

INVEST VANCOUVER

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Technical Paper:

Preparing Metro Vancouver for the Digital Economy



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Invest Vancouver

Invest Vancouver is the region's economic development leadership service with the mission to position the region for success in a rapidly evolving global economy.

Collaborating with a cross-section of regional leaders from industry, First Nations, labour, government, non-profit organizations, and education, Invest Vancouver:

- works directly with global investors to facilitate business investment and expansion into our region
- informs economic development decision-making with cutting-edge data analytics and comprehensive market intelligence
- advises leaders on sound economic development strategy and policy to enhance our region's global competitiveness
- fosters regional economic development collaboration to position our communities and people to prosper amidst our changing economy
- promotes and showcases the industry advantages and opportunities our region has to offer to the world

This technical paper is intended to advance informed economic development decision making.

Message from the Chair



I am pleased to present the inaugural technical paper from Invest Vancouver, titled: Preparing Metro Vancouver for the Digital Economy.

This past year has truly been historic, and the disruptions wrought by the COVID-19 pandemic have revealed much. On the positive side, we learned that many of our systems are indeed resilient, that courage and compassion are endemic, and that bold changes are possible if we pull together.

However, the pandemic also exposed and exacerbated many divides, such as the uneven playing fields people experience in the health care and justice systems, in job and income security, and in feeling safe and respected.

The transition to an innovation-driven digital economy, where ideas and intellectual property are more valuable than physical assets, is already underway. At Metro Vancouver, we have always planned and prepared for the future and worked to ensure the resilience of our systems and essential services in the face of great change, both expected and unexpected. And now it is clear our commitment must go even deeper – to ensure the resilience of our economy, institutions and communities in the face of even faster changes.

Despite the challenges we have all faced, I am optimistic about our collective ability to navigate this transition and the opportunities that lie ahead, and I am confident that through our willingness to work together, we can build on our strong foundations and achieve a shared vision of a livable, prosperous, and sustainable region for all.

If we make the right moves today, play to our region's unique industrial strengths and remove systemic barriers to investment relative to other global regions, we can ensure our region is a key player in the 21st century global economy, for the benefit of all who are fortunate to call this region, "home."

A handwritten signature in black ink that reads "Sav Dhaliwal". The signature is fluid and cursive.

Sav Dhaliwal,
Chair, Metro Vancouver Board of Directors

I. Executive Summary

The ongoing rapid transition to the digital economy, with its accompanying shifts and dislocations in the labour market, will require workers and governments alike to adapt to the changing demand for labour. The number of well-paid, full-time jobs is falling in production-based industries due to mechanization, automation, outsourcing, and the use of temporary and contract workers. Employment growth in extraction-based industries such as forestry and mining is constrained by environmental concerns and climate change. And while there will be many opportunities for firms to innovate and thrive in the digital economy, job seekers must overcome barriers to specialized education and training pathways, or risk being further left behind.

This paper lays out the challenges presented by the current transition to a digital economy and presents four economic development strategies to help the Metro Vancouver region meet them.

Digital Economy

The digital economy is driven by innovation. Increasingly, ideas and intellectual property are more valuable than physical assets. Digitization, automation, robotics, artificial intelligence (AI), and improvements to information technologies enable faster and more efficient processes, but also have large implications on the nature of work and allocation of labour.

To contend with the challenges and take advantage of the opportunities presented by the digital economy, the region's leaders should focus on the following four economic development strategies:

1. Invest in our people

Reinforce a regional talent development structure that is more connected, industry-responsive, "future-proof", and adaptive to the rapidly changing labour market needs of industry

2. Catalyze innovation

Develop the region's innovation capabilities to diversify and strengthen the productive advantages of established industries and to create entirely new ones that drive solutions to societal challenges

3. Build capacity in our key industries

Align and deploy assets and fill gaps along the product / service value chains within our region's export-oriented industries

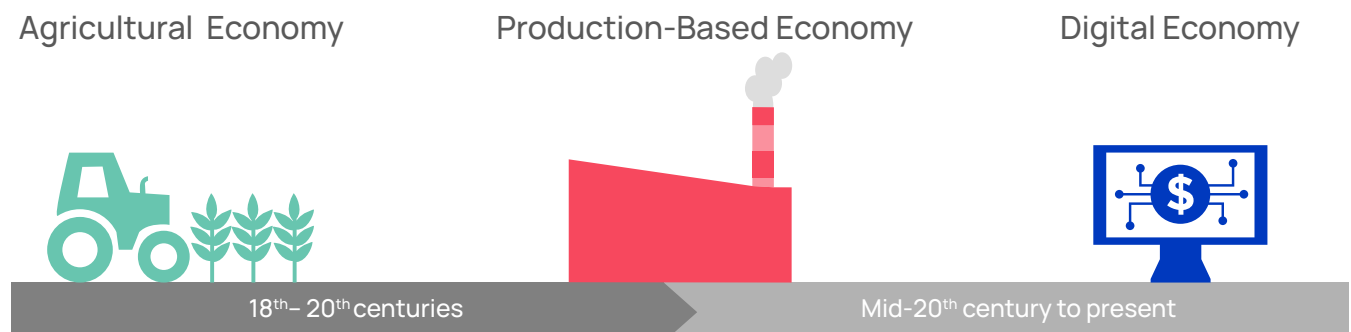
4. Increase our global connectedness

Open up new markets for the region through trade facilitation, export assistance programs to increase the number of export-ready firms, and the attraction of foreign investment into the region within key industries

Prioritizing these areas will drive the region's economic recovery, further its resiliency, and power the region's next economic renaissance in a way that advances equitable opportunity and more broadly shared prosperity for all of Metro Vancouver's residents.

II. The Past: Transition from an Agricultural to a Production-Based Economy

The transition to a digital economy has been striking in its level of labour market disruption due to its speed, the rapid pace of skills transformation, and the high levels of potential job loss.



The transition from an agricultural economy to a production-centric one, which was driven by the introduction, adoption, and deployment of new time-saving equipment in both agriculture- and production-based industries, occurred over more than 250 years. Due to the long timeframe, growing production-oriented industries had time to reabsorb and redeploy the workers leaving the agricultural-based economy. This was due, in large part, to the low opportunity costs associated with this transition and the transferability of skills between field work and factory work. Specifically, the process of reabsorbing the excess supply of labour leaving farms was aided by the similar physical labour requirements between the two different economies during most of this transition. Additionally, the productivity gains achieved through new factory machinery and technology helped to grow the overall size of the production-based economy.

Efficient Reabsorption of Excess Labour due to:

Low opportunity costs: a worker could leave a farm and transition to employment on the floor of a factory, especially in commoditized / routine manufacturing where new skills or higher levels of education were not required.

Transferrable skills: the skills that were required for a worker in an agricultural-based economy adapted well to the production-oriented one.

Productivity gains: labour, on a unit basis, is much more productive in a manufacturing-based economy than in an agriculture-centric one. The rapid adoption and deployment of new machinery and technology (including within the agricultural sector) meant that efficiency gains could be reinvested, resulting in larger, more labour-dense, and concentrated manufacturing sectors that could accommodate more labour leaving the agricultural economy. (See Figure 1)

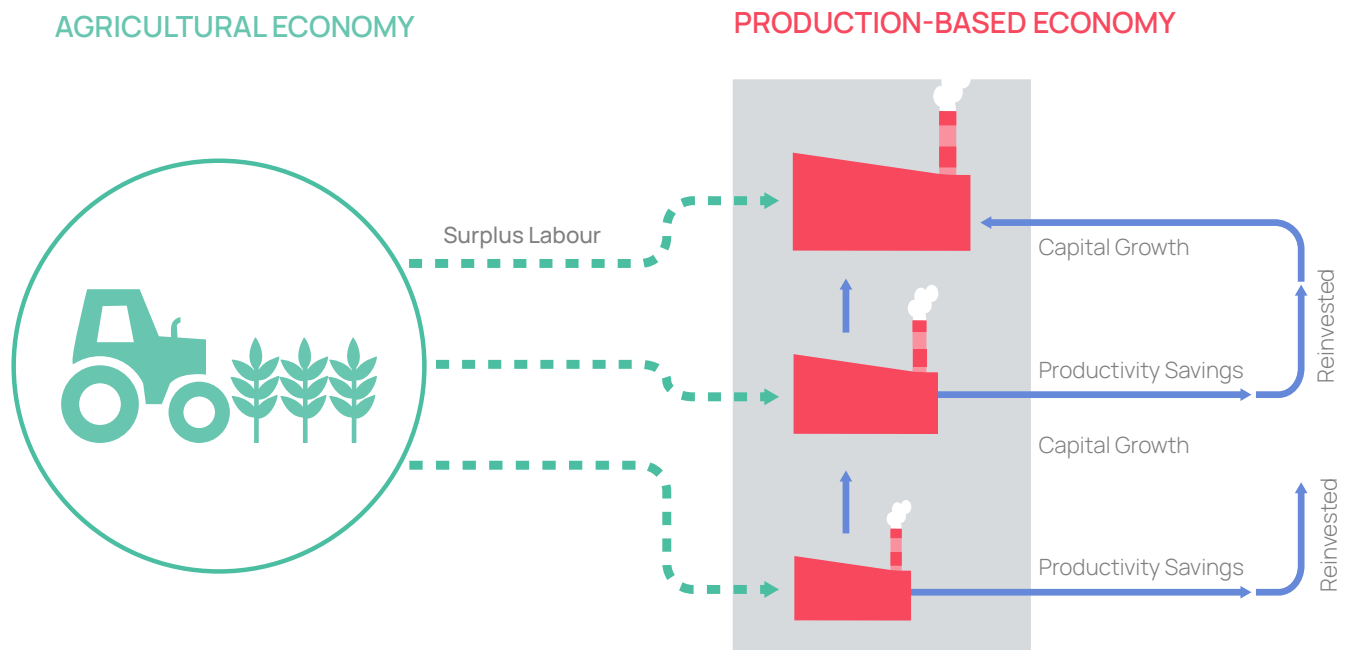


Figure 1: The Lewis Model of Economic Development¹

¹ The Lewis Model of Economic Development, the core of which is: the transfer of labour resources from the agricultural sector, where the work is menial and routine without sophisticated technology and where there is much labour that is underemployed, to the more modern industrial sector, where labour that can be deployed more productively without large wage increases will create a surplus (i.e. profits) that may be used for further growth and development, such as building more factories and expanding businesses.

III. Transition from a Production-Based to a Digital Economy

Unlike the 250-year transition from an agricultural economy to the industrialized one, the transition to the digital economy has occurred in fewer than 50 years. In a production-based economy, labour was the driving force of value creation. In today's digital economy, intellectual property, technology, capital, and knowledge are driving value creation and capture. Two important factors that allowed for labour to be efficiently absorbed and deployed during the previous transition: low opportunity costs and transferrable skills, are not present in the transition to the digital economy. In addition, the excess of labour leaving the production-based economy exceeds the amount of labour needed in the digital economy.

Percentage of workers at a high risk of seeing their jobs transformed through automation in Canada²:

- 11% of all Canadian workers
- 33% of workers without a certificate, degree, or diploma
- 27% of workers in the bottom decile of income distribution
- 27% of workers in manufacturing

² Frenette, Marc, and Kristyn Frank. 2020. The Demographics of Automation in Canada: Who Is at Risk? IRPP Study 77. Montreal: Institute for Research on Public Policy. Retrieved from <https://irpp.org/wp-content/uploads/2020/06/The-Demographics-of-Automation-in-Canada-Who-Is-at-Risk.pdf>

Difficult to Reabsorb Labour due to:

Lower demand: the digital economy is not labour-intensive, and due to rapid efficiency gains and other factors, the quantity of workers needed today is far lower than the production-based economy.

High opportunity cost: large investments are required to upskill, better educate, and retrain workers to enter the digital economy.

Skills not transferrable: the skills and competencies that were required for success in the production-based economy do not easily translate to the innovation-intensive industries of the digital age.

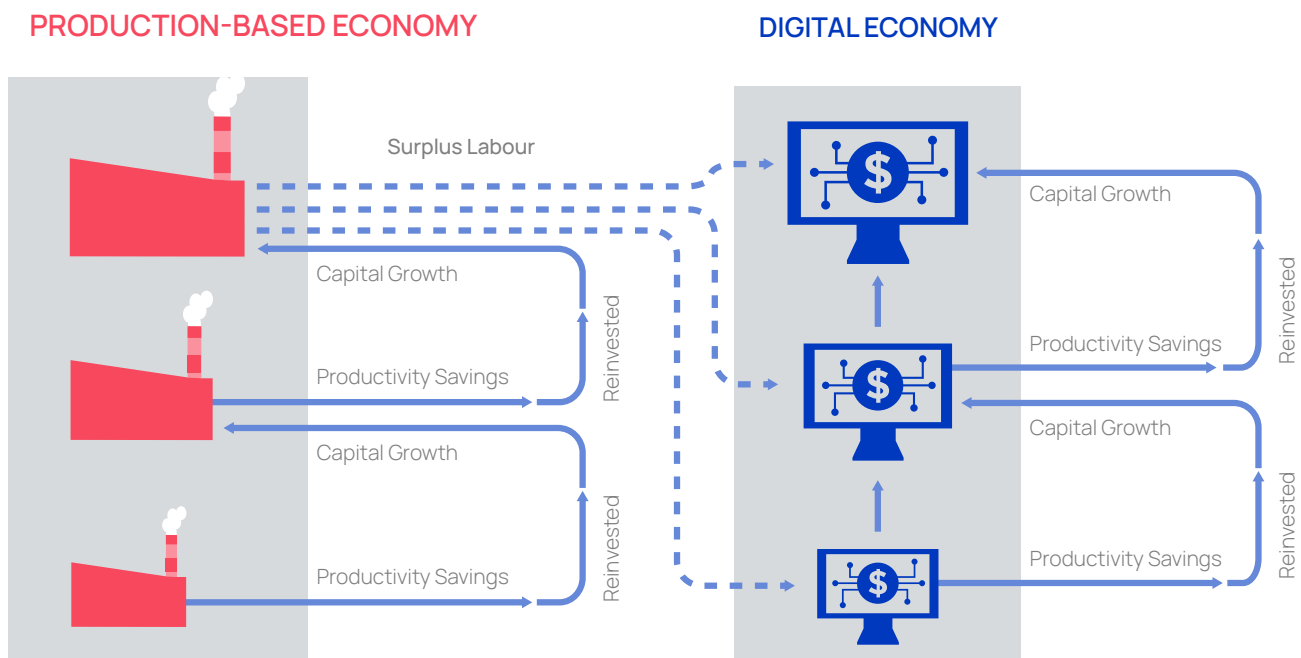


Figure 2: Extension of the Lewis Model of Economic Development

As the economy shifts, policy makers should focus on growing the region's competitive advanced industries, as opposed to putting in place policies meant solely to protect contracting sectors of the economy. By not also focusing on growing and preparing more residents for the economy of the future, the negative social and economic impacts of this transition will be amplified.

Negative Social and Economic Impacts:

Underemployment, precarious work, and the “gig” economy: the changing nature of work has given rise to precarious employment that lacks the benefits and protections available to previous generations.³

Employment growth concentrated in low-wage service-sector positions: some of the fastest growing occupational categories pre-pandemic in the Metro Vancouver region have been occupations such as restaurant servers, retail salespeople, cashiers, healthcare aides, and food preparation.⁴ These occupations provide limited opportunity for advancement and are at a greater risk of automation.

Growth does not equal prosperity: headline economic measures, such as unemployment rates and gross domestic product (GDP), do not tell the full story in terms of the growing numbers of underemployed, working poor, and contract workers barely getting by during the “full employment” economy that preceded the global pandemic. This has been recognized by initiatives such as the Community Well-Being Index.⁵

Despite the rising growth rates seen in the economy over the last 50 years, many workers have fallen further behind as productive gains have been achieved through the rapid and mass adoption of new technologies at the expense of labour.

More people are becoming disconnected from traditional pathways into the middle class.

Prior to the COVID-19 pandemic:

13% of British Columbians were employed on a contract or temporary basis, making on average \$6/hour less than a permanent employee.⁶

8.2% of Canadians were participants in the unstable “gig economy”.⁷

Both of these numbers are likely to rise.

3 Statistics Canada (2019). Temporary Employment in Canada, 2018. Catalogue no. 11-627-M. Ottawa, ON: Statistics Canada. Retrieved from <https://www150.statcan.gc.ca/n1/pub/11-627-m/11-627-m2019034-eng.htm#moreinfo>

4 British Columbia WorkBC (2019). British Columbia Labour Market Outlook: 2019 Edition. Victoria, BC: British Columbia WorkBC. Retrieved from https://www.workbc.ca/getmedia/18214b5d-b338-4bbd-80bf-b04e48a11386/BC_Labour_Market_Outlook_2019.pdf.aspx

5 Indigenous Services Canada (2019). Community Wellbeing Index. [Website]. Retrieved from <https://www.sac-isc.gc.ca/eng/1100100016579/1557319653695>

6 Statistics Canada (2019). Measuring the Gig Economy in Canada Using Administrative Data, 2019. Catalogue no. 11F0019M. Ottawa, ON: Statistics Canada. Retrieved from <https://www150.statcan.gc.ca/n1/pub/11f0019m/11f0019m2019025-eng.htm#moreinfo>

7 Statistics Canada (2019). Temporary Employment in Canada, 2018. Catalogue no. 11-627-M. Ottawa, ON: Statistics Canada. Retrieved from <https://www150.statcan.gc.ca/n1/pub/11-627-m/11-627-m2019034-eng.htm#moreinfo>

“ At YVR, innovation is central to who we are and how we operate. For many years, we have taken steps to adapt to the shift toward a digital economy. As we move through the pandemic, this shift is accelerating and we see a real opportunity for YVR to lead the exchange of learning and ideas that will drive B.C.’s economic recovery. This is our role as the Gateway to the New Economy. Operating our airport and safely moving people, planes and goods will remain at our core. At the same time, we are broadening our focus to also advance innovation, support the region and set the bar for sustainability, both in and outside of aviation. We are excited about the potential for partnership and collaboration and ensuring B.C. is ready to thrive in the future.”

— Tamara Vrooman, President and CEO at the Vancouver Airport Authority

Image credit: Vancouver Airport Authority

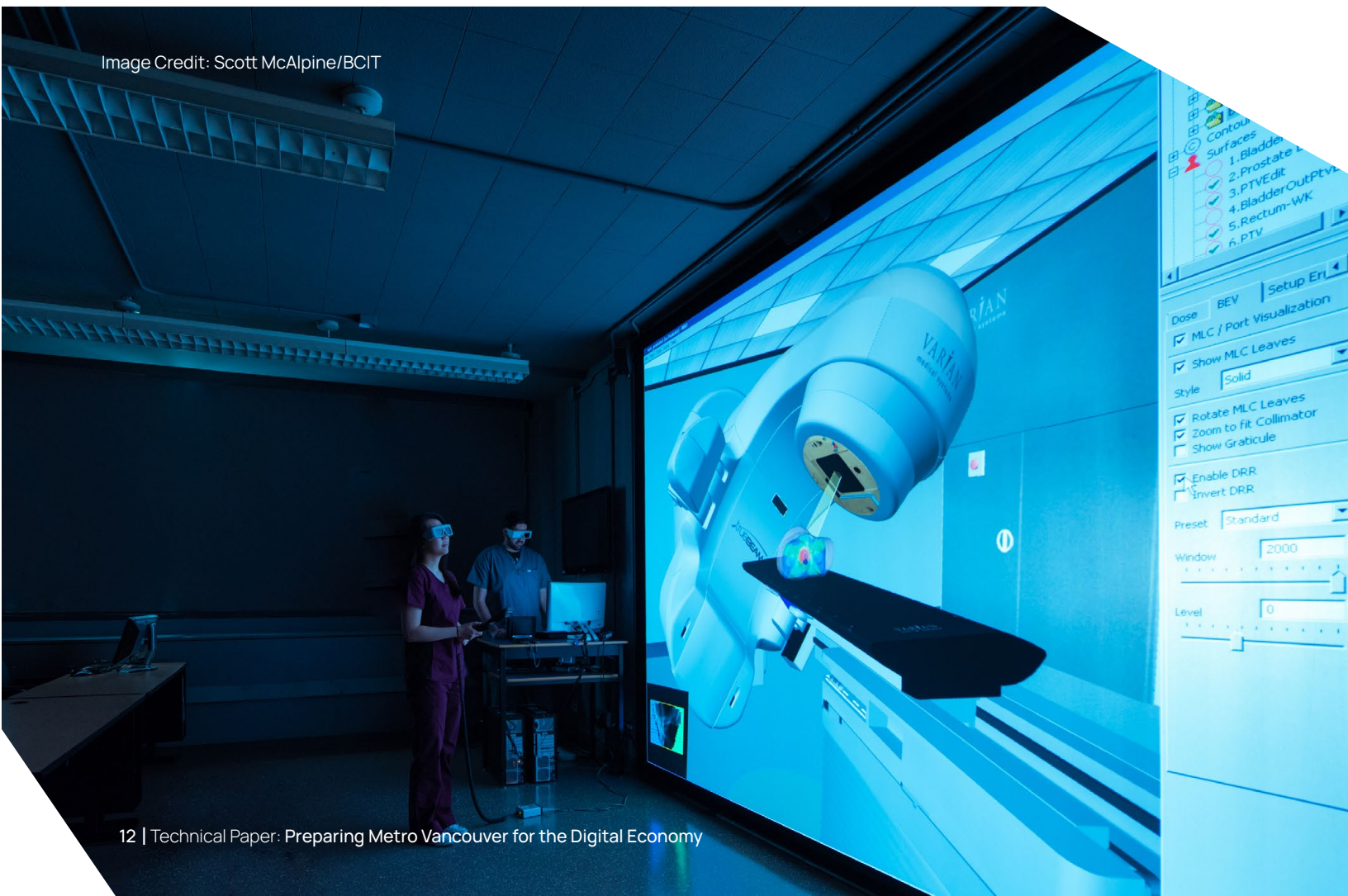


IV. Strategic Economic Development Priorities for the Region

To contend with the challenges and take advantage of the opportunities presented by the digital economy, the region's public, private, economic development, education, non-profit, labour, and philanthropic leaders should focus on the following four economic development strategies:

1. Invest in our people
2. Catalyze innovation
3. Build capacity in our key industries
4. Increase our global connectedness

Image Credit: Scott McAlpine/BCIT



1. Invest in Our People

Prepare the region's workforce for the digital economy

In a digital economy, specialized training and educational attainment are critical to economic success. The fastest growing sectors within the advanced economy are technology-centric, knowledge-based industries. This include sectors such as enterprise software, internet technology, biopharmaceuticals, clean technology, and digital media. These sectors offer well-paying jobs and career ladders, but require highly specialized education at all levels along the product / service value chain, from skilled machinists, to technicians, to engineers and scientists.

In order for the Metro Vancouver region to produce the right type of labour for the advanced digital economy, the region needs to ensure talent development systems are re-configured and linked across all educational systems, from kindergarten through high school to adult schools, technical colleges, and universities. In addition to ensuring that necessary programs are increasing their capacity, the system needs to be more industry-responsive, demand driven, future-forward, and equity-centred, providing greater opportunity for those that have faced historic barriers to participation, such as the region's Indigenous communities.

“ People are the key to unlocking our region's innovation potential.

An education system that is dynamic, undertaking cutting-edge research and engaging with industries, governments, and communities, is essential for creating a more prosperous society.”

— Joanne Curry, Vice President, External Relations, Simon Fraser University

A regional education and talent development system for the digital age must be:

1. **Adaptive and responsive** to industry and fast-changing labour market needs in real-time, with industry representatives “at the table” in the development of stackable industry-recognized certificates, short-term talent development programs, and longer-term curricula to train students, job seekers, incumbent workers, and dislocated workers for occupations at low-risk of automation and in high demand by the industries of tomorrow
2. **Demand-driven** and linked between all talent development systems and institutions to provide education and talent development pathways and quick “pain point” identification to ensure training and educational advancement
3. **“Future-proof”** in preparing job seekers, incumbent workers, students, and dislocated workers for jobs that are at low-risk of redundancy and in high-demand by the industries that represent the drivers of tomorrow's economy
4. **Equity-centred**, focused on removing barriers to education for equity-denied groups and Indigenous communities, and developing comprehensive skills transfer programs for newly-arrived immigrants with professional licences in their former countries

2. Catalyze Innovation

Through entrepreneurship, innovation and technological development, accelerate the region's development and commercialization of solutions for the world's great global challenges

Innovation will be vitally important for meeting the current economic, environmental, health, and social challenges facing the region and globe. Traditional 20th century economic development strategies tend to focus on the attraction of outside industries through incentives or other tactics to lure single businesses or companies to a region. Economic development for the digital age, however, must focus more on growth drivers, such as entrepreneurship, innovation, and technology development from within. Reframing the region's strategic economic development approach to prioritize innovation and entrepreneurship will boost the productive advantages of established and emerging industries while also creating entirely new industries, especially as the region addresses some of its strengths and weaknesses in a post-pandemic economy.

Productive Advantage

Many factors can contribute to a region's productive advantages in an industry, such as:

- Firm and employment concentrations
- Supplier specializations
- Research and development expertise
- Knowledge spillovers
- Deep pools of skilled labour
- Education and skills training
- Competitive cost environment
- Industry incentives
- Access to international markets



Metro Vancouver's innovation landscape benefits from three key features:

1. The diversity and multidisciplinary nature of its established and emerging industrial base

Metro Vancouver is not dominated by a single industry. Instead, innovation is driven by its established industries, such as transportation and film production, as well as fast-emerging sectors in digital media, clean technology, and advanced transportation, and the connections and convergence between these industries.

2. Leading research universities

The region's research universities are global leaders in applied and translational research, aiming to solve societal, environmental, health, industrial, and economic challenges through applied science, technology transfer, and the propagation of entrepreneurship.

3. Regional commitment to address global challenges

The region is committed to addressing major global challenges locally, such as climate change, water and food security, and health pandemics. This commitment to research, develop, and commercialize solutions to these global challenges has the potential to become a significant driver of economic development in the region, positioning an increasing number of Metro Vancouver-based firms and institutions to become some of the world's leading exporters of these solutions.

By leveraging these regional differentiating features, the Metro Vancouver region can ensure that it is not simply consuming the products and services designed to solve these global challenges. Instead, the region can become a leading researcher, engineer, manufacturer, and exporter of these solutions. The starting point is investment in applied and translational research and talent, and the capitalization and commercialization of that research and innovation.

Catalyzing Innovation at Canada's Digital Technology Supercluster

The Digital Technology Supercluster, based in B.C., is proud to accelerate innovation to solve some of industry and society's biggest problems and help Canadian companies build job-ready, world-class, digital talent and teams.

The Supercluster does this by co-investing in Canadian-made technologies and rapid skilling systems. Along with funding, they bring together private and public sector organizations of all sizes to address challenges facing Canada's economic sectors including healthcare, natural resources, manufacturing, and other important industries.

“ Through a collaborative innovation approach, the Supercluster helps to drive solutions better than any single organization could on its own.”

– Gina Arsens, CFO, Digital Technology Supercluster

3. Build Capacity in Our Key Industries

Play to the region’s established and emerging industrial strengths as an economic development differentiator, in a globally competitive, digital economy

As the transition to the digital economy will outpace our ability to retrain and reabsorb workers, the region must prioritize strategies to build labour demand capacity within key industries in the region. Target industries should include those in which the region demonstrates productive advantages over other economic regions, such as deep talent pools, supplier concentration and specialization, research and development expertise, and knowledge spillovers. Seven industry clusters have been identified as established and emerging industries that should be targeted here in the Metro Vancouver region (Figure 3).

These industry clusters have the following features, which make them important industrial targets on which to focus the region’s capacity-building strategies and activities:

- **High concentrations of interconnected businesses** producing a reinforcing cycle of job creation and wage growth, accelerating innovation and complementary linkages among industry members, and increasing the productivity of firms, suppliers, and workers
- **Export-oriented**, selling goods and services outside as well as within the region
- **Drive the local service economy** triggering ripple effects, in the form of job, wage, and tax revenue growth, which are felt by more locally-serving businesses, workers, and communities

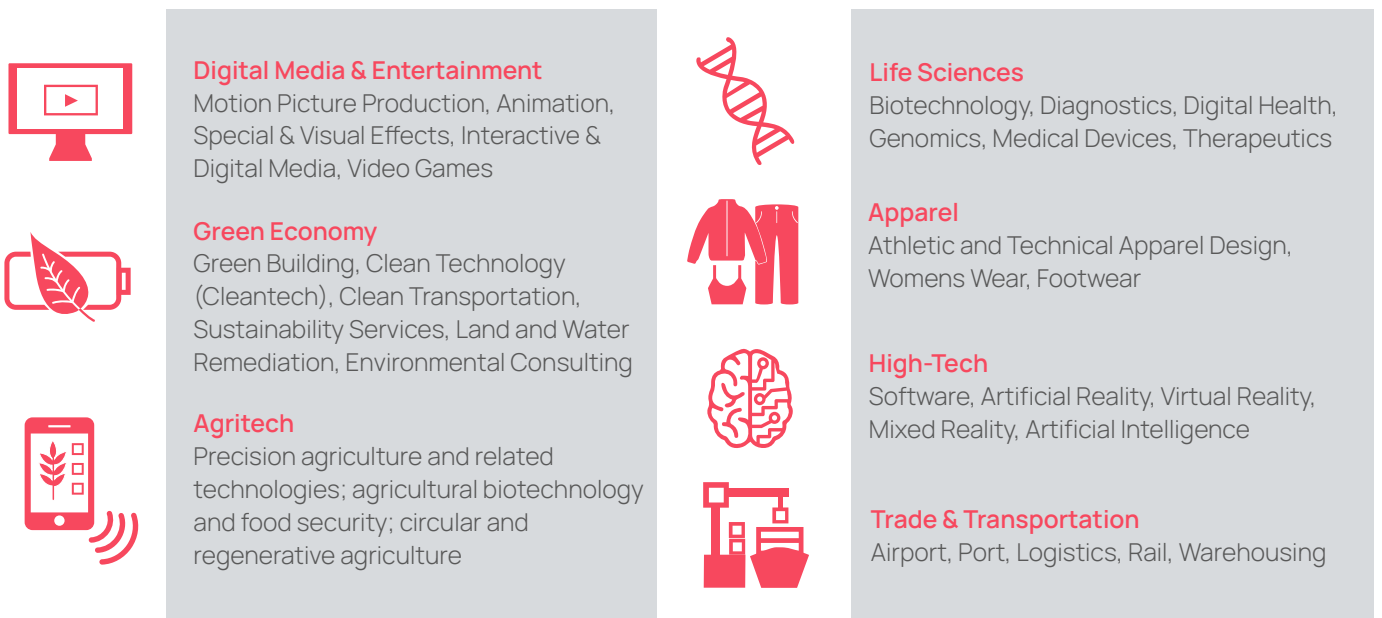


Figure 3: Metro Vancouver's Key Industry Clusters

In order to maximize the clustering benefits of these industries, an “idea” to “export” capacity building approach must be adopted (Figure 4). This involves assessing the entire product or service value chains associated with the region’s key industries, from research, to design, to create, to build, to market, to export. Based on that assessment, economic development-related assets or inputs, such as physical spaces, talent, education institutions, capital, networking organizations, and research and development, can be better aligned and deployed to strengthen and grow these key industry clusters. Importantly, the region must also implement strategies to fill any gaps along the value chain, such as limited access to capital or the lack of industrial space.

Finally, the region’s leaders must institute strategies to reduce barriers to entry to these key sectors to enable a more diverse and inclusive workforce. Providing better pathways into these industries for people in under-represented groups must be a top priority as the region looks to ensure greater access to the rewards of this digital economy and its emerging industries. This will help build more ethnic, cultural, gender, and racial diversity within these industries and advance more inclusive and shared prosperity across the Metro Vancouver region going forward.



Figure 4: “Idea” to “Export” value chain

“ The resilience of our economy depends, in part, on understanding the determinants of competitive success in an era of accelerating technological change. **A forward-looking economy must take advantage of opportunities afforded by emerging technologies, particularly in the export-oriented industries that do so much to underpin regional prosperity.**”

— Jock Finlayson, Senior Policy Advisor, Business Council of British Columbia

4. Increase Our Global Connectedness

Build global connections to open up new markets and attract more investment into the region

Metro Vancouver's economy is highly reliant on its interactions with the global economy. Exports from the region, and foreign investments made into the region, drive business and job creation, along with generating tax revenues. Transactions such as tourists reserving hotels, international students studying at universities, businesses moving goods through Metro Vancouver's ports, and international firms opening North American headquarters in the region increase productivity, create jobs, and foster wage growth. These global connections need to be further developed as a key differentiator and lure for investment into Metro Vancouver going forward, strengthening the region's reputation as an attractive and safe market for international investors.

The region can increase its global connectedness through a targeted branding strategy to enhance the attractiveness, profile, and reputation of the region on a global stage.

Increase Global Connectedness:

1. **Market the region** as a place for businesses to succeed, capital to be invested, and skilled talent to be found in target industries
2. **Facilitate deeper trade relations** to open up new foreign markets for key industries
3. **Focus on export assistance** and "readiness" strategies, programs, and services to increase the number of export-ready firms
4. **Collaborate to attract foreign direct investment** in target industries

In a connected global economy, organizations have a wide variety of choices on where to invest. By investing in our people, catalyzing our innovation capacities, building capacity in our key industries, and increasing our global connectedness the Metro Vancouver region will be better positioned to attract foreign capital and investment into the region, targeted into our key industries. In turn, this foreign investment will produce ripple effects in our economy.

Diversity is our strength

In addition to the global connectedness of the region, Metro Vancouver is recognized for its diversity and multiculturalism. According to the 2016 census:

- 48% of the region's population is made up of immigrants
- 50% speak a language other than French or English⁸

8 Statistics Canada (2017). Focus on Geography Series, 2016 Census. Catalogue no. 98-404-X2016001. Ottawa, Ontario. Data products, 2016 Census. Retrieved from <https://www12.statcan.gc.ca/census-recensement/2016/as-sa/fogs-spg/Facts-cma-eng.cfm?LANG=Eng&GK=CMA&GC=933&TOPIC=7#sec-geo-dq>

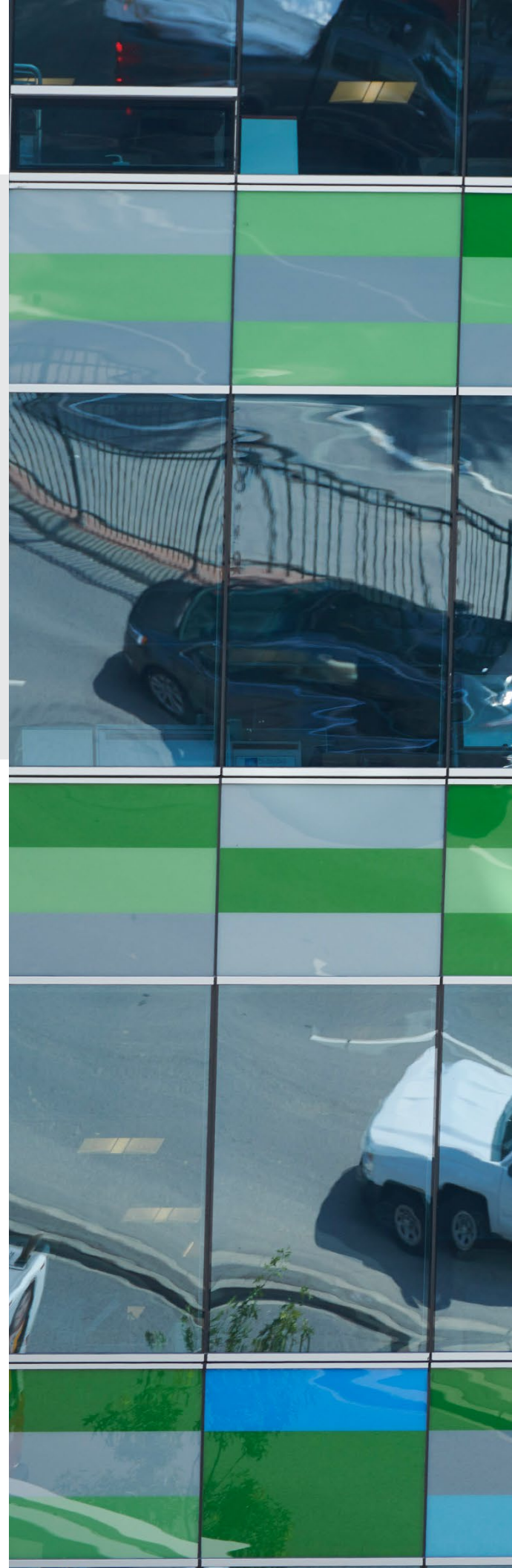
“ As we work to create more capacity to accommodate growth in trade, the digital programs we have in place aim to increase visibility and operating efficiencies across the supply chain. Programs like these increase the region’s reputation of having a reliable and efficient supply chain while attracting investment and connecting Canadian businesses to global markets, which is critical for the long-term economic viability of this gateway and of Canada.”

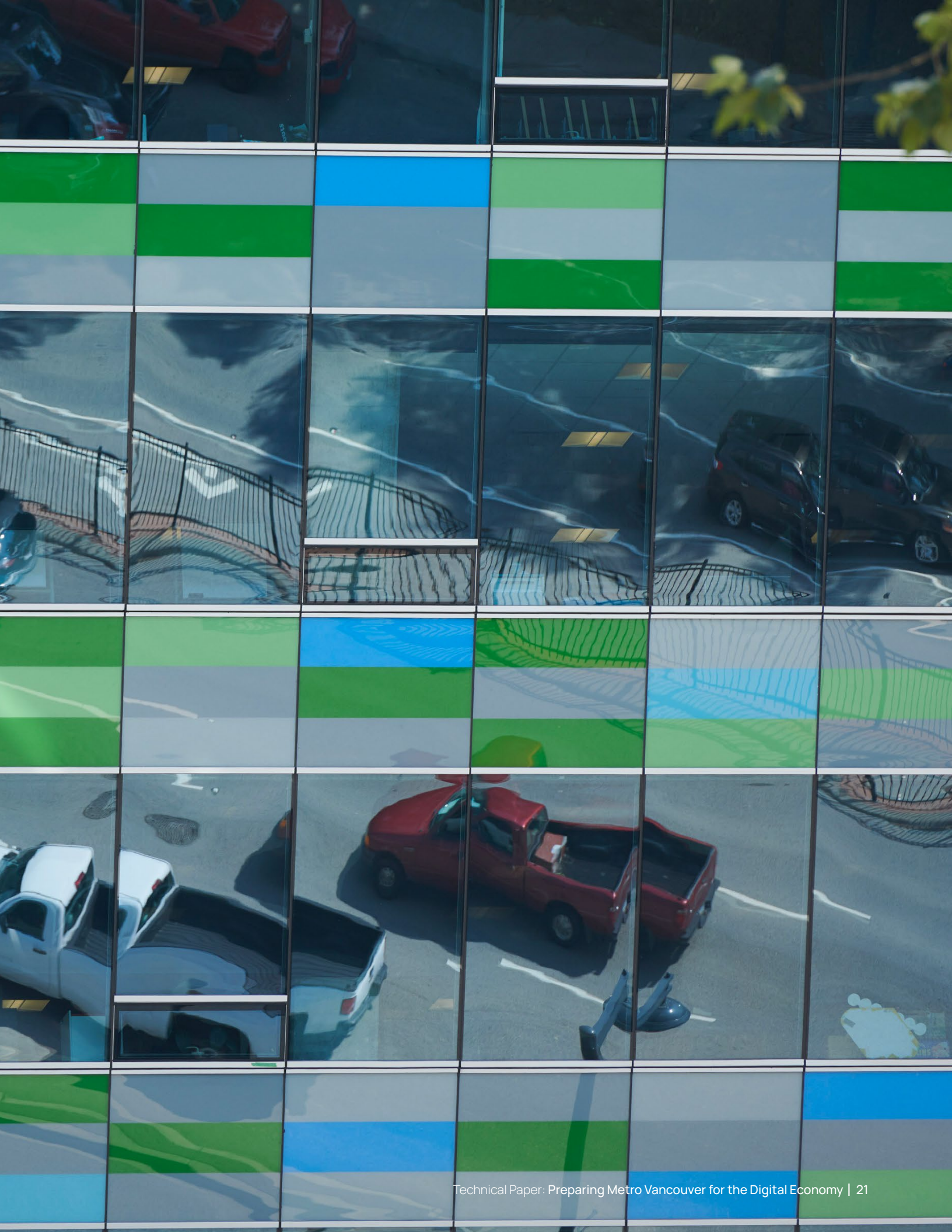
— Robin Silvester, President and Chief Executive Officer,
Vancouver Fraser Port Authority



V. Conclusion

The rapid pace of the transition to a digital economy presents many global challenges, but also opportunities for the Metro Vancouver region. As the region contends with the economic impacts of the COVID-19 pandemic, public, private, economic development, education, non-profit, labour, and philanthropic leaders must re-think their approaches to economic development. By retooling our systems and processes for the digital age, Metro Vancouver can seize the opportunity presented by the transitioning economy and build more inclusive and shared prosperity for all residents.





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