alongside the challenges, CDO researchers have identified digital inclusion and intelligent communities as two of the greatest opportunities of the 21st century. Digital innovation, which presents a variety of challenges, is key to the pursuit of inclusive economic growth. However, many groups are being disadvantaged or marginalized by the pace and nature of innovation. These include workers being pushed into unemployment by technological change, whole regions (like the Canadian North and rural areas) that are being left behind, groups of people (Indigenous peoples, the disabled), and those who are marginalized within otherwise prosperous communities or regions. The 'key takeaways' from this aspect of the research can be summarized as follows:

Is there a digital divide in Canada? The answer is clearly yes, but the researchers recognize the need to provide better definitions and to explain the concepts so that benchmarking and proper evaluations can be undertaken.

How are the benefits and opportunities shared? At present, the sharing is decidedly uneven. Evidence is growing that the world is shifting toward greater inequality. This could well be the unwelcome hallmark of the digital revolution.

Is there a Canadian model for digitally-enabled communities, of all sizes? The answer, at present, is no, but the intelligent communities movement has potential. At the same time, Canadian efforts lag well behind smart city installations in other parts of the world. Canada needs to improve its efforts, without ignoring the special needs and interests of small towns, rural areas and Indigenous peoples.

Can the research findings from this project play a significant role in educating Canadians about the national benefits of technological change? At present, the high-tech sector is seen as an urban phenomenon, largely tied to a few cities (Toronto, Vancouver, Montreal, Ottawa and Waterloo). It is vital that Canadians see the growth of the high technology industry in selected cities as being in the national interest and contributing, through tax revenues, investment, and related developments, to national prosperity and the redistribution of wealth and opportunity across Canada.

Is more to be learned from comparative research in other countries? There is a strong appreciation for the value of carefully constructed and realistic case studies and comparatives. Canada does well in some aspects of the digital revolution but lags well behind competitive nations in East Asia and Europe in many regards. In terms of digital inclusion, there is much to be learned by comparing Canadian developments to those in Scandinavia and other parts of Europe. Intelligent/smart community initiatives in Japan and South Korea, as well as Taiwan, Hong Kong, Malaysia and Singapore show what may be possible.

What are the key policy areas that will promote digital inclusion and the growth of intelligent communities? There are many fields of endeavour that could contribute substantially to improvements in the target areas for this research. These include:

- Education, training, and workforce development with an expanded focus on polytechnics and colleges (and less of an assumption that universities are key to success);
- National standards for digital infrastructure are urgently required. The obviously crucial Internet quality and costs warrant the provision of uniform standards across Canada.
- Inclusive strategies require clear and careful attention. At present, the country is lurching toward greater inequality. Canada needs carefully developed context-sensitive strategies that address places and specific groups and target populations. These must be informed by a careful examination of existing inequalities, local capacities, and the uneven urban manifestations of technological innovation.
- Greater investment in digital infrastructure for rural and remote communities and greater focus on aligning the implementation of smart city/intelligent community strategies with the objectives of citizens will create multiple opportunities to use the new public spending on digital technology, including software and services, to create procurement opportunities for Canadian SMEs that are scaling up and to allow them to demonstrate the effectiveness of their products and services on a domestic platform to increase their export opportunities in global markets. Implementation of this recommendation will allow for a closer alignment of the goals of our digital inclusion theme with recommendations arising from the other three themes of the CDO project.

ENDNOTES

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