Appendix A

# City of Hamilton

# Information and Communications Technology (ICT) and Digital Media Sector FDI Strategy

February 2020

# Table of Contents

# Executive Summary

The Information and Communications Technology (ICT) and Digital Media Sector FDI Strategy is a sector profile initiated by the City of Hamilton that describes the current state and value proposition of this sector and provides direction for the City of Hamilton to foster a thriving ICT & Digital Media sector.

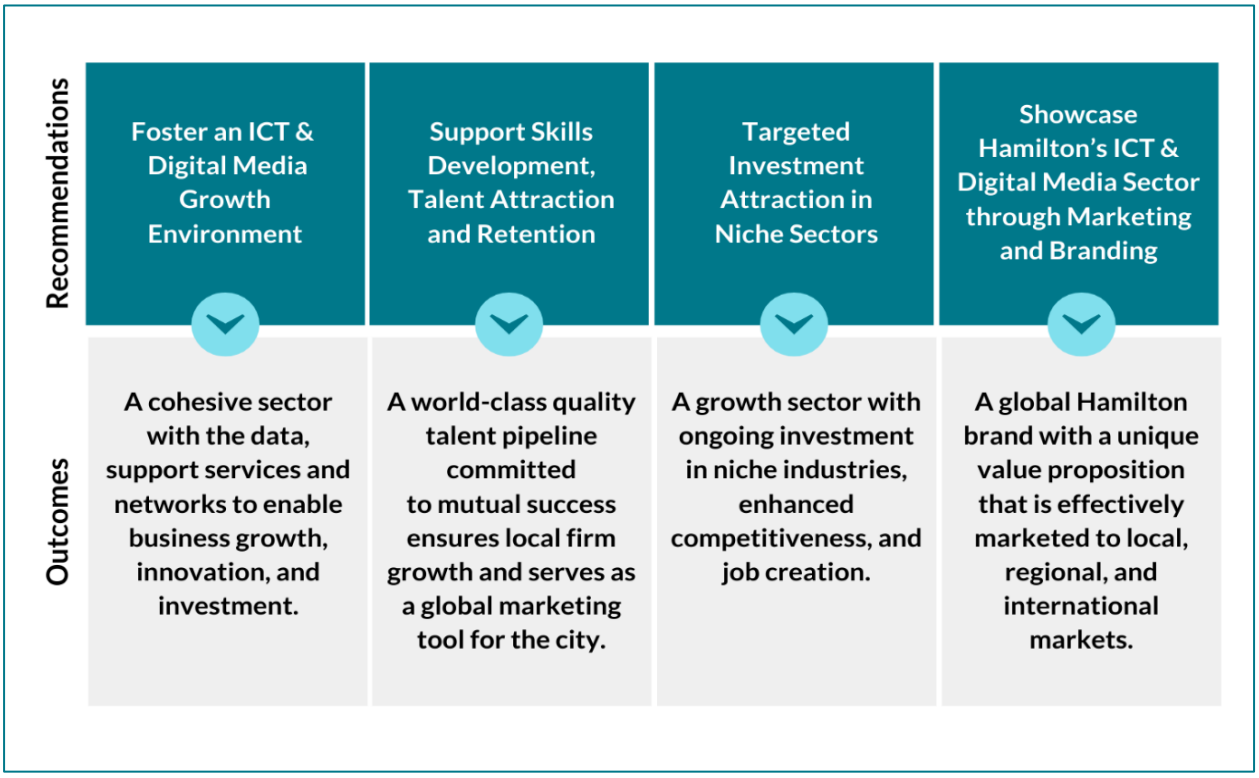
The Strategy development process started in October 2019. It included research and analysis, a comprehensive consultation process with businesses and industry partners, the development of a unique value proposition and potential FDI targets for the city and recommendations to advance the sector.

The city of Hamilton is well-positioned to capitalize on the growing opportunities and strengths of the ICT and Digital Media sector. The sector which saw a higher rate of growth compared to all other industry sectors within the city has been driven primarily by professional and technical services and the information and cultural services. Digital media is an important aspect of these industries for the production and delivery of content including motion pictures, videos, television programs or commercials. Niche opportunities exist for the City, including Interactive Digital Media (IDM) and Health based Technologies. Also, potential FDI targets, primarily Californian companies looking to expand across North America, Europe, and the Asia Pacific, present prospects for the city to realize growth and investment. The following infographic sheets present an economic snapshot of Hamilton's Information and Communications Technology (ICT) and Digital Media Sector.

The City has been a strong enabler of businesses growth and support, innovation and talent. Central to these efforts are the Hamilton Business Centre and local incubators, accelerators and innovation support that include The Forge, McMaster Innovation Park, ideaWORKS, mHealth & eHealth Development and Innovation Centre (MEDIC), Surge, Hamilton Health Sciences (HHS) and the CREATE (CentRE for dAta science and digiTal hEalth) team along with major post-secondary institutions such as McMaster University and Mohawk College. New investments by the City, including the creation of a "Technology and Medical Innovation Centre" and the McMaster Innovation Park's (MIP) Master Plan, are central to supporting the continued growth of the sector.

The Information and Communications Technology (ICT) and Digital Media Sector FDI Strategy defines a value proposition for Hamilton's ICT & Digital Media sector, one that goes beyond the traditional messages and focuses on the assets and attributes that can enable the City to realize success in sector-based investment attraction and marketing. Key attributes for the city include its strong and highly qualified labour force, a world-class education and innovation system with a unique digital technology focus, a growing digital economy industry base and a strong base for ICT & Digital Media growth and investment. Hamilton is in a unique position to capitalize on its digital businesses and pave the way for digital transformation, particularly during the current COVID-19 period.

Actions identified within the Information and Communications Technology (ICT) and Digital Media Sector FDI Strategy align with four high-level recommendations to achieve stated outcomes. The recommendations and outcomes for the Strategy are highlighted below.


Recommendations
Foster an ICT & Digital Media Growth Environment
Support Skills Development, Talent Attraction and Retention
Targeted Investment Attraction in Niche Sectors
Showcase Hamilton's ICT & Digital Media Sector through Marketing and Branding
Outcomes
A cohesive sector with the data, support services and networks to enable business growth, innovation, and investment.
A world-class quality talent pipeline committed to mutual success ensures local firm growth and serves as a global marketing tool for the city.
A growth sector with ongoing investment in niche industries, enhanced competitiveness, and job creation.
A global Hamilton brand with a unique value proposition that is effectively marketed to local, regional, and international markets.

# Hamilton's ICT & Digital Media Sector

**4%** Of all industries in the city can be classified as ICT & Digital Media

**+22%** Sector experienced a steady increase from 1,487 enterprises in 2016 to 1,808 in 2019

**60%** Of ICT & DM businesses in Hamilton are in the professional, scientific and technical services

**6TH** Hamilton ranks sixth in number of ICT & DM businesses compared to ten selected communities

**68%** Of the 1,808 businesses, the majority are sole proprietorships

**55%** Of businesses in the sector are in the growth phase with increasing revenues and customers

**79%** Of businesses in the sector expect business revenues to increase

Source: Canadian Business Counts, June 2019

## $1.3 billion


Hamilton's ICT & Digital Media sector makes a strong and growing contribution to its economy

**20%** Of the ICT & DM professionals work in the ICT & DM sector

## Top Occupations

Information systems analysts and consultants

Computer programmers and interactive media developers

Graphic designers and illustrators

Software engineers and designers

Computer and information systems managers

metroeconomics' Community-Based Projection System.

## Key Successes

- Located within the Toronto-Waterloo technology corridor
- As per the BRANHAM300 list, Hamilton is listed as a place for one of the Top 25 ICT Up and Comers in the country
- New initiatives by the City include the "Technology and Medical Innovation Centre" which includes a tech campus – a net leasable area of 572,000 sq. ft, a wellness center, flex workspaces and social spaces
- Local ICT & DM businesses consider Hamilton a favourable location for growth, and are highly satisfied with the quality of broadband/hi-speed Internet

## Niche Opportunities

- Interactive Digital Media (IDM) – games developers and publishers, eLearning software developers, VR/AR/MR developers, VR arcades, mobile app developers, digital advertising firms, interactive site web developers and software developers
- Health based Technologies – e-Health, digital health informatics
- Digital media is one of the fastest-growing parts of the creative cultural industries, both as a sector onto itself, tied closely to gaming, and as a force transforming the creation and distribution of a wide range of cultural content

## ICT & Digital Media FDI Opportunity

- Cloud solutions, AR/VR, autonomous vehicles, AI HQ. Cloud applications, Data science/analytics and Video conferencing
- EdTech
- Gaming
- Sports Analytics
- Motion Capture

Source: Statistics Canada, 2016 Census, 2018 Manifold Data Mining

# 1. Introduction

The Information and Communications Technology (ICT) and Digital Media Sector FDI Strategy is a sector profile initiated by the City of Hamilton to describe the current state and value proposition of this sector in the Hamilton economy. The Information and Communications Technology (ICT) and Digital Media Sector FDI Strategy (ICT & Digital Media Strategy) provides direction for the City of Hamilton to foster a thriving ICT & Digital Media and provide support for the city's digital industries.

Key components of the Strategy include:

- Target sub-sector opportunities
- Labour force development initiatives to address skills gaps identified
- Marketing messages that identify the unique value proposition of Hamilton to differentiate it from its competitors
- Required activities to underpin investment attraction potential within the sector including new or enhanced infrastructure
- Local, regional, and national partnerships and network development with organisations and applicable professional/industry associations
- A vision for the growth and retention of businesses and investment in the sector
- Recommendations related to marketing strategies for the retention, expansion, and attraction of new business investment and talent including ICT and Digital Media events to attend and attract to Hamilton
- Key performance indicators to ensure ongoing monitoring of success, growth, and areas of improvement in the sector

## 1.1 Project Process

The Information and Communications Technology (ICT) and Digital Media Sector FDI Strategy process began in September 2019 and included the following phases.

The process began with Research and Analysis (October 2019), providing a detailed analysis of the current state of Hamilton's Information and Communications Technology (ICT) and Digital Media Sector. This analysis included:

- A review of the City of Hamilton's existing strategies and initiatives of relevance to ICT and Digital Media sector development
- A statistical analysis of the ICT and Digital Media sector
- An assessment of the economic impact associated with Hamilton's ICT and Digital Media sector
- A benchmark analysis comparing Hamilton's ICT and Digital Media sector against ten comparator communities
- An asset inventory providing an initial universe of information of the ICT and Digital Media sector that the City can build

This was followed by a comprehensive community consultation process (January 2020), that provided insight into relevant opportunities and challenges in the sector, the role of Hamilton Economic Development Office and economic development partners in advancing these opportunities and initiatives needed to make the sector competitive in Hamilton. This engagement phase included:

- A CATI survey of 80 ICT and Digital Media businesses
- Eleven (11) targeted one – on – one interview with ICT & Digital Media businesses and economic development partners
- A targeted in-community workshop with ICT & Digital Media businesses and economic development partners

The results of the Research and Analysis and the sector CATI survey are provided as Appendix I: ICT and Digital Media Sector FDI Strategy Key Findings Report to this strategy report.

The final strategy development phase (February 2020) concluded in this Strategy. It included a summary of research and consultation and a value proposition that defines Hamilton's strengths as a digital city and economy, together with a series of strategic themes emerging from engagement. This was followed by actions and potential recommendations to advance the sector and its sub-sectors.

## 1.2 Defining Hamilton's ICT and Digital Media Sector

The working definition of the ICT and Digital Media Sector in Hamilton is based on the North American Industry Classification System (NAICS) codes identified in the City of Hamilton's Terms of Reference for this strategy. The definition is further informed by the Innovation, Science and Economic Development, Canadian ICT Sector Profile.

### 1.2.1 ICT and Digital Media Industries

The ICT and Digital Media industries defined using the North American Industry Classification System (NAICS) codes at the six-digit level are listed below. Approximately 44 industries were identified as part of the sector.

The ICT and Digital Media sector are further sub-divided into six sub-sectors based on industry focus, namely, manufacturing, wholesale, information and cultural, professional and technical services, educational services and other services. The sub-sectors are further detailed below:

- **ICT & DM – Manufacturing** – includes firms specializing in the manufacturing of computer and peripheral equipment, communications equipment, electronic components, audio and video equipment and magnetic and optical media.
- **ICT & DM – Wholesale** – includes firms engaged in wholesaling new and used computers, computer peripherals and pre-packaged computer software, electronic components, navigational and communications equipment and supplies.
- **ICT & DM - Information and Cultural** – includes firms engaged in core sub-sectors including software publishers, computer systems design and telecommunications carriers along with digital media economies including film and sound industries.
- **ICT & DM - Professional and Technical Services** – includes firms engaged in core professional and technical services such as digital design, video game and computer systems design.
- **ICT & DM - Educational Services** – includes computer training and professional schools that form an import part of the ICT & Digital Media value chain.
- **ICT & DM - Other Services** – includes firms engaged in repairing and maintaining electronic equipment and precision instruments.

| NAICS | Industries |
|---|---|
| **ICT & DM - Manufacturing** | |
| 334110 | Computer and peripheral equipment manufacturing |
| 334210 | Telephone apparatus manufacturing |
| 334220 | Radio and television broadcasting and wireless communications equipment manufacturing |
| 334290 | Other communications equipment manufacturing |
| 334310 | Audio and video equipment manufacturing |
| 334410 | Semiconductor and another electronic component manufacturing |
| 334511 | Navigational and guidance instruments manufacturing |
| 334512 | Measuring, medical and controlling devices manufacturing |
| 334610 | Manufacturing and reproducing magnetic and optical media |
| **ICT & DM - Wholesale** | |
| 417310 | Computer, computer peripheral and pre-packaged software merchant wholesalers |
| 417320 | Electronic components, navigational & communications equipment & supplies merchant wholesalers |
| **ICT & DM - Information and Cultural** | |
| 511211 | Software publishers (except video game publishers) |
| 511212 | Video game publishers |
| 512110 | Motion picture and video production |
| 512120 | Motion picture and video distribution |
| 512130 | Motion picture and video exhibition |
| 512190 | Post-production and other motion picture and video industries |

| NAICS | Industries |
|---|---|
| 512230 | Music publishers |
| 512240 | Sound recording studios |
| 512250 | Record production and distribution |
| 512290 | Other sound recording industries |
| 515110 | Radio broadcasting |
| 515120 | Television broadcasting |
| 515210 | Pay and specialty television |
| 517310 | Wired and wireless telecommunications carriers (except satellite) |
| 517410 | Satellite telecommunications |
| 517911 | Telecommunications resellers |
| 517919 | All other telecommunications |
| 518210 | Data processing, hosting, and related services |
| 519110 | News syndicates |
| 519121 | Libraries |
| 519122 | Archives |
| 519130 | Internet broadcasting and web search portals |
| 519190 | All other information services |
| **ICT & DM - Professional and Technical Services** | |
| 541410 | Interior design services |
| 541420 | Industrial design services |
| 541430 | Graphic design services |
| 541490 | Other specialized design services |
| 541514 | Computer systems design and related services (except video game design and development |
| 541515 | Video game design and development services |
| **ICT & DM - Educational Services** | |
| 611410 | Business and secretarial schools |
| 611420 | Computer training |
| 611430 | Professional and management development training |
| **ICT & DM - Other Services** | |
| 811210 | Electronic and precision equipment repair and maintenance |

### 1.2.2 ICT and Digital Media Occupations

In addition to the foregoing, MDB Insight has identified 15 occupations in the National Occupation Classification System (NOCS) considered crucial to the development of Hamilton's ICT&DM sector.

| NOC | Occupations |
|---|---|
| 0131 | Telecommunication carriers' managers |
| 0213 | Computer and information systems managers |
| 2133 | Electrical and electronics engineers |
| 2147 | Computer engineers (except software engineers and designers) |
| 2171 | Information systems analysts and consultants |

| NOC | Occupations |
|---|---|
| 2172 | Database analysts and data administrators |
| 2173 | Software engineers and designers |
| 2174 | Computer programmers and interactive media developers |
| 2175 | Web designers and developers |
| 2241 | Electrical and electronics engineering technologists and technicians |
| 2281 | Computer network technicians |
| 2282 | User support technicians |
| 2283 | Information systems testing technicians |
| 5224 | Broadcast technicians |
| 5241 | Graphic designers and illustrators |

### 1.2.3 Notes to the Reader

Given that the ICT sector and digital media are constantly evolving sectors of the economy and in some instances act as enablers for other industry sectors, we identify that providing set definitions for the sector using the NAICS should be approached with caution. The ICT and digital economy encompass many fields, including business intelligence, enterprise content management, supply chain management, video games, digital media, IT security, e-health, and e-commerce. The lack of set NAICS and NOC codes to define these connections and also to define key emerging economies such as cryptography and encryption, mobile authentication, cybersecurity, public safety and product certification, prove difficult in describing the breadth of the sector.

However, the data provided throughout the report provides a baseline of information for the City of Hamilton in defining and exploring the sector and in understanding contributions to the value chain and the economy more generally. Throughout this report, selected ICT and Digital Media NAICS codes are used to define Hamilton's sector, determine its performance and contributions to the economy, understand the labour force and occupations that are critical to the sector and benchmark it against comparator communities.

## 1.3 The Canadian Digital Landscape

The 2017 OECD Digital Economy Outlook identifies that despite the global economic crisis, the long-term prospects for sustained growth in the ICT sector among the OCED countries is strong. However, Canada lags behind its trading partners in the creation of large digital technology firms and in having a community of successful high-growth firms. It is estimated that between 2013-2016, China, Chinese Taipei, Japan, Korea, and the United States together accounted for 72% to 98% of the top 25 fast-accelerating digital technologies. Comparatively, Canada lacks deep technology ecosystems to best support accelerated innovation and firm growth.

The 2018 interim report for the Digital Industries Economic Strategy[1] in recognizing the opportunities

[1] Canada's Economic Strategy Tables: Digital Industries. The Economic Strategy Tables—a new model for industry-government collaboration—were announced as part of the Government of Canada's Innovation and Skills Plan to support economic growth in six key sectors, including digital industries.

and challenges associated with Canadian digital industries has identified the following interrelated priority themes:

- Increasing the domestic uptake of digital innovation will improve productivity. It is estimated that a 1% increase in digital technology adoption could generate $2.5 billion for Canada. Also, increased technology uptake will enable sustainable, inclusive growth, creating high-value jobs and making Canadian companies more globally competitive.
- Leveraging intellectual property (IP) will promote the value of data. It is understood that frameworks that leverage and promote Canada's data and IP assets at home and abroad will boost innovation and wealth creation in the global economy. Companies need to pay close attention to the strategic importance of data and IP as well as be confident they will reap returns on their investments in data tools and analytics.
- Need to foster the growth of homegrown digital companies to realize growth. Canada lags behind its trading partners in the creation of large digital technology firms and in having a community of successful high-growth firms. As a result, Canada lacks deep technology ecosystems to best support accelerated innovation and firm growth.
- Need to grow the digital talent base. Canada is ranked first in the G7 in the share of science, technology, engineering, and math (STEM) PhD graduates. Yet, fewer than half of Canadian high school graduates have senior credits in STEM, suggesting Canada has tremendous potential to expand the talent base. Key actions to build Canada's talent base include growing the number of students in science, technology, engineering, arts and math (STEAM); increasing participation by groups underrepresented in the technology workforce; encouraging continuous workplace learning; and addressing the challenges in attracting global talent and building our C-Suite capacity.

In addition to these priorities, it is identified that five technologies will drive the Canadian digital economy to heighten innovation and growth, increase productivity, reduce costs, and generate revenues. These technologies provide important considerations for Hamilton as it advances its ICT & Digital Media Ecosystem.

- **Virtual and augmented reality** – the sector is projected to rapidly grow to a $150 billion market in the current year, largely driven by augmented reality.
- **Artificial intelligence** –AI has the ability to impact all industry sectors and is expected to reach $7-$13 trillion in value by 2025.
- **5G mobile** – this sector is a facilitator for emerging technologies, including autonomous vehicles, industrial automation, and education. It will enable the Internet of Things growth by facilitating better connection with high reliability and ultra-low latency connectivity. Canada’s major telecoms are already investigating and implementing 5G technology.
- **3D printing** – enables a shift to a customized production model and is estimated to generate an economic impact of $230-$550 billion annually by 2025.
- **Blockchain** – a facilitator for the financial services, retail, and energy sectors as it allows the collection and storage of information independent of central control and protection against hacking. Canadian banks and the healthcare system are already banking on this technology.

# 2. Hamilton's ICT & Digital Media Sector Planning Environment

A document review conducted as part of this strategy development suggests the City has a strong enabling environment to realize growth in the ICT & Digital Media sector. Key insights that emerged are described in the following paragraphs. A detailed background review is set out in ***Appendix I.***

The City of Hamilton has recognized the ICT and Digital Media sector as one of its key industry sectors through its 2016-2020 Economic Development Action Plan. Key focus areas identified in the plan calls for programs and services that assist new and growing businesses and supports Hamilton's entrepreneurial ecosystem. The Hamilton Business Centre, operating as an arm of the City's Economic Development Division, is an important support resource for business information and sector-specific entrepreneurial programming. Given that Hamilton's ICT and Digital Media sector is largely comprised of start-ups, single operator firms and small businesses, the programs offered by the Centre is of critical importance.

In addition to business support, the City's strategic location as part of the Greater Toronto and Hamilton Area (GTHA) and the Innovation Corridor[2], affordable office market when compared to surrounding regions and a strong innovation ecosystem provides a strong and enabling environment for growth and investment. Critical partners acting as important support systems for ICT & Digital Media Sector include The Forge[3], McMaster Innovation Park, and the Hamilton Technology Centre. The Innovation Factory (iF) is another important provincial resource with strong expertise in the Information Technology sector.

The City is well-positioned to build on and grow workforce development initiatives to ensure the viability of the ICT and Digital Media sector. Post-secondary institutions such as McMaster University and Mohawk College are key in ensuring the city has a reliable supply of quality tech talent. They are also viewed as highly adaptable; for example, the Bachelor of Technology Combined Degree/Diploma program was created in response to local business needs. The 2016-2020 Economic Development Action Plan has identified targeted actions to ensure workforce development, including increased support for youth through mentorship, entrepreneurship and peer programs and career pathways.

The City of Hamilton has also developed initiatives to ensure investment and business growth through the Office Tenancy Assistance Program (OTAP) and data intelligence gathering that identifies gaps and opportunities for new investment and reveals possible international parent companies and business contacts. As per the 2015 City of Hamilton Foreign Direct Investment Economic Development Strategy, the city has key advantages in ICT manufacturing, software and computer services and communications services along with Interactive Digital Media (IDM) subsectors.

Opportunities exist for the City to expand business development and investment activities, specifically by improving ICT Infrastructure across the City. The 2016-2020 Economic Development Action Plan identifies the need for a Digital Strategy, improving internet speeds in business parks and major commercial areas and establishing a data centre within the city to support the ICT sector.

[2] Canada's Innovation Corridor is the Toronto-Waterloo Region Corridor. https://thecorridor.ca
[3] Start-up incubator for McMaster University and Hamilton Region.

## 2.1 Key Sector Initiatives

The City of Hamilton is undertaking key initiatives to support the growth of the ICT & Digital Media sector. These include the Technology and Medical Innovation Centre and the McMaster Innovation Park's (MIP) Master Plan.

### 2.1.1 Technology and Medical Innovation Centre (MetroPartners Inc)

Metro Partners proposed the creation of a "Technology and Medical Innovation Centre" to Hamilton City Council in February 2020. The Centre is proposed to be developed on the south end of the City Hall property, on lands of the existing parking facilities. In general, Metro Partners is seeking a real estate acquisition of the identified lands at "fair-market-value" under the condition that they build, construct and finance the creation of Class "A" office and medical space for this center. The center is to include:

- Tech Campus – 20 & 24 Storey office towers with a combined net leasable area of 572,000 sq. ft. The campus also includes a 3 Storey podium space with 250,000 sq.ft. of leasable area. A net Zero, double facade building with premier office space and rooftop amenity spaces with auditorium space. Approximately 1,350 Parking spaces with 200 secure bicycle spaces - Integrated "social function" podium connects the two towers - Flex office space atriums provide a convenient public-private meeting space.
- Wellness Centre – Modern gym facilities providing a broad range of equipment and spaces. A public orientated gym facility located adjacent to the City Hall will provide continuous pedestrian activity and interaction with the existing municipal grounds
- Transition Space – Expansive atriums provide a flex workspace where the public and private realms can interact. Multi-storey atrium spaces with living Garden Walls, Meeting Spaces (private, semi-private, lounges, etc.) & security interface between public and tower users
- Social Functions – 3 Storey podium structure provides the social programming for the towers including cafes, cafeterias, meeting spaces, conference space, social clubs, grocery store, internal running track, rooftop gardens and rooftop skating rink.

### 2.1.2 McMaster Innovation Park's (MIP) Master Plan

McMaster Innovation Park (MIP) is gaining international recognition as a thriving campus for innovation, commercialization, and entrepreneurship. The heart of Ontario's Life Sciences Corridor, MIP is a 50+ acre community of forward-thinkers coming together in a common space to work, live, play, and CREATE. MIP's Vision is to be internationally recognized as a thriving hub for innovation, commercialization and entrepreneurship aligned with the research strengths and priorities of McMaster University.

MIP's Mission is to be a bridge between research and industry, to leverage the resources and capabilities of McMaster University and the community to foster and accelerate the innovator's journey from ideation to business reality develop and sustain an environment that facilitates and accelerates innovation, encourages successful collaboration amongst private sector, government, hospital, university and college, has global reach resulting in regional prosperity, educates and excites the community about the vital role of the University in the innovation process. The goals of the MIP's Master Plan are to:

- develop a compelling Vision for the Park
- identify potential partners (capitol & tenant) / ideal mix
- communicate with stakeholders including authorities
- integrate building opportunities with sustainable goals
- develop an implementation strategy (short & long-term phases)

The desired outcomes of the MIP's Master Plan are to:

- Foster an Innovation community culture: Build state of the art infrastructure to substantively enhance McMaster Innovation Park's ability to create economic growth, conduct research and encourage collaboration
- Lead in sustainable design: Develop and transfer new technologies including Energy Conservation
- The connector in Hamilton Business Community: Provide industry with the information it needs to build upon the previous work based on Hamilton's current economic strengths, the global competitive landscape, and the feedback from business owners, developers, citizens
- Research Excellence: Build on current research and technological development in emerging areas of Business Incubators, Accelerators and Clusters, Life Sciences, Advanced Materials and Manufacturing and Aero Space
- World Class: Support the activity of world-class research that meets the McMaster Innovation Park mandate to address strategic themes, competitive advantage, environment, and community
- The plan is expected to result in over $1B CDN total investment, 400 residential condo units, over 1 million sq. ft. of commercial laboratory and office space growth in 11 buildings and over 35 acres of developable brownfield with world-class adaptive reuse opportunity with direct highway access and visibility.

# 3. Hamilton's ICT & Digital Media Sector Economic Context

Hamilton's manufacturing heritage has enabled the city to grow a technologically advanced and innovative economy. The city today is part of a rapidly growing regional economy with a labour force of more than 270,000 with strengths in traditional sectors and growth in tech-based health and digitally-focused businesses. Hamilton's professional, scientific, and technical services and the information and culture form two major industries within the ICT & Digital Media sector. These sectors are also important components of the Finance, Insurance and Real Estate (FIRE) and the creative industries. The following sub-sectors provide a detailed economic view of Hamilton's ICT & Digital Media Industry.

- Sector Profile
- Economic Impact Assessment
- Sector Benchmark Analysis
- Asset Inventory

## 3.1 Sector Profile

This section of the report provides an overview of the ICT and Digital Media Sector in Hamilton. The analysis is intended as an educative piece for the City, to illustrate the current nature and composition of ICT and Digital Media Sector goods and services in the community and contributions to economic growth.

### 3.1.1 ICT & Digital Media Industries

In 2018, Hamilton's ICT & Digital Media Industries with contributions of $817 million, accounted for 3.5% of total GDP generated by all industry sectors (**Figure 1**). From 2016 to 2018, GDP generated by the sector grew by 4% from $787 to $817 million, indicating room for continued growth in the sector.

**Figure 1: City of Hamilton Gross Domestic Product (GDP), 2016-2018**

| GDP ($ 2012 million) | 2016 | 2017 | 2018 |
|---|---|---|---|
| All Industries (Total Economy) | $22,015 | $22,628 | $23,050 |
| ICT & Digital Media Sector | $787 | $811 | $817 |
| ICT & Digital Media Sector (% Shares) | 3.6% | 3.6% | 3.5% |

Source: *metroeconomics*

Hamilton is an important contributor to Ontario's ICT & Digital Media sector, which saw GDP contributions of $64.83 billion in 2018 (**Figure 2**).

GDP contributions of the ICT & Digital Media accounted for 8.9% of total GDP by all industries sectors in the Province. Ontario is the largest output contributor to total ICT & Digital Media GDP in Canada, accounting for approximately 46% of the national ICT & Digital Media GDP in 2018 with $64.83 billion.

**Figure 2: ICT & Digital Media Sector Gross Domestic Product (GDP), Ontario & Rest of Canada, 2016-2018**

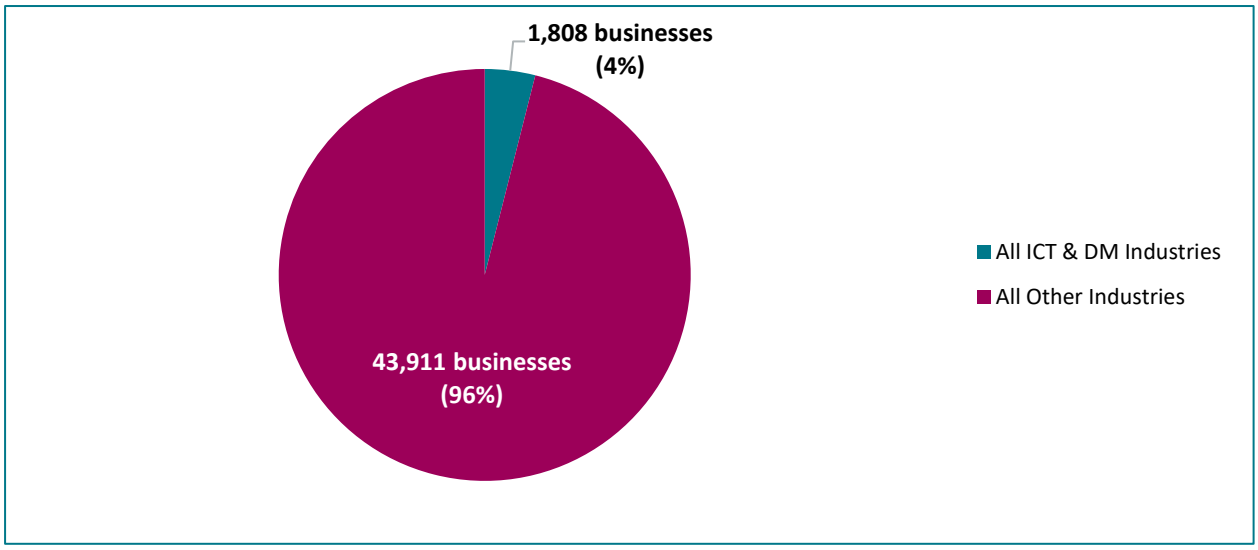
| ICT & Digital Media Sector GDP ($ 2012 billion) | 2016 | 2017 | 2018 |
|---|---|---|---|
| Canada | $129.74 | $135.52 | $140.72 |
| Ontario | $59.33 | $61.86 | $64.83 |

Source: Statistics Canada. Table 36-10-0402-01

## Industry Size and Composition

As per the 2019 Canadian Business Counts, a total of 1,808 businesses were classified as ICT & Digital Media Industries. This relates to 4% of all industries in the city.

**Figure 3: Hamilton's ICT & DM Industries, 2019**




Source: Canadian Business Counts, June 2019

Similar to national and provincial trends, Hamilton's ICT and Digital Media sector are characterized by a significant number of sole proprietorships (**Figure 4**).

Of the 1,808 industries in this sector, 68% of all businesses fall into this category. Micro and small businesses are also an important part of Hamilton's ICT, and Digital Media sector, around 23% of businesses were micro-establishments employing between 1-4 employees, while 5% employ between 5-9 employees.

**Figure 4: Total Industries in the ICT & Digital Media Sector, 2019**

| Hamilton | Total | Without employees | With employees | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | 1-4 | 5-9 | 10-19 | 20-49 | 50-99 | 100-199 | 200-499 | 500+ |
| ICT & DM Industries | 1,808 | 1,221 | 415 | 93 | 46 | 21 | 9 | 1 | 2 | - |
| ICT & DM Industries (%) | 100% | 68% | 23% | 5% | 3% | 1.2% | 0.5% | 0.1% | 0.1% | 0% |

Source: Canadian Business Counts, June 2019

It is understood that single operator companies or small businesses are focussed on providing professional services to local clients. While the presence of small firms is important to the viability and sustainability of the sector, the lack of medium and large firms is considered to affect the long term growth of the sector as they are often export-oriented and R&D intensive firms. Furthermore, large establishments can help foster cluster development and enable the growth and viability of an entrepreneurial economy.

## Industry Subsectors and Value Chain

Hamilton's ICT & Digital Media sector is diverse and shows strength in several sub-sectors. The ICT & Digital Media sector is divided into manufacturing and services, which include wholesale, information and culture, professional and technical, educational and other support services. The subsectors are further detailed below and shown in **Figure 5** and in ***Appendix II***.

**Professional and Technical Services** – was determined to be one of the strongest ICT industry sub-sectors in Hamilton by the number of firms. In 2019, this subsector comprised of 1,083 businesses (60% of all ICT and Digital Media industries). The majority of firms in this sub-sector were sole-proprietorships (739 businesses - 68% of all Professional and Technical Services). The top services within this sector were:

- *Computer systems design and related services (except video game design and development)* account for the majority of businesses with approximately 772 businesses (43% of all total ICT & DM industries). Businesses are primarily engaged in writing, modifying, testing and supporting software and include computer consulting, computer facilities management and custom programming services. 491 of these businesses were sole-proprietorships, and 231 were micro-businesses employing 1 to 4 employees.
- Approximately 134 businesses provide *graphic design services* in Hamilton, the majority of which are sole proprietorships: 108 businesses. Of the 26 businesses employing workers, 23 are micro-establishments.

**Information and Cultural Services** – This sub-sector accounted for the second-highest number of firms in Hamilton with approximately 547 businesses (30% of all ICT and Digital Media industries). Similar to the professional and technical services, the majority of firms were sole-proprietorships (167 businesses – 68% of all information and cultural services). The top services within this sector were:

- *Motion picture and video production*, accounting for the majority of businesses with approximately 202 businesses (11% of all total ICT & DM industries). Digital media is an important aspect of these industries for the production and delivery of content including motion pictures, videos, television programs or commercials. 167 of these businesses were sole-proprietorships, and 31 were micro-businesses employing 1 to 4 employees.
- *Telecommunications,* accounting for 95 businesses (5% of all ICT and Digital Media industries). Wired and wireless telecommunications carriers (except satellite) account for 23% (22 businesses) of Hamilton's telecommunications market. Wireless telecommunications include establishments that provide cellular phone services, paging services and personal communication services. These industries are identified to be one of the strongest ICT industry sub-sectors in Canada.
- *Software publishers (except video game publishers),* accounting for 30 businesses (2% of all ICT and Digital Media industries). These establishments are involved in computer software publishing

(including designing and developing). Of the 30 establishments, 16 were sole proprietorships while 6 were micro-businesses employing 1 to 4 employees.

**Educational Services** – this subsector represents an important support sector for the ICT & DM sector with approximately 79 businesses providing educational services related to the ICT & DM sector. Support in the educational sector is provided through Professional and management development training (61 establishments), Computer training (15 establishments) and Business and secretarial schools (3 establishments). Of the 79 businesses, 60 are sole-proprietorships, possibly meaning they may be online training services.

**Other Services** – this subsector comprises solely of *electronic and precision equipment repair and maintenance* and includes 50 firms of which 30 are were sole-proprietorships, and 18 were micro-businesses employing 1 to 4 employees. This is an important support sector to the ICT and Digital Media sector, predominately comprising of establishments that are engaged in repairing and maintaining electronic equipment and precision instruments.

**Wholesale** – Approximately 25 firms are involved in this ICT and Digital Media support subsector. The majority of firms in this sector were employee-based establishments; 14 firms. Firms within this subsector are either *computer, computer peripheral and pre-packaged software merchant wholesalers* or *electronic components, navigational & communications equipment & supplies merchant wholesalers*

**Manufacturing** – Approximately 24 businesses can be attributed to Hamilton's ICT and Digital Media manufacturing subsector. Approximately 5 firms are *computer and peripheral equipment* manufacturers, who make equipment for computers such as monitors, storage devices, mice and printers. Approximately 2 firms are involved in *Semiconductor and another electronic component manufacturing*. The semiconductor industry is an area of strength for Canada, specifically as it relates to niche sectors including fabless semiconductor and microelectronics[4]. *Radio and television broadcasting and wireless communications equipment manufacturing* form a major part of ICT manufacturing specifically as it relates to wireless communications manufacturing. Within Ontario's ICT manufacturing, approximately 103 firms (7% of all ICT manufacturing) specialize in this subsector, centred in Toronto, Ottawa and Markham. In terms of companies with strengths in exports, Canada shows particular strength in wireless manufacturing and services including wireless infrastructures[5]. Thus, the lack of firms in Hamilton that specialize in this particular subsector may indicate a gap in Hamilton's telecommunications value chain.

**Figure 5: Hamilton's ICT & DM Industries by Sub-sectors, 2019**

| ICT & DM Industries Sub-sectors | Total | | Without employees | | With employees | |
|---|---|---|---|---|---|---|
| | Count | % of total | Count | % of total | Count | % of total |
| Total | 1,808 | 100% | 1,221 | 68% | 587 | 32% |
| ICT & DM - Professional and Technical Services | 1,083 | 60% | 739 | 68% | 344 | 32% |
| ICT & DM - Information and Cultural | 547 | 30% | 370 | 68% | 177 | 32% |
| ICT & DM - Educational Services | 79 | 4% | 60 | 76% | 19 | 24% |

[4] Growing the ICT Industry in Canada: A Knowledge Synthesis Paper.

[5] Ibid.

| ICT & DM Industries Sub-sectors | Total | | Without employees | | With employees | |
|---|---|---|---|---|---|---|
| | Count | % of total | Count | % of total | Count | % of total |
| ICT & DM - Other Services | 50 | 3% | 30 | 60% | 20 | 40% |
| ICT & DM - Wholesale | 25 | 1.4% | 11 | 44% | 14 | 56% |
| ICT & DM - Manufacturing | 24 | 1.3% | 11 | 46% | 13 | 54% |

Source: Canadian Business Counts, June 2019

### Sector Growth

Comparing the Canadian Business Counts between 2016 and 2019, the following observations can be drawn. The number of registered businesses in Hamilton's ICT and Digital Media sector has grown from 1,487 industries in 2016 to 1,808 industries in 2019. This relates to a net increase in 321 firms or a 22% growth from 2016 to 2019. Hamilton's ICT and Digital Media sector have grown at a far higher pace than all other industry sectors in the City, which showed a growth rate of 16% for the same time period.

The major growth subsectors were *professional and technical services* and *information and cultural* industries which showed growth by of 18% (net increase of 168 firms) and 35% (net increase of 141 firms), respectively. Hamilton showed a decline in firms in support sectors, including *wholesale* and *electronic and precision equipment repair and maintenance*.

**Figure 6: Hamilton's ICT & DM Industries by Sub-sectors, Net Change 2016 – 2019**

| ICT & DM Industries Sub-sectors | Total Firm Count | | Firm Count Change 2016-2019 | |
|---|---|---|---|---|
| | 2016 | 2019 | Net Change | % Change |
| Total | 1,487 | 1,808 | 321 | 22% |
| ICT & DM - Manufacturing | 22 | 24 | 2 | 9% |
| ICT & DM - Wholesale | 29 | 25 | -4 | -14% |
| ICT & DM - Information and Cultural | 406 | 547 | 141 | 35% |
| ICT & DM - Professional and Technical Services | 915 | 1,083 | 168 | 18% |
| ICT & DM - Educational Services | 58 | 79 | 21 | 36% |
| ICT & DM - Other Services | 57 | 50 | -7 | -12% |

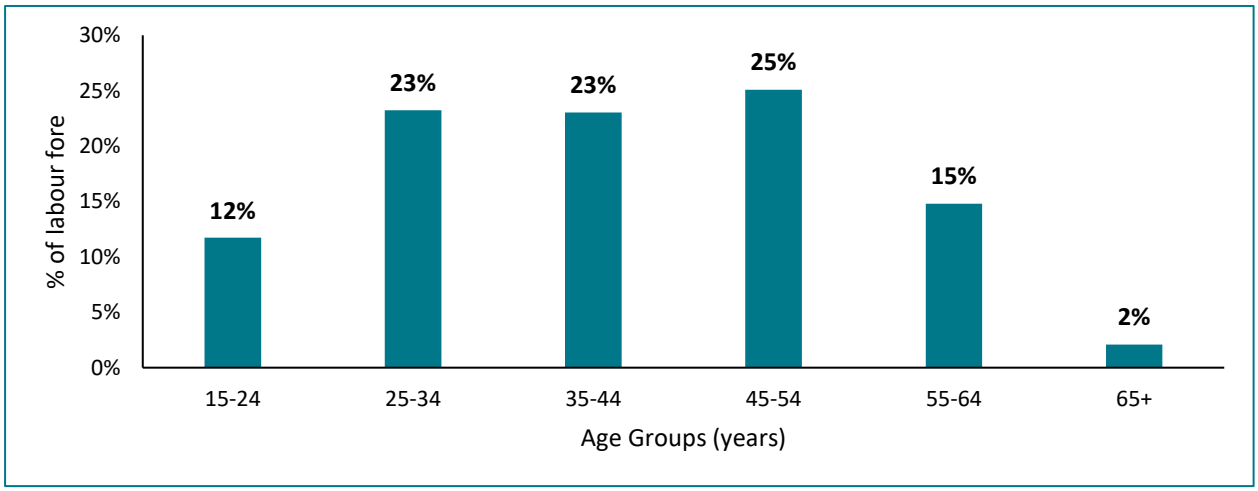
Source: Canadian Business Counts, June 2019

## 3.1.2 Sector Labour Force

In 2016, Hamilton had a labour force of approximately 10,745 people in the ICT & DM Industries, accounting for 4% of the total labour force.

The ICT & DM industries are equally distributed among almost all broad age groups. The majority of workers are between 45 to 54 years; accounting for 25% of the total labour force. Approximately 23% are early professionals between 25-34 years of age.

**Figure 7: Age of the Labour force, Hamilton's ICT & DM Industries, 2016**

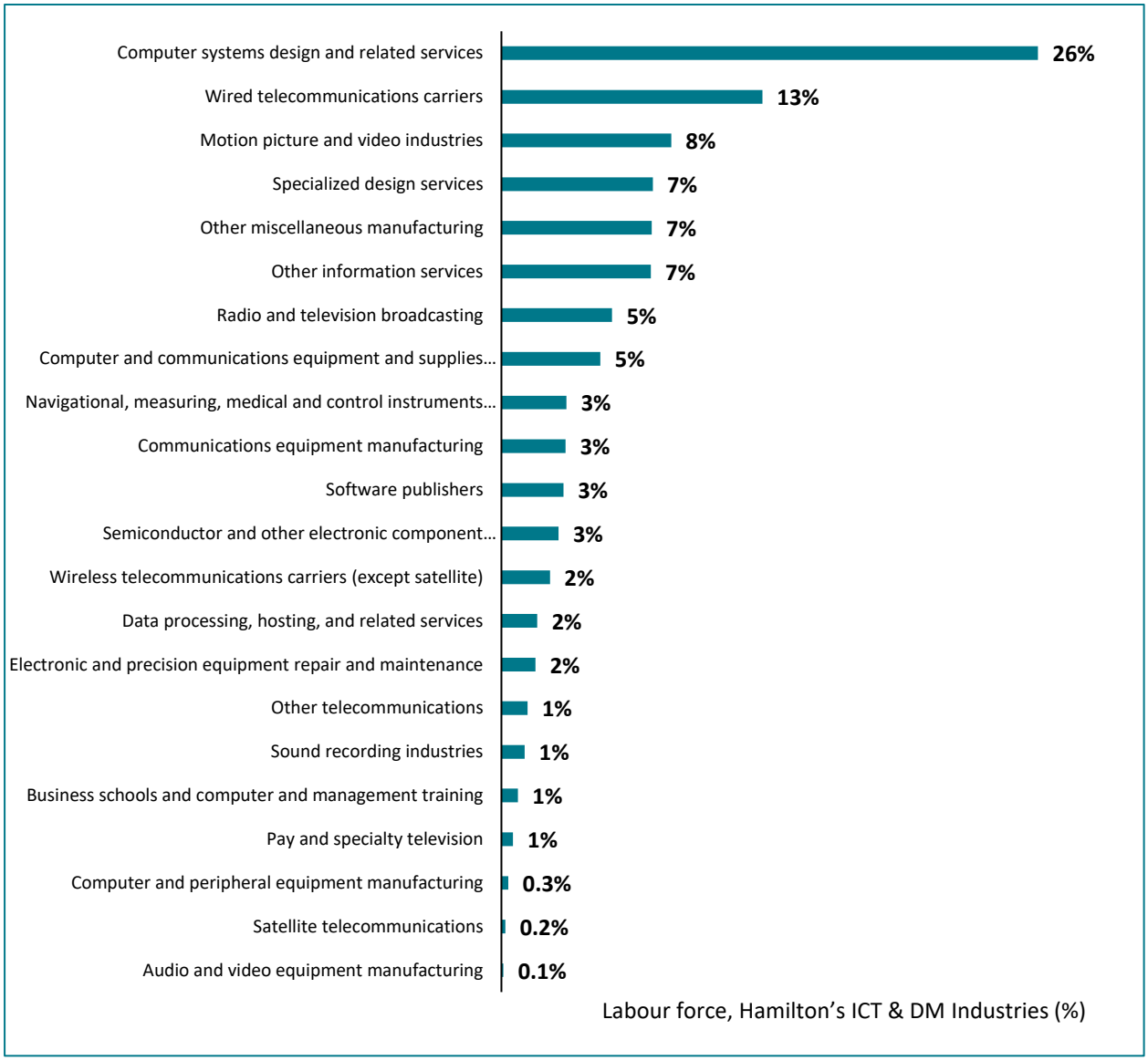



Source: Statistics Canada, 2016 Census of Population.

In 2016, the majority of Hamilton's ICT & DM Industries labour force was centred in the following industry sectors:

- Computer systems design and related services – 2,765 people (26% of the total labour force)
- Wired telecommunications carriers – 1,345 people (13% of the total labour force)
- Motion picture and video industries – 875 people (8% of the total labour force)
- Specialized design services – 780 people (7% of the total labour force)
- Other miscellaneous manufacturing – 775 people (7% of the total labour force)
- Other information services – 770 people (7% of the total labour force)

**Figure 8: Labour force, Hamilton's ICT & DM Industries (%), 2016**




Source: Statistics Canada, 2016 Census of Population.

From 2011 to 2016, the labour force in this sector grew by 18%; an approximate increase of 1,610 labour force. Labour force in this sector grew at a faster rate than labour force growth in all other industries, which showed a growth of 12%.

The majority of labour force growth was in the *ICT & DM - information and cultural*, which saw a net increase of 1,005 people from 2011 to 2016. The *ICT & DM - professional and technical services* also saw a net increase in the labour force, an approximate increase of 790 people. Labour force in support sectors, including the *ICT & DM – wholesale, education and manufacturing* saw a decline from 2011 to 2016.

**Figure 9: Hamilton's ICT & DM Industries Labour force, Net Change 2011 – 2016**

| ICT & DM Industries Sub-sectors | Labour Force | | Labour force Change 2011 - 2016 | |
|---|---|---|---|---|
| | 2011 | 2016 | Net Change | % Change |
| Total Labour force | 9,135 | 10,745 | 1,610 | 18% |
| ICT & DM - Manufacturing | 1,795 | 1,780 | -15 | -1% |
| ICT & DM - Wholesale | 655 | 510 | -145 | -22% |
| ICT & DM - Information and Cultural | 3,645 | 4,650 | 1,005 | 28% |
| ICT & DM - Professional and Technical Services | 2,755 | 3,545 | 790 | 29% |
| ICT & DM - Educational Services | 130 | 85 | -45 | -35% |
| ICT & DM - Other Services | 155 | 175 | 20 | 13% |

Source: Statistics Canada, 2016 Census of Population.

## Labour Force Commuting Patterns

The labour force commuting patterns indicate if Hamilton's labour force is employed in the ICT & Digital Media industries within Hamilton or if they commute outside the city to work. The commuting patterns are important in this regard, as it indicates where Hamilton's ICT & Digital Media labour force live and work.

As illustrated in the **Figure 10**, approximately 26,160 residents of Hamilton work in Hamilton's ICT & Digital Media sector. The majority work within educational services (15,285 residents) followed by professional, scientific and technical services (5,250 residents) and repair and maintenance (2,070 residents). Approximately 15,365 Hamilton residents work outside Hamilton (A). Most of the residents travelling to communities outside Hamilton to work in ICT & Digital Media sectors are employed in educational services, professional, scientific and technical services and machinery, equipment & supplies merchant wholesalers. Hamilton attracts approximately 9,185 people from outside communities to work in its in ICT & Digital Media sector (B). Educational services and professional, scientific and technical services are the top sectors that attract the greatest number of workers.

**Figure 10: Net Export (-)/Net Import (+) of Labour for Hamilton's ICT & DM Industries, 2016**

| Industry | Resident working IN Hamilton | Hamilton resident 'working outside' Hamilton (A) | Non-resident 'working in' Hamilton (B) | B-A = Net Import (+)/Net Export (-) |
|---|---|---|---|---|
| Total ICT & Digital Media labour force | 26,160 | 15,365 | 9,185 | -6,180 |
| Computer and electronic product manufacturing | 175 | 695 | 90 | -605 |
| Miscellaneous manufacturing | 455 | 405 | 175 | -230 |
| Machinery, equipment & supplies merchant wholesalers | 670 | 1,205 | 515 | -690 |
| Publishing industries (except Internet) | 525 | 315 | 185 | -130 |
| Motion picture and sound recording industries | 315 | 240 | 100 | -140 |
| Broadcasting (except Internet) | 180 | 320 | 140 | -180 |
| Telecommunications | 645 | 715 | 210 | -505 |
| Data processing, hosting, and related services | 35 | 90 | - | -90 |
| Other information services | 555 | 125 | 170 | 45 |

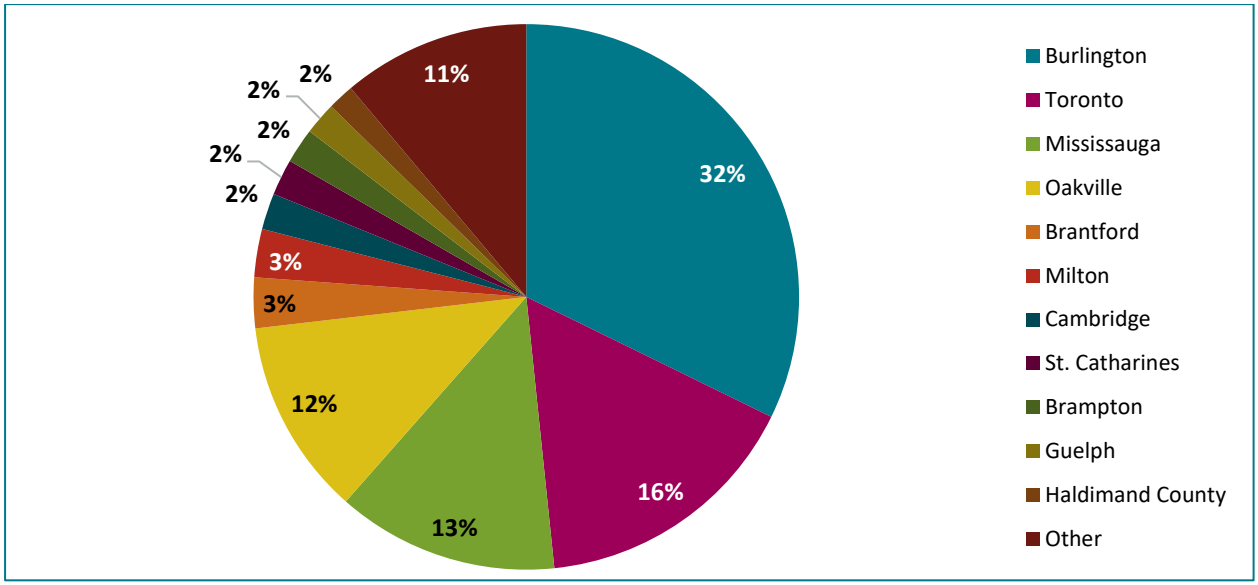
| Industry | Resident working IN Hamilton | Hamilton resident 'working outside' Hamilton (A) | Non-resident 'working in' Hamilton (B) | B-A = Net Import (+)/Net Export (-) |
|---|---|---|---|---|
| Professional, scientific and technical services | 5,250 | 5,145 | 2,165 | -2,980 |
| Educational services | 15,285 | 5,315 | 4,815 | -500 |
| Repair and maintenance | 2,070 | 795 | 620 | -175 |

While the City attracts approximately 9,185 workers, it still saw a loss of 15,365 residents to employment opportunities outside of Hamilton. Considering the net flow of labour (B-A), it can be understood that Hamilton is a net exporter of workers, with net exports of 6,180 people. Hamilton shows the greatest outflow in the professional, scientific and technical services.

**Figure 11** and **Figure 12** shows the communities that Hamilton's ICT & Digital Media labour force commutes to and from.

Of the 15,365 residents who commute to employment opportunities outside of Hamilton, the majority commute to work in Burlington's ICT and Digital Media sector (4,955 residents – 32% of the commuting labour force) (**Figure 11**). Another 2,475 residents – 13% of the commuting labour force, commute to work in Toronto's ICT and Digital Media sectors. Other communities that the Hamilton residents commute to include Mississauga and Oakville.

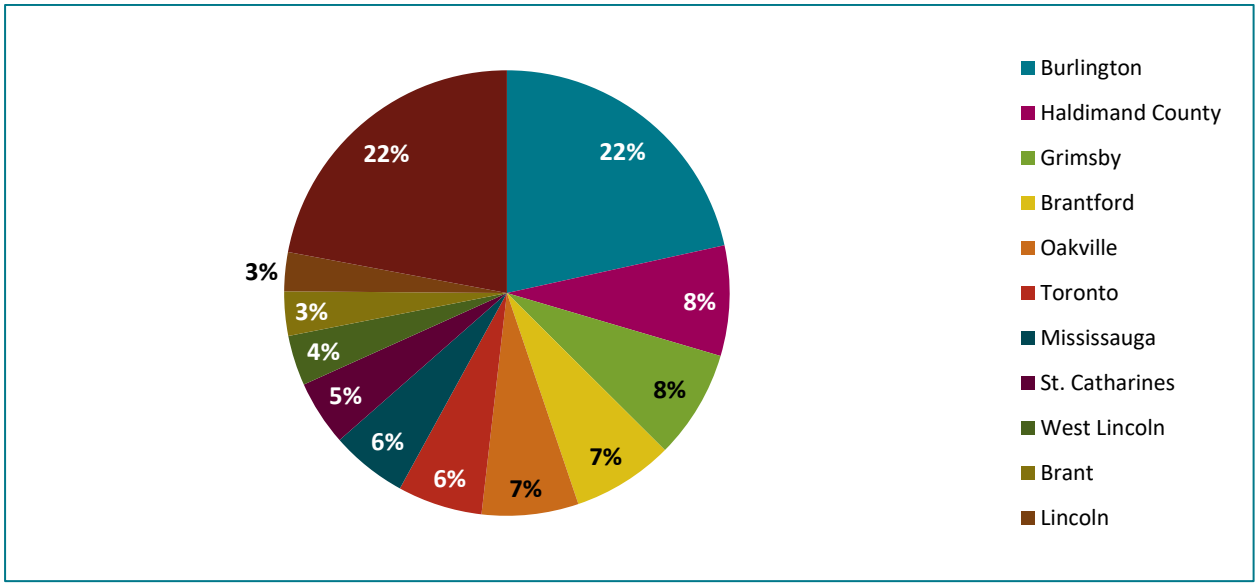
**Figure 11: Place of Work for Hamilton's Residents, ICT & DM Industries, 2016**




Source: Statistics Canada, 2016 Census of Population. Other communities include Waterloo, Kitchener, Grimsby, Lincoln and Vaughan, among others.

**Figure 12** shows the commuting patterns of workers who commute to Hamilton to work in its ICT and Digital Media sector. Of the 9,185 workers that the City attracts, the majority are from Burlington (1,980 people – 22% of total), followed by Haldimand County and Grimsby.

**Figure 12: Place of Residence for Workers who Commute to Hamilton to Work, 2016**




Source: Statistics Canada, 2016 Census of Population. Other communities include Guelph, Cambridge, Milton and Brampton, among others.

### 3.1.3 Sector Related Occupations

MDB Insight identified 15 occupations considered of critical importance to the ICT and Digital Media sector.

The data presented below is for Hamilton CMA. In 2016, Hamilton's labour force population aged 15 years and over accounted for 369,070 occupations. Of these, approximately 13,905 occupations were related to the ICT & Digital Media sector. This equates to 3.8% of all occupations by industry sectors.

In 2016, the top occupation in the ICT and Digital Media sector were:

- Information systems analysts and consultants
- Computer programmers and interactive media developers
- Computer and information systems managers
- Graphic designers and illustrators
- Computer network technicians

**Figure 13: ICT and Digital Media sector Occupation, Hamilton CMA, 2016**

| ICT & Digital Media Occupations (NOC) | Occupations | % of total |
|---|---|---|
| Total | 13,905 | 100% |
| Information systems analysts and consultants | 2,870 | 21% |
| Computer programmers and interactive media developers | 1,565 | 11% |
| Computer and information systems managers | 1,340 | 10% |

| ICT & Digital Media Occupations (NOC) | Occupations | % of total |
|---|---|---|
| Graphic designers and illustrators | 1,320 | 9% |
| Computer network technicians | 1,265 | 9% |
| Electrical and electronics engineers | 1,065 | 8% |
| Electrical and electronics engineering technologists and technicians | 1,035 | 7% |
| User support technicians | 900 | 6% |
| Software engineers and designers | 765 | 6% |
| Web designers and developers | 550 | 4% |
| Database analysts and data administrators | 375 | 3% |
| Computer engineers (except software engineers and designers) | 360 | 3% |
| Telecommunication carriers' managers | 310 | 2% |
| Information systems testing technicians | 95 | 1% |
| Broadcast technicians | 90 | 1% |

Source: Statistics Canada, 2016 Census of Population

## 3.2 Economic Impact Assessment

This section of the report provides an assessment of the economic impact associated with Hamilton's ICT and Digital Media sector. The impact assessment was completed by Metroeconomics at the request of MDB Insight and is based on a sub-provincial employment projection system and on the following Statistics Canada information sets:

- Census 2016 data regarding employment in Hamilton on a place-of-work basis by detailed industry at the 4-digit NAICS level
- Sources and uses information regarding the Ontario economy by detailed industry in 2014; and
- Gross Domestic Product information for Ontario by industry from 2016 through to 2018

***Appendix III*** *provides a description of metroeconomics' Community-Based Projection System.*

The economic importance details Hamilton's ICT and Digital Media sector output, GDP and Labour Income ($ millions) and Employment in 2020. It provides a snapshot of the sector's overall health and enables growth and new business opportunities. Furthermore, using the sub-provincial projection system, the labour market requirements of the sector is detailed for 2020 and projected to 2025. The assessment identifies the top industries within the sector and occupations that will be critical to the continued growth of the sector.

### 3.2.1 Economic Importance

**Figure 14** quantifies the economic importance of the ICT&DM sector to the City. Based on these various sources, it is estimated that in 2020:

- the city's ICT&DM sector's output (sales) will reach $1.623 billion

- its Gross Domestic Product associated with this sector (GDP, the value it adds to the inputs it purchases from other industries) will reach $845 million
- the sector will pay workers $470 million in wages and salaries; and
- the sector will employ just over 6,000 people

**Figure 14: City of Hamilton Economic Impacts of the ICT & DM Sector in 2020 Output, GDP and Labour Income ($ millions) and Employment**

| Economic Concepts | Impacts | | | |
|---|---|---|---|---|
| | Direct | Indirect | Induced | Total |
| Output ($ millions) | 1,623 | 911 | 600 | 3,134 |
| GDP ($ millions) | 845 | 255 | 182 | 1,282 |
| Labour income ($ millions) | 470 | 87 | 53 | 609 |
| Employment | 6,008 | 4,497 | 3,026 | 13,531 |

Source: Statistics Canada various sources and metroeconomics

The sector will indirectly – through its purchases of goods and services from other industries – generate an additional:

- $911 million in output
- $255 million in GDP
- $87 million in wages and salaries; and
- jobs for almost 4,500 workers

Note that it is not possible to determine the extent to which the induced impacts will benefit businesses and workers located in the City of Hamilton since an unknown portion of the inputs will be sourced from businesses located in other parts of Ontario, Canada and the rest of the world.

In addition – since the sector employs people who live in Hamilton or nearby and who spend their incomes in the area – the sector will induce an additional:

- $600 million in output (sales)
- $182 million in GDP
- $53 million in labour income; and
- more than 3,000 more jobs

Overall – through these direct, indirect and induced impacts – the City's ICT&DM sector leads to:

- more than $3 billion in sales
- almost $1.3 billion of GDP
- more than $600 million in labour income; and
- more than 13,500 jobs

To place these estimates in context:

- the City's GDP in 2020 economy-wide will reach almost $24 billion measured in constant 2012 dollars; thus, the City's ICT&DM sector directly accounts for 3.5 percent of its GDP
- the City's total employment on a place-of-work basis will reach more than 212,000 this year; thus, the City's ICT&DM sector directly accounts for 2.8 percent of its jobs; and
- that the sector accounts for a much larger GDP share than employment share reflects the fact that productivity in the sector significantly exceeds the average economy-wide level (Note that these shares do not include the indirect or induced impacts).

### 3.2.2 Labour Market Requirements To 2025

Metroeconomics also developed a correspondence between the 44 6-digit NAICS industries identified by MDB Insight as defining the ICT&DM sector and 2016 Census data regarding employment by industry at the 4-digit level. That procedure, coupled with metroeconomics' detailed estimates and projections of the City's employment by industry at the 4-digit level, led to the estimate in the previous section that just over 6,000 people will be directly employed in the ICT&DM sector in Hamilton in 2020. It is projected that the sector's total employment will grow to almost 6,700 in 2025. Thus the sector will employ almost 700 more people in 2025 than is the case today.

**Figure 15** shows the employment estimates for 2020 and the projection for 2025 for the ICT&DM sector into the 22 4-digit industries that correspond to the 44 6-digit industries cited earlier:

- within the sector as a whole, the most important from an employment viewpoint across all occupations is computer systems design and related services (NAICS code number 5415); this industry alone accounts for 1,733 of the sector's total of 6,008 employees or 29%.
- the next most important are other information services (5191) at 769; wired telecommunications carriers (5171) at 707; specialized design services (5414) at 603; motion picture and video industries (5121) at 559; and radio and television broadcasting (5151) at 359; collectively these 5 industries account for 2,997 jobs (or half of all the jobs in the sector).

MDB Insight identified 15 occupations considered of critical importance to the sector. These 15 collectively account for 2,163 of the 6,008 people employed by the ICT&DM sector in 2020, or 36 percent of the sector's total. The gains in employment within the sector for the selected group of 15 occupations are also indicated by industry in Figure 15. Computer systems design and related services – which, as noted above, employs 29 percent of all those employed within the sector – employs 54 percent of those employed in the sector in the 15 selected occupations.

**Figure 15: City of Hamilton ICT & DM Sector Employment Estimated for 2020 and Projected for 2025 All Occupations and 15 Selected Occupations**

| ICT & Digital Media Industries (NAICS) | All 500 Occupations | | | 15 Selected Occupations | | |
|---|---|---|---|---|---|---|
| | 2020 | 2025 | Change | 2020 | 2025 | Change |
| Total All Industries | 212,327 | 231,041 | 18,714 | 7,128 | 7,667 | 538 |
| Total ICT and Digital Media Sector Industries | 6,008 | 6,693 | 685 | 2,170 | 2,462 | 293 |
| Computer and peripheral equipment manufacturing | 19 | 16 | -3 | 5 | 5 | -1 |
| Communications equipment manufacturing | 57 | 50 | -8 | 20 | 17 | -3 |
| Audio and video equipment manufacturing | 0 | 0 | 0 | 0 | 0 | 0 |
| Semiconductor and other electronic component manufacturing | 92 | 86 | -6 | 21 | 19 | -1 |
| Navigational, measuring, medical and control instruments manufacturing | 119 | 123 | 4 | 24 | 25 | 1 |
| Manufacturing and reproducing magnetic and optical media | 0 | 0 | 0 | 0 | 0 | 0 |
| Computer and communications equipment and supplies merchant wholesalers | 196 | 177 | -18 | 72 | 65 | -7 |
| Software publishers | 135 | 165 | 30 | 77 | 94 | 17 |
| Motion picture and video industries | 559 | 682 | 123 | 56 | 68 | 12 |
| Sound recording industries | 99 | 121 | 22 | 3 | 4 | 1 |
| Radio and television broadcasting | 359 | 363 | 4 | 43 | 44 | 0 |
| Pay and specialty television | 10 | 13 | 2 | 1 | 2 | 0 |
| Wired telecommunications carriers | 707 | 684 | -23 | 237 | 229 | -8 |
| Wireless telecommunications carriers (except satellite) | 182 | 166 | -16 | 52 | 48 | -5 |
| Satellite telecommunications | 15 | 15 | 0 | 6 | 6 | 0 |
| Other telecommunications | 100 | 122 | 22 | 35 | 43 | 8 |
| Data processing, hosting, and related services | 74 | 90 | 16 | 32 | 39 | 7 |
| Other information services | 769 | 889 | 120 | 63 | 72 | 10 |
| Specialized design services | 603 | 669 | 66 | 220 | 244 | 24 |
| Computer systems design and related services | 1,733 | 2,081 | 348 | 1,174 | 1,409 | 235 |
| Business schools and computer and management training | 56 | 52 | -5 | 5 | 5 | 0 |
| Electronic and precision equipment repair and maintenance | 121 | 128 | 7 | 23 | 24 | 1 |

Source: *metroeconomics*

The projections summarized in **Figure 15** have significant importance for the City (note that the percent changes cited below are not included in **Figure 14**):

- total employment City-wide across all industries and occupations is expected to grow by 8.8 percent between 2020 and 2025

- total employment in the ICT&DM sector across all occupations is expected to grow 11.4 percent
- total employment City-wide for the 15 selected occupations is expected to grow 7.6 percent; and
- total employment for the selected 15 occupations within the ICT&DM sector only is projected to grow 13.5 percent

The total need for new workers across the 15 selected occupations as a group is 538, of which 293 will be needed by the ICT&DM sector and the rest by other industries. Thus, the sector faces significant competition from other industries in the area for the skills crucial to its continued success. The 22 industries in the ICT&DM sector employ 2,170 workers in the selected 15 occupations while all industries as a whole employ 7,128. **Figure 16** indicates the relative importance of the number employed in each occupation within the ICT&DM sector relative to their employment economy-wide. Key insights include:

- economy-wide the ICT&DM sector employs 30 percent of all those employed in the group of 15 selected occupations
- the ICT&DM sector dominates in the employment of people employed as telecommunication carriers' managers (NOCS number 131) at 87 percent, and broadcast technicians (5224) at 84 percent
- the sector accounts for at least 40 percent of those occupied in the City as software engineers and designers (2173) at 47 percent; graphic designers and illustrators (5241) at 43 percent; information systems testing technicians (2283) at 42 percent; computer programmers and interactive media developers (2174) at 41 percent; and computer engineers (except software engineers and designers) (2147) at 40 percent
- the sector accounts for between 20 and 40 percent of those employed as web designers and developers (2175) at 39 percent; information systems analysts and consultants (2171) at 27 percent; computer and information systems managers (213) at 26 percent; and user support technicians (2282) at 22 percent

The ICT&DM sector is not the dominant employer for the remaining 4 occupations.

**Figure 16: City of Hamilton ICT & DM Sector Employment Estimated for 2020 and Projected for 2025 All Occupations and 15 Selected Occupations**

| ICT & Digital Media Occupations (NOC) | 22 ICT&DM Industries | All 303 Industries | ICT&DM % Share |
|---|---|---|---|
| Total ICT and Digital Media Sector Selected Occupations | 2,163 | 7,134 | 30 |
| Telecommunication carriers' managers | 103 | 118 | 87 |
| Computer and information systems managers | 167 | 640 | 26 |
| Electrical and electronics engineers | 61 | 439 | 14 |
| Computer engineers (except software engineers and designers) | 88 | 220 | 40 |
| Information systems analysts and consultants | 469 | 1714 | 27 |
| Database analysts and data administrators | 40 | 235 | 17 |
| Software engineers and designers | 205 | 436 | 47 |

| ICT & Digital Media Occupations (NOC) | 22 ICT&DM Industries | All 303 Industries | ICT&DM % Share |
|---|---|---|---|
| Computer programmers and interactive media developers | 351 | 858 | 41 |
| Web designers and developers | 95 | 246 | 39 |
| Electrical & electronics engineering technologists & technicians | 49 | 444 | 11 |
| Computer network technicians | 126 | 656 | 19 |
| User support technicians | 96 | 429 | 22 |
| Information systems testing technicians | 32 | 77 | 42 |
| Broadcast technicians | 20 | 24 | 84 |
| Graphic designers and illustrators | 260 | 598 | 43 |

Source: *metroeconomics*

**Figure 15** indicated that the ICT&DM sector would require almost 300 new workers between 2020 and 2025 across the 15 selected occupations as a group. Exhibit 6 breaks this total down into the number to be required over that span in each of the 15 occupations. **Figure 17** indicates that within the City's ICT&DM sector:

- the largest need is for 76 additional information systems analysts and consultants (2171);
- the next largest need is for 63 computer programmers and interactive media developers (2174);
- another 33 workers will be required for each of software engineers and designers (2173) and graphic designers and illustrators (5241); and
- another 26 computer and information systems managers (213) will be required.

These 5 occupations collectively account for 79 percent of the total need of 293 workers across the 15 selected occupations within the ICT&DM sector. Those industries that employ people in these 15 occupations in the City – both those inside and outside of the ICT&DM sector – will need to recruit new workers (a) as their businesses grow and (b) because a number of the workers in these occupations will retire over that span. The total recruitment needs for each of these occupations faced by employers City-wide are summarized in **Figure 18**. Considering the 15 occupations as a group, employers over the next 5 years will need to recruit:

- 538 workers to fill the positions created by economic growth and
- 201 new workers to fill the positions that arise due to retirements.

The greatest total needs by occupation (economic growth plus retiree replacement) include:

- 193 information systems analysts and consultants (2171);
- 102 computer programmers and interactive media developers (2174);
- 70 computer network technicians (2281);
- 66 graphic designers and illustrators (5241); and
- 58 computer and information systems managers (213).

- These 5 occupations collectively account for two-thirds of the City's requirements for new workers across all industries for the group of 15 selected occupations.

**Figure 17: City of Hamilton ICT & DM Sector Employment Total and by 15 Selected Occupations Estimated for 2020 and Projected for 2025**

| ICT & Digital Media Occupations (NOC) | Employed | | Economic Demand |
|---|---|---|---|
| | 2020 | 2025 | 2020 to 2025 |
| Total ICT and Digital Media Sector Selected Occupations | 2,170 | 2,462 | 293 |
| Telecommunication carriers' managers | 103 | 102 | -1 |
| Computer and information systems managers | 167 | 193 | 26 |
| Electrical and electronics engineers | 61 | 63 | 2 |
| Computer engineers (except software engineers and designers) | 89 | 94 | 6 |
| Information systems analysts and consultants | 470 | 546 | 76 |
| Database analysts and data administrators | 40 | 46 | 6 |
| Software engineers and designers | 206 | 238 | 33 |
| Computer programmers and interactive media developers | 352 | 415 | 63 |
| Web designers and developers | 95 | 112 | 17 |
| Electrical and electronics engineering technologists and technicians | 49 | 51 | 1 |
| Computer network technicians | 127 | 141 | 14 |
| User support technicians | 97 | 108 | 12 |
| Information systems testing technicians | 32 | 38 | 6 |
| Broadcast technicians | 20 | 21 | 1 |
| Graphic designers and illustrators | 261 | 294 | 33 |

Source: *metroeconomics*

**Figure 18: City of Hamilton Employment in 15 Selected Occupations Projected Economic Demand and Retiree Replacement Demand 2020 to 2025**

| ICT & Digital Media Occupations (NOC) | Employed | | Economic Demand | Retiree Replacement Demand | Total Demand |
|---|---|---|---|---|---|
| | 2020 | 2025 | 20 to 25 | 20 to 25 | 20 to 25 |
| Total 15 Selected Occupations Across All 303 Industries | 7,128 | 7,667 | 538 | 201 | 739 |
| Telecommunication carriers' managers | 117 | 116 | -1 | 1 | 0 |
| Computer and information systems managers | 639 | 687 | 48 | 11 | 58 |
| Electrical and electronics engineers | 438 | 449 | 10 | 29 | 40 |

| ICT & Digital Media Occupations (NOC) | Employed | | Economic Demand | Retiree Replacement Demand | Total Demand |
|---|---|---|---|---|---|
| | 2020 | 2025 | 20 to 25 | 20 to 25 | 20 to 25 |
| Computer engineers (except software engineers and designers) | 220 | 230 | 10 | 7 | 17 |
| Information systems analysts and consultants | 1,713 | 1,857 | 144 | 49 | 193 |
| Database analysts and data administrators | 234 | 250 | 16 | 9 | 25 |
| Software engineers and designers | 437 | 477 | 40 | 8 | 48 |
| Computer programmers and interactive media developers | 859 | 943 | 84 | 17 | 102 |
| Web designers and developers | 247 | 273 | 26 | 1 | 27 |
| Electrical and electronics engineering technologists and technicians | 442 | 465 | 23 | 20 | 44 |
| Computer network technicians | 654 | 702 | 48 | 22 | 70 |
| User support technicians | 428 | 456 | 28 | 10 | 39 |
| Information systems testing technicians | 77 | 85 | 8 | 1 | 8 |
| Broadcast technicians | 24 | 25 | 1 | 0 | 1 |
| Graphic designers and illustrators | 599 | 651 | 52 | 14 | 66 |

Source: *metroeconomics*

## 3.3 Sector Benchmark Analysis

In addition to understanding the nature and characteristics of the ICT and Digital Media Sector, Hamilton's ICT & Digital Media sector was benchmarked against those in select peer regions, to determine overall success in the growth of the sector.

The ten selected geographies were the City of Toronto, City of Markham, Kitchener-Waterloo, City of London, City of Ottawa, City of Calgary, City of Halifax, City of Winnipeg and the GTHA (Greater Toronto and Hamilton Area). The regions were selected based on:

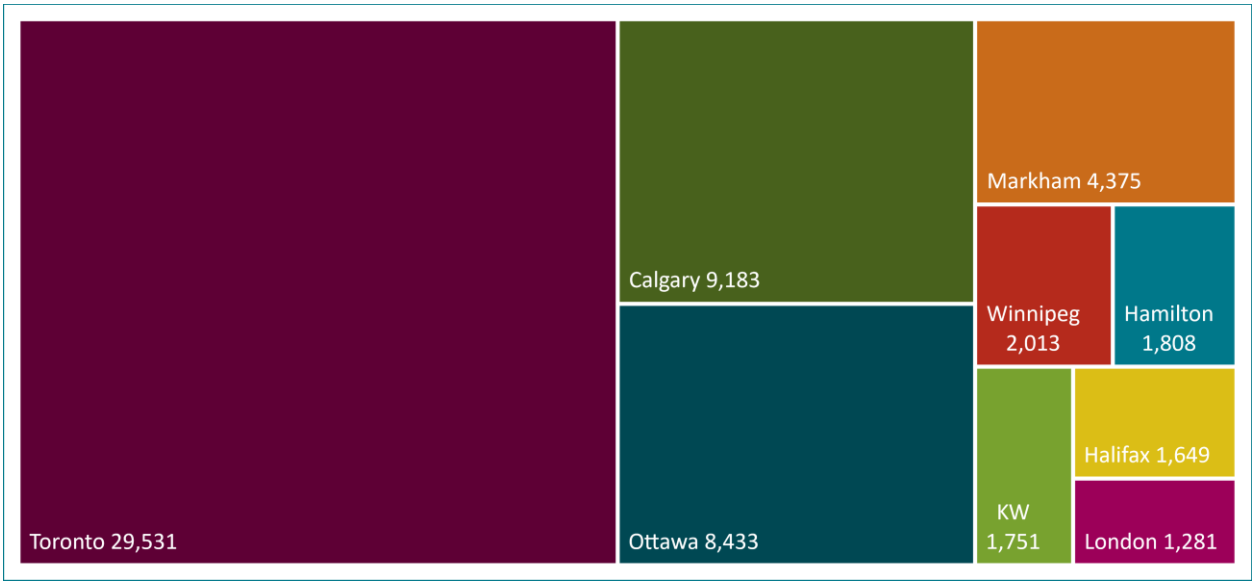
- Size and nature – urban centres
- ICT and Digital Media assets and amenities
- A critical mass of technology-based industries

### 3.3.1 Industry Size and Concentration

As per the Canadian Business Counts, a total of 1,808 businesses were classified as ICT & Digital Media Industries. This relates to 4% of all industries in the city and 3% of all GTHA ICT & Digital Media businesses. Placing Hamilton in the context of the Province and the Nation, it can be said that ICT & Digital Media Industries at 4% is lower than the provincial rate at 6% and 5% in Canada. As shown in **Figure 19**, Hamilton's ICT & Digital Media business counts are comparable to counts in Kitchener-

Waterloo, London, and Halifax. The city of Toronto with 29,531 businesses in the sector accounts for 45% of all GTHA and 33% of Ontario's ICT &Digital Media businesses.

**Figure 19: Number of ICT and Digital Media businesses, 2019**

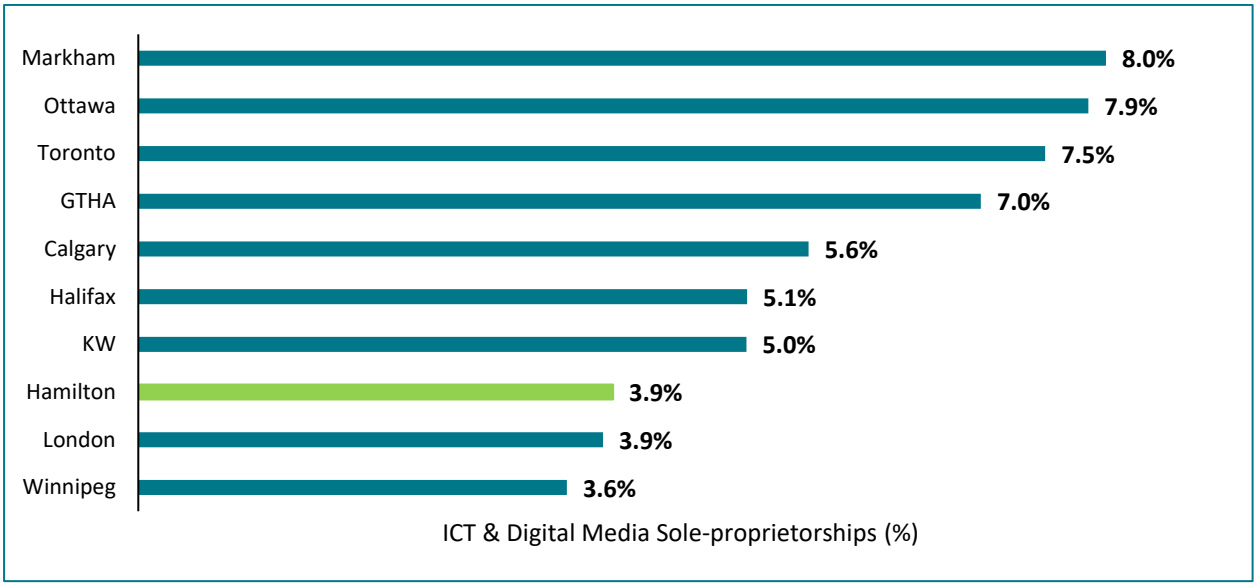



Source: Canadian Business Counts, June 2019

As shown in **Figure 20**, 3.9% of ICT & Digital Media businesses in Hamilton are sole-proprietorships. While sole-proprietorships by definition, are not job creators, these businesses are an important part of the entrepreneurial ecosystem. Within the sector, many sole-proprietorships perform functions such as consulting, IT specialists, software, and design agents.

Compared to comparator communities, Hamilton's percentage of sole-proprietorships is lower than the GTHA average and is comparable to London and Winnipeg. Communities such as Markham, Ottawa and Toronto show a higher proportion of sole-proprietorships, possibly due to the presence of anchor firms. These communities have more developed sectors with high quality and innovative anchor/flagship firms. These firms act as incubators, enabling knowledge, innovation and business model spillover that can result in the overall growth of sole-proprietorships and enable existing sole-proprietorships to improve their business competitiveness, resulting in a high-value small business sector.

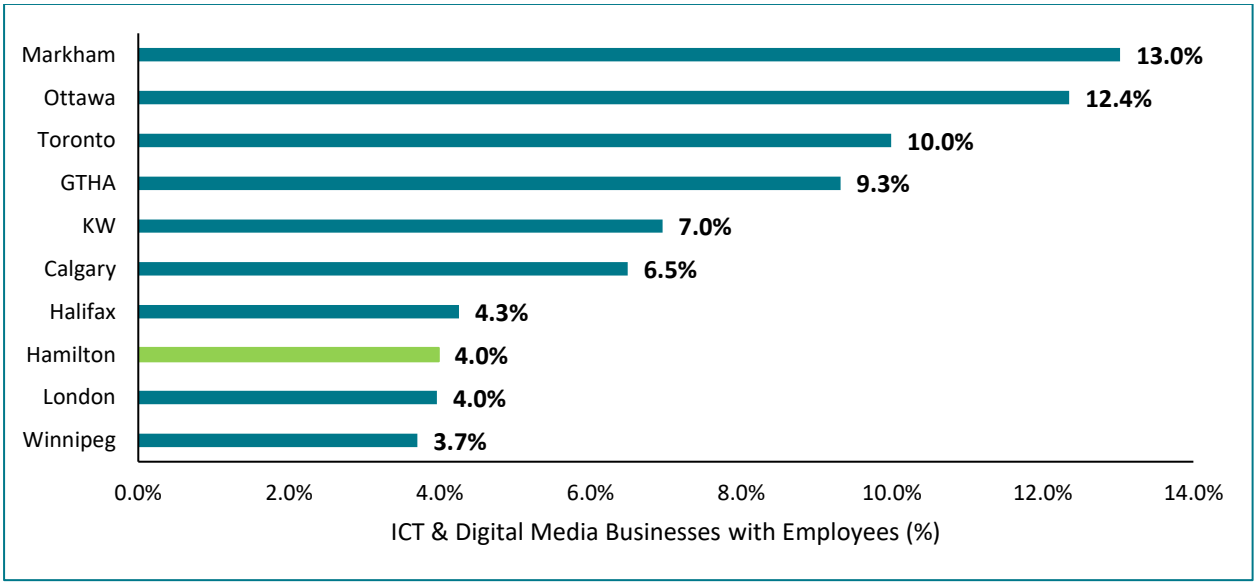
**Figure 20: ICT & Digital Media Sole-proprietorships (%), 2019**




Source: Canadian Business Counts, June 2019

**Figure 21** shows the percentage share of ICT & Digital Media businesses with employees. Similar to sole-proprietorships, Hamilton has a lower proportion of ICT & Digital Media businesses with employees. Markham, Ottawa, and Toronto show a higher proportion of employee establishments, which may indicate that those communities are a desired destination for high-tech firms.

**Figure 21: ICT & Digital Media Businesses with Employees (%), 2019**




Source: Canadian Business Counts, June 2019

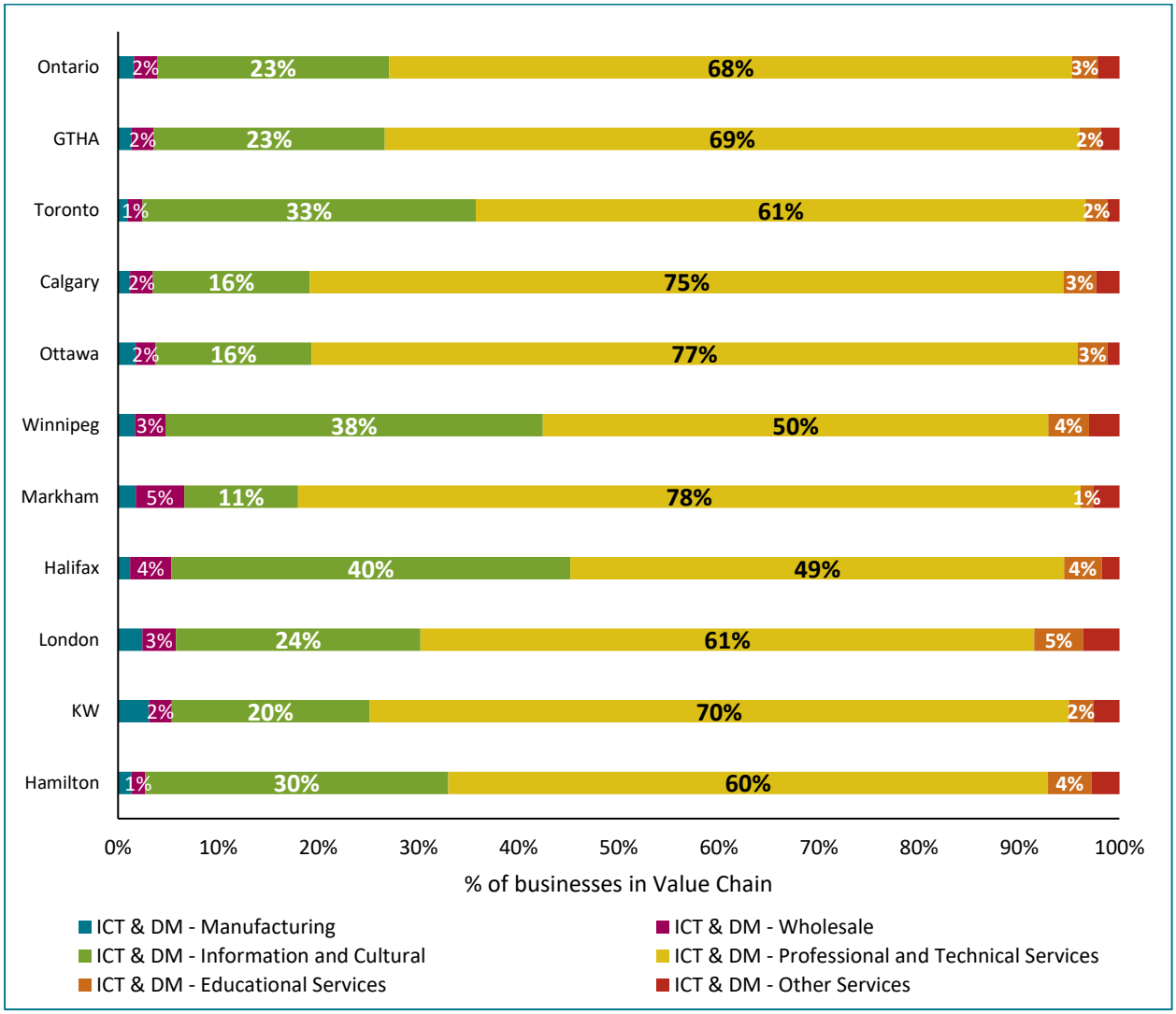
As illustrated in **Figure 22**, while firms in the ICT & DM – manufacturing and wholesale are comparable across all comparator communities, the largest differences are in core sub-sectors including ICT & DM - professional and technical services and information and cultural services.

Approximately 30% of firms in Hamilton are in information and cultural services and is comparable to Toronto at 33% and ranks higher than Markham, Ottawa, Calgary, KW, London and the GTHA. Hamilton ranks lower than Winnipeg and Halifax.

Approximately 60% of firms in Hamilton are in professional and technical services and is comparable to Toronto and London at 61%. Hamilton ranks higher than Winnipeg and Halifax and lower than KW, Calgary, Ottawa, and Markham.

Approximately 4.4% of firms in Hamilton are in educational services. Hamilton ranks higher than almost all communities in this subsector and is only lower than London at 4.9%.

**Figure 22: ICT & Digital Media Businesses by Sub-sectors, 2019**

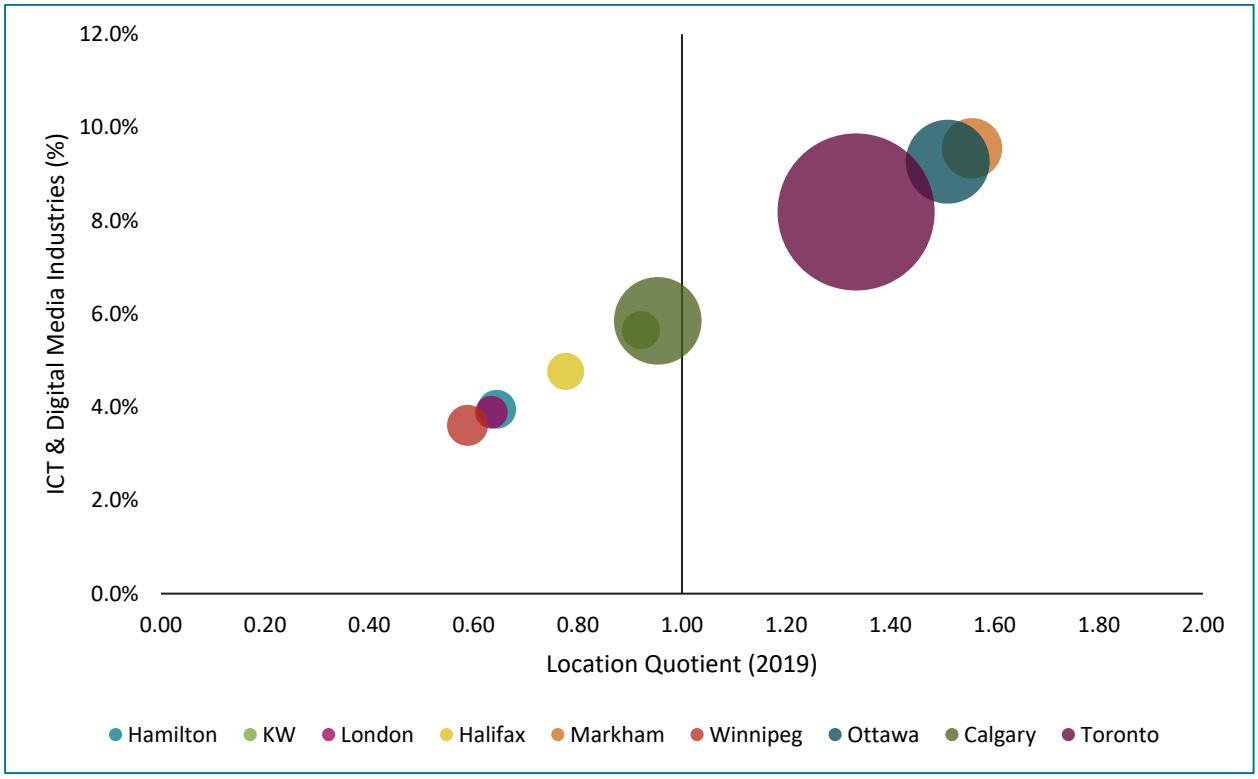



Source: Canadian Business Counts, June 2019

Hamilton's ICT and Digital Media sector concentration (LQ) and % of ICT & Digital Media Industries in 2019 were analysed in relation to regional comparators. ***Appendix III*** *provides a description of Location Quotient (LQ).* Studying **Figure 23** provides the following insight:

- The bubble size indicates the number of ICT and Digital Media businesses in each community in 2019 (this is similar to Figure 19)
- Hamilton's ICT and Digital Media sector concentration with an LQ of 0.64, shows that the concentration of businesses in the city is below the provincial average of 1.00
- Markham (LQ 1.56), Ottawa (LQ 1.51) and Toronto (LQ 1.33) show high LQ's indicating that ICT & Digital Media are highly concentrated in these communities. In tandem with the high LQ's, these communities show a higher % of ICT & Digital Media Industries when compared to Hamilton and the Province.
- Hamilton's ICT and Digital Media sector concentration are comparable to the cities of London and Winnipeg.

**Figure 23: Percentage of ICT and Digital Media businesses and Industry Concentration, 2019**




Source: Canadian Business Counts, June 2019

## 3.3.2 Industry Labour Force

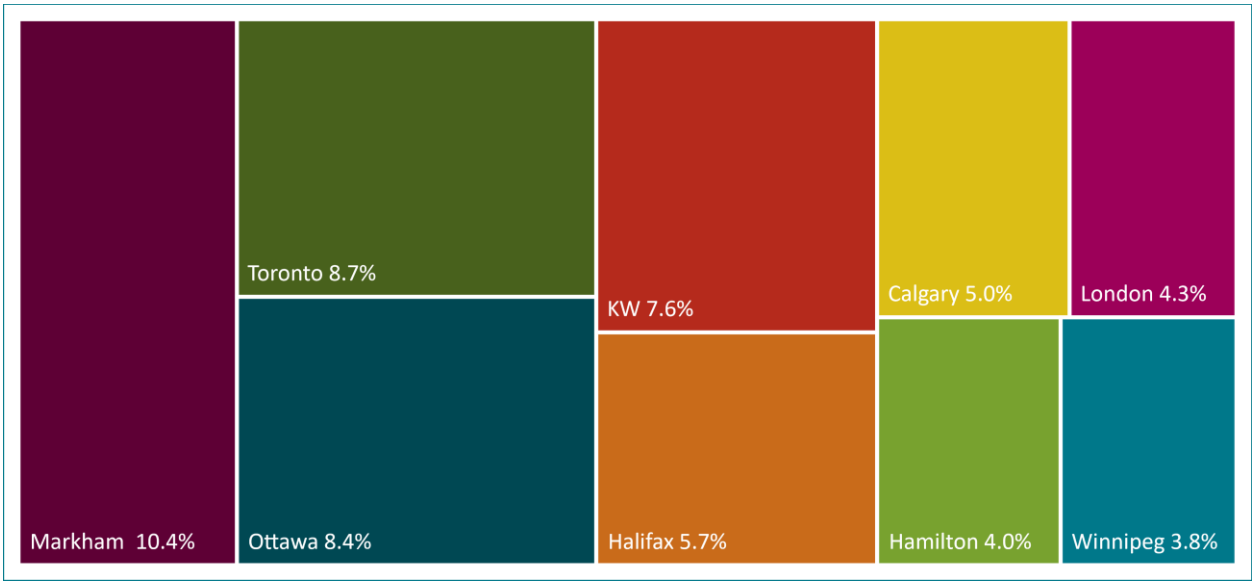
The labour force analysis showed that in 2016, Hamilton had a labour force of approximately 10,745 people in the ICT & DM Industries, accounting for 4% of the total labour force. Hamilton's labour force percentage in the sector is lower than the provincial rate of 6% and Canada at 6%.

Furthermore, Hamilton accounted for 4% of the GTHA's labour force compared to the city of Toronto with a labour force of 124,830 in the sector, representing 47% of the GTHA's labour force.

As shown in

**Figure 24**, Hamilton's ICT & Digital Media labour force percentage is comparable to rates in Winnipeg (3.8%), Hamilton (4.0%) and London (4.3%). The city of Markham leads among comparator communities in terms of the sector labour force with 10.4%, followed by Toronto and Ottawa.

**Figure 24: ICT and Digital Media Labour force, 2016**




Source: Statistics Canada, 2016 Census of Population

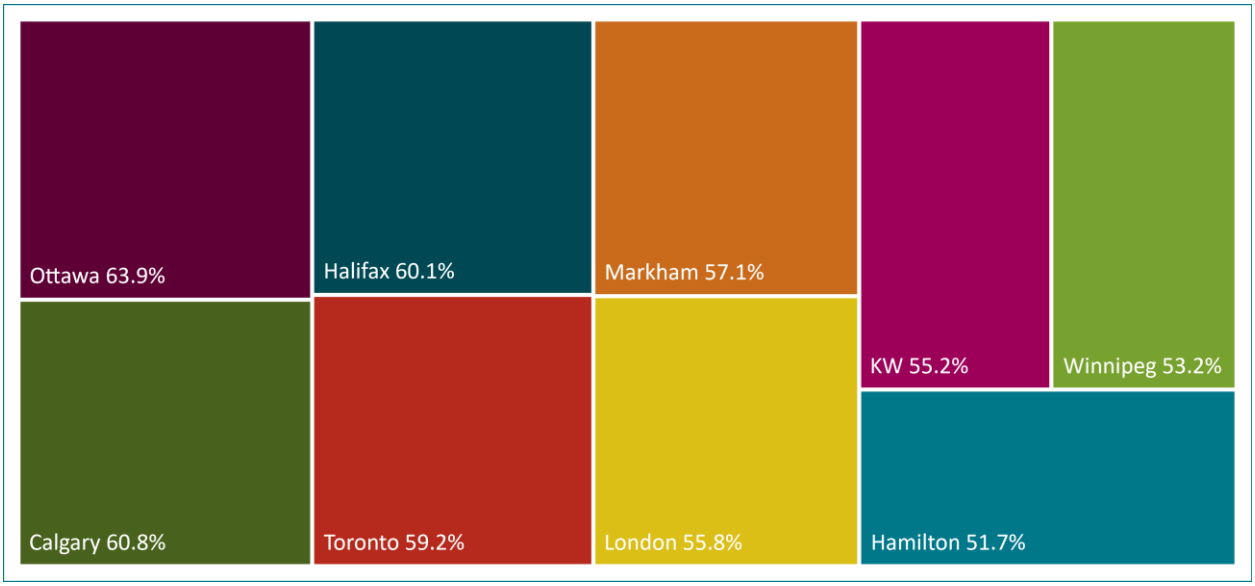
### 3.3.3 Education Levels

Measuring the share of the population with a post-secondary degree often correlates with the overall health and prosperity of a community and enables an assessment of the skilled talent available to participate in the ICT & Digital Media sector.

**Figure 25** illustrates the share of the population (15 years or older) with a post-secondary degree. Over 51% of Hamilton's population has a post-secondary degree.

Hamilton's share of the population with a post-secondary degree is lower than all other comparator communities. Ottawa ranks highest at 64%, followed by Calgary at 61%. The GTHA and provincial rates are at 57.4% and 55% respectively.

**Figure 25: Percentage of Population with Post-Secondary Degree, All Fields of Study, 2018**

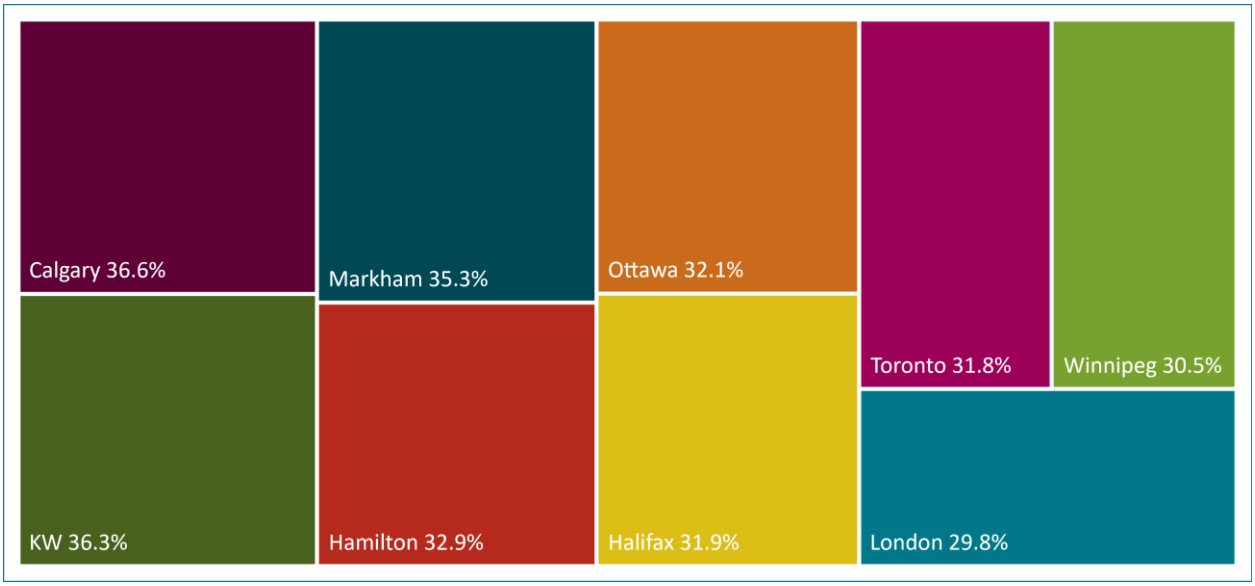



Source: Manifold data, 2018

Hamilton's share of population post-secondary degrees in all fields of study are comparable to Ottawa, Halifax and Toronto and is higher than Winnipeg and London. Calgary ranks highest at 37%, followed by Kitchener-Waterloo at 36%. The GTHA and provincial rates are at 32.8% and 33% respectively.

**Figure 26** presents a further examination of the share of the population with a post-secondary degree with degrees related to ICT & Digital Media. Broad fields of study associated with the sector include visual and performing arts, and communications technologies, mathematics, computer and information sciences, physical and life sciences and technologies and engineering, and related technologies. Hamilton's share of population post-secondary degrees related to the sector are comparable to Ottawa, Halifax and Toronto and is higher than Winnipeg and London. Calgary ranks highest at 37%, followed by Kitchener-Waterloo at 36%. The GTHA and provincial rates are at 32.8% and 33% respectively.

**Figure 26: ICT & Digital Media Related Fields of Study, 2018**

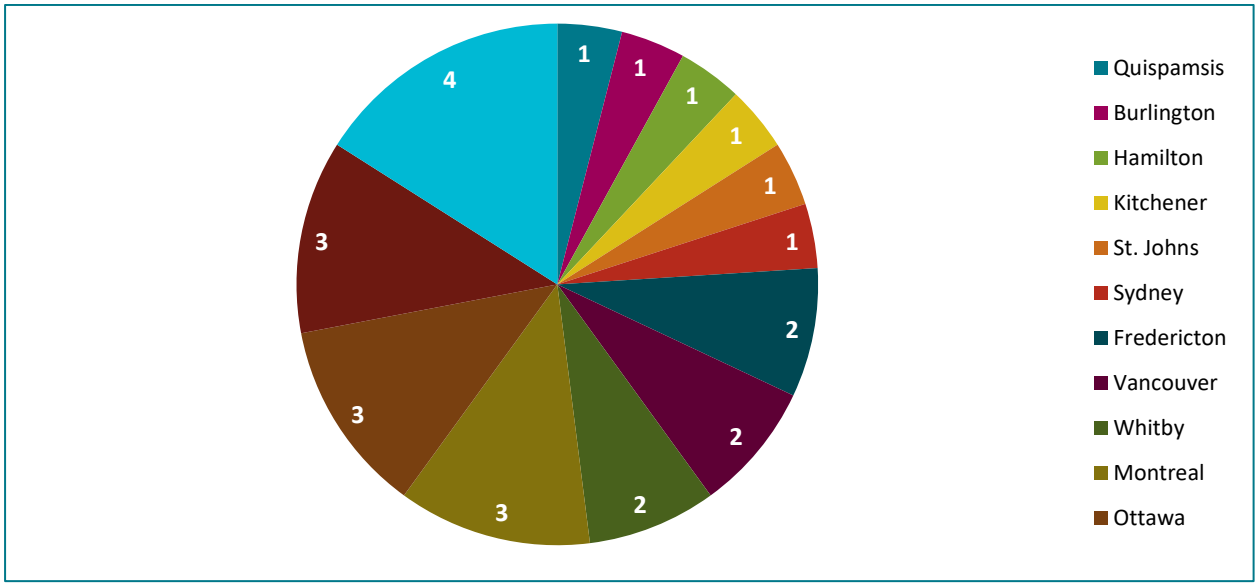



Source: Manifold data, 2018

### 3.3.4 Top 25 ICT

- The BRANHAM300 is an annual ranking of Canadian tech companies, providing insights on the Top 250 Canadian ICT Companies, Top 25 ICT Multinationals and Top 25 ICT Up and Comers.
- As per the survey results, the Canadian ICT sector has seen a major growth thrust. The performance of the companies reflects the continual maturation and growth of the Canadian ICT Industry as a key economic contributor and rising brand both domestically and globally. Key insights of the survey include:
- In 2018, the Top 250 Canadian ICT Companies (ranked by revenue) generated cumulative revenue of $115.3 Billion in fiscal 2018 compared to $106.3 Billion in the previous year. This represents a year-over-year revenue increase of 8.5%, compared to 1.14%, growth in fiscal 2017.
- In fiscal 2018, the top 25 multinationals generated $89.5 Billion in this country, an 12.4% increase over the $79.6 Billion total the year prior. Notable growth performers include Facebook, up an impressive 35%, and Amazon up 33%.
- Hamilton is listed as a place for one of the Top 25 ICT Up and Comers in the country (Figure 27). The Top 25 ICT Up and Comers are defined by Branham Group as promising young companies at the beginning of their successes. It is the only Branham300 list not based on revenue. Nine (36%) of this year's class of 25 Up and Comers are from Atlantic Canada. This reflects the increasing focus on ICT innovation in this region of Canada.

**Figure 27: Top 25 ICT Up and Comers by City, 2018**




Source: BRANHAM300, 2018.

## 3.4 ICT and Digital Media Asset Inventory

In addition to the analysis of Business Counts, the Key Findings Report also includes an asset inventory (or business listing) for Hamilton's ICT and Digital Media sector. The asset inventory was developed using various sources of data, namely,

- Dun & Bradstreet, Inc.
- City of Hamilton business List
- City of Hamilton Salesforce List
- Software Hamilton List

The data from the various sources were categorized based on three factors (a): corresponding ICT & Digital Media NAICS and (b): a description of business activities (c): listed phone numbers. The four data sources were combined to remove duplicates and errors and create one 'master list'. A total of 500 assets were determined to be in the final directory that was used to develop the asset inventory. The same asset inventory was used to administer the ICT, and Digital Media Business Survey discussed later in this report.

The complete asset inventory list is provided to the client in an excel format. The asset inventory forms a baseline for the City to build upon and develop a comprehensive business directory for the sector.

The key insights that emerged from this exercise are described below:

**Information and Communications Technologies (ICT) and Related** – Approximately 376 businesses were identified as ICT. These include core ICT sectors such as custom computer programming and support services, software publishers and developers, telecommunications, data processing,

hosting, and related services, and wholesalers. ICT firms engaged in sectors including healthcare, digital media, engineering and advanced process and business services also form part of the asset inventory. The core sectors within this include:

- **Custom Computer Programming and Support Services** – Approximately 125 businesses were identified in this sub-sector. Firms include those that are involved in custom computer programming services (72 firms), computer system design services (38 firms) and computer and office machine repair and maintenance.
- **Telecommunications** – Approximately 90 businesses were identified as Telecommunication firms. These firms are engaged in providing telecommunications and/or video entertainment services over their own networks or over networks operated by others and include Wired telecommunications carriers and wireless telecommunications carriers (except satellite).
- **Data Processing, Hosting, and Related Services** – Approximately 32 businesses were identified in this sub-sector. Firms are primarily engaged in providing hosting or data processing services and include automated data processing, computer services and video and audio streaming services.
- **Software Publishers and Related** – Approximately 34 businesses were identified in this sub-sector. Firms are primarily engaged in publishing computer software, usually for multiple clients and generally referred to as packaged software.
- **ICT Wholesalers** – Approximately 5 businesses were identified in this sub-sector, primarily engaged in the merchant wholesale distribution of computers, computer peripheral equipment, loaded computer boards, and/or computer software.
- **Design & Digital Media** – Approximately 105 businesses were identified as Design & Digital Media firms. These include both support and core firms including graphic designers, design studios, film and animation studios. Digital design marketing and advertising agencies were also identified as part of the subsector.

The asset inventory analysis shows that there is a significant opportunity for the City to build upon this baseline and build a comprehensive and current business directory. The 2019 Canadian Business Counts shows a total of 1,808 businesses compared to the 500 businesses identified in the inventory. A comprehensive business directory is an important tool for the City to grow and support the ICT and Digital Media sector. In addition, it can also serve as a resource for local firms to gain visibility in the local and regional market, improve their brand, identify industry partnerships and business resources, and support available to grow and improve the customer base.

## 3.5 Summary of Observations

The following section provides high-level insights into the sector current economic performance.

### ICT & Digital Media Businesses

Hamilton's ICT & Digital Media sector is a dynamic and global economic sector that has experienced a

steady increase from 1,487 enterprises in 2016 to 1,808 industries in 2019[6]. This relates to a net increase in 321 firms or a 22% growth from 2016 to 2019. The sector has grown at a faster pace than all other industry sectors in the city, which showed a growth rate of 16% for the same period.

The sector is dominated by small, single operator firms. Of the 1,808 businesses, accounting for 4% of all industries in the city, the majority are sole proprietorships (68% of all businesses). While sole-proprietorships by definition, are not job creators, these businesses are central to the economic growth and the viability of the local supply chain. Within the sector, many sole-proprietorships perform functions such as consulting, IT specialists, software, and design agents. The sector is also characterized by micro-establishments employing between 1-4 employees (23% of all businesses) or small businesses employing between 5-9 employees (5% of all businesses).

The strong economic performance of Hamilton's ICT & Digital Media sector has been driven by the professional and technical services, which saw a net increase from 915 firms in 2016 to 1,083 firms in 2019. This subsector accounts for 60% of all ICT and Digital Media industries. Computer systems design and graphic design are some of the services driving growth within the sub-sector.

Another major growth driver is information and cultural services with 547 businesses in 2019, witnessing a high growth rate of 35% from 2016 to 2019 (net increase of 141 firms). The majority of businesses in this subsector are *Motion picture and video production firms* (202) while 30 businesses are involved in the publishing of software. Digital media is an important aspect of these industries for the production and delivery of content including motion pictures, videos, television programs or commercials.

As per the 2018 ICT Sector Snapshot, growth in these subsectors is primarily driven by technologies including Cybersecurity, data analytics and artificial intelligence. The shift to cloud computing delivery models is also a primary driver of growth, given that these models have led to declines in the prices of several IT services, resulting in stronger demand for these services. It has also resulted in the outsourcing of data storage and management, in turn, creating stronger growth in the sector.

### ICT & Digital Media Economic Impact

Hamilton's ICT & Digital Media sector makes a strong and growing contribution to its economy. As per current-year estimates, GDP associated with this sector will reach almost $1.3 billion[7]. The city's GDP in 2020 economy-wide will reach almost $24 billion measured in constant 2012 dollars; thus, the ICT & Digital Media sector directly accounts for 3.5% of its GDP.

Of the $1.3 billion in GDP contributions, direct GDP associated with this sector will reach $845 million. Economic contributions have posted strong growth of 7.4% from $787 million in 2016 to $845 million in 2020; only one percentage point lower than the rest of Hamilton economic growth.

It is further estimated that through direct, indirect, and induced impacts, the city's ICT & Digital Media sector leads to more than $3 billion in sales in 2020[8]. Of this, approximately 54% or $1.623 billion is directly associated through sales in the sector.

In addition to GDP and sales growth, the sector has witnessed labour force and associated income growth. Through direct, indirect, and induced impacts, the sector leads to more than $600 million in

[6] Canadian Business Counts, December 2016 & 2019.
[7] metroeconomics' Community-Based Projection System.
[8] Ibid.

labour income and a labour force of more than 13,500[9]. Direct impacts of the sector will pay workers $470 million in wages and salaries and employ just over 6,000 people.

To place these estimates in context, the ICT & Digital Media sector directly accounts for 2.8% of all total jobs in the city. The sector's direct productivity in the sector significantly exceeds the average economy-wide level as reflected in the much larger GDP share than employment share.

## ICT & Digital Media Employment

As per current-year estimates, approximately 10,993 people are employed in Hamilton's ICT & Digital Media ecosystem[10]. This includes 6,008 ICT & Digital Media professionals working in Hamilton's ICT & Digital Media sector and 4,985 ICT & Digital Media professionals working in non-ICT & Digital Media industries.

The ICT & Digital Media sector employing 6,008 people accounts for 2.8% of all total jobs in the city. This includes 2,170 ICT & Digital Media professionals working in the ICT & Digital Media sector (20% of total) and approximately 3,838 non-ICT & Digital Media professionals working in the ICT& Digital Media industry (35% of total).

Of the 2,170 ICT & Digital Media professionals working in the ICT & Digital Media sector, the majority are employed within the computer systems design industry, accounting for 1,733 or 54% of all occupations. Employment in this sector is projected to grow by 13% to 2,462 jobs in 2025. Hamilton has particular opportunities to capitalize on this sector and realize growth. As evidenced in the 2018 ICT Sector Snapshot, the Canadian software and computer industries accounted for the largest share in GDP contributions, with 48% of $86.5 billion in 2018. The sector is also a major player in R&D expenditures and export-oriented growth.

## ICT & Digital Media Occupations

Of the 2,170 ICT & Digital Media professionals working in the ICT & Digital Media sector, the top five occupations are information systems analysts and consultants, computer programmers and interactive media developers, graphic designers and illustrators, software engineers and designers and computer and information systems managers.

Hamilton's ICT & Digital Media sector dominates in the employment of people employed as telecommunication carriers' managers at 87% and broadcast technicians at 84%. The sector also accounts for between 40 - 47% of software engineers, designers, graphic designers and illustrators, information systems testing technicians, computer programmers and interactive media developers and computer engineers (except software engineers and designers).

## Labour Market Requirements and Skills Supply

Based on estimates, Hamilton's ICT & Digital Media sector would require almost 300 new workers between 2020 and 2025[11]. The largest need is for 76 additional information systems analysts and consultants, followed by 63 computer programmers and interactive media developers. Approximately, 33 workers will be required for each of software engineers and designers, and graphic designers and illustrators and 26 computer and information systems managers will be required.

[9] Ibid.

[10] metroeconomics' Community-Based Projection System. Adapted by MDB Insight.

[11] metroeconomics' Community-Based Projection System.

These five occupations collectively account for 79% of the total need for workers. It is estimated that Hamilton's ICT & Digital Media sector will need to recruit new workers (a) as their businesses grow and (b) because some portion of the workers in these occupations will retire over that span.

The occupational data shows that the ICT and Digital Media sector is characterized by a knowledge-intensive workforce, with a great need for post-secondary educated workers. Given that approximately 52% of Hamilton's population 15 years or older hold a university degree across all industries sectors, the city has the skilled talent needed to participate in the ICT & Digital Media sector. Further analysis shows that 33% of Hamilton's population have post-secondary degrees related to ICT & Digital Media. Broad fields of study associated with the sector include visual and performing arts, communications technologies, computer, and information sciences, providing evidence for the sector to meet its current and future labour force requirements.

### ICT and Digital Media Sector Benchmark

Placing Hamilton in the context of the Province and Canada, it can be said that ICT & Digital Media Industries at 4% is lower than the provincial rate at 6% and 5% in the country.

Hamilton's ICT & Digital Media business counts are comparable to counts in Kitchener-Waterloo, London, and Halifax. The city of Toronto with 29,531 businesses in the sector accounts for 45% of all GTHA and 33% of Ontario's ICT &Digital Media businesses. Communities such as Markham, Ottawa and Toronto have a more established ICT & Digital Media sector and a higher proportion of anchor firms. It is understood that high quality and innovative anchor/flagship firms act as incubators, enabling knowledge, innovation, and business model spillover. This, in turn, will allow small businesses to improve their overall business competitiveness, resulting in a high-value business ecosystem.

It is understood that Hamilton's share of the population with a post-secondary degree is lower than all other comparator communities. Ottawa ranks highest at 64%, followed by Calgary at 61%. The GTHA and provincial rates are at 57% and 55% respectively.

Hamilton's share of population post-secondary degrees related to the sector are comparable to Ottawa, Halifax and Toronto and is higher than Winnipeg and London. Calgary ranks highest at 37%, followed by Kitchener-Waterloo at 36%. The GTHA and provincial rates are at 32.8% and 33% respectively.

# 4. Sector Consultation & SWOT Analysis

To further inform strategy development and recommendations for Hamilton's ICT & Digital Media sector, a comprehensive consultation process was undertaken. Consultations with stakeholders included a business survey, targeted phone interviews and an in-community workshop. The focus of the consultation process was an examination of the nature and current state of Hamilton's ICT & Digital Media sector, challenges and opportunities associated with the sector and the role played by Hamilton Economic Development and Partners in advancing these opportunities. The stakeholder interviews and workshops provided responses to several core questions identified for the Strategy, including:

- What challenges do the ICT & Digital Media businesses face in Hamilton?
- What is working well in the ICT & Digital Media sector in Hamilton? What initiatives should be undertaken to make the sector competitive in Hamilton/Ontario?
- What role should Hamilton's economic development partners play in advancing these opportunities?

## 4.1 ICT and Digital Media Business Survey

A statistically valid CATI survey was administered by MDB Insight in January 2020 to ICT and Digital Media businesses in Hamilton.

The survey was designed in consultation with the City of Hamilton Economic Development Staff and further informed through stakeholder interviews with local businesses in the sector. The survey aimed to gain insight into the current business environment, business satisfaction levels and the skills needs of businesses in the sector. The full result of the business survey is provided in ***Appendix IV***. The key insights that are emerged are described below.

### 4.1.1 Respondent Profile

Approximately 80 businesses in the sector provided input to the study. Respondents included software firms, IT consulting services, website design, marketing and advertising agencies, computer services and telecommunication carriers. The majority of respondents were micro and small businesses, employing between 1 to 4 full-time employees (46%) or 5 to 9 full-time employees (25%). Majority of respondents indicate that they do not employ part-time workers; 56% of businesses do not employ any part-time workers.

When asked to identify the 'primary reason for operating your business/operation in Hamilton', 65% of respondents indicated that they are residents of the city. 18% of businesses operate their business/operation in Hamilton due to proximity to customers, while 8% identified access to business supply chain as the primary reason. 16% of businesses also indicated that they relocated their business to Hamilton from another municipality.

### 4.1.2 Business Environment

Majority of respondents are in the early growth stage of their business; approximately 55% (44

businesses) are in the growth phase with increasing revenues and customers. These include firms specialising in custom computer programming services, computer systems, design services and software publishers. It can be understood that these are core sub-sectors of the ICT & Digital Media sector. Of these 55% growth stage businesses, 98% expect the revenues to increase. Furthermore, 32% of these businesses have their primary customer base in international markets and 27% locally within Hamilton. In addition to this, approximately 34% of the growth stage businesses are actively pursuing international business opportunities with a further 14% either in the initial or mid planning stages. This suggests that Hamilton's ICT and Digital Media start-up sector is healthy, with significant local and international business opportunities.

A quarter of respondents are in the established stage of their business's growth; approximately 25% (20 businesses). These include firms specialising in telecommunications, business services and computer equipment and other computer-related services. These sub-sectors can be viewed as core sub-sectors of the ICT & Digital Media sector. Out of these businesses, a majority (55% or 11 businesses) are expecting to see no change in revenues over the next year. Additionally, 50% (11 businesses) have their primary customer base located in Hamilton with a further 20% located internationally. Interestingly, results, as shown in **Figure 29**, indicate that of these established businesses, over half (55%) are not considering international business opportunities, and out of those who are, 25% are in the late-stage of actively pursuing opportunities. This indicates that Hamilton's ICT and Digital Media sector has a healthy concentration of established businesses and that there are substantial international opportunities for these firms.

Survey results shown in **Figure 28** illustrate that 18% (14 businesses) of ICT and Digital Media firms are in the expansion stage of their business, meaning they are actively exploring new markets and distribution channels to sell their products. These include firms within the ICT and data processing, hosting, and related services categories. All of the respondents in this category reported expected increases in revenue over the next year and a further 43% (6 businesses) that their primary customer base would be located in international markets. Interestingly, only 7% (1 business) reported that their customer base would be located locally in Hamilton. Regarding international business opportunities (**Figure 29**), 29% of respondents (4 businesses) reported that they are in the initial stages of planning and a further 35% (5 businesses) are in the mid-late stage. Overall, this indicates that Hamilton's local market is suitable for firms seeking to expand and that there is a high level of opportunity to fuel expansion activities by targeting international customers to grow revenue streams.

**Figure 28: Cross-tabulation of business growth stage by customer base and expected revenue**

| Which of the following best describes your stage of business? | | Is your primary customer base located in...? | | | | Over the next year, do you expect the revenues for your business to ...? | | |
|---|---|---|---|---|---|---|---|---|
| Stage | % | Hamilton | Greater Toronto Area | National | International | Increase | Remain the Same | Decrease |
| Growth (Revenues & customers are increasing) | 55% | 27% | 20% | 20% | 32% | 98% | 2% | 0% |
| Established (business has reached maturity) | 25% | 50% | 15% | 15% | 20% | 30% | 55% | 10% |
| Expansion (exploring new markets and distribution channels) | 18% | 7% | 29% | 21% | 43% | 100% | 0% | 0% |
| Decline (declining business opportunities and/or market share) | 3% | 50% | 0% | 50% | 0% | 0% | 50% | 50% |
| Exit Stage (cash out or shutting down) | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% |

Source: MDB Insight, CATI Survey, 2019

**Figure 29: Cross-tabulation of business growth stage by stage of international business opportunity**

| Which of the following best describes your stage of business? | | Which of the following best describes your interest in international business opportunities? | | | |
|---|---|---|---|---|---|
| Stage | % | Initial stage (We are in research and planning) | Mid-stage (We are developing strategies) | Late-stage (We are actively pursuing international business opportunities) | We are not considering international business opportunities now |
| Growth (Revenues & customers are increasing) | 55% | 7% | 7% | 34% | 52% |
| Established (business has reached maturity) | 25% | 10% | 10% | 25% | 55% |
| Expansion (exploring new markets and distribution channels) | 18% | 29% | 21% | 14% | 36% |
| Decline (declining business opportunities and/or market share) | 3% | 0% | 0% | 50% | 50% |
| Exit Stage (cash out or shutting down) | 0% | 0% | 0% | 0% | 0% |

Source: MDB Insight, CATI Survey, 2019

### 4.1.3 Skill Requirements

Only 13% of respondents indicated that the availability of skilled workers in Hamilton for their business needs as 'excellent' while the majority; approximately 39% indicated the rate of available skilled workers as 'fair'.

When asked to indicate skills that are in highest demand for their business, respondents mentioned skills, personal attributes and knowledge descriptor used for the execution of tasks and activities. Skills and personal attributes mentioned include communication and interpersonal skills, customer service, marketing, and sales skills. In terms of knowledge descriptors, respondents identified the need for software programmers and developers, knowledge related to computer and information sciences and support services, including computer programming and data processing. Respondents also indicated the need for experienced graphic designers. Web and game design were other attributes that were mentioned. IT support was another major knowledge descriptor that respondents identified. Examples include technical IT skills, computer repair and telecommunication networking.

### 4.1.4 Business Satisfaction

Businesses were also asked to rate their satisfaction levels with various factors of owning and operating their ICT and Digital Media business in Hamilton. **Figure 30** shows the satisfaction levels of businesses with various business factors.

Majority of businesses indicated *'Don't know/Not applicable'* when asked satisfaction levels with municipal property tax rates, availability of property for purchase or lease, quality of business support programming, access to capital/availability of public funding and support programs and access to Light Rail Transit (LRT). This indicates a possible gap as businesses may not be aware of the business support programming that the city provides or that businesses have not accessed any of these services for their needs. Businesses seem *'Very Satisfied'* with the quality of broadband/hi-speed Internet; 38% indicated high satisfaction and a further 36% said they are *'Somewhat Satisfied'*. Businesses also indicated satisfaction with attracting and retaining skilled talent and attracting new customers.

**Figure 30: Business Satisfaction with various Factors**

| Factors | Very Satisfied | | Somewhat Satisfied | | Somewhat Dissatisfied | | Very Dissatisfied | | Don't know/Not applicable | | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Municipal property tax rates | 2 | 3% | 28 | 35% | 8 | 10% | 10 | 13% | 32 | 40% | 80 |
| Availability of property for purchase or lease | 9 | 11% | 26 | 33% | 13 | 16% | 4 | 5% | 28 | 35% | 80 |
| Quality of business support programming | 18 | 23% | 21 | 26% | 7 | 9% | 5 | 6% | 29 | 36% | 80 |
| Attracting and retaining skilled talent | 17 | 21% | 35 | 44% | 11 | 14% | 7 | 9% | 10 | 13% | 80 |
| Attracting new customers | 15 | 19% | 31 | 39% | 13 | 16% | 6 | 8% | 15 | 19% | 80 |
| Quality of broadband/hi-speed Internet | 30 | 38% | 29 | 36% | 10 | 13% | 10 | 13% | 1 | 1% | 80 |
| Access to capital/Availability of public funding and support programs | 6 | 8% | 20 | 25% | 12 | 15% | 10 | 13% | 32 | 40% | 80 |
| Access to Light Rail Transit (LRT) | 4 | 5% | 11 | 14% | 4 | 5% | 13 | 16% | 48 | 60% | 80 |

Source: MDB Insight, CATI Survey, 2019

Businesses were also asked if they have accessed any of business support funds and/or programs that the City provides or any provincial or federal funding programs. The results are illustrated in **Figure 31**. The majority of respondents indicated not being familiar with any of the funds and/or programs. These include Innovation Factory Programs & Services, Hamilton's Soft-Landing Program, Hamilton Business Centre and the Office Tenancy Assistance Program. Businesses did indicate that they would be like to be notified of future networking or tradeshow opportunities, indicating opportunities for the City to connect with local businesses.

**Figure 31: Familiarity of businesses with Programs & Services**

| Programs & Services | Have accessed | | Heard of it but not accessed | | Not familiar | | Total |
|---|---|---|---|---|---|---|---|
| Innovation Factory Programs & Services | 18 | 23% | 20 | 25% | 42 | 53% | 80 |
| Hamilton's Soft-Landing Program | 2 | 3% | 6 | 8% | 72 | 90% | 80 |
| Hamilton Business Centre (formerly Small Business Enterprise Centre) | 8 | 10% | 28 | 35% | 44 | 55% | 80 |
| One-Stop for Business | 1 | 1% | 8 | 10% | 71 | 89% | 80 |
| Business Improvement Area Commercial Property Improvement Grant Program | 5 | 6% | 17 | 21% | 58 | 73% | 80 |
| Office Tenancy Assistance Program | 0 | 0% | 6 | 8% | 74 | 93% | 80 |
| Provincial funding programs | 11 | 14% | 16 | 20% | 53 | 66% | 80 |
| Federal funding programs | 11 | 14% | 19 | 24% | 50 | 63% | 80 |

Source: MDB Insight, CATI Survey, 2019

## 4.2 SWOT Analysis

The insights that emerged from the consultation were pivoted to frame a SWOT (strengths, weaknesses, opportunities, and threats) assessment of the ICT & Digital Media sector. The SWOT, in turn, articulates a value proposition that is unique and compelling for Hamilton's ICT & Digital Media sector and aims to enhance the competitive advantage within Hamilton and the region. A well-defined value proposition will result in a focused set of recommendations that form the basis for future sector development activities.

Complete results from the sector consultation are provided as *Appendix II: Consultation Summary.* The results of the SWOT assessment are summarized below.


### 4.2.1 Strengths

- **Location Advantage:** Hamilton's central location as part of the Greater Toronto and Hamilton Area (GTHA) and Canada's Innovation Corridor[12], ensures a strong economic zone with strengths in manufacturing and technology and provides easy access to a network of highways, international airport, and ability to reach internal markets.
- **Affordable City:** As per the 2018 Manifold data, Hamilton's median dwellings values at $415,623 is on average $150,000 – $415,000 less than comparator communities including Ottawa, Calgary, Toronto, and Markham. Rental rates in Hamilton are also lower compared to Toronto, Markham, and Ottawa and comparable to the Kitchener - Cambridge – Waterloo region. These estimates show that Hamilton is still considered an affordable alternative to comparator communities.
- **Talent & Innovation Cluster:** The presence of key post-secondary institutions, including McMaster University and Mohawk College, Hamilton Technology Centre, McMaster Innovation Park, and Innovation Factory (iF), among others has ensured that the city has a network of strategic business resources to help ICT companies in Hamilton.
- **Responsive Educational Institutions and Programs:** Hamilton's post-secondary institutions are effective in responding to industry needs. The Joint McMaster University & Mohawk College Bachelor of Technology Program, Mohawk College's Graphic Design Advanced Diploma and Master of Technology Entrepreneurship and Innovation are key examples of universities enabling talent with technology and digital skills.
- **Skilled Labour Force:** 33% (81,355 people) of Hamilton's population have post-secondary degrees related to ICT & Digital Media. Broad fields of study associated with the sector include visual and

[12] Canada's Innovation Corridor is the Toronto-Waterloo Region Corridor. https://thecorridor.ca/

performing arts, communications technologies, computer, and information sciences, providing evidence for the sector to meet its current and future labour force requirements.

- **Favourable Business Size:** Stakeholders mentioned that Hamilton is large enough to realize a critical mass but small enough to support community networks and communication. Relatedly, start-ups and small businesses feel that they are included and considered an integral part of the business environment.
- **Strong Business Environment:** As per the Canadian Business Counts, a total of 1,808 businesses were classified as ICT & Digital Media Industries. Businesses in the sector are also witnessing an increase in counts; the sector saw a net increase of 321 firms or a 22% growth from 2016 to 2019. Hamilton's ICT and Digital Media sector have grown at a far higher pace than all other industry sectors in the City, which showed a growth rate of 16% for the same time period.
- **Economic Contribution of the Sector:** GDP associated with this sector will reach almost $1.3 billion[13]. The city's GDP in 2020 economy-wide will reach almost $24 billion measured in constant 2012 dollars; thus, the ICT & Digital Media sector directly accounts for 3.5% of its GDP.
- **Software and Computer Services:** The software and computer services which include software publishers, computer systems design, and data processing is a major growth driver for the City. This sector is an integral part of the Canadian ICT sector and thus provides investment synergies for City.
- **Innovation in Healthcare:** Hamilton has an increased focus on IT integration, innovation, and commercialization in the health care sector. The presence of Hamilton Health Sciences (HHS) and the CREATE (CentRE for dAta science and digiTal hEalth) and Mohawk College eHealth & mHealth Development and Innovation Centre (MEDIC) along with healthcare IT firms are critical in this regard.
- **Hamilton Economic Development:** Majority of businesses consulted through stakeholder interviews identified that they have a strong relationship with Hamilton Economic Development. Businesses feel they can approach the Economic Development team for their business needs.

### 4.2.2 Weakness

- **Gaps in Transportation Infrastructure:** Stakeholders identified that gaps in public transportation are affecting the ability of employees to commute to work, and businesses to attract young, knowledge workers to the downtown core. They pointed to a need for increased frequency of GO and LRT at high-density transit hubs.
- **Downtown Revitalization Gaps:** Perspectives shared by stakeholders identified that Hamilton's downtown does not provide a stimulating and appealing environment for investment. Furthermore, the downtown is disconnected, and businesses find it difficult to access downtown spaces and services, including restaurants, cultural and recreation opportunities.
- **Gaps in Talent Retention and Attraction:** Stakeholders identified that hiring and retaining skilled talent is a major challenge affecting business growth and expansion. While there is a robust talent pool of new graduates, businesses are finding it difficult to hire and retain experienced talent.

[13] *metroeconomics' Community-Based Projection System*

Businesses do offer internships and training programs to train new graduates. However, it is hard to find local talent with the right technical skills, for example, software developers & IT sales.

- **Labour Outflow:** Hamilton shows an outflow of its ICT & Digital Media labour force to surrounding communities, including Burlington, Toronto, Mississauga, and Oakville. The greatest outflow is in the professional, scientific, and technical services. This suggests that the local sector does not have enough job opportunities to employ the local labour force.
- **Businesses Unable to Reach Critical Mass:** Stakeholders suggested that small businesses in the sector are unable to self-sustain and scale-up. Challenges identified by businesses related to this include lack of investment, employee turnover and lack of brand identity.
- **A Dearth of Anchor Firms:** Stakeholders suggested that Hamilton is witnessing momentum in the growth of the ICT & Digital Media sector. However, the sector is dominated by small businesses and start-ups. The lack of anchor or flagship firms is affecting the viability of the sector, the ability to attract top talent and foster new business investment.
- **Gaps in C-level, or C-suite Leadership:** Related to the previous gap, Hamilton suffers from a gap in management expertise. It is understood that high-level executives demonstrate leadership skills and business expertise, as well as team-building abilities and decision-making skills. This is of significance for small and midsize businesses (SMEs) as they can learn from and access the benefits of such a formal structure.
- **Good News Business Strengths are not Communicated:** A theme frequently repeated in consultation with the sector is that businesses in the sector are not marketed effectively, hampering profitability and sustainability.
- **Ineffectual Branding of the City to Attract Business Investment:** Hamilton needs a brand that is attractive to businesses and positions them for investing in the community. There is a need to move away from the 'quality of life' messaging to a more 'what we offer businesses' message. Stakeholders also mentioned that Hamilton is still perceived as 'Blue Collar'. The City's strengths in the knowledge-based and creative economy sectors and cultural life are not recognized.
- **Partnerships are not Leveraged:** The City has several local assets, including educational institutions and incubators. However, a common theme highlighted in consultation efforts was that these partnerships were not fully leveraged. Opportunities exist to research and improve awareness and support to take full advantages of local assets.
- **OTAP not Recognized/Marketed Effectively:** The Office Tenancy Assistance Program (OTAP) is an interest-free loan program that allows business owners to improve their properties through loans worth up to $450,000 with repayment terms up to five years. However, of the 80 businesses consulted through the business survey, 93% are not familiar with the Program.
- **Gaps in finding appropriate Physical Space:** Businesses indicated difficulties in finding appropriate space for their needs. While the Economic Development team is helpful in site selection, red tape and difficulties dealing with building and planning departments affect the development approvals process.
- **Poor Profile of Business Support Funds and/or Programs:** The business survey results suggest that Hamilton's businesses are not aware/familiar with Programs & Services provided by Hamilton

Business Centre, Innovation Factory, Hamilton's Soft-Landing Program, and the Business Improvement Area Commercial Property Improvement Grant Program. Stakeholder interviews further indicated that Hamilton economic development needs to effectively communicate the support services that they offer.

### 4.2.3 Opportunities

- **Focus on Success Stories:** Feedback from the business stakeholders identified the need for the city to focus on success stories to create awareness and improve recognition of the sector both within the community and externally.
- **Collaboration among Key Sectors:** Hamilton's focus on digital technology and advanced information technology provides opportunities for targeted growth and development strategies and actions in the creative and FIRE industry sectors.
- **Leverage the Post-Secondary Institutions:** As indicated in the strengths, McMaster University and Mohawk College are effective in responding to industry needs and creating programs. The City should foster more partnerships between industry and educators to create training and support programs that adapt to the new economy.
- **Reshoring Talent:** The commuting patterns data suggest a significant amount of the ICT & Digital Media talent that lives in Hamilton is commuting to other communities to work. Stakeholders identified that there was an appetite to reshore these talents by promoting telework or co-working stations in Hamilton.
- **Dedicated Directory of Businesses:** There is a desire among local businesses to be able to access the City's website or business directory and understand the universe of businesses/support activities within the sector.
- **Increased Awareness for McMaster Innovation Park and Innovation Factory (iF):** Businesses are not fully aware of the differences in McMaster Innovation Park & Innovation Factory and the programs and services offered; they are often viewed through the same lens.
- City-Owned Incubator: Appetite among businesses to see a business incubator that is owned and operated by the City. The idea stems from difficulties faced by software start-ups in accessing management training or office space. Businesses also suggested that a business incubator would improve their eligibility to access government funding. It should be noted that Hamilton is home to the Forge and the Hamilton Business Centre. This indicates a lack of awareness among businesses regarding the support systems available in the city.
- **Meet-ups, Mentorships and Networking Events:** Opportunities exist for Hamilton to invest in hosting events and networking to increase collaboration between technology companies, university partners, the city and new talent. The city should provide support to meet-ups (e.g., financing).
- **Changing Mindset:** Hamilton should move away from a competing mindset to a collaboration mindset. Instead of viewing Toronto and Kitchener as competitors, the City should gain a regional mindset, whereby it can leverage the flagship firms and associated opportunities provided by these communities in this sector. The growth of Hamilton's manufacturing sector is viewed as an organic process. The emerging health technology, digital media and creative industries are strengths for the City that should be leveraged by taking a regional approach to development.

### 4.2.4 Threats

- **'Build to Flip' Mind-Set:** A common theme among Canadian technology-based entrepreneurs is they often start-up with a 'build to flip mindset and opt to exit via acquisition. Thus, a high proportion of start-ups never reach large-scale commercialization in Canada.
- **Unsustainable Start-Up Business Models:** Businesses are factoring the provincial tax credits in their business models, especially in the animation sector, which is highly subsidized. This business model is unsustainable as the wait for the provincial tax credit is too long (takes up to 2 years). Businesses are unable to bridge financing and struggle to stay afloat.
- **Gaps in Commercialization:** Hamilton's university and innovation partners are focussed on research and not commercialization. Late-stage start-ups face difficulties in scaling up and acceleration.
- **Intellectual Property Violations:** Intellectual property threats include threats from unauthorized copying over the internet, threats from hackers, and threats from employees.
- **Gaps in Funding/Venture Capital:** Businesses in the sector lack the funding supply and opportunities that Toronto and Kitchener can access. While firms in Hamilton have access to angel capital, the lack of a deeper venture capital network means that Hamilton firms are unable to participate in the commercialization and scaling up phase which may require financing of at least $10 million.
- **Sector-based FDI:** Recent research published by EY[14] identified that while there was a dramatic surge in the overall number of FDI projects in the Hamilton region, FDI within the high-tech sector is comparatively low when compared to investments by firms in the mineral industry (energy and metallic minerals sector).
- **Lack of Progressive Regulation:** Within the tech sector, business models are regularly evolving. Governments need to be progressive to respond to these changes and develop and enforce regulations that protect businesses and the community and ensures that investment and innovation continues.
- **Lack of Progressive City Leadership:** Businesses felt that Hamilton's leadership needs to have a more progressive mindset and aggressively engage in opportunities that enhance infrastructure and investment in innovation.
- **Coronavirus (COVID-19) Crisis:** The economic challenges associated with COVID-19 are unprecedented. In addition to the serious implications for people's health and healthcare services, COVID-19 is having a significant impact on businesses and the economy. Businesses are navigating a broad range of interrelated issues that span from keeping their employees and customers safe, ensuring operations and supply chain are viable, shoring-up cash and liquidity, reorienting operations and navigating complicated government support programs.

[14] Toronto Global & Waterloo EDC – Technology & Innovation FDI Strategy Project – December 2019

# 5. Advancing Hamilton's ICT & Digital Media Ecosystem

## 5.1 Key Opportunity Areas & Considerations

This section highlights the key opportunities and considerations for Hamilton as it advances its ICT & Digital Media sector.

### 5.1.1 Niche Sub-sectors

As identified through the SWOT analysis, Hamilton has unique opportunities to capitalize on several niche sectors, including Interactive Digital Media (IDM) and Health based Technologies.

Interactive Digital Media refers to the industry of user engaged digital platforms. As per the Measuring Success report[15], IDM includes games developers and publishers, eLearning software developers, VR/AR/MR developers, VR arcades, mobile app developers, digital advertising firms, interactive site web developers and software developers servicing the above companies.

Hamilton has a number of successful businesses in the digital media space including Q4, Pipeline Studios, Clearcable, Nix Color Sensor, Fluidmedia and Calibre Communications. Supporting these businesses is a network of innovation and education partners. Some key examples include start-up programming provided by Innovation Factory, the Forge accelerator[16], iDeaWORKS and Mohawk College's Graphic Design Advanced Diploma. Also, the AVR Development Lab at Mohawk College functions as a training and research hub for AR/VR (augmented and virtual reality).

As identified in the 2021 ICTC Outlook[17], Virtual and Augmented Reality will be one of the five key technologies driving innovation in Canada. Moreover, as per the Measuring Success report[18], Ontario's IDM companies are expected to see substantial growth over the coming years due to the advancements of businesses in this space. In 2017, the sector generated $1.66 billion of revenue in 2017 with an implied profit margin of 31%.

Hamilton's technology strengths are also visible in the health sector, specifically in digital health. Opportunities include system integration, interoperability to prototype novel technologies and educating the next generation of digital health entrepreneurs.

The mHealth & eHealth Development and Innovation Centre (MEDIC) at Mohawk College with a focus on digital health serves to bridge the gap between innovative industries and the mobile health and ehealth needs of the healthcare system. In addition to MEDIC, McMaster University offers Canada's only masters in e-Health, designed to build capacity around digital health informatics. Further, the Institute for Applied Health Sciences, a joint collaboration between Mohawk and McMaster, enables real-world

[15] Measuring Success: The Impact of the Interactive Digital Media Sector in Ontario – 2nd edition. 2019
[16] Innovation Factory and McMaster University launched The Forge accelerator, a collaborative workspace in 2014.
[17] The Next Talent Wave: Navigating the Digital Shift – ICTC's Labour Market Outlook Report 2017-2021.
[18] Measuring Success: The Impact of the Interactive Digital Media Sector in Ontario – 2nd edition. 2019

experiences for more than 2,000 students a year.

### 5.1.2 Collaboration among Key Industry Sectors

As identified in Hamilton's 2016-2020 Economic Development Action Plan, key industry sectors identified for the city include advanced manufacturing, goods movement, agriculture and food processing, ICT & digital media, creative industries, life sciences, finance, insurance, and real estate (FIRE) and tourism.

Given that the permeation of technology across all industries is broadening, the city is well-positioned to leverage industry strengths and cross over opportunities in advanced manufacturing, creative industries, life sciences and the FIRE sector.

Digital media is one of the fastest-growing parts of the creative cultural industries, both as a sector onto itself, tied closely to gaming, and as a force transforming the creation and distribution of a wide range of cultural content. The recent investment of a production hub in the City-owned Barton-Tiffany lands will enable crossover opportunities in post-production, animation, visual effects, and game development.

ICT and the digital economy have given FIRE sector businesses access to big data and analytics, realise operational efficiency and improve customer experience. New technologies such as blockchain could make the financial services industry's infrastructure much less expensive and create seamless financial transactions and automated contractual agreements. Recent trends show that hyper-connectivity[19] will also pave the way for greater product customisation in the health sector. IoT technology has also enabled financial institutions to implement big data analytics to monitor for covert threats.

### 5.1.3 Leveraging Digital Transformation During COVID-19

As per the 2020 HSBC review of mid- to long-term implications, COVID-19 is significantly impacting on the technology sector, affecting raw materials supply, disrupting the electronics value chain, and causing an inflationary risk on products. However, the impact on the sector is not as significant as some of the hardest-hit sectors such as Commercial Aerospace, Recreation & Culture, Hospitality and Oil & Gas. More positively, disruption in the sector has caused an acceleration of remote working, and a rapid focus on evaluating and de-risking the end-to-end value chain. The report further predicts that in the mid to long-term, the sector will witness a digital transformation and 'servicisation' trend. Remote working, distance learning, online media content, telemedicine, eCommerce, and Real Estate "Servicisation" are among the key industries driving this transformation.

Hamilton is in a unique position to capitalize on their digital businesses and pave the way for digital transformation. A strong digital strategy is critical in this regard. In addition, the following insights can serve as key learnings for the city[20]:

- Creating a design thinking approach that focuses on end-users or businesses and provides real-time data that shows how suppliers, channel partners, and competitors are responding to the crisis, and how the ecosystem is evolving

[19] Referred to as the 'Internet of Things', big data analytics, sensor technology and the communicating will allow life and health insurers to anticipate risks and customer demands with far greater precision than ever before.

[20] https://knowledge.insead.edu/blog/insead-blog/how-corporates-can-leverage-start-ups-against-covid-19-13756

- Focus on highly practical challenges – e.g. transforming processes to allow for all-digital or remote working
- Leverage start-ups for problem-solving as they could directly support governments with innovative and fast solutions
- Improve access/visibility to funding for start-ups and public-sector partnerships to close the funding gap created as investors withdraw due to the economic downturn.

### 5.1.4 ICT & Digital Media FDI Opportunity

As part of the strategy development for the ICT & Digital sector, a potential company targets exercise was completed for the City of Hamilton. The complete results are provided as an excel sheet to the City and form *Appendix III: Hamilton FDI Target List.* Key insights are provided here:

#### High Priority

- Eighteen potential targets that are larger and medium-sized high growth companies, primarily in ICT and out of California. The rationale for the IDM companies included the rapid expansion of these companies with offices across North America, Europe, and the Asia Pacific. Three of the targets are in IDM while four are in cloud solutions and one Gaming, AR/VR, autonomous vehicles, AI HQ. Cloud applications, Data science/analytics and Video conferencing are identified as sectors that will benefit from the COVID-19 pandemic.
- EdTech is an important sector given the impact of COVID-19. Companies are likely to be experiencing a growth spike due to the surge in remote learning in education. Target companies serving schools as opposed to adults. Sixteen potential targets were identified, the majority of which were HQ leads from the United States.
- Gaming is a strong fit for Hamilton, especially as some companies are beginning to deploy manufacturing applications. Eight potential targets were identified in this sector, the majority of which were cities in the United States, including San Francisco and Santa Monica. The targets include leading Game developers with a global footprint and largest game company in the Americas in terms of revenue and market capitalization. The sector is also identified to be less impacted by COVID-19.

#### Medium Priority

- Eleven potential targets in sports, the majority of which were sports analytics. It should be noted that a key action of Hamilton's 2016-2020 Economic Development Action Plan is to establish a Sports Analytics Cluster. This sector, while small, is rapidly evolving. Notably, this sub-sector has little or no presence in Canada, so Hamilton could have a first-mover advantage here. This sector is identified to be one of the sectors adversely affected by COVID-19.
- Nine potential targets in motion capture. They show long term prospect and are a great fit for Hamilton as a) it combines sports and manufacturing applications and b) is at the intersection of AR/VR and artificial intelligence. This sector is identified to be one of the sectors adversely affected by COVID-19.

#### Low Priority

- Twenty-three potential targets that are Toronto's small and high growth companies. These include IDM and software development. A small number of data centres are included. The results of the FDI analysis complements the sector analysis results that identified niche opportunities for Hamilton in IDM. However, it should be noted that Ontario is at a significant competitive disadvantage as compared to Quebec on account of electricity costs. Cloud computing companies are included as a better option.

While these potential targets provide a significant opportunity for Hamilton, it should be noted that the companies have not been qualified and need to be developed through conversations with the company.

### 5.1.5 City of Hamilton Role

A key insight that emerged from the consultation process was the need for clarity surrounding for Hamilton Economic Development's role in enabling further growth in the ICT & Digital Media sector. Stakeholders also identified a disconnect between the economic development, building and planning departments. Hamilton is home to many innovations and research partners. However, businesses are unaware of the various support and innovation systems available. Relatedly, there is a perception that innovation partners and firms work in silos and opportunities exist to better leverage these to ensure there is no duplication of services.

Considering this, there is a need to shift from a traditional "planner-provider-deliverer" model to an increasingly collaborative "enabler-convener-catalyst-broker" model. The collaboration includes those between and within municipal departments, community partners, business organizations and industries. This will allow the City to pool talent and resources and address growth opportunities in a collaborative and cohesive manner.

The enabler-convener-catalyst-broker model is essential to the health of Hamilton's ICT & Digital Media sector. In a planning and investment role, investing in placemaking initiatives through collaboration between various City departments including Planning, Economic Development and Parks and Recreation, among others, is essential. In a partnership role, Economic Development should continue to establish and sustain relationships with external partners, including education institutions, innovation partners, local businesses, and community partners. In a convener role, the City should build knowledge and strengthen collaboration through regular meet-ups and coordinated programming. Establishing digital platforms for continued communication is also essential.

## 5.2 Value Proposition

The value proposition for Hamilton's ICT & Digital Media sector has been assembled based on the results of the sector analysis, consultations, and key trends. It goes beyond the traditional messages and focuses on those assets and attributes that can enable the City to realize success in sector-based investment attraction and marketing. In preparing the value proposition for Hamilton's ICT & Digital Media sector, the value proposition for Interactive Digital Media in Ontario and the Toronto-Waterloo Region Corridor was considered.

Though the messaging targeted at the sector is consistent with that of the broader region (i.e. GTHA), it also identifies key factors that differentiate Hamilton from its closest competitors. The value proposition places the highest emphasis on several factors characteristic of most technology-based industries,

including labour force, education and training, local industry and incentives and business support programs. Some of the key differentiating points that should be highlighted to identify Hamilton's position in the ICT & Digital Media sector is described below.

### 5.2.1 A Strong and Highly Qualified Labour Force

Hamilton is home to a strong and highly qualified labour force of 300,719 as of 2018. Most of this labour force is concentrated in industry sectors, including health care and social assistance, accounting for 13% of the total labour force. Manufacturing and retail trade accounts for 11% of the total labour force, each followed by educational services at 9% and professional, scientific, and technical services at 6%. Hamilton's labour force has grown by 8% within the past two years, an additional 22,074 people. The city is also home to a growing immigrant and multilingual population, at 25% of the total population. Hamilton's immigrant population base is higher than national rates at 22%.

In addition to the strong labour force, Hamilton enjoys a strong employment base in the ICT & Digital Media sector. As per current-year estimates, approximately 10,993 people are employed within Hamilton's ICT & Digital Media ecosystem. The majority of ICT & Digital Media professionals are employed within the computer systems design industry, accounting for 1,733 or 54% of all occupations. Employment in this sector is projected to grow by 13% to 2,462 jobs by 2025.

ICT & Digital Media professionals perform core occupations including information systems analysts and consultants, computer programmers and interactive media developers, graphic designers and illustrators, software engineers and designers and computer and information systems managers.

Hamilton's manufacturing strengths are evident in the digital technology sector, with labour force growth in a number of key IT equipment manufacturing industries (e.g. computers and peripheral equipment, communications equipment, and audio and video equipment manufacturing). Hamilton's ICT & Digital Media sector dominates in the employment of people employed as telecommunication carriers' managers at 87% and broadcast technicians at 84%.

Hamilton's strong employment in a range of ICT & Digital Media industries and occupations provides it with the potential to support the growth of core digital technology industries and peripheral digital technology sector in Hamilton and across the rest of the GTHA.

### 5.2.2 World-Class Education and Innovation with Unique Digital Technology Focus

As of 2018, over 51% of Hamilton's population 15 years or older have a post-secondary degree. Hamilton's share of the population with post-secondary degrees related to the ICT & Digital Media sector is comparable to Ottawa, Halifax and Toronto and is higher than Winnipeg and London. Broad fields of study associated with the sector include visual and performing arts, and communications technologies, mathematics, computer and information sciences, physical and life sciences and technologies and engineering, and related technologies.

McMaster University and Mohawk College offer relevant programs at the diploma and degree (undergraduate and graduate) level, with unique sector-specific programming in areas that integrate digital technology into other sectors (e.g. health informatics, game development/entrepreneurship, adult education, and digital technology). In addition, the W Booth School of Engineering Practice provides interdisciplinary graduate education through the Master of Technology Entrepreneurship and

Innovation.

Hamilton's unique value proposition focuses on enabling IT integration, innovation, and commercialization in the health care sector. Key innovation partners include Mohawk eHealth & mHealth Development and Innovation Centre (MEDIC). MEDIC works with companies to help them launch and commercialize innovative new healthcare IT products and services, as well as provide a centre of excellence for organizations undertaking interconnected healthcare projects[21].

McMaster Innovation Park (MIP) offers research opportunities in Hamilton in key industrial areas, including advanced manufacturing and materials, nanotechnology, and biotechnology. Current buildings include the Atrium@MIP, the McMaster Automotive Resource Centre, and the CanmetMATERIALS Laboratory.

Another key value proposition for Hamilton is the focus on Interactive Digital Media and the integration with the creative industries. The Joint McMaster University & Mohawk College Bachelor of Technology Program and Mohawk College's Graphic Design Advanced Diploma provide graduates with the skills to participate in the digital economy. Mohawk College's iDeaWORKS is a key partner, specifically in technologies including augmented & Virtual Reality, IoT and Big data.

The 2019 investment of a production hub in the City-owned Barton-Tiffany lands by Aeon Studio Group (ASG) is expected to create high-value, high-paying jobs in the film sector. Moreover, it will revitalize the brownfield, creating an accessible community that is conveniently located next to the West Harbour GO station and near our future LRT. This investment is of critical importance to the ICT & Digital Media sector as it enables crossover opportunities in post-production, animation, visual effects, and game development.

### 5.2.3 A Growing Digital Economy Industry Base

Hamilton has an emerging technology cluster where firms drive innovation, growth, and productivity. The city is home to 1,808 firms, including core digital technology companies in professional and information technology services and support firms in ICT manufacturing, ICT wholesale, education and maintenance and repair to support the sector.

Hamilton's industry base is slightly more characteristic of entrepreneurs and small businesses, with a slightly higher profile of self-employed than across the rest of the GTA. The strong economic performance of Hamilton's ICT & Digital Media sector has been driven by the Professional and Technical Services. Computer systems design and graphic design are some of the services driving growth within the sub-sector.

Other major growth drivers are the motion picture and video production firms and businesses involved in the publishing of software. Digital media is an important aspect of these industries for the production and delivery of content including motion pictures, videos, television programs or commercials.

Educational support services are comparatively higher in Hamilton than across the GTHA, providing the city with unique strengths, specifically in digital health and interactive digital media. Hamilton's ICT manufacturing industries are comparable to communities across the GTHA and represent a consistent market for new digital technology product and service integration and innovation.

[21] https://investinhamilton.ca/wp-content/uploads/2019/06/EcDev-0916-ICT-Knowledge-Brochure-NEW.pdf

### 5.2.4 Hamilton is a Strong Base for ICT & Digital Media Growth and Investment

The operating cost environment in a jurisdiction is an important factor for each of the targeted sectors. From a business perspective, locating in Hamilton allows firms to run leaner operations compared to the well-known industry locations such as Toronto and Markham. From a talent perspective, Hamilton provides highly skilled workers with a much lower cost of living compared to most other locations in the GTAH. Considering the demand for office market across the GTAH, Hamilton's market is well-positioned to offer downtown office space with lower lease rates.

Hamilton offers a range of office and commercial spaces that have the potential to support these targeted industry activities on a temporary and permanent basis, which is further enhanced by a comparative lack of traffic congestion and parking issues that are often experienced in other larger municipalities. Recent investments made by co-working space providers have also introduced teleworking options and short-term rental-based spaces.

The Office Tenancy Assistance Program[22] also provides financial assistance to either building owners or tenants for eligible leasehold improvements to office buildings located within Downtown Hamilton, Community Downtowns, the Mount Hope / Airport Gateway, Business Improvement Areas (BIAs) and the commercial corridors along Barton Street, east of the Barton Village BIA and along Kenilworth Avenue North as identified in the Downtown and Community Renewal Community Improvement Project Area By-law. The intent of the Program is to facilitate the increased attractiveness and marketability of the office stock and reduce the office vacancy rate by attracting new office tenants, and owner-occupied office uses from outside the City, and to assist existing businesses to expand. Acting as a lender, the City provides financial support for the Program in the form of a zero-interest loan.

The ICT & Digital Media sector benefits from a supportive government at the local, provincial, and federal levels. As identified in the Hamilton Economic Development Strategy, the sector is a priority sector. The Provincial government is a key ally in helping to promote the industry across Ontario and around the world. Specific to the sector, the provincial and federal government offers incentives aimed at digital media, production, and animation companies.

[22] Ibid.

# 6. ICT and Digital Media Sector Action Plan

The primary focus of the City of Hamilton ICT & Digital Media Sector FDI Strategy was to build a strong body of knowledge to inform subsequent, research, consultation, and strategy formulation.

The recommendations and associated actions for Hamilton's ICT and Digital Media Sector build on Canada's Economic Strategy Tables: Digital Industries. The Economic Strategy Tables—a new model for industry-government collaboration—were announced as part of the Government of Canada's Innovation and Skills Plan to support economic growth in six key sectors, including digital industries.

The recommendations that follow help position and prepare the City for future sector investment and strategic planning.

| **Recommendation #1: Foster an ICT & Digital Media Growth Environment** | |
|---|---|
| Why is this important? | Firms in Hamilton's ICT & Digital Media sector have mentioned barriers to productivity and commercialization, communication, and collaboration.<br><br>Hamilton has the unique opportunity to foster higher levels of productivity and innovation in the ICT & Digital Media sector by understanding the needs of local businesses, having access to up to date market research and responding to market signals. |
| Outcome | A cohesive sector with the data, support services and networks to enable business growth, innovation, and investment. |
| Actions | ▪ Use statistically valid survey tools to better understand the issues faced by firms in the sector, including barriers to commercializing and bringing new technologies to market. A bi-annual Triage BR+E survey will effectively measure the health of local businesses.<br>▪ Explore the feasibility of creating an online asset map tool which showcases Hamilton's ICT & Digital Media businesses and support systems (e.g. Waterloo EDC Market data[23]). This will ensure that existing firms are aware of key service providers and local/regional supply chain linkages and also act as a marketing tool.<br>▪ Create and host signature events that allow businesses to engage with resources and partners that strengthen and grow the sector.<br>▪ In partnership with the creative sector, existing co-working spaces and innovation partners, work toward co-locating independent artists, arts and culture non-profit groups, and small digital and interactive technology firms. |

[23] https://www.waterlooedc.ca/en/market-data/market-data.aspx

| | |
|---|---|
| | ▪ Explore the feasibility of collaborating with Hamilton's Creative Exchange, to examine crossover benefits between Hamilton's creative industries and Digital Media.<br>▪ Support the development of an industry-driven peer organization to enable professionals to share challenges and best practices. (e.g. Toronto's TechConnex or Communitech Peer2Peer Network).<br>▪ Consider the development of an ICT & Digital Media Sector Council comprising of industry partners (similar to Mississauga's Industry Sector Councils). The Council should also include representation from post-secondary and innovation partners, City department and the Mayor's Office. |
| **Recommendation #2: Support Skills Development, Talent Attraction and Retention** | |
| Why is this important? | Hamilton is one of the 25 up-and-coming global tech talent markets[24]. As home to McMaster University and Mohawk College, the city is a significant source of a skilled tech talent pipeline. However, firms in the sector mention challenges with attracting and retaining talent and difficulties in hiring skilled talent with the technical skills to perform tasks. Hamilton also has management expertise.<br>There is a significant opportunity to further leverage the post-secondary institutions and innovation partners to provide a talent pipeline enables sector growth. |
| Outcome | A world-class quality talent pipeline committed to mutual success ensures local firm growth and serves as a global marketing tool for the city. |
| Actions | ▪ Leverage Workforce Planning Hamilton to develop projects that will provide accurate and current information on the evolving Tech-based labour market.<br>▪ Continuously engage with local businesses to understand their evolving skill needs. A dedicated resource such as university students could be engaged to reach out to local businesses.<br>▪ In understanding the skill needs of local firms, engage with academic partners to develop training and retraining programs to ensure that the talent has the right skills to participate in the labour force.<br>▪ As a facilitator, convene a quarterly forum, inviting CEO's and technology leaders of firms in Hamilton and the GTHA to share insights with Hamilton firms to grow their management expertise (similar model to Platform Calgary CEO roundtable).<br>▪ In conjunction with firms in the sector, examine opportunities to encourage continuous workplace learning for students whereby students receive on the job experience or training.<br>▪ Leverage the flexible Joint Intellectual Property Policy of McMaster University to drive research into commercialization and entrepreneurship. |

[24] 2019 CBRE scoring tech talent report. The study reviewed cities based on their ability to attract and grow tech talent.

| Recommendation #3: Targeted Investment Attraction in Niche Sectors | |
|---|---|
| Why is this important? | While FDI increased significantly, there is room for growth in the ICT/digital media sector, which accounts for only 4% of all industries in the City.<br><br>Hamilton has the unique opportunity to identify medium and large companies in niche sectors to improve its competitive positioning and long-term growth prospects. This will also enable the city to reverse the labour leakage that it is currently witnessing. |
| Outcome | A growth sector with ongoing investment in niche industries, enhanced competitiveness, and job creation. |
| Actions | ▪ Regularly monitor foreign direct investment (FDI) opportunities in niche sectors, including Interactive Digital Media and Digital Health.<br><br>▪ Explore the possibility of designating an ICT & Digital Media Industry expert who can advise Hamilton's Economic Development team on niche sector opportunities.<br><br>▪ Develop high-quality marketing materials that highlight Hamilton's unique sector-based value proposition.<br><br>▪ Assess the opportunity for targeted financial incentives for attracting businesses to the sector. Develop targeted incentives can enable the attraction of firms and ensure that Hamilton is able to foster growth in HQ and flagship firms. |
| **Recommendation #4: Showcase Hamilton's ICT & Digital Media Sector through Marketing and Branding** | |
| Why is this important? | Hamilton is still perceived as 'Blue Collar' by potential investors looking to locate in the GTHA.<br><br>There is a unique opportunity for Hamilton to highlight its value proposition, including niche sectors, industry sector collaboration, FDI opportunity, and ability to leverage digital transformation during COVID-19. |
| Outcome | A global Hamilton brand with a unique value proposition that is effectively marketed to local, regional, and international markets. |
| Actions | ▪ Continue to raise the profile of both start-ups and established digital and interactive enterprises both within the community and externally to better support accelerated innovation and firm growth.<br><br>▪ Create a central hub of information on the labour force profile, events and networking sessions, funding opportunities, partner information, existing business profiles, business support services and research and development opportunities.<br><br>▪ In addressing the need for businesses support and services, promote existing supports, including Hamilton Business Centre and Innovation Factory. |

| | |
|---|---|
| | ▪ Create a local ICT & Digital Media Sector campaign that highlights business retention and attraction efforts. Develop targeted marketing materials or industry profiles that highlight success stories and current and emerging opportunities in the sector.<br>▪ Seek out local champions that can promote the City's ICT & Digital Media sector. An industry-led initiative will better enable the municipality to attract investment, post-secondary support while strengthening the capabilities of local businesses. |

# Appendices

## Appendix I – Background Review

The City of Hamilton in recognising the importance of a diversified economy identified key industry sectors as part of the *2016-2020 Economic Development Action Plan.* The ICT and Digital Media Sector was identified as one of the 8 key industry sectors, enabling the City to leverage finite resources to engage in sector-specific business development and attraction initiatives. Initiatives included the assignment of a staff lead for the sector, enabling targeted business attraction and retention and building knowledge and expertise that can provide value to associated local businesses. Major actions identified in the Plan that relate to the sector are:

- Develop and implement an ICT & Digital Media Sector Strategy
- Create and implement a Digital Strategy for the City of Hamilton that identifies strategies to improve the ICT infrastructure (broadband/internet) in the city
- Complete a comprehensive asset mapping exercise of all ICT sector companies and infrastructure
- Establish a Sports Analytics Cluster to pursue a nationally recognized area of expertise

Key themes that emerged from the review are explored below:

### Small Business Development and Entrepreneurship Support

A key focus area for Hamilton is to *provide assistance to new and growing businesses through programs and services to foster and grow Hamilton's entrepreneurial eco-system.* This is of critical importance to the ICT and Digital Media sector, given that the sector is largely comprised of start-ups, single operator firms and small businesses.

The Hamilton Business Centre, operating as an arm of the Economic Development Division of the City of Hamilton, is a major opportunity for small business growth. The Centre is a one-stop source for business information, providing core programming for mid and late-career entrepreneurs and sector-specific entrepreneurial programming.

### Enabling Environment for Business Growth

Hamilton's strategic location as part of the Greater Toronto and Hamilton Area (GTHA) provides an enabling environment for new businesses investment and growth in the ICT and Digital Media sector. Hamilton's affordable office market when compared to surrounding regions, acts as another key growth enabler. As per the 2019 CBRE report[25], Hamilton's metro office gross rental space was only $23.80 per square foot compared to over $55 in downtown Toronto.

Business incubators, accelerators and innovation support including The Forge, McMaster Innovation Park, ideaWORKS, mHealth & eHealth Development and Innovation Centre (MEDIC), Surge, Hamilton Health Sciences (HHS) and the CREATE (CentRE for dAta science and digiTal hEalth) team act as important support systems for ICT & Digital Media Sector growth. Software Hamilton is a key newsletter, providing news coverage for the Hamilton, Ontario technology and start-up community.

The Hamilton Technology Centre previously operated by the City's Economic Development Department is a private innovation hub owned and operated by Clearcable Networks. The Centre is a modern 40,000 square foot, fibre optic equipped incubator providing investment and leadership for emerging

[25] 2019 Scoring Canadian Tech Talent CBRE

technology companies and connects with other community initiatives such as the McMaster Innovation Park, Innovation Factory and Hamilton Hive.

In addition to local support, the Innovation Factory (iF), a Regional Innovation Centre (RIC) based in Hamilton provides start-up resources, programming, and mentorship to early-stage companies. Innovation Factory has strong expertise within the Information Technology sector.

### Enabling Environment for Talent Growth

The City is home to key post-secondary institutions including McMaster University and Mohawk College, focused on developing and retaining quality tech talent. This is of particular relevance, given that workforce development is a key focus area of the *2016-2020 Economic Development Action Plan.* Specific actions identified include increased support for youth through mentorship, entrepreneurship, and peer programs, to allow for greater opportunities to identify career pathways.

Hamilton has become a key up-and-coming tech market due to significant growth across the tech talent pool. A report published by CBRE[26] which measured 20 Canadian cities by their competitive advantages and appeal for tech workers and employers, found that Hamilton experienced the fastest pace of growth amongst mid and small markets in terms of talent availability, growing by 52.9% to 18,200 over a five-year period (2013-2018). This has resulted in tech talent representing 5.1% of Hamilton's total labour force, only slightly below the Ontario average of 5.3%.

In addition to a large talent pool, the report found that Hamilton possesses an abundance of high-quality tech labour with an overall quality rating of A- (excellent). Quality labour is especially important in the tech sector due to the high cost involved in acquiring new talent and is a key consideration for firms when moving to a region. McMaster University and Mohawk College's continued focus on developing ICT centred degrees, such as their joint Bachelor of Technology program, which is the fastest-growing program at McMaster, has resulted in strong talent growth locally. Overall, the report ranked Hamilton 9th in Canada for tech degree completion (804), representing an 8.8% growth over a five-year period ending in 2012-17.

### Investment Attraction

The City of Hamilton has developed key initiatives to ensure key investment and business growth in industry sectors. Programs include the Office Tenancy Assistance Program, which provides financial assistance (up to $450,000) to either building owners or tenants for eligible leasehold improvements to office buildings located within Downtown Hamilton and surrounding areas. The aim of the program is to reduce office tenancy rates by attracting new businesses to the area.

The City has also implemented a data collection and analysis program that assess the needs, opportunities, and trends of the business community. The data helps identify gaps and opportunities for new investment and reveal possible international parent companies and business contacts.

A key theme identified within the *2016-2020 Economic Development Action Plan* was the need to continue diversifying Hamilton's economy through increasing investment attraction activities.

As per the *2015 City of Hamilton Foreign Direct Investment Economic Development Strategy*, Hamilton's location is advantageous as Canada has the G7's lowest costs in R&D-intensive sectors (up to 15.8% lower than the U.S. average). Specific opportunity sectors include ICT manufacturing, ICT wholesaling,

[26] 2019 Scoring Canadian Tech Talent CBRE

software and computer services, communications services along with Interactive Digital Media (IDM) subsectors (post-production, SFX and animation, internet-online commercial information providers) and other IDM-Related subsectors. The report identifies specific geographic targets for the City, such as the GTA, California and Brazil.

Recent research published by EY[27], which mapped Foreign Direct Investment Inflows across the Toronto-Waterloo Corridor, showed that average FDI inflows for Hamilton across all sectors increased dramatically, from US$35.7M for the 2003 – 2010 period to US$123.2M during 2011 – 2017. Hamilton's FDI share for 2011 – 2017 is 16% of total FDI inflows in the Corridor. This dramatic increase was caused by a surge in the overall number of FDI projects in the Hamilton region, increasing from 13 to 24 across the two periods, and affirms the region's attractiveness as a destination for FDI. However, FDI within the high-tech sector fell 35% across the same two time periods as large investments by firms in the mineral industry (energy and metallic minerals sector) distorted investments made by international firms within the high-tech sector.

It is important to note that these trends represent total FDI inflows across all sectors and therefore should be viewed as a general indicator on the overall health of Hamilton's economy and its competitiveness in attracting FDI.

### Improving ICT Infrastructure

Another key theme that emerged from the *2016-2020 Economic Development Action Plan* was the need to develop and implement a Digital Strategy for the city that improves ICT infrastructure in both urban and rural areas. Specifically, the report detailed a 'stretch target' of improving internet speeds to 250 megabits/second to all rural areas, 1 gigabit/second to all urban Hamilton and 10 gigabit/second to all business parks and major commercial areas. Establishing a data centre within the city to support the ICT sector was also identified as a potential action.

[27] Toronto Global & Waterloo EDC – Technology & Innovation FDI Strategy Project – December 2019

## Appendix II – Industry Subsectors and Value Chain

### ICT & DM Industries Sub-sector Businesses with and without Employees, 2019

| NAICS | ICT & DM Industries Sub-sectors | Total | | Without employees | | With employees | |
|---|---|---|---|---|---|---|---|
| | | Count | % of total | Count | % of total | Count | % of total |
| **ICT & DM** | | **1,808** | **100.0%** | **1,221** | **68%** | **587** | **32%** |
| **ICT & DM - Manufacturing** | | **24** | **1.3%** | **11** | **46%** | **13** | **54%** |
| 334512 | Measuring, medical and controlling devices manufacturing | 7 | 0.4% | 0 | 0% | 7 | 100% |
| 334110 | Computer and peripheral equipment manufacturing | 5 | 0.3% | 4 | 80% | 1 | 20% |
| 334310 | Audio and video equipment manufacturing | 4 | 0.2% | 3 | 75% | 1 | 25% |
| 334290 | Other communications equipment manufacturing | 3 | 0.2% | 1 | 33% | 2 | 67% |
| 334410 | Semiconductor and another electronic component manufacturing | 2 | 0.1% | 1 | 50% | 1 | 50% |
| 334610 | Manufacturing and reproducing magnetic and optical media | 2 | 0.1% | 1 | 50% | 1 | 50% |
| 334220 | Radio television broadcasting and wireless communications equipment manufacturing | 1 | 0.1% | 1 | 100% | 0 | 0% |
| 334210 | Telephone apparatus manufacturing | 0 | 0% | 0 | | 0 | |
| 334511 | Navigational and guidance instruments manufacturing | 0 | 0% | 0 | | 0 | |
| **ICT & DM - Wholesale** | | **25** | **1.4%** | **11** | **44%** | **14** | **56%** |
| 417310 | Computer, computer peripheral and pre-packaged software merchant wholesalers | 14 | 0.8% | 5 | 36% | 9 | 64% |
| 417320 | Electronic components, navigational & comm. equip. & supplies merchant wholesalers | 11 | 0.6% | 6 | 55% | 5 | 45% |
| **ICT & DM - Information and Cultural** | | **547** | **30.3%** | **370** | **68%** | **177** | **32%** |
| 512110 | Motion picture and video production | 202 | 11.2% | 167 | 83% | 35 | 17% |
| 517911 | Telecommunications resellers | 42 | 2.3% | 0 | 0% | 42 | 100% |
| 519190 | All other information services | 41 | 2.3% | 40 | 98% | 1 | 2% |
| 519130 | Internet broadcasting and web search portals | 38 | 2.1% | 32 | 84% | 6 | 16% |
| 518210 | Data processing, hosting, and related services | 37 | 2.0% | 28 | 76% | 9 | 24% |
| 511211 | Software publishers (except video game publishers) | 30 | 1.7% | 16 | 53% | 14 | 47% |
| 517919 | All other telecommunications | 26 | 1.4% | 19 | 73% | 7 | 27% |
| 517310 | Wired and wireless telecommunications carriers (except satellite | 22 | 1.2% | 2 | 9% | 20 | 91% |
| 512190 | Post-production and other motion picture and video industries | 15 | 0.8% | 11 | 73% | 4 | 27% |
| 515110 | Radio broadcasting | 13 | 0.7% | 5 | 38% | 8 | 62% |
| 519121 | Libraries | 13 | 0.7% | 0 | 0% | 13 | 100% |
| 512290 | Other sound recording industries | 11 | 0.6% | 10 | 91% | 1 | 9% |

| NAICS | ICT & DM Industries Sub-sectors | Total | | Without employees | | With employees | |
|---|---|---|---|---|---|---|---|
| | | Count | % of total | Count | % of total | Count | % of total |
| 512240 | Sound recording studios | 10 | 0.6% | 8 | 80% | 2 | 20% |
| 512130 | Motion picture and video exhibition | 8 | 0.4% | 3 | 38% | 5 | 63% |
| 515120 | Television broadcasting | 8 | 0.4% | 5 | 63% | 3 | 38% |
| 512250 | Record production and distribution | 6 | 0.3% | 4 | 67% | 2 | 33% |
| 511212 | Video game publishers | 5 | 0.3% | 4 | 80% | 1 | 20% |
| 512230 | Music publishers | 5 | 0.3% | 3 | 60% | 2 | 40% |
| 517410 | Satellite telecommunications | 5 | 0.3% | 5 | 100% | 0 | 0% |
| 512120 | Motion picture and video distribution | 4 | 0.2% | 4 | 100% | 0 | 0% |
| 519110 | News syndicates | 3 | 0.2% | 2 | 67% | 1 | 33% |
| 515210 | Pay and specialty television | 2 | 0.1% | 2 | 100% | 0 | 0% |
| 519122 | Archives | 1 | 0.1% | 0 | 0% | 1 | 100% |
| **ICT & DM - Professional and Technical Services** | | **1,083** | **59.9%** | **739** | **68%** | **344** | **32%** |
| 541514 | Computer systems design & related services (except video game design & development | 772 | 42.7% | 491 | 64% | 281 | 36% |
| 541430 | Graphic design services | 134 | 7.4% | 108 | 81% | 26 | 19% |
| 541410 | Interior design services | 113 | 6.3% | 86 | 76% | 27 | 24% |
| 541490 | Other specialized design services | 30 | 1.7% | 27 | 90% | 3 | 10% |
| 541420 | Industrial design services | 18 | 1.0% | 13 | 72% | 5 | 28% |
| 541515 | Video game design and development services | 16 | 0.9% | 14 | 88% | 2 | 13% |
| **ICT & DM - Educational Services** | | **79** | **4.4%** | **60** | **76%** | **19** | **24%** |
| 611430 | Professional and management development training | 61 | 3.4% | 47 | 77% | 14 | 23% |
| 611420 | Computer training | 15 | 0.8% | 11 | 73% | 4 | 27% |
| 611410 | Business and secretarial schools | 3 | 0.2% | 2 | 67% | 1 | 33% |
| **ICT & DM - Other Services** | | **50** | **2.8%** | **30** | **60%** | **20** | **40%** |
| 811210 | Electronic and precision equipment repair and maintenance | 50 | 2.8% | 30 | 60% | 20 | 40% |

Source: Canadian Business Counts, June 2019

## ICT & DM Industries Sub-sector Businesses with Employees by Range, 2019

| NAICS | ICT & DM Industries Sub-sectors | With employees | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Count | % of total | 1-4 | 5-9 | 10-19 | 20-49 | 50-99 | 100-199 | 200-499 |
| **ICT & DM** | | **587** | **32%** | **415** | **93** | **46** | **21** | **9** | **1** | **2** |
| **ICT & DM - Manufacturing** | | **13** | **54%** | **7** | **1** | **4** | **1** | **0** | **0** | **0** |
| 334110 | Computer and peripheral equipment manufacturing | 1 | 20% | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 334210 | Telephone apparatus manufacturing | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 334220 | Radio & television broadcasting & wireless communications equipment manufacturing | 0 | 0% | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 334290 | Other communications equipment manufacturing | 2 | 67% | 1 | 0 | 1 | 0 | 0 | 0 | 0 |
| 334310 | Audio and video equipment manufacturing | 1 | 25% | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 334410 | Semiconductor and another electronic component manufacturing | 1 | 50% | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 334511 | Navigational and guidance instruments manufacturing | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 334512 | Measuring, medical and controlling devices manufacturing | 7 | 100% | 3 | 1 | 2 | 1 | 0 | 0 | 0 |
| 334610 | Manufacturing and reproducing magnetic and optical media | 1 | 50% | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| **ICT & DM - Wholesale** | | **14** | **56%** | **7** | **6** | **0** | **1** | **0** | **0** | **0** |
| 417310 | Computer, computer peripheral and pre-packaged software merchant wholesalers | 9 | 64% | 4 | 4 | 0 | 1 | 0 | 0 | 0 |
| 417320 | Electronic components, navigational & comm. equip. & supplies merchant wholesalers | 5 | 45% | 3 | 2 | 0 | 0 | 0 | 0 | 0 |
| **ICT & DM - Information and Cultural** | | **177** | **32%** | **87** | **45** | **23** | **13** | **6** | **1** | **2** |
| 511211 | Software publishers (except video game publishers) | 14 | 47% | 6 | 2 | 5 | 1 | 0 | 0 | 0 |
| 511212 | Video game publishers | 1 | 20% | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 512110 | Motion picture and video production | 35 | 17% | 31 | 2 | 0 | 1 | 1 | 0 | 0 |
| 512120 | Motion picture and video distribution | 0 | 0% | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 512130 | Motion picture and video exhibition | 5 | 63% | 1 | 0 | 0 | 1 | 3 | 0 | 0 |
| 512190 | Post-production and other motion picture and video industries | 4 | 27% | 3 | 0 | 0 | 1 | 0 | 0 | 0 |
| 512230 | Music publishers | 2 | 40% | 2 | 0 | 0 | 0 | 0 | 0 | 0 |
| 512240 | Sound recording studios | 2 | 20% | 1 | 1 | 0 | 0 | 0 | 0 | 0 |
| 512250 | Record production and distribution | 2 | 33% | 1 | 1 | 0 | 0 | 0 | 0 | 0 |
| 512290 | Other sound recording industries | 1 | 9% | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 515110 | Radio broadcasting | 8 | 62% | 0 | 3 | 4 | 1 | 0 | 0 | 0 |
| 515120 | Television broadcasting | 3 | 38% | 2 | 0 | 0 | 0 | 1 | 0 | 0 |
| 515210 | Pay and specialty television | 0 | 0% | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 517310 | Wired and wireless telecommunications carriers (except satellite | 20 | 91% | 7 | 5 | 2 | 4 | 1 | 1 | 0 |
| 517410 | Satellite telecommunications | 0 | 0% | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 517911 | Telecommunications resellers | 42 | 100% | 15 | 13 | 10 | 4 | 0 | 0 | 0 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 517919 | All other telecommunications | 7 | 27% | 5 | 1 | 1 | 0 | 0 | 0 | 0 |
| 518210 | Data processing, hosting, and related services | 9 | 24% | 5 | 3 | 1 | 0 | 0 | 0 | 0 |
| 519110 | News syndicates | 1 | 33% | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 519121 | Libraries | 13 | 100% | 0 | 12 | 0 | 0 | 0 | 0 | 1 |
| 519122 | Archives | 1 | 100% | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 519130 | Internet broadcasting and web search portals | 6 | 16% | 4 | 1 | 0 | 0 | 0 | 0 | 1 |
| 519190 | All other information services | 1 | 2% | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| **ICT & DM - Professional and Technical Services** | | **344** | **32%** | **283** | **36** | **18** | **5** | **2** | **0** | **0** |
| 541410 | Interior design services | 27 | 24% | 21 | 6 | 0 | 0 | 0 | 0 | 0 |
| 541420 | Industrial design services | 5 | 28% | 3 | 1 | 0 | 1 | 0 | 0 | 0 |
| 541430 | Graphic design services | 26 | 19% | 23 | 2 | 1 | 0 | 0 | 0 | 0 |
| 541490 | Other specialized design services | 3 | 10% | 3 | 0 | 0 | 0 | 0 | 0 | 0 |
| 541514 | Computer systems design & related services (except video game design & development | 281 | 36% | 231 | 27 | 17 | 4 | 2 | 0 | 0 |
| 541515 | Video game design and development services | 2 | 13% | 2 | 0 | 0 | 0 | 0 | 0 | 0 |
| **ICT & DM - Educational Services** | | **19** | **24%** | **13** | **3** | **1** | **1** | **1** | **0** | **0** |
| 611410 | Business and secretarial schools | 1 | 33% | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 611420 | Computer training | 4 | 27% | 4 | 0 | 0 | 0 | 0 | 0 | 0 |
| 611430 | Professional and management development training | 14 | 23% | 9 | 2 | 1 | 1 | 1 | 0 | 0 |
| **ICT & DM - Other Services** | | **20** | **40%** | **18** | **2** | **0** | **0** | **0** | **0** | **0** |
| 811210 | Electronic and precision equipment repair and maintenance | 20 | 40% | 18 | 2 | 0 | 0 | 0 | 0 | 0 |

Source: Canadian Business Counts, June 2019

# Appendix III – metroeconomics' Community-Based Projection System

Employment by industry in any given area can be decomposed into economic base jobs (those that drive the overall economy) and community base jobs (those that serve the local population). The population growth of an area typically depends on its potential for growth in economic base employment while an area's growth in community base employment depends on its population growth. In recognition of this interdependence between population and employment growth *metroeconomics* has developed a community-based projection system that takes account of the economic and demographic factors influencing an area's growth potential. The system takes these factors into account as follows:

- the economic base of the community is identified through the de-composition of local jobs on a place of work basis by industry into those that are *economic base* jobs and those that are *community base* jobs; this is achieved using a location quotient process
- economic base industries produce goods and services consumed primarily by businesses or people outside of the local community; these industries – also called export based industries – produce agriculture, mining or manufactured products for consumption elsewhere or provide tourism or higher-order education/health care services to visitors/temporary residents
- the potential for growth of a local community's economic base jobs is identified through assessing how many such jobs exist today and how many might exist in the future drawing on *metroeconomics*' extensive forecasts of economic base industrial job trends nation-wide and province-wide
- an assessment is also made of the potential for local residents to commute to jobs in nearby employment locations drawing on existing patterns and on *metroeconomics*' base case forecasts of such jobs by sub-provincial area across the country
- the potential for job growth within the local area and for job growth in nearby locations determines the potential for job growth among local residents
- the *metroeconomics* system ties this resident job growth potential to the demographic side of the community; if potential job growth among residents exceeds the current supply of workers (based on an age and gender assessment of the current population, age specific rates of labour force participation, the level of unemployment, and the need to replace retiring workers), in-migration occurs; thus job growth potential determines population growth potential recognizing that each new job-holding resident typically brings along one or two dependents
- the system further takes into account the fact that each new resident job-holder increases the need for workers who service the local population – the community base jobs – and that these additional community base jobs, in turn, create the need for more workers, more residents, etc.
- employed resident's growth, in other words, drives the community's net in-migration requirements which, along with standard assumptions regarding fertility and mortality rates, provide the parameters needed to develop local area population projections by age and gender
- projected economic base jobs by industry are added to projected community base jobs by industry to determine the total number of jobs by place of work that will exist in the community in the decades ahead

The Location Quotient procedure is carried out as follows:

- All jobs in agriculture and forestry, in mining and oil and gas extraction, and in manufacturing are considered to be economic base jobs as most of their production is consumed by businesses and people outside of the area.
- For all other industries the number of jobs per 1,000 residents in the Calgary CMA is compared to that ratio across all 32 CMAs in Canada as a group. Where the ratio in an industry in the CMA exceeds that of all CMAs it is assumed the excess jobs in the Calgary CMA are providing services to people or businesses outside of the CMA. These excess jobs are defined as export based service jobs and their output as exportable services.

## Appendix IV – Description of Location Quotient (LQ)

A Location Quotient (LQ) analysis provides information on the concentration of jobs or industries in a community of interest relative to an over-arching area, usually the province or nation. It can reveal what makes a particular region "unique". LQ's Classifications:

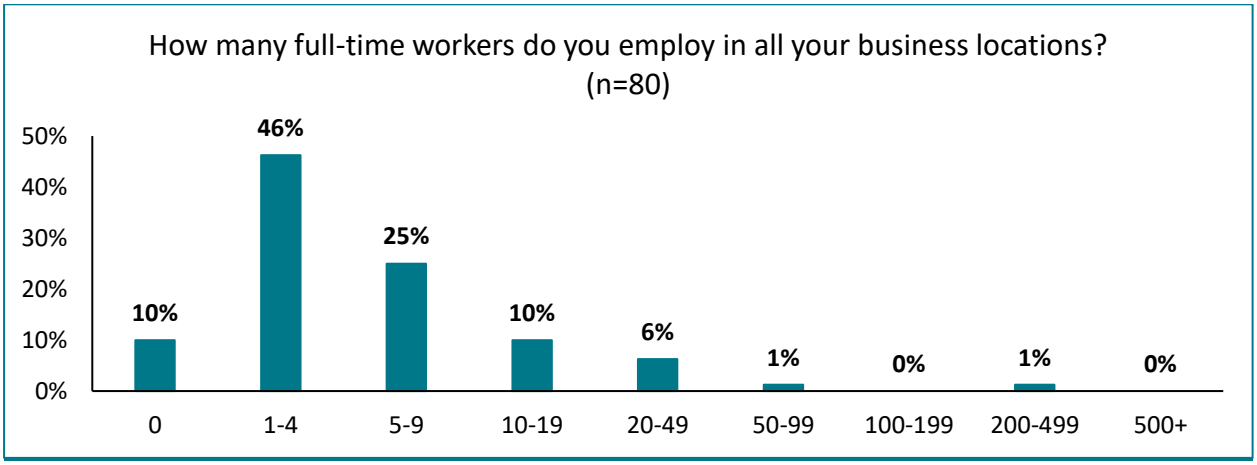
1. LQ greater than or equal to 1.25 – indicates that the community has a proportionately **'high'** concentration of workers/industries than the larger comparison area employed in a specific industry.
2. LQ lower than 1.25 and higher than 1.0 – indicates that the community has an '**above average**' concentration of workers/industries than the larger comparison area employed in a specific industry.
3. LQ 1.0 – indicates employment/industry concentration in the community is **'on par'** with the larger comparison area employed in a specific industry.
4. LQ lower than 1.0 and higher than 0.75 – indicates that the community has a **'moderate'** concentration of workers/industries than the larger comparison area employed in a specific industry.
5. LQ lower than 0.75 - indicates that the community has a **'low'** concentration of workers/industries than the larger comparison area employed in a specific industry.

## Appendix V – Results of the ICT and Digital Media Business Survey

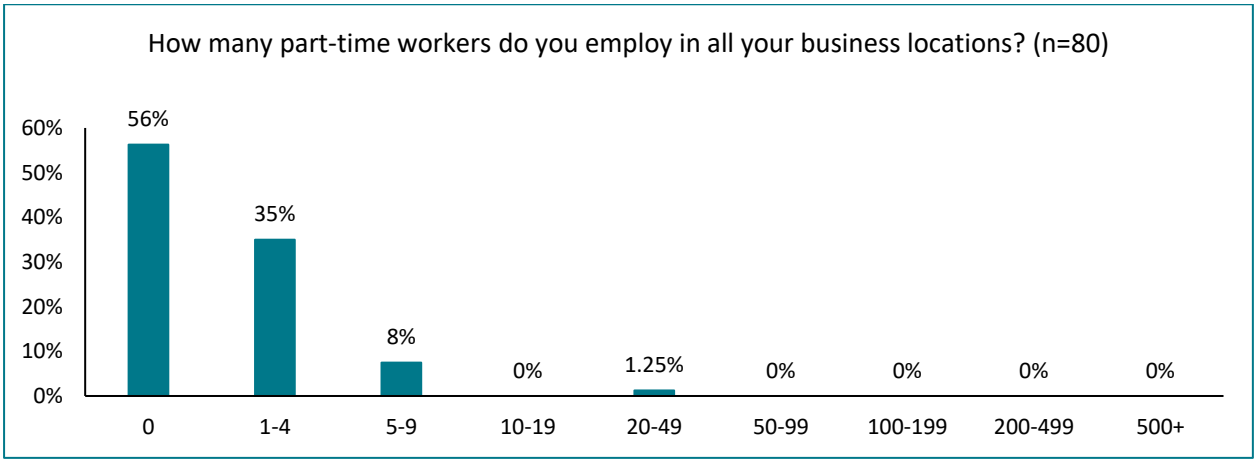
1. What type of business do you operate? ***Read & Record one response***

| What type of business do you operate? | n=56 |
|---|---|
| Data Processing, Hosting, and Related Services | 2 |
| Software Publishers | 2 |
| Other Computer Related Services | 3 |
| All other | 5 |
| ICT | 6 |
| Telecommunications | 8 |
| Custom Computer Programming Services | 15 |
| Design & Digital Media | 15 |

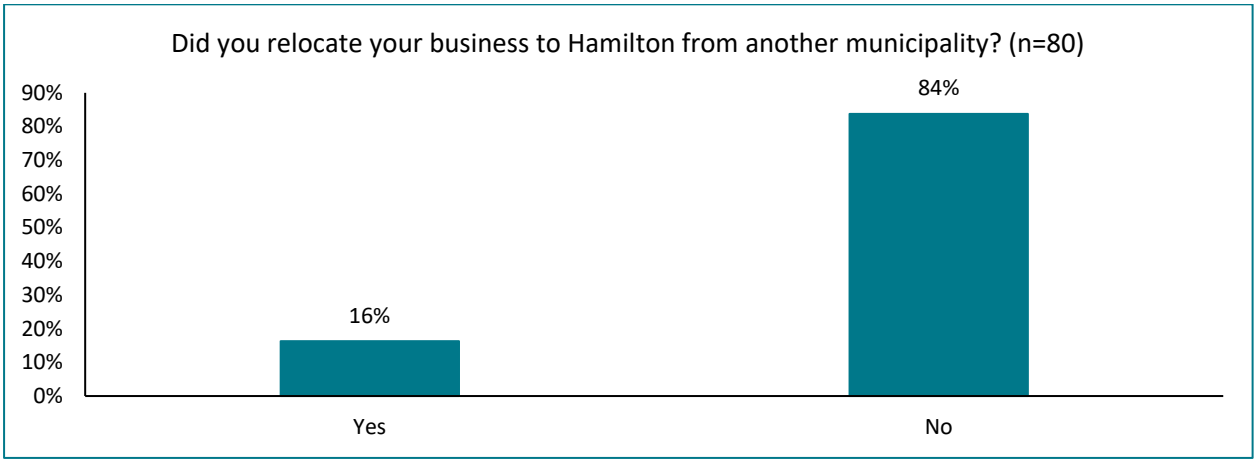
2. How many full-time workers do you employ in all your business locations?



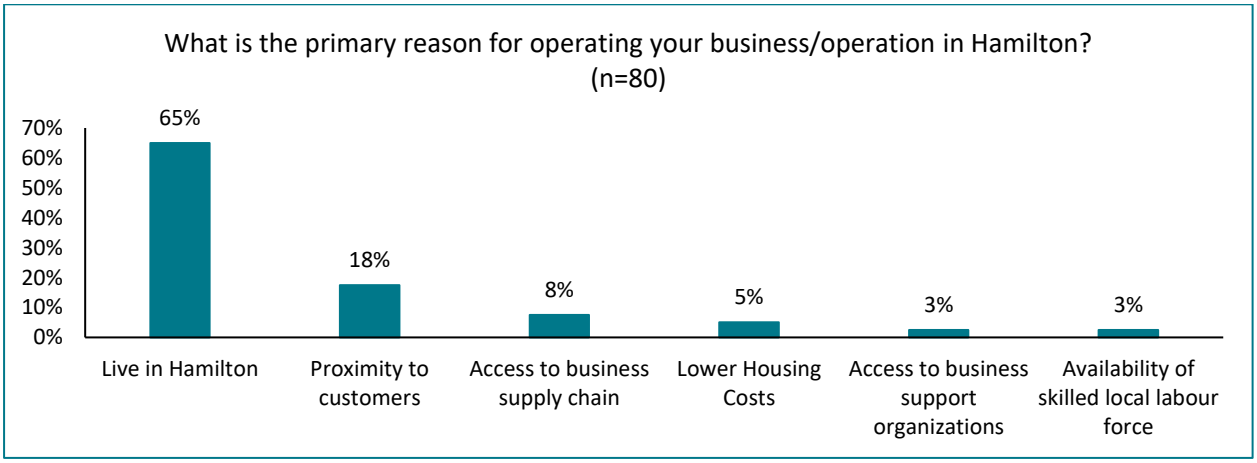

3. How many part-time workers do you employ in all your business locations?



4. Did you relocate your business to Hamilton from another municipality?

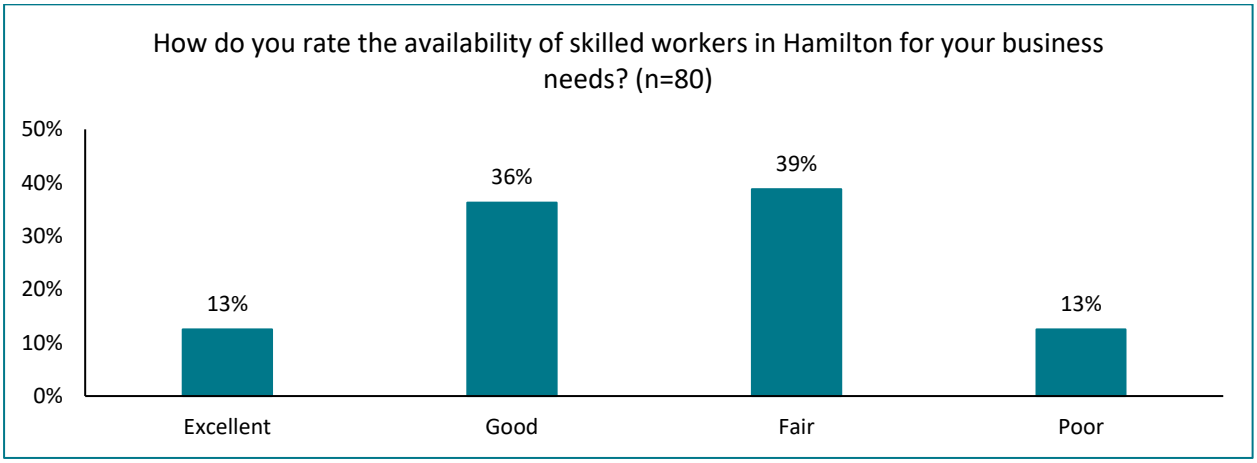



5. What is the primary reason for operating your business/operation in Hamilton?




## Skill Requirements

6. How do you rate the availability of skilled workers in Hamilton for your business needs?

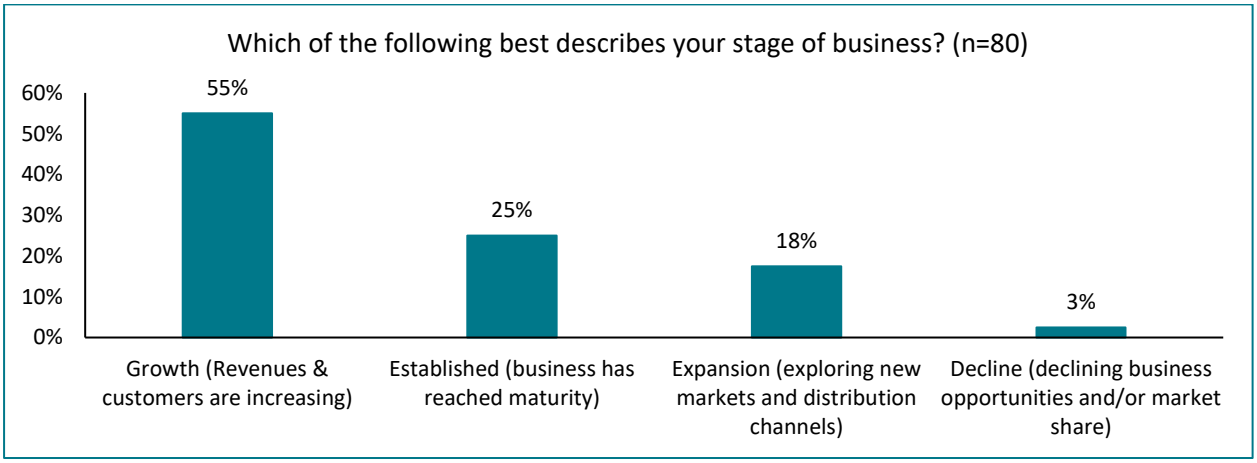


7. What skills are in highest demand for your business?

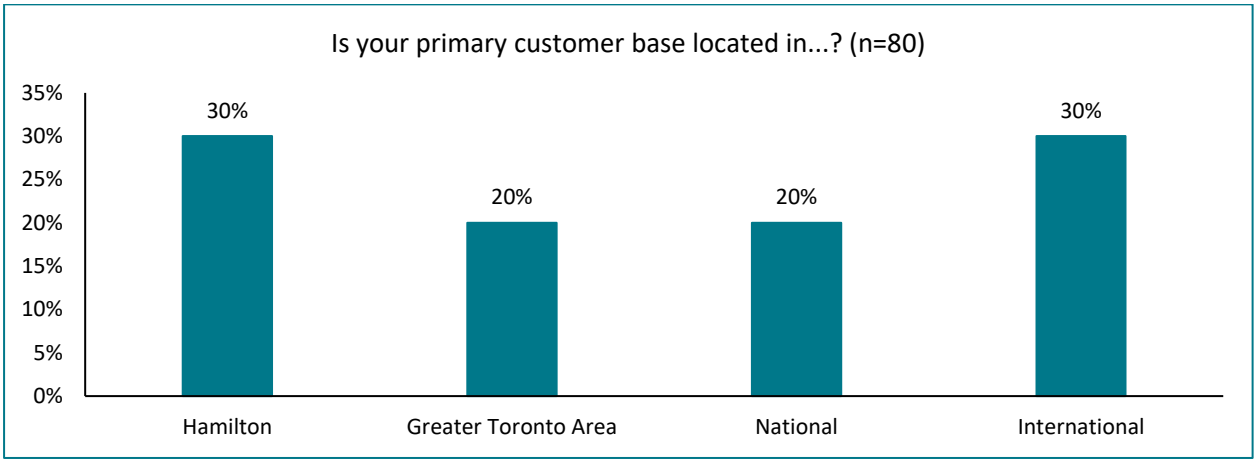
| What skills are in highest demand for your business? (n=80) | | | | | |
|---|---|---|---|---|---|
| Skills | Knowledge Descriptors | | | | |
| | Software engineers/developers | Computer and information sciences and support services | Graphic designers | Video game | IT support |
| Ability to communicate with customers. | Computer prog. & software prog. | Computer aided design and manufacturing | Graphic design | Game design | IT person |
| Communication skills | Computer software development | Computer programming | Graphic design | | It support |
| Communication skills. | Experienced software developers | Computer science | Graphic design senior/intermediate | | Information technology |
| Customer care | Software development | Computer skills. | Graphic design skills. | | Tech. Skills |
| Customer service | Software development | C-sharp programming | Graphic designers. | | Technical skills, it |
| Customer service | Software development | Data programming | Web design | | Technology certification |
| Customer service | Software development skills | Coding. | | | Technology skills |
| Being conscientious and having good people skills | Software development. | Java programming. | | | Telecommunication networking |
| Bilingualism | Software knowledge | Good web development. | | | Voice and data tech |
| Flexibility | Programming | | | | Knowing the different medias. |
| Good Handy Skills | Programming and development. | | | | License To Fix Computers. |
| Intelligent | Programming web | | | | Computer Repair |
| Interpersonal skills | Programming | | | | |
| People skills | Programming. | | | | |
| Sales skills. | Developers who are experienced | | | | |
| Sales skills. | Development | | | | |
| Salesmanship | | | | | |
| Marketing and sales skills. | | | | | |
| Outbound marketing | | | | | |
| Sales | | | | | |

## Business Environment

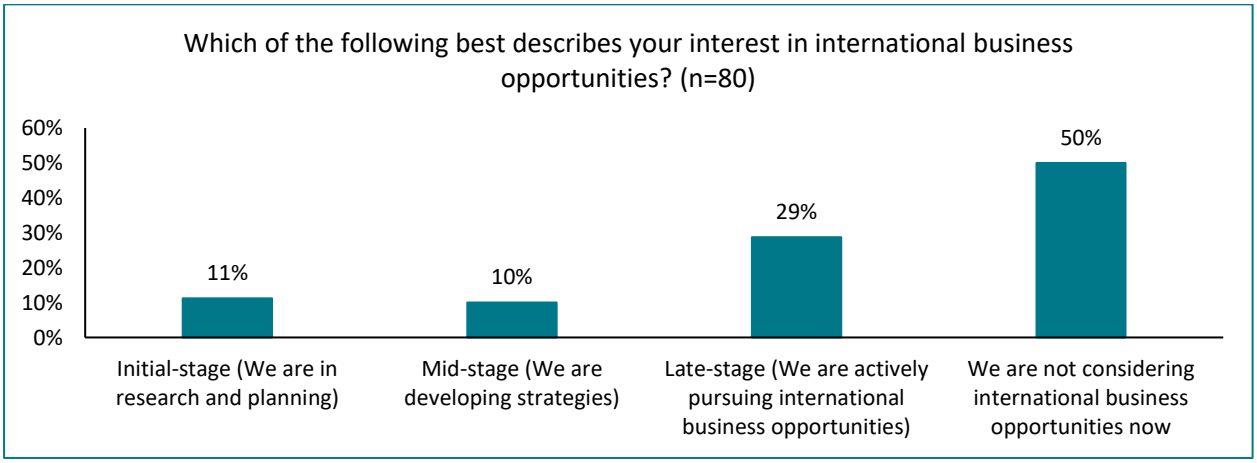
8. Which of the following best describes your stage of business?



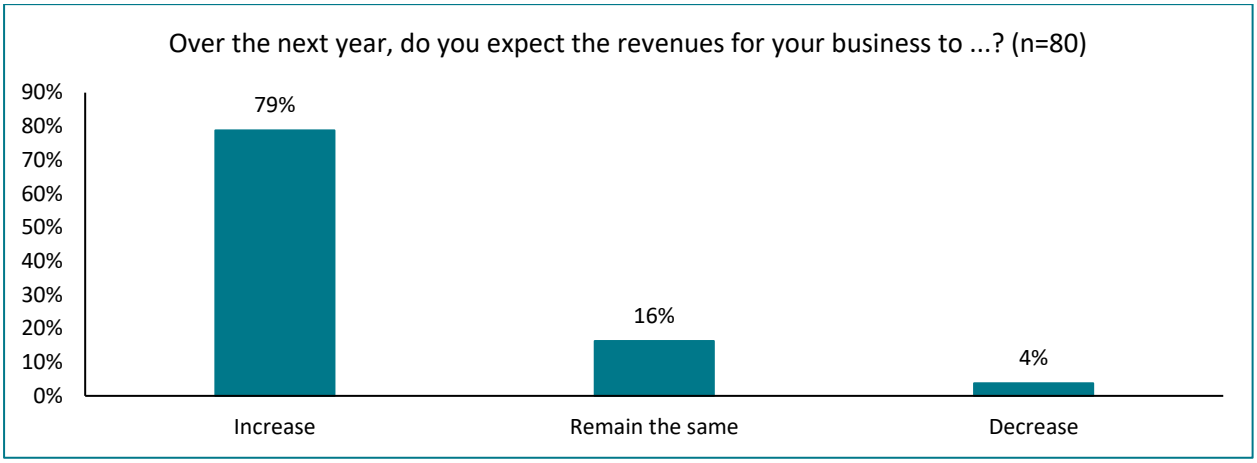

9. Is your primary customer base located in…?




10. Which of the following best describes your interest in international business opportunities?



11. Over the next year, do you expect the revenues for your business to ...?




## Business Satisfaction

12. How satisfied are you with the following factors of owning and operating your ICT and Digital Media business in Hamilton? For each item, please tell me if you: Very Satisfied, Somewhat Satisfied, Somewhat Dissatisfied or Very Dissatisfied.

| Factors | Very Satisfied | | Somewhat Satisfied | | Somewhat Dissatisfied | | Very Dissatisfied | | Don't know/Not applicable | | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Municipal property tax rates | 2 | 3% | 28 | 35% | 8 | 10% | 10 | 13% | 32 | 40% | 80 |
| Availability of property for purchase or lease | 9 | 11% | 26 | 33% | 13 | 16% | 4 | 5% | 28 | 35% | 80 |
| Quality of business support programming | 18 | 23% | 21 | 26% | 7 | 9% | 5 | 6% | 29 | 36% | 80 |
| Attracting and retaining skilled talent | 17 | 21% | 35 | 44% | 11 | 14% | 7 | 9% | 10 | 13% | 80 |
| Attracting new customers | 15 | 19% | 31 | 39% | 13 | 16% | 6 | 8% | 15 | 19% | 80 |
| Quality of broadband/hi-speed Internet | 30 | 38% | 29 | 36% | 10 | 13% | 10 | 13% | 1 | 1% | 80 |
| Access to capital/Availability of public funding and support programs | 6 | 8% | 20 | 25% | 12 | 15% | 10 | 13% | 32 | 40% | 80 |
| Access to Light Rail Transit (LRT) | 4 | 5% | 11 | 14% | 4 | 5% | 13 | 16% | 48 | 60% | 80 |

13. Has your business accessed any of the following business support funds and/or programs? For each item, please tell me if you: have accessed, heard of it but not accessed, not familiar.

| | Have accessed | | Heard of it but not accessed | | Not familiar | | Total |
|---|---|---|---|---|---|---|---|
| Innovation Factory Programs & Services | 18 | 23% | 20 | 25% | 42 | 53% | 80 |
| Hamilton's Soft-Landing Program | 2 | 3% | 6 | 8% | 72 | 90% | 80 |
| Hamilton Business Centre (formerly Small Business Enterprise Centre) | 8 | 10% | 28 | 35% | 44 | 55% | 80 |
| One-Stop for Business | 1 | 1% | 8 | 10% | 71 | 89% | 80 |
| Business Improvement Area Commercial Property Improvement Grant Program | 5 | 6% | 17 | 21% | 58 | 73% | 80 |
| Office Tenancy Assistance Program | 0 | 0% | 6 | 8% | 74 | 93% | 80 |
| Provincial funding programs | 11 | 14% | 16 | 20% | 53 | 66% | 80 |
| Federal funding programs | 11 | 14% | 19 | 24% | 50 | 63% | 80 |

14. Would you like to be notified of any future networking or tradeshow opportunities?