New Technology

Rapid, wide-reaching change

The pace and scale of technological change is transforming our lives, work and societies. It's hard to imagine an area of life not impacted by new technologies, from the way we interact with each other and our environment, to industry, medicine, politics and arts and culture. The World Economic Forum has said we are entering a Fourth Industrial Revolution fuelled by rapid technological change. These changes bring great promise, with the potential to protect our environment, improve connections between people, empower the less fortunate and shape our health. However, mass technological change can also be disruptive, threatening complete industries and jobs, compromising security and testing our privacy rights. As a primarily rural and small-town region, the Basin has unique opportunities and challenges when it comes to technology. For example, connectivity may remove geographic barriers, allowing people to work from anywhere, but it could also leave rural governments, businesses and organizations more open to security risks. To take advantage of the opportunities and lower the risks caused by technological shifts, people, businesses and communities will require education, smart investments, foresight and good planning.

Understanding global trends

BIG, OPEN DATA

The amount of data is rapidly growing: about 90 per cent of the world's data has been generated in the last two years alone. A data-driven world could reshape all aspects of our society as services, products and the ways we govern continue to become more flexible and customized. The institutions that make regulations, and society more broadly, will have to look at the grand, optimistic promises of flexible, customized services and products, and evaluate them against the emerging issues of open data, including biases in the data, ownership, privacy and fairness.

What the research tells us

↪ Over the coming years, the amount of global data is expected to increase by 40 per cent annually[i].

↪ The OpenData Barometer ranks the Canadian federal government second among 115 countries on their open data performance[ii].

↪ In 2011, BC introduced its Open Information and Open Data Policy, becoming the first province in Canada to make its data easily accessible to the public[iii].

CONNECTIVITY

With the ever-increasing importance of connectivity, access to high-speed, broadband internet is emerging as a right, almost like clean water and electricity. Access to low-cost broadband internet has the potential to reduce social and regional inequalities and distribute economic benefits beyond urban centres[iv]. In much of the world, people rely on the internet to fully participate in their communities and the economy. The Internet of Things (IoT)—objects like lights, engines and coffee machines that contain sensors and are connected to the internet— also promises vast transformations. IoT possibilities are endless, from bracelets that could contact first responders at the first sign of a heart attack, to crops that could automatically turn on irrigation systems when they are thirsty.

What the research tells us

↪ In Canada, the number of households with internet access rose from 80 per cent to 94 per cent between 2010 and 2019[v].

↪ The number of IoT devices in Canada is expected to grow by approximately 60 per cent between 2017 and 2021[vi].

↪ About 94 per cent of people in BC and Alberta use the internet, which is the highest percentage in Canada.

ARTIFICIAL INTELLIEGENCE AND AUTOMATION

Powered by advances in computing and rapidly increasing amounts of data, artificial intelligence (AI) and automation are impacting many aspects of our lives. The benefits are many, with AI already being used to reduce workplace accidents, identify children at risk of violence and support medical diagnoses. However, this technology may also lead to new and increasingly problematic social and economic challenges. There's significant potential for automation to replace existing jobs, put pressure on average wages and disrupt sectors and local economies. We'll also need new controls and systems to counter the biases of the people who program the technology and the lack of transparency and accountability about how technological decisions are made.

What the research tells us

↪ AI could contribute an estimated $15.6 trillion to the global economy by 2030[vii].

↪ In the next 10 years, 50 per cent of Canadian jobs may be disrupted by automation[viii].

↪ About 42 per cent of jobs in BC are in occupations in which there is significant potential for automation[ix].

VULNERABILITY AND CYBERTHREATS

As the scope, number and severity of cyberattacks increase globally, so do the risks posed to the well-being of people, organizations and societies. All aspects of our lives are increasingly reliant on technology, from power and communications networks to basic public services, bank accounts and private records. The risks posed by cyberattacks continue to grow as those seeking to disrupt or attack these systems get more sophisticated and obtain more resources.

What the research tells us

↪ By mid-2018, Canada was the country with the third most cyber-incidents in the world[x].

↪ A data breach at Desjardins Group in June 2019 is thought to be one of the largest-ever among Canadian financial institutions, affecting roughly 2.7 million people and 173,000 businesses[xi].

↪ In 2018, 30 per cent of BC businesses were victims of cyberattacks[xii].

What could this mean for the Basin?

Technology and innovation are associated more often with big cities and Silicon Valley than with the Basin's rural areas and small towns. However, they will still greatly impact the region's future. Almost all aspects of life in the Basin will be affected by these changes, including economic productivity and job markets, environmental health, community relationships and personal well-being.

Here are some of the impacts the Basin may experience in coming years:

Changes to industries and the skills workers need mean local economies face both risks and opportunities.	Smart cities and internet-connected objects impact how we navigate the world and the infrastructure we need.	With technology shifting how people connect with each other, individual wellness and mental health will need to be addressed in new ways.	The ability to capture live data in the field helps environmental organizations, industries and governments manage their operations better.	Cyber threats create new risks to privacy, security and critical infrastructure.

Among many others, issues like these have the potential to both benefit and negatively impact the region's prosperity and well-being. People, businesses and communities will require education, smart investments, foresight and good planning to navigate technological shits, take advantage of emerging opportunities and lower anticipated and unforeseen risks associated with new technology.

How can the potential impacts be addressed?

There are many ways people and organizations in the Basin can adapt to situations like those mentioned above. Here are a few ideas.

Increase access to high-speed, reliable and affordable internet.	Help industries improve their practices by finding and adapting to new technology.	Create strategies to attract and develop new businesses, as well as professionals with in-demand skill sets.	Understand and address issues of well-being in a digital age, including internet addiction, mental illness and loneliness.	Identify, assess and plan for cyberthreats linked to a greater reliance on technology.

CHANGING THE BUSINESS ENVIRONMENT

New technology and innovation are influencing the skills employers are looking for, the size and makeup of the labour force, the nature of work and opportunities for new types of businesses. In recent years, BC has made significant advances in technology-based employment and has attracted tech companies to the province[xiii]. The Basin is also seeing tech companies slowly move into the region thanks to greater investment in high-speed internet access and other factors that make it more practical for companies to do business here[xiv].

As new technologies emerge, the Basin is undertaking initiatives to attract new companies and remote workers, help existing businesses expand to virtual markets and train the next generation of employees[xv][xvi]. The Basin has fewer businesses in the scientific and technical services sector than the rest of the province, partly because of the limited availability of relevant knowledge and skills[xvii][xviii]. However, efforts are under way to increase business opportunities; for example, Metal Tech Alley, a collection of over 80 high-tech companies, is working to attract businesses specializing in IoT and big data to the city of Trail[xix].

There are several ways to increase the competitiveness of Basin businesses, enable the people who live here to seize opportunities, and attract new businesses and workers to the region. These include continuing to invest in and adopt new technologies and promoting programs that will educate people and provide them with skills, like digital literacy, that they'll require for future business and employment needs.

CHANGING THE HUMAN EXPERIENCE

Connectivity has increased rapidly in other parts of the country, but telecommunications infrastructure and access to high-speed internet hasn't reached everywhere in the Basin[xx]. For many, high-speed internet is considered a necessity of life that enables them to fully participate in society[xxi][xxii]. Efforts by the Columbia Basin Broadband Corporation have increased access to broadband networks and helped

improve internet services around the region[xxiii]; however, many rural areas still do not have the same level of service as urban centres. Increased connectivity could help the Basin retain and grow businesses, create and retain skilled workers, re-invigorate communities[xxiv] and support essential services like health, education and public safety[xxv].

On the plus side, unlike many rural communities in Canada, the Basin doesn't have issues with data analysis and making it available and accessible to others[xxvi]. For example, Basin residents can access the national Community Data Program, which houses a wide range of data on topics like demographics, housing and the workforce. As we adopt new technologies and generate more data, new opportunities will become available to improve accessibility and strengthen how data is used to make informed decisions and work toward broader societal objectives.

DATA GOVERNANCE AND PRIVACY

As the amount of data increases and becomes more accessible, new models of data ownership and access are emerging. For example, the Water Data Hub by Living Lakes Canada is an "open-source" database under development in the Basin[xxvii]. Databases like this—which users can use, change and distribute freely—put a spotlight on who governs data and are shifting data ownership away from private corporations and public institutions and toward individuals and the public. Changes like this are creating new expectations around data transparency and management. Now, anyone can use data like this for novel and non-traditional purposes.

The reliance on technological systems to house data, and other trends like AI, can also present security risks. People and businesses in the Basin rely on a number of services, like banking and telecommunications, that store sensitive information online and are vulnerable to privacy breaches. There are also many small- and medium-sized companies in the Basin that are considered among the most susceptible to a growing type of cyberattacks[xxviii][xxix].

Linkages

- 🔴 Lives and communities
- 🟡 Toward a sustainable economy
- 🟢 The environment
- 🔵 Health and wellness
- ⚫ A globalized world

→ Trends in new technology **influence:**

Demand for jobs and skills	Technological changes are leading to new job opportunities and driving demand for associated skills like digital literacy.
Future work	AI and automation may shift the future of work toward a more-knowledge based economy.
Moving to cities	Access to low-cost broadband internet can help bridge the urban/rural divide.
Approaches to well-being	The Internet of Things, big, open data, artificial intelligence (AI) and automation can support patient-centred care through the use of fitness trackers and other health apps that monitor and help people adjust their behaviours and treatments.
Shifts in information and trust	Increased connectivity and the growing presence of AI has been linked to a surge in "fake news" and "post-truth," which may impact people's awareness of international contexts and create a growing fear of cyberthreats.
Expecting responsible sourcing	Big, open data could lead to more informed consumers pressuring businesses to ensure the sustainability of their supply chains.

← Trends in new technology are **influenced by:**

Low-carbon economy	A move to a low-carbon economy could require new, clean technologies that could be enhanced by AI, automation and big data.
Demographics profiles	Newer generations have different expectations, including being able to work remotely, which requires access to high-speed, broadband internet.

↓ Trends in new technology are **counter to:**

Mental health and loneliness	Individuals are recognizing the need to have more time socializing in person to combat feelings of loneliness.

References

i United Nations. (n.d.) *Big Data for Sustainable Development.* Available at: https://www.un.org/en/sections/issues-depth/big-data-sustainable-development/index.html

ii World Wide Web Foundation. (2017). *Open Data Barometer 4th Edition.* Available at: http://opendatabarometer.org/doc/4thEdition/ODB-4thEdition-GlobalReport.pdf

iii Government of British Columbia. (n.d.). *Open Data.* Available at: https://www2.gov.bc.ca/gov/content/data/open-data

iv Policy Horizons Canada. (2017). *Scan of Emerging Issues: Infrastructure.* Available at: https://horizons.gc.ca/wp-content/uploads/2018/11/2017-0277-eng.pdf

v Statistics Canada. (2019). *Canadian Internet Use Survey.* Available at: https://www150.statcan.gc.ca/n1/daily-quotidien/191029/dq191029a-eng.htm

vi Conference Board of Canada. (2018). *Canada 2030: The Defining Forces Disrupting Business.* Available at: https://www.conferenceboard.ca/e-library/abstract.aspx?did=9813

vii PwC. (2017). *Sizing the prize: What's the real value of AI for your business and how can you capitalise.* Available at: https://www.pwc.com/gx/en/issues/analytics/assets/pwc-ai-analysis-sizing-the-prize-report.pdf

viii Newswire. (2018). *Automation to impact at least 50% of Canadian jobs in the next decade: RBC research.* Available at: https://www.newswire.ca/news-releases/automation-to-impact-at-least-50-of-canadian-jobs-in-the-next-decade-rbc-research-677900483.html

ix Business Council of British Columbia. (2018). *The Automation Potential of the British Columbia Labour Market.* Available at: https://bcbc.com/reports-and-research/research-paper-the-automation-potential-of-the-british-columbia-labour-market

x Brookfield Institute. (2019). *Turn and Face the Strange: Changes impacting the future of employment in Canada.* https://brookfieldinstitute.ca/wp-content/uploads/Turn-and-Face-the-Strange-FINAL-online-1.pdf

xi CBC News (June 21, 2019). *What you need to know about the Desjardins data breach.* Available at: https://www.cbc.ca/news/canada/montreal/desjardins-data-breach-explain-1.5185163

xii BC Business. (2019). *BC Bogged Down by Cyber Threats.* Available at: https://www.bcbusiness.ca/BC-businesses-bogged-down-by-cyber-threats

xiii Government of British Columbia. (2018). *British Columbia Labour Market Outlook: 2018 Edition.* Available at: https://www.workbc.ca/getmedia/1dce90f9-f2f9-4eca-b9e5-c19de9598f32/BC_Labour_Market_Outlook_2018_English.pdf.aspx

xiv Rural Development Institute. (n.d.). *Vancouver Tech Firms Migrate to B.C. Interior.* Available at: http://cbrdi.ca/VancouverTechFirmsMigrateToBCInterior

xv The Columbia Basin Trust offers a Training Fee Support program, which includes training in "programming and coding", among others

xvi Nelson Star. *Public tech access funded by Columbia Basin Trust.* Retrieved from https://www.nelsonstar.com/community/public-tech-access-funded-by-columbia-basin-trust/

xvii Rethoret, L. and MacDonald, T. (Eds.). (2017). State of the Basin 2017: Full Report. Castlegar. http://datacat.cbrdi.ca/sites/default/files/attachments/2017SOTB_FullReport.pdf

xviii Imagine Kootenay. May 4, 2018). *Selkirk College set to expand its tech programming.* Available at: https://imaginekootenay.com/selkirk-college-set-to-expand-its-tech-programming/

xix Metal Tech Alley. *About.* Retrieved from https://metaltechalley.com/about/

xx Columbia Basin Rural Development Institute. (n.d.). *Broadband.* Available at: https://broadband.ourtrust.org/

xxi Columbia Shuswap Regional District, Ktunaxa Nation, Central Kootenay Regional District, Regional District of East Kootenay, Regional District of Kootenay Boundary, Columbia Basin Trust, and Village of Valemount. (2018). Columbia Basin & Boundary Connectivity Strategy. Available at: https://pub-csrd.escribemeetings.com/filestream.ashx?DocumentId=11302

xxii Columbia Basin Trust. *Broadband – Who we are.* Available at: https://broadband.ourtrust.org/about/who-we-are/

xxiii Columbia Basin Trust. (2018). *Broadband Strategic Framework 2016/2017-2019/2020.* Available at: 2018-02-CBBC_Strategic_Plan_2018_Final.pdf

xxiv Columbia Shuswap Regional District, Ktunaxa Nation, Central Kootenay Regional District, Regional District of East Kootenay, Regional District of Kootenay Boundary, Columbia Basin Trust, and Village of Valemount. (2018). Columbia Basin & Boundary Connectivity Strategy. Available at: https://pub-csrd.escribemeetings.com/filestream.ashx?DocumentId=11302

xxv Northern Development BC. (n.d.). *Connectivity Handbook.* Available at: https://www.northerndevelopment.bc.ca/wp-content/uploads/2015/06/Connectivity-Handbook.pdf

xxvi Canadian Rural Revitalization Foundation. (2019). *State of Rural Canada III – Bridging Rural Data Gaps.* Eds. Main, H.; Breen, S.P.; Collins, D.;Gaspard, V.; Lowery, B.; Minnes, S.; and Reimer, W. Available at: http://sorc.crrf.ca/sorc3/

xxvii Living Lakes Canada, Columbia Basin Trust, Columbia Basin Watershed Network, Selkirk College. (2017). *Water Data Hub: Conference Summary.* Available at: https://livinglakescanada.ca/wp-content/uploads/2018/09/Columbia-Water-Data-Hub-2017-Conference-Summary-FINAL.pdf

xxviii Rural Development Institute. (2016). *Trends Analysis: Economy.* Available at: http://datacat.cbrdi.ca/sites/default/files/attachments/TA_Economy_2016.pdf

xxix The Globe and Mail. (2019). *Small Businesses caught in an epidemic of cyber attacks.* Available at: https://www.theglobeandmail.com/featured-reports/article-small-businesses-caught-in-an-epidemic-of-cyber-attacks/