ManufacturingGPS

STATE OF CANADIAN MANUFACTURING LMI

A Map of Canada's Manufacturing Workforce

THIS REPORT WAS DESIGNED AND DEVELOPED BY:

EXCELLENCE
IN MANUFACTURING
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Canada

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Derek Hughes and research team at R.A. Malatest & Associates Ltd

An electronic copy of this report and report summary are available at www.manufacturingGPS.ca

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STATE OF CANADA'S MANUFACTURING SECTOR: A MAP OF THE MANUFACTURING WORKFORCE

Canada's manufacturing sector needs support in making human resource decisions, including what other manufacturers are offering for wages, are experiencing as difficult to hire positions and are investing in training. Government, other policy groups and educational institutions also need information on the makeup and educational attainment of the manufacturing workforce. ManufacturingGPS provides insight into Canada's manufacturing sector by collecting and reporting on up-to-date and user-defined labour market information.

ManufacturingGPS consolidates LMI information from over 100 post-education institutions and 2,500 Canadian manufacturers from all manufacturing subsectors, firm sizes, and provinces. ManufacturingGPS allows manufacturers to obtain information from comparable firms to determine their competitiveness for hiring new workers, and to learn about local, regional, and national labour markets. The following provides a summary of findings that can be found using ManufacturingGPS.

Ongoing Need to Replace Workers: High Vacancy and Involuntary Turnover Rates

Using the labour market information available to all participating employers, ManufacturingGPS shows that recruitment will be a key issue for Canada's manufacturing sector over the coming years. Over the next year alone, a full sixth (17%) of the workforce will need to be recruited to fill current vacancies and to replace voluntary and involuntary turnover. Further, one-fifth (20%) of the workforce is expected to retire over the next decade, representing a loss of knowledge and experience that can hinder a firm's operation.

Perhaps as a result of these trends, the job vacancy rate in the manufacturing sector is significantly higher than elsewhere in the Canadian workforce; 3.9% for the manufacturing sector vs. 2.5% for all of Canada. The vacancy rate in the manufacturing sector is 1.4% higher (3.9% vs. 2.5%) than that of other sectors. As well, the involuntary turnover experienced by the manufacturing sector is 2.4% higher (6.1% vs. 3.7%) than that of other sectors. The higher vacancy rates and involuntary turnover rates are strong indicators of the challenges employers are experiencing in filling vacancies with qualified employees. However, the manufacturing sector is also experiencing lower voluntary turnover rates than other sectors; being 0.9% lower (6.4% vs. 7.3%) than other sectors.

Maintenance trades and machine operator positions are expected to face the highest replacement rates in the manufacturing sector. Over the next year it is estimated that manufacturing firms will need to fill vacancies equal to one-fifth (22%) of the current positions. The large demand for skilled tradespeople has the potential to present significant challenges for Canada's manufacturing sector.

Hiring Challenges:
Skills and Experience

The main challenge employers face when filling vacancies is finding applicants with the skills and experience required. In particular, Canadian manufacturers reported that they face challenges in hiring qualified employees into highly skilled occupations. The three most difficult to hire occupations are: 1. production managers; 2. development, engineering, and quality control staff; and 3. sales and business development professional. These occupations require a specific degree of specialization; most of these skills are not readily acquired through on the job training.
The challenges in hiring such occupations are an indicator of a lack of qualified individuals to fill the positions, and potentially indicating an inadequacy of training facilities to produce these workers.

Employers' difficulties in filling vacancies with qualified employees may be driven by their reliance on local labour markets. Nearly two thirds (62%) of employers source employees only from local labour markets. Employers who solely relied on local labour markets reported to face greater challenges in attracting applicants with the skills and experience they required. In particular, smaller employers reported relying solely on local labour markets to meet their hiring needs.

Stable and Uneven Wages:

Wage growth in Canada's manufacturing sector, as it is elsewhere in the Canadian economy, is matching inflation (usually hovering around 2%). But some occupations are bucking this trend; wages for occupation groups pertaining to production, development, engineering and quality control are growing at higher rates. The higher level of wage growth indicates a greater level of competition to retain these workers.

Wages within Canada's manufacturing sector vary across the country, typically higher in the west and lower in the east. Employers in Western Canada offer wages approximately 8% higher than those offered in Central Canada, and 18% higher than employers in Atlantic Canada. The disparity of wages across Canada may present challenges in completing for and keeping qualified workers in the long run.

Education & Training:
Manufacturing sector invests less per capita than other sectors.

The majority of manufacturers (74%) engage in training activities. Training activities were typically to support employee health and safety or to provide workers with technical skills related to manufacturing. Training activities were primarily undertaken to develop employees' skills or to comply with regulations. Employer engagement in training activities is related to their size, with larger employers being more likely to

have engaged in training activities. Smaller employers were more likely to report that they did not engage in training due to none of their staff requiring training.

The manufacturing sector invests less per capita than other sectors. On average, Canadian firms invest $800 per person per year; whereas, employers that engage in training only spend $530 per person per year. Despite being less likely to engage in training activities, smaller employers had higher expenditures on training per person than larger firms.

Canadian postsecondary institutions continue to support Canada's manufacturing sector. However, there appears to be a shift away from trade-based enrollment towards post-secondary enrollment. ManufacturingGPS shows that the number of students in relevant trade programs is declining, while the number of students in relevant college and university programs is increasing. Educators and the manufacturing sector are generally not engaging with one another as barely more than one-in-three institutions (36%) collaborate with the sector.

ManufacturingGPS: Evergreen LMI for employers, educator and community partners

With LMI presented in ManufacturingGPS, it is hoped that Canadian manufacturers, government, educators and others can develop the workforce required to continue to contribute so much to Canada's economic prosperity. At http://ManufacturingGPS.ca you can complete a survey, update your LMI information and/or simply access the latest manufacturing LMI data that is filterable to specific years, subsectors, firm sizes and locations.

SECTION 1: INTRODUCTION

The manufacturing sector is a key driver of Canada's economy as it accounts for 5% of Canada's GDP and employs 10% of its labour force. [1] Despite this importance, the labour market information (LMI) available to Canadian manufacturers is often outdated and limited as it addresses only certain industries or regions of Canada. Manufacturers need an LMI system that forecasts the supply and demand of the workforce from a pan-manufacturing perspective and accounts for competition for workers from other sectors.

Further, an effective LMI system requires a wide variety of data and tools to respond to the different information needs of employers (such as job descriptions, pay scales, skills and development modules).

Employers need a trusted source of labour market information that goes beyond traditional measures, but that includes HR benchmarks and other market information as well. ManufacturingGPS is based on one of the largest datasets of its kind and provides real-time and searchable LMI to Canada's manufacturing sector and other stakeholder groups alike.

1.1 The Potential of LMI: Up-to-date and Specific LMI are Required to Engage Stakeholders

To support continued economic growth, the manufacturing sector needs sound, timely and relevant information on which to base important business decisions. Businesses need to understand what skills they will require and how to access them. Human resource managers require the tools and information to manage their workforces. Governments at all levels need to understand how they can support labour mobility, industries in need, and how to support sub-sectors poised to grow. Educational training institutions need to predict the future demand for their graduates of their various programs and the curricula that will best help them transition into the workforce.

LMI details the current and future labour supply and demand to assist decision makers in industry, government, and educational institutions in planning their human resource (HR) strategies accurately and effectively.

Valuable LMI enables organizations to make informed HR decisions that are based on a better understanding of labour supply and demand. Timely information also helps educational institutions create education programs that develop a qualified supply of labour to meet demand. Finally, LMI aims to facilitate governments' efforts to support employers, education institutions and occupational groups.

Employers also require other forms of information to make sound strategic decisions. The ability to benchmark their compensation, turnover and other

[1] Source: Statistics Canada. Tables 282-0008 - Labour force survey estimates (LFS), by North American Industry Classification System (NAICS), sex and age group, annual (persons unless otherwise noted), and 379-0028 - Gross domestic product (GDP) at basic prices, by North American Industry Classification System (NAICS), provinces and territories, annual (percentage share), CANSIM (database). (accessed: April 6, 2017)

HR outcomes is critical in establishing a viable long-term HR strategy. Canadian employers need more than traditional LMI. They need a wide array of market information to maximize their chances of expanding in a dynamic global economy.

5%
OF CANADA'S GDP EMPLOYS
10%
OF ITS LABOUR FORCE

In particular, the mobility of workers to relocate within the country or from one industry to another means that market information compiled for a given industry or region can quickly become outmoded as people move jobs or location to appease demand. This is made even more complex when one considers the impact of international labour mobility through permanent immigration or temporary foreign worker programs. Other economic conditions such as regional economic growth and exchange rates are just as complex and dynamic. To be valuable, a market information system must be updated on an ongoing basis.

The labour market information must not only be up to date, it must also be specific. For stakeholders to understand the state of the labour market in their region and industry, information must enable the understanding of market information from pan-sectoral, national and even international perspectives.

What has not worked in the past is a piecemeal approach to the Canadian manufacturing market information on an industry-by-industry basis. Further, the information provided has focused too much on traditional LMI, at the expense of other key market information. A new centralized initiative is needed that focuses on a more complete understanding of supply and demand, while giving the user the power to select the information they need and compare their performance to their own reference group. ManufacturingGPS fills this requirement to provide comprehensive LMI to a key sector to the Canadian economy.

SECTION 2: OVERVIEW OF MANUFACTURING FIRMS

ManufacturingGPS is powered by data from over 2,500 Canadian manufacturers, by far the largest pool of manufacturing LMI data of its kind in Canada. These manufacturers represent all sub-sectors, sizes, and all provinces. ManufacturingGPS represents nearly 5% of all manufacturers in Canada, a sufficient number that can provide insight into the sector and the challenges that they face.

2.1 Broad Geographic Distribution and Industry Representation

ManufacturingGPS reached out to manufacturers across Canada in an attempt to provide a comprehensive picture of Canada's manufacturing sector at a regional level. The findings of ManufacturingGPS provide a reasonable representation of Canada's manufacturing sector, as well as the manufacturing sectors of British Columbia, Alberta, Ontario, and Quebec[2]. The following table summarizes the firms responding to ManufacturingGPS and of the estimated universe of the manufacturing firms in Canada **(Table 2-1)**.

A key aspect of ManufacturingGPS is the production of LMI data that is specific to a region, an industry, and or size of firm. Although region is an important level of analysis for policy makers, employers and employees often operate at a more local level – the manufacturing hub. To ensure that the data was digestible to these groups, fifty-three manufacturing hubs were identified across Canada. The following figures represent the manufacturing hubs in Canada, Western Canada, Ontario and Quebec, and Atlantic Canada.

Figure 2-1: Western Canadian Manufacturing Hubs

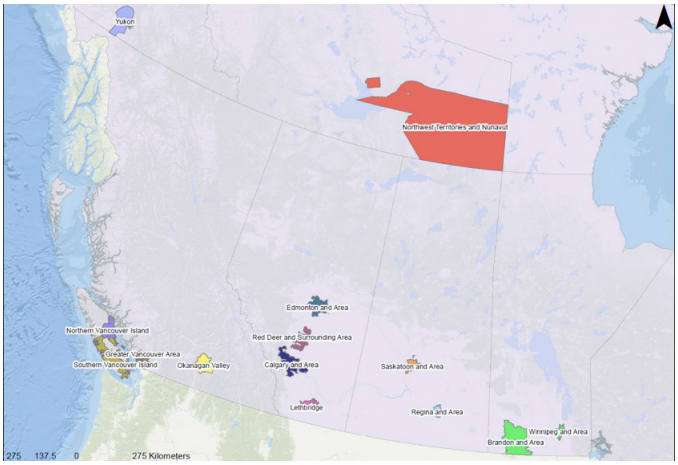


Figure 2-2: Ontario and Quebec Manufacturing Hubs

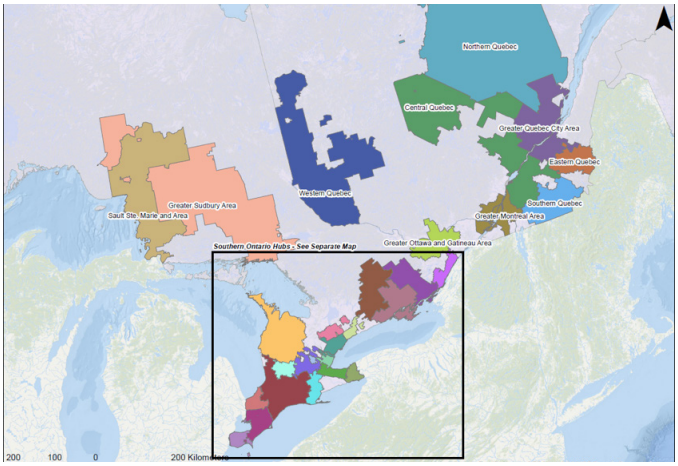


Figure 2-3: Central Ontario Manufacturing Hubs

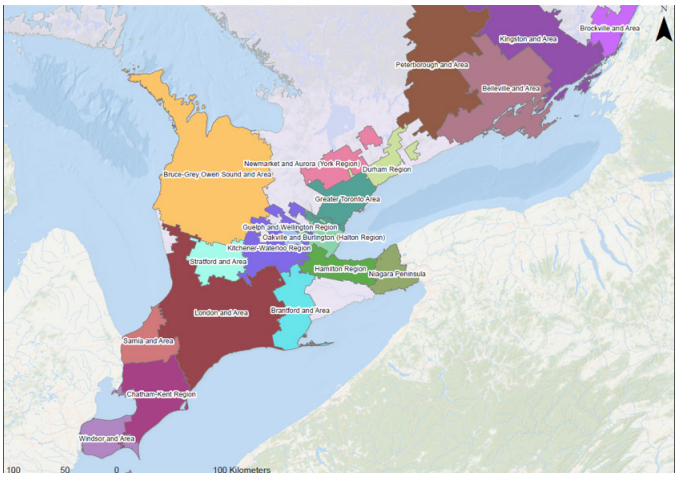


Figure 2-4: Atlantic Canada Manufacturing Hubs

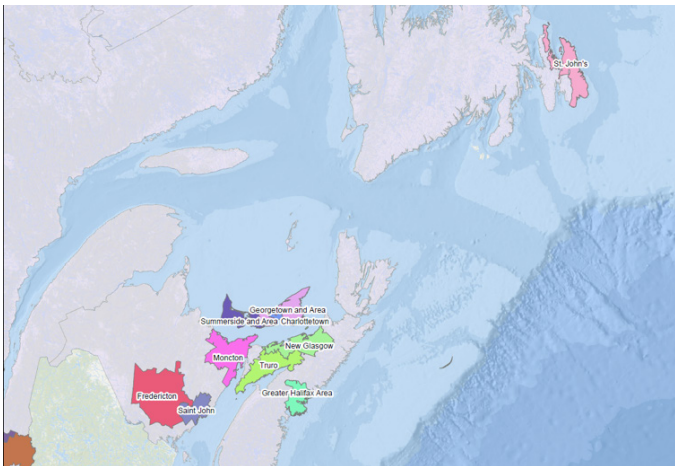


Table 2-1: Manufacturers by Province

Province	Manufacturing GPS		Statistic Canda	
	Count	*Percent*	*Count*	*Percent*
British Columbia	237	9%	7,200	14%
Alberta	254	10%	5,326	10%
Saskatchewan	75	3%	1,085	2%
Manitoba	107	4%	1,403	3%
Ontario	1,225	49%	20,114	39%
Quebec	349	14%	13,303	26%
New Brunswick	97	4%	857	2%
Nova Scotia	111	4%	1,018	2%
Prince Edward Island	19	1%	208	0%
Newfoundland and Labrador	32	1%	415	1%
Territories	3	0%	52	0%
Total	**2,509**	**100%**	**50,981**	**100%**

Source: ManufacturingGPS Employer's Survey (as of February 14, 2017)
Source: Statistics Canada. Table 552-0004 - Canadian business counts, location counts with employees, by employment size and North American Industry Classification System (NAICS), Canada and provinces, June 2016, semi-annual (number), CANSIM (database). (Accessed: February 14, 2017)

2.2 All Manufacturing Sub-sectors Represented

Manufacturers responding to the ManufacturingGPS survey represented the entire manufacturing sector. Employers were classified into fifteen (15) sub-sectors/ industries. As such, the data collected by ManufacturingGPS provides a reasonably reliable picture of Canada's Manufacturing sector, as well as at a sub-sector level for fabricated metal, food, beverage and tobacco, machinery, miscellaneous manufacturing, wood and paper, and plastic and rubber.[3] The following table summarizes the number of survey completions by sub-sector **(Table 2-2)**.

Table 2-2: Manufacturers by Sub-Sector

Industry Sub-Sector	Manufacturing GPS		Statistic Canda	
	Count	*Percent*	*Count*	*Percent*
Aerospace	32	1%	321	1%
Chemical, Petroleum, and Coal	90	4%	2,342	5%
Computers and Appliances	85	3%	2,796	6%
Fabricated Metal	587	23%	7,621	15%
Food, Beverage and Tobacco	287	11%	6,666	13%
Furniture	101	4%	3,812	8%
Machinery	235	9%	4,736	9%
Miscellaneous Manufacturing	313	12%	5,386	11%
Motor Vehicle and Parts	97	4%	1,628	3%
Non-metallic Mineral	68	3%	2,231	4%
Plastics and Rubber	156	6%	2,135	4%
Primary Metal	46	2%	587	1%
Printing and Related Support Activities	117	5%	3,698	7%
Textiles and Related Products	91	4%	2,543	5%
Wood and Paper	202	8%	3,941	8%
Total	**2,507**	**100%**	**50,443**	**100%**

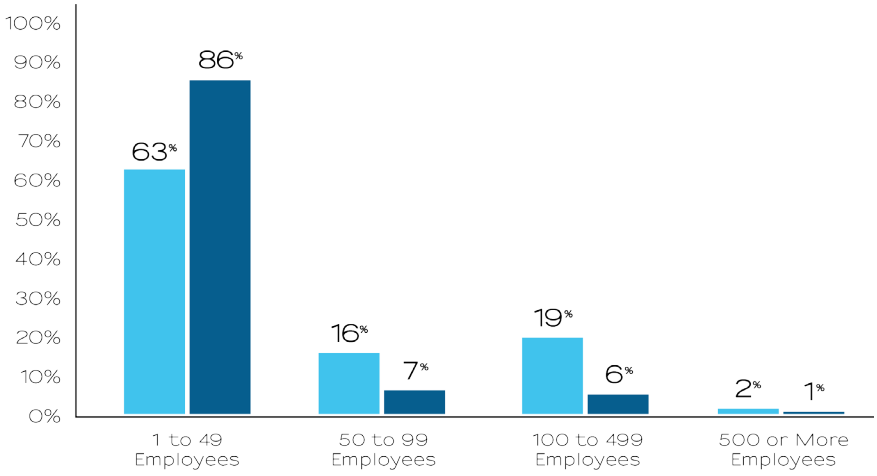
Source: ManufacturingGPS Employer's Survey (as of February 14, 2017)
Source: Statistics Canada. Table 552-0004 - Canadian business counts, location counts with employees, by employment size and North American Industry Classification System (NAICS), Canada and provinces, June 2016, semi-annual (number), CANSIM (database). (Accessed: February 14, 2017)

2.3 Most Firms are Small

Perhaps the perception of the manufacturing sector is that it is dominated by multinationals operating huge factories, the reality is quite different. ManufacturingGPS included manufacturing firms of all sizes. Although Manufacturing GPS ensured the inclusion of smaller Canadian manufacturing firms, many small firms (i.e., less than 5 employees) may not have participated in ManufacturingGPS as they saw limited opportunity to use LMI data for their very small operations. Still on the whole, ManufacturingGPS provides reliable information about each segment of Canada's small and medium enterprises (SMEs). [4,5] The proportion of medium and large employers participating in ManufacturingGPS is larger than that found within Canada's manufacturing sector, Figure 2-5 shows the difference between the distribution of firm sizes of companies participating in ManufacturingGPS and that of Canada's manufacturing sector.

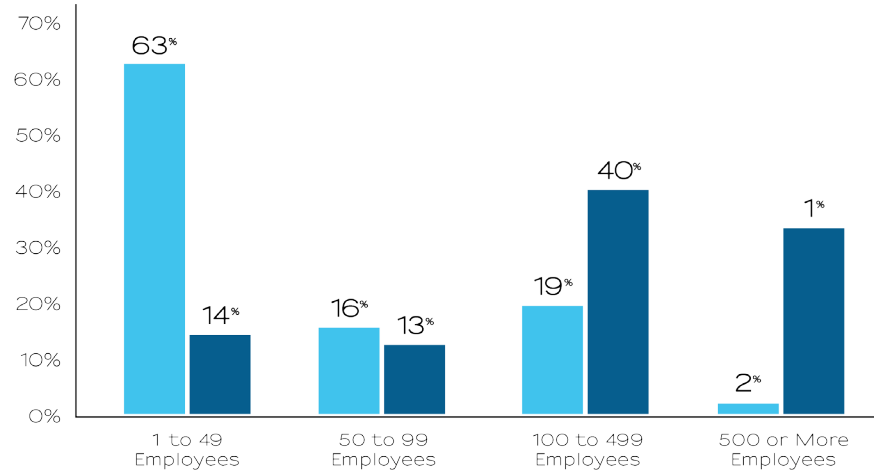
Employers responding to the ManufacturingGPS survey, and Canada's manufacturing sector at large, may primarily consist of businesses with less than 100 employees; however, it is the larger firms that represent the majority of the workforce.

FIGURE 2-5: Manufacturers by Number of Employees



Source: ManufacturingGPS Employer's Survey (as of February 14, 2017)
Source: Statistics Canada. Table 552-0004 - Canadian business counts, location counts with employees, by employment size and North American Industry Classification System (NAICS), Canada and provinces, June 2016, semi-annual (number), CANSIM (database). (Accessed: February 14, 2017)

FIGURE 2-6: Distribution of Workforce and Number of Firms by Firm Size



Note: % of workers represents the percent of workers in the manufacturing sector working at firms of that size.
Source: ManufacturingGPS Employer's Survey (as of February 14, 2017)

[3] The margin of error for these sub-sectors is less than 8% at the 95% confidence level.
[4] Small and medium sized establishments (SME) are defined by Industry Canada as firms with fewer than 500 employees.
[5] Margin of error for firms with 1 to 49, 50 to 99 and 100 to 499 each have a margin of error less than 5% at the 95% confidence level.

The size of a firm is not necessarily defined by its number of employees; the revenue of the firm is also an important indicator of size and importance to the regional economy. The following table summarizes respondents to the size of manufacturing firms by annual revenue **(Table 2-3)**.

Table 2-3: Manufacturers by Annual Revenue

Annual Revenue of Firms	Manufacturing GPS	
	Count	*Percent*
Less than $1 million	220	10%
$1 million to less than $5 million	850	41%
$5 million to less than $10 million	372	18%
$10 million to less than $50 million	453	22%
More than $50 million	201	9%
Total	**2,096**	**100%**

Source: ManufacturingGPS Employer's Survey (as of February 14, 2017)

2.4 Limited Geographic Scope of Business

Given that most manufacturers are small, perhaps it is not surprising that manufacturing in Canada is a local affair. The vast majority of manufacturing firms operating inside of Canada are Canadian firms that are tied to a single location. Nearly nine in ten (85%) of manufacturing firms in Canada operate locally **(Table 2-4)**, including nearly three-quarters (72%) of firms who only operate locally.

However, even though Canadian manufacturing firms primarily operate locally, their markets go well beyond the local markets. Few firms (7%) only serve local markets. The majority sell their products to multiple markets (62%), and many internationally (59%) **(Table 2-4)**.

Table 2-4: Geography of Canadian Manufacturers' Manufacturing Facilities, and Their Markets

Markets Serviced by Employers	Where Firm Manufactures Percent	Where Firms Sell Their Products Percent
Local (only)	72%	7%
Local (including other geographies)	13%	48%
Regional (only and including other geographies)	10%	49%
Provincial (only and including other geographies)	14%	55%
National (only and including other geographies)	10%	56%
International (only and including other geographies)	9%	59%
Total	**100%**	**100%**

Note: Total may sum to more than 100% due to respondents selecting more than one response.Source: ManufacturingGPS Employer's Survey (as of February 14, 2017)

SECTION 3: MANUFACTURING WORKFORCE

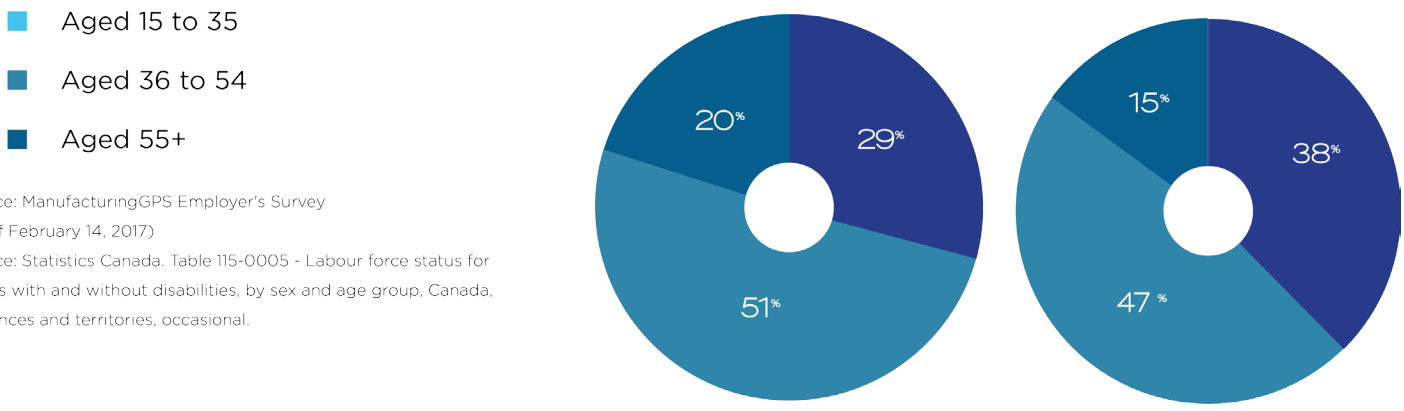
The workforce fueling Canada's manufacturing sector can be characterized as a relatively local, young, and male workforce that does not have a post-secondary education. However, like many workforces, it is a workforce that is changing. As the sector transforms through technological change, there are now more workers having a post-secondary education working in the sector than ever before. [6]

3.1 The Manufacturing Workforce is an Older Workforce

The majority of the Manufacturing workforce (51% of employees) is made up of Generation X; those born in the early 60s to late 70s. The generation X workforce can be viewed as being established; having finished their education and having a significant amount of experience in the workforce. The inclusion of a large established workforce provides younger workers a sufficient opportunity to be mentored by their colleagues creating an environment that will allow for young workers to become highly skilled in their work. Canada's manufacturing workforce may contain a large number of workers far from their retirement; however, the manufacturing workforce is generally older than that of Canada. The proportion of the workforce under the age of 35 is lower than that of the rest of Canada (29% vs. 38%) (Figure 0 6Figure 2 6). As well, the proportion of the workforce over the age of 55 is greater than that of the rest of Canada (20% vs. 15%).

Over the next 10 years it can be reasonably expected that this sizable portion of the manufacturing workforce that is 55 and over will retire. These mature workers (55+) make up a significant portion of the workforce (20%), which presents a risk to the sector in losing not

FIGURE 3-1: **Distribution of Workforce by Age**



Source: ManufacturingGPS Employer's Survey (as of February 14, 2017)
Source: Statistics Canada. Table 115-0005 - Labour force status for adults with and without disabilities, by sex and age group, Canada, provinces and territories, occasional.

only these employees but their skill and experience. Retirement can be especially troublesome to the vast majority of manufacturers that are relatively small in size, and may not have the next generation of workers with skills sufficiently developed to take their place. The presence of the large number of established workers (36 to 54) does lessen the overall threat of this loss; however, employers need to be aware of the impact of the loss on their business and plan accordingly.

Perhaps the small size of employers does not lend itself to having a unionized workforce. This is reflected in that less than one-quarter (24%) of the manufacturing workforce is unionized. However, unionization was found to be dependent on the size of the firm; both the largest and smallest firms had the lowest rates of unionization. Unionization rate ranged dramatically between smaller firms (less than 50 employees) that had less than one-sixteenth (6%) of their workforce unionized, and very large firms (500 or more employees) that had less than one-third (29%) of their workforce unionized. The unionization of workers requires the development of a critical mass of employees, emerging when firms become large in size (100 to 499 employees) (30% of employees in firms 100 to 499 employees are unionized).

Canada's manufacturing sector has been historically a male dominated sector, and the gender gap is not closing.[7] Less than one-third of the manufacturing sector's workforce is women (28%). This can be primarily explained by major occupational groups (e.g., management occupations, natural and applied sciences and related occupations, and occupations in manufacturing and utilities) that comprise the manufacturing sector being predominantly male.[8]

3.2 Manufacturing Production-centric Workforce

Canada's manufacturing sector provides reliable and consistent employment to its workers. The vast majority (93%) of its workforce is made up of full-time employees, with very few part-time or temporary positions (3% each). The large proportion of full time occupations provides a level of consistency within the workforce, as well as offering job security to its workers and prized benefits.

The backbone of the manufacturing industry is its employees directly involved in the production of goods. The majority (58%) of the manufacturing workforce are employed as machine operators and assemblers, and l abourers (31% and 26%, respectively) **(Table 3-1)**. Perhaps as a result, only a modest proportion of the manufacturing sector's workforce has a post-secondary education (36%) [9], whereas nearly two-thirds (63%) of Canada's workforce has a post-secondary education. [10]

[7] Statistics Canada. Table 282-0008 - Labour force survey estimates (LFS), by North American Industry Classification System (NAICS), sex and age group, annual (persons unless otherwise noted) (accessed: February 21, 2017)

[8] Statistics Canada. Table 282-0142 - Labour force survey estimates (LFS), by National Occupational Classification (NOC) and sex, annual (persons unless otherwise noted), CANSIM (database). (accessed: February 21, 2017)

[9] Employers did not specify which employees within their organization did not have a post-secondary education; instead providing an overall proportion.

[10] Statistics Canada. (2011). Occupation - National Occupational Classification (NOC) 2011 (691), Industry - North American Industry Classification System (NAICS) 2007 (122), Age Groups (5) and Sex (3) for the Employed Labour Force Aged 15 Years and Over, in Private Households of Canada, Provinces, Territories, Census Metropolitan Areas and Census Agglomerations, 2011 National Household Survey. CANSIM (database). (Accessed: February 21, 2017).

Table 3-1: Workforce Distribution by Occupational Functional Group

Occupational Functional Group	ManufacturingGPS Percent
Production Managers	3%
Administration Managers	3%
Sales and Business Development	4%
Shipping and Receiving	5%
Development, Engineering, and Quality Control	9%
Maintenance Trades	15%
Production - Supervisors	4%
Production - Machine Operators and Assemblers	31%
Production - Labourers	26%
Total	**100%**

Source: ManufacturingGPS Employer's Survey (as of February 14, 2017)

SECTION 4: COMPENSATION AND BENEFITS

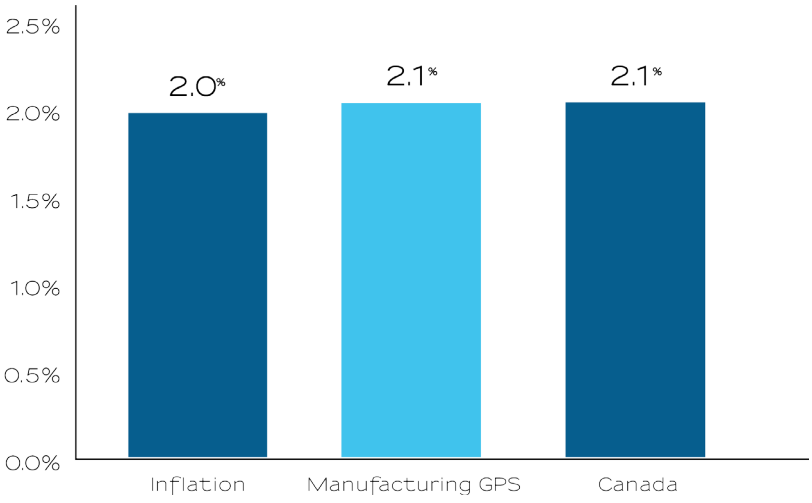
An important piece of ManufacturingGPS was the examination of compensation provided to employees of the manufacturing sector. The compensation and benefits offered by employers are key drivers in individuals' decisions to work in the sector. Employers have to juggle employee expectations for compensation and benefits, and the opportunity for expansion against growing cost of hiring and retaining workers. Wages within Canada's manufacturing sector are not consistent across Canada, and are growing slower than other sectors.

4.1 Wages Are Stable, as They are Elsewhere

Overall, wage growth in the manufacturing sector is relatively stable, as over the next year employers project that the average wage of their workers will increase by 2.1%; the same rate as inflation (2.0%). Wages that increase at the same rate as inflation do not result in greater income to workers as their relative wage will remain the same. However, when comparing wage growth between Canada's manufacturing sector and that of the rest of Canada, we see that wages elsewhere are similarly in the same positions. The average Canadian's salary grew only slightly greater than that of the rate of inflation but the same as those in the manufacturing sector (2.1% wage for each).

Wage growth is not consistent throughout the industry; some occupations are seeing their wages growing at faster rates than others. Wages for machine operators and assemblers (2.19%), and labourers (2.15%) are growing at a slightly higher rate than other occupations within the sector. The higher wage growth may be an indicator of increased competition for workers in these functional occupations, and effort expended to retain its current workforce.

FIGURE 4-1: Wage Growth in the Manufacturing Sector vs. the Rest of Canada and Inflation



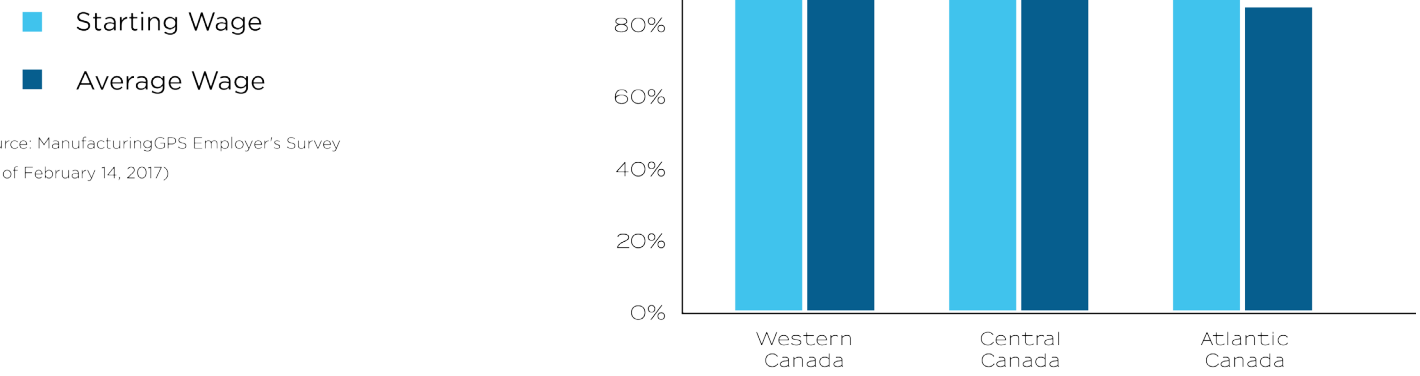
Source: ManufacturingGPS Employer's Survey (as of February 14, 2017) Inflation Source: Statistics Canada, Consumer Price Indexes for Canada, Monthly (V41690973 series.)
Canada Source: Statistics Canada. Table 282-0072 - Labour force survey estimates (LFS), wages of employees by type of work, North American Industry Classification System (NAICS), sex and age group, annual (current dollars unless otherwise noted), CANSIM (database). (Accessed: March 2017)

Table 4-1: Starting and Average Wages, and Expected Growth of Occupations

Occupational Functional Group	Starting Wage	Average Wage	Expected Growth in Average Wage
Production Managers	$59,300	$66,800	2.11
Administration Managers	$47,300	$55,900	2.08
Sales and Business Development	$56,700	$67,200	2.12
Shipping and Receiving	$34,200	$38,900	2.14
Development, Engineering, and Quality Control	$47,600	$55,600	2.15
Maintenance Trades	$44,700	$52,200	2.05
Production - Supervisors	$48,700	$56,600	2.16
Production - Machine Operators and Assemblers	$33,800	$39,900	2.19
Production - Labourers	$30,100	$34,800	2.15

Source: ManufacturingGPS Employer's Survey (as of February 14, 2017)

FIGURE 4-2: **Comparison of Starting and Average Wages by Region of Canada**
(% of Industry Average)



Source: ManufacturingGPS Employer's Survey
(as of February 14, 2017)

[11] Western Canada is defined as the provinces of British Columbia, Alberta, Saskatchewan and Manitoba. Central Canada is defined as the provinces of Ontario and Quebec. Atlantic Canada is defined as the provinces of Nova Scotia, New Brunswick, Prince Edward Island, and Newfoundland and Labrador.

4.2 Wage Disparity across Canada

The wages offered by employers are not uniform across Canada. Employers in Western Canada offer higher starting and average wages than those in Central Canada, and employers in Atlantic Canada offer the lowest wages to its employees. [11] Disparity in wages across Canada can lead to a drain of local labour markets in Atlantic Canada as workers migrate to Western Canada for the promise of higher wages.

4.3 Benefits Ensure Productivity

Benefits also play a major part in employees deciding to work for the manufacturing sector. Workers are not solely interested in the financial compensation provided by the employer, but also of the assurances of quality of life and the feeling that the employer is looking out for their employees. The primary benefits employers offer to employees appears to focus on those benefits that ensure their workforce remains productive, and mitigates the risk associated with working in the industry. These benefits come in the form of assisting employees in remaining viable (e.g., training), helping them stay healthy (e.g., medical/health insurance), and covering tragedy (e.g., life insurance). The benefits that are typically less likely to be offered are ones that provide employees piece of mind (e.g., paid sick time and retirement funding).

Table 4-2: Benefits Offered to Employees

Benefits Offered	Canada
Medical/health insurance	84%
Training	84%
Life insurance	74%
Paid sick time	46%
Retirement funding *(pension)*	43%
Enhanced vacation	37%
Employee assistance programs	37%
Wellness program	24%
Employee supports *(Scholarships for close family members)*	18%
Flex benefits	18%
Stock options	6%
No benefits provided	7%

Source: ManufacturingGPS Employer's Survey (as of February 14, 2017

SECTION 5: RECRUITMENT AND HIRING

As the manufacturing workforce is not static, there is a constant need to fill vacancies associated with both voluntary and involuntary turnover. The manufacturing sector is projecting higher than average replacement rate over the next year than that historically experienced by the Canadian economy. The churn experienced by employers is not uniform across their workforce, and can be problematic when key positions become vacant and individuals to fill those positions are hard to find. Employers that will be facing greater challenges filling vacancies are smaller operations or operations that solely focus on local labour markets.

5.1 The Manufacturing Industry is Facing a Large Recruitment Need

The need for the manufacturing industry to replace a large segment of their workforce stems from two causes; challenges to keep qualified employees, and challenges to find qualified employees. Difficulties in keeping qualified employees results from the competition firms are facing from other firms and industries that are able to offer greater wages, benefits, or other non-financial benefits (e.g., location). As well, manufacturers are losing qualified employees to retirement as a significant portion of the workforce is expected to retire over the next decade. Not only are employers losing valuable employees but also the employees' valuable knowledge and experience. The loss of employees to other jobs or retirement is known as voluntary turnover.

Challenges with finding qualified employees can manifest in two separate ways. The first is a vacancy that is left open for a significant period of time, indicating that the company has been unable to attract suitable candidates. The second comes from filling positions with individuals who prove to not be a good fit for the position, resulting in terminations (known as involuntary turnover), or leave the company for their own reasons (known as voluntary turnover).

The vacancy rate, and turnover rates, of the manufacturing sector help measure the workforce health of the sector. Overall, the manufacturing sector is experiencing higher vacancy and turnover rates (Figure 5-1). **The vacancy rate in the manufacturing sector is over one and a half times that of the national average (3.9% vs. 2.5%).**[12] As well, the involuntary turnover rate is also significantly greater (6.1% vs. 3.7%). [13, 14] However, the voluntary turnover rate of the manufacturing sector is below that of the rest of Canada, indicating that workers employed by the manufacturing sector are more likely to stay at their employers than other sectors. Industries experiencing higher growth are more likely to have higher voluntary turnover as employers are competing

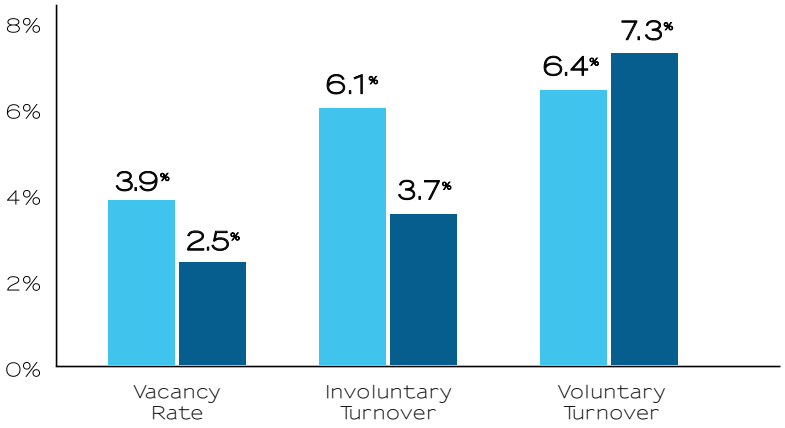
[12] Source: Statistics Canada. Table 285-0001 - Job Vacancy and Wage Survey (JVWS), job vacancies, job vacancy rate and average offered hourly wage by economic region, unadjusted for seasonality, quarterly (number unless otherwise noted), CANSIM (database). (Accessed: February 14, 2017).

[13] Source: Conference Board of Canada. HR Q&A. 2017. Online Article. Available at: www.conferenceboard.ca/topics/humanresource/resources/questions.aspx (Accesses: February 24, 2017).

[14] Please note that the voluntary turnover rate and involuntary turnover rate are for 2013.

for workers; whereas those industries experiencing low growth are less likely to have voluntary turnover as employees have fewer options and desire to keep the jobs they have. Even through the manufacturing sector shows that workers have a higher affinity of maintaining their employment the sector is facing challenges in recruiting qualified individuals to meet its work force needs.

FIGURE 5-1: Comparison of Vacancy and Turnover Rates of the Manufacturing Sector and that of Canadian Employers (%)



Source: ManufacturingGPS Employer's Survey February 14, 2017)
Source: Statistics Canada. Table 285-0001 - Job Vacancy and Wage Survey (JVWS), job vacancies, job vacancy rate and average offered hourly wage by economic region, unadjusted for seasonality, quarterly (number unless otherwise noted), CANSIM (database). (Accessed: Feb 14, 2017)
Source: Conference Board of Canada. HR Q&A. 2017. Online Article. Available at: www.conferenceboard.ca/topics/humanresource/resources/questions.aspx (Accesses: February 24, 2017).

Canada's manufacturing sector is experiencing different challenges than other firms in Canada. The manufacturing sector is projecting that over the next year it will need to recruit one-sixth (17%) of their current workforce **(Table 5-1)**. This rate of hiring is higher than what is happening in other industries in Canada; of whom are only replacing one-eight (14%) of their workforce. Occupations with the highest replacement rates are those of maintenance trades (22%), production - machine operators (21%), and production - labourers (16%) **(Table 5-1)**. The replacement of production - machine operators and production - labourers requires unskilled or semi-skilled workers; whereas the filling of maintenance trades positions requires individuals with specific training, typically that of a post-secondary education (e.g., journeymen or apprentices). The hiring for unskilled and semi-skilled positions may be a simpler task than hiring those that require a post-secondary education. The difficulty stems from the smaller pool of qualified individuals, and the higher level of competition for these individuals by other employers.

The high replacement rate of maintenance trades is primarily driven by the higher than average involuntary turnover rate (9.2% vs. 6.1% for all occupations). Involuntary turnover is an indication of a mismatch between the employee and the position. The individual may not have the specific skill set required by the employer, or that they were a poor match for the company and their culture. As a result, this is an indicator that there is a mismatch between the training these individuals are provided and employer expectations.

Table 5-1: Workforce Replacement by Occupational Functional Group

Occupational Functional Group	Current Vacancies	Voluntary Turnover	Involuntary Turnover	Workforce Replacement
Production Managers	2.6%	5.4%	3.6%	12%
Administration Managers	2.1%	3.7%	2.6%	9%
Sales and Business Development	4.9%	4.7%	3.7%	13%
Shipping and Receiving	2.3%	4.8%	4.1%	11%
Development, Engineering, and Quality Control	4.0%	4.1%	3.0%	11%
Maintenance Trades	4.4%	6.8%	9.2%	22%
Production - Supervisors	2.6%	3.1%	2.9%	9%
Production - Machine Operators and Assemblers	4.2%	5.7%	6.0%	16%
Production - Labourers	3.8%	9.3%	7.4%	21%
Total	**3.9%**	**6.4%**	**6.1%**	**17%**

Source: ManufacturingGPS Employer's Survey (as of February 14, 2017)

Table 5-2: Geography of Employer's Hiring Efforts

Geography of Employer's Hiring	ManufacturingGPS Percent
Local *(only)*	62%
Local *(Including other geographies)*	25%
Regional *(only and including other geographies)*	26%
Provincial *(only and including other geographies)*	17%
National *(only and including other geographies)*	11%
International *(only and including other geographies)*	7%
Total	**100%**

Source: ManufacturingGPS Employer's Survey (as of February 14, 2017)

5.2 Local Labour Markets May Not be Enough

Not surprisingly, the local labour market is important to manufacturers, as the vast majority (87%) view it as a source of labour. Moreover, nearly two-thirds (62%) of manufacturers solely rely on local labour markets to fill vacancies. The exclusive use of local labour markets can limit the pool of available workers, and increase competition for local workers.

Where an employer searches for new hires is influenced by the size of the firm. Small firms (1 to 49 employees) are more likely to only look at the local labour market; whereas, large employers (500 or more employees) are more likely to look at a wider labour market **(Table 5-3)**.

As a result, a limited local labour market will have a larger impact on small employers who will have fewer individuals to choose from to hire, potentially resulting in a poor fit between employees and employers (i.e., resulting in involuntary turnover) if lower qualified individuals are hired.

5.3 Highly Skilled Occupations are Difficult to Hire

Manufacturers provided insight into the relative difficulty they face when looking to fill vacancies. Some of the hardest vacancies to fill were that of highly skilled occupations; including supervisors, managers, as well as technical staff such as engineers and tradespeople. **The most difficult to hire occupations were production manager occupations, sales and business development occupations, and those in development, engineering, and quality control occupations (Table 5-4)**.

The relative level of difficulty that employers face in hiring is also related to firm size. Perhaps due to being more reliant on local labour markets, smaller firms reported greater difficulty in hiring most occupations than larger employers **(Table 5-5)**.

Some of the difficult to hire functional groups were also projected to require a large number of new hires over the forthcoming year; specifically those in the maintenance trades. Overall maintenance trades were reported to be somewhat difficult to hire (3.2 out of 5), and will require the highest percentage of replacement over the forthcoming year (22% of the current workforce). The other high difficulty occupations had significantly lower levels of replacement, requiring on average 11% of their workforce to be replaced.

The large number of hires and relative difficulty in hiring maintenance trades will present a challenge to the manufacturing sector in the forthcoming year, and

Table 5-3: Geography of Employer's Hiring Efforts by Firm Size

Geography of Employer's Hiring	All Sizes	1 to 49 Employees	50 to 99 Employees	100 to 499 Employees	500 or More Employees
Local	87%	90%	87%	82%	72%
Regional	26%	22%	26%	37%	52%
Provincial	17%	11%	20%	31%	46%
National	11%	6%	13%	23%	54%
International	7%	4%	10%	14%	24%

* Please note that columns do not sum to 100% as employers are able to source employees from multiple geographies.
Source: ManufacturingGPS Employer's Survey (as of February 14, 2017)

possibly subsequent years. The difficulty may stem from the educational requirements of these occupations, and the competition employers face from other manufacturing and non-manufacturing firms. Manufacturers will want to overcome these difficulties as these occupations may be crucial for the companies operation. Unfilled positions may potentially interfere with production. To address these challenges, employers will require innovative recruitment strategies to effectively compete for workers, as well as offer sufficient wages to attract high quality personnel and ensure their continued employment.

The top three reasons why employers have vacancies that are hard to fill is because the applicants lack the required skills (71% reporting), the applicants lack the work experience required (58% reporting), and that there is a low number of applicants (51% reporting). The majority of employers reporting these issues hired only from local labour markets. [15]

Table 5-4: Difficulty in Hiring by Occupation

Occupational Functional Group	**Difficulty in Hiring** (1 to 5 Scale)*
Production Managers	3.8
Administration Managers	2.9
Sales and Business Development	3.4
Shipping and Receiving	2.2
Development, Engineering, and Quality Control	3.4
Maintenance Trades	3.2
Production - Supervisors	3.3
Production - Machine Operators and Assemblers	2.9
Production - Labourers	2.1
Overall	**3.1**

* Difficulty in hiring uses a 1 to 5 scale where 1 represents "Not at all difficult to hire" and 5 represents "Very difficult to hire". Source: ManufacturingGPS Employer's Survey (as of February 14, 2017)

[15] Nearly three-fifths (58%) of employers reporting "Applicants lack the skills required" only hire from local labour markets. Nearly three-fifths (58%) of employers reporting "Applicants lack the work experience required" only hired from local labour markets. Over half (56%) of employers reporting "Low number of applicants" only hire from local labour markets.

Table 5-5: Difficulty in Hiring by Occupation by Firm Size

Occupational Functional Group	1 to 49 Employees	50 to 99 Employees	100 to 499 Employees	500 or More Employees	OVERALL
Production Managers	3.8	3.7	3.7	3.5	3.8
Administration Managers	2.9	2.9	2.8	3.1	2.9
Sales and Business Development	3.4	3.3	3.3	3.4	3.4
Shipping and Receiving	2.2	2.2	2.2	1.8	2.2
Development, Engineering, and Quality Control	3.4	3.4	3.4	3.4	3.4
Maintenance Trades	2.9	3.1	3.4	3.4	3.2
Production - Supervisors	3.4	3.3	3.2	3.0	3.3
Production - Machine Operators and Assemblers	2.9	2.6	2.4	2.3	2.9
Production - Labourers	2.2	2.1	1.9	1.8	2.1
Overall	**3.0**	**2.9**	**2.9**	**2.9**	**3.1**

* Difficulty in hiring uses a 1 to 5 scale where 1 represents "Not at all difficult to hire" and 5 represents "Very difficult to hire". Source: ManufacturingGPS Employer's Survey (as of February 14, 2017)

Table 5-6: Causes of Hard to Fill Vacancies

Causes of Hard to Fill Vacancies	Percent of Employers
Applicants lack the skills required	71%
Applicants lack the work experience required	58%
Low number of applicants	51%
Competition from other employers	44%
Not enough people trained / applicants lack the educational qualifications	37%
The skills we need are located in other regions	27%

Source: ManufacturingGPS Employer's Survey (as of February 14, 2017)

SECTION 6: EDUCATIONAL INSTITUTIONS AND THE MANUFACTURING SECTOR

Canada's post-secondary educational institutions play an important role in the development of Canada's manufacturing workforce. They provide workers with the skills and experience required to successfully transition into the workforce, or to upgrade their skills to remain competitive in the workforce. Canada's educational institutions reported low levels of engagement with Canada's manufacturing sector and a reduction in enrollment in programs supporting many key occupations. The following tables summarize the number of survey completions by type of institution **(Table 6-1)** and location **(Table 6-2)**.

6.1 Educators are not Engaging the Manufacturing Sector

A little over one-third (36%) of educators have co-op programs that involve collaboration with the manufacturing sector. [16] As well, only the minority (42%) of educators offer workplace training programs for the manufacturing sector. Workplace training programs are individual-focused training programs that provide work experience to individuals with the intent on assisting them in finding and maintaining employment. Workplace training programs not only provide individuals with the training and experience they require, but also expose employees to potential employers.

Table 6-1: Educator Survey Completions by Type of Institution

Type of Institution	Survey Completions #	Survey Completions %
Colleges	49	48%
Universities	25	24%
Private Training Institutions	28	28%
Total	**102**	**100%**

Source: Manufacturing GPS Educator's Survey

Table 6-2: Educator Survey Completions by Type Province

Type of Institution	Survey Completions #	Survey Completions %
Ontario	26	25%
Alberta	12	12%
British Columbia	12	12%
Saskatchewan	12	12%
Quebec	9	9%
New Brunswick	8	8%
Newfoundland and Labrador	8	8%
Manitoba	7	7%
Nova Scotia	6	5%
Prince Edward Island	2	2%
Total	**102**	**100%**

Source: Manufacturing GPS Educator's Survey

[16] The absence of a co-op program that is collaborative with the manufacturing sector does not imply that they do not have a co-op program, but that it is not tailored to the needs of the manufacturing sector

Coordination and collaboration between institutions and employers require the initiative and communication of both parties, or that of the involvement of a facilitator working on behalf of the sector. The low level of collaboration between educators and employers indicates an opportunity for the manufacturing sector to come together and work with educators to ensure that they are producing graduates that have skills pertinent to the manufacturing sector, and in sufficient quantities to meet demand.

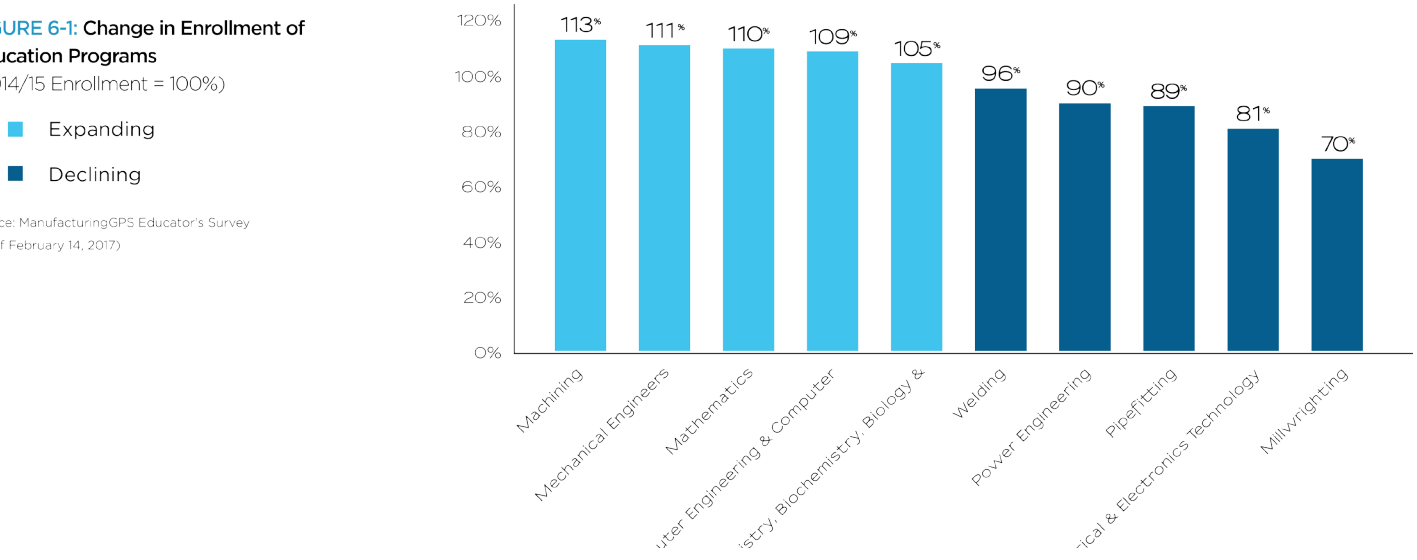
ENROLLMENT IN UNIVERSITY PROGRAMS THAT ARE IMPORTANT TO MANUFACTURING ARE INCREASING BY ***10%*** *WHILE ENROLLMENT IN COLLEGE PROGRAMS IS DECREASING BY* ***10%***

6.2 Maintenance Trade Programming is Decreasing

Educators provided insight into their programming planning over the next year, indicating which programs will be shrinking and which will be expanding. Educators provided information on 39 different programs. The majority of programs were undergoing minor fluctuation (33%); however, some programs were seeing large changes in expected enrollment.

The programs that are significantly expanding were associated with universities (e.g., engineering, mathematics, computer science), and those that are significantly shrinking were associated with colleges and trades schools (e.g., pipefitting, millwright, electrical technicians). The following figure represents the top five programs that are expanding, and the bottom five programs that are shrinking **(Figure 6-1)**.

FIGURE 6-1: **Change in Enrollment of Education Programs**
(2014/15 Enrollment = 100%)



Source: ManufacturingGPS Educator's Survey (as of February 14, 2017)

SECTION 7: TRAINING

Training can be an important investment employers make in their employees. Training ensures that the workforce has the ability to fully use current technology, and be prepared to adopt future technology. As well, proper training of employees in health and safety helps to ensure that accidents do not happen, or when they do the damage can be minimized.

Training also empowers employees, and can assist with their job satisfaction. As a result, investment in training can assist with reduction in turnover rates. The large proportion of manufacturers that provide training shows an understanding its importance in keeping workers productive and safe on the job. The need for training stems from the gap between the current skills of the workforce and the skills the work requires.

7.1 Employers Engage in Training to Keep their Workers Safe and Improve their Skills

The large majority (74%) of employers reported that they engaged in training activities. The most frequently cited types of training provided were for health and safety (93%), as well as technical skills related to manufacturing (81%). The drivers of this training were to bring existing staff skills up to where they needed to be (86%) or to meet regulations (78%).

Table 7-1: Type of Training Undertaken

Type of Training Undertaken	Percent of Employers who Provided Training
Health and safety	93%
Technical skills related to manufacturing	81%
Business skills *(leadership, management, sales)*	55%
Essential skills *(teamwork, problem solving skills, computer skills)*	51%
Literacy *(reading, writing and numeracy)*	8%

Source: ManufacturingGPS Employer's Survey (as of February 14, 2017)

The drivers behind training are to narrow the skills gap of employees, as well as ensure that regulations are met. Employers are providing training for both existing employees (86%) and new hires (78%) **(Table 7-2)**. Investing in the current workforce allows the workforce to remain up-to-date with new technologies and standards. For individuals that are entering the workforce, the training they received during their education may not have included lessons pertinent to the manufacturing sector. Whereas training for individuals moving into the manufacturing sector may indicate operational/technological differences in skills between the manufacturing sector and others. The need for training of new, but experienced employees may result in termination as they do not have the skills to meet job requirements.

Table 7-2: Reason for Employers to Offer Training

Reason for Offering Training	Percent of Employers who Provided Training
To bring existing staff skills up to where they need to be	86%
To meet regulations	78%
To bring new hires' skills up to where they need to be	73%
To become certified or maintain certification	64%
To support their career development	58%
To adopt new technology	57%

Source: ManufacturingGPS Employer's Survey (as of February 14, 2017)

Table 7-3: Percent of Employers Engaging in Training Activities by Size

Size of Firm	Percent of Employers Engaged in Training
1 to 49 Employees	66%
50 to 99 Employees	82%
100 to 499 Employees	90%
500 or More Employees	92%
Overall	**74%**

Source: ManufacturingGPS Employer's Survey (as of February 14, 2017)

7.2 The Size of Employer Influences their Engagement in Training

The larger an employer is the more likely they will engage in training. Almost all (92%) employers with 500 or more employees engaged in training activities, whereas only two-thirds (66%) of employers with 1 to 49 employees engaged in training **(Table 7-3)**. As this only measures whether the employer trains any employees, the differences in training rates by size could potentially stem from larger employers being more likely to have an employee requiring training. As well, larger employers may have more funds available for training and the larger workforce's ability to be more flexible for production to not be interrupted by an individual taking time off of work to obtain training.

The primary reason why employers did not engage in training was that they believed that their staff did not require any training (83% of employers who did not provide training reporting) **(Table 7-4)**. Fewer employers (27%) stated that the cost of training was a barrier to training. It should be emphasized, however, that only one-quarter (26%) of employers surveyed noted that they did not offer any training.

The importance of the top two reasons for not engaging in training shift as firm size increases. Medium sized employers (100 to 499 employees) were more likely cited the cost of training (45%) more frequently than smaller employers (36% of employers with 50 to 99 employees, and 25% for employers with 1 to 49 employees). As well, these smaller employers were more likely to report that their employees did not require training than

larger employers (86% vs. 72% of employers with 50 to 99 employees, and 65% of employers with 100 to 499 employees) **(Table 7-5)**.

7.3 The Manufacturing Sector Is Under-investing in Training

The amount of expenditure of Canadian manufacturing firms on its employees can be calculated in two separate ways. The first is to look at the expenditure by those who did engage in training; and the second is to calculate it based on all employers, including those who did not engage in training. On average, employers expended $261 per employee on training.[17] Employers who did engage in training expended, on average, $530 per employee, a figure considerably less than the figure published by The Conference Board of Canada, which estimates that the average Canadian firm expends $800 per employee. However, when discounting for those who did not engage in training the figure drops to $261 per employee.

The amount of expenditure of Canadian manufacturing firms was found to vary by province, industry, and firm size. A lower proportion of employees in Western Canada received training, resulting in a significantly lower expenditure per employee than those in Central or Atlantic Canada **(Table 7-6)**. As well, the size of the firm was found to be inversely related to expenditure with smaller firms expending more than larger ones **(Table 7-7)**.

Table 7-4: Reason for Not Providing Training

Reason for Not Offering Training	Percent of Employers who Did Not Provide Training
Staff did not require any training	83%
Cost of training	27%
Employees can't afford the time to attend training	18%
Lack of training offered in the area	16%
Managers can't afford the time to organize training	12%

Source: ManufacturingGPS Employer's Survey (as of February 14, 2017)

FIGURE 7-1: **Training Expenditure of Manufacturing Firms vs. Canadian Firms**

Source: ManufacturingGPS Employer's Survey (as of February 14, 2017)
Source: Conference Board of Canada (Unpublished)

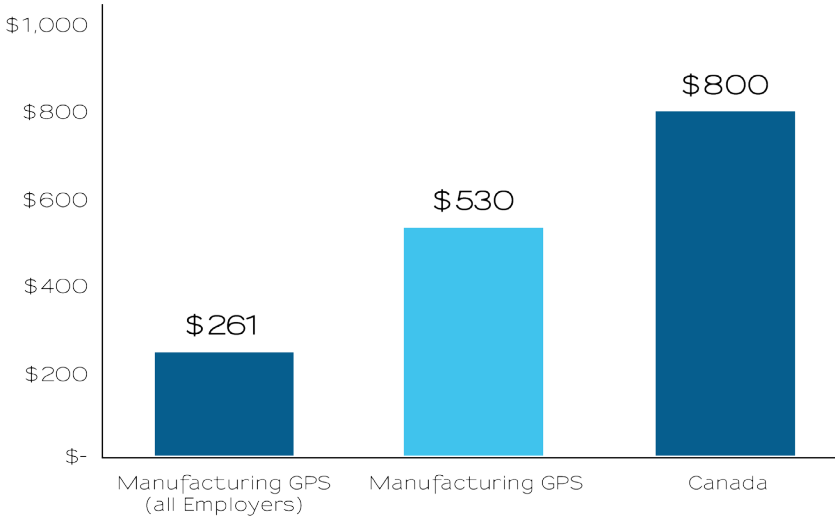


Table 7-5: Reason for Not Providing Training by Firm Size

Reason for Not Offering Training	1 to 49 Employees	50 to 99 Employees	100 to 499 Employees	500 or More Employees	CANADA
Staff did not require any training	86%	72%	65%	*	83%
Cost of training	25%	36%	45%	*	27%
Employees can't afford the time to attend training	16%	22%	28%	*	18%
Lack of training offered in the area	16%	14%	25%	*	16%
Managers can't afford the time to organize training	10%	17%	28%	*	12%

Note: The responses for employers with 500 or more employees were suppressed due to the small number not engaging in training.
Source: ManufacturingGPS Employer's Survey (as of February 14, 2017)

Table 7-6: Training Expenditure by Employers by Geography

Amount Spent on Training	Canada	Western Canada	Eastern Canada	Atlantic Canada
Amount spent on training	$530	$492	$542	$529
Amount spent on training *(all employees)*	$261	$176	$302	$260

Source: ManufacturingGPS Employer's Survey (as of February 14, 2017)

Table 7-7: Training Expenditure by Employers by Firm Size

Amount Spent on Training	CANADA	1 to 49 Employees	50 to 99 Employees	100 to 499 Employees	500 or More Employees
Amount spent on training	$530	$796	$466	$455	$525
Amount spent on training *(all employees)*	$261	$545	$263	$231	$193

Source: ManufacturingGPS Employer's Survey (as of February 14, 2017)

SECTION 8: CONCLUSION & DISCUSSION

Canada's manufacturing sector is primarily comprised of small firms with less than 50 employees. These small employers may not have the resources or staff to gather information to facilitate their human resource needs. ManufacturingGPS is an essential tool to help companies to access information that is pertinent to their sub-sector, size, and location. Over the next decade, these manufacturers will need sound, up to date information to address human resource challenges caused by retiring workers and stagnating pay. As well, companies need sound information to addressing technological changes and the training necessary to keep the workforce competitive. ManufacturingGPS may help these employers make these decisions by providing information on wages, turnover and training budgets, among other important human resource metrics.

In particular, manufacturers need to understand that the workforce fueling the manufacturing sector is aging. Its workforce is comprised of more workers over the age of 55, and fewer workers under the age of 35 than those are found in Canada's labour force. The retirement of workers over the age of 55 and the associated loss of much needed skills and experience is a threat to the manufacturing sector, especially for smaller firms. Employers need to be aware of the impact of the retiring workforce on their businesses and must plan accordingly to maintain productivity.

Manufacturers are already keenly aware that turnover is a constant struggle. In fact, the Canada's manufacturing sector is experiencing more turnover than that of other sectors. Over the next year Canada's manufacturing sector will need to hire nearly one-sixth (17%) of its current workforce. This is to fill current vacancies, as well as those resulting from voluntary and involuntary turnover. The vacancy and involuntary turnover rates of the manufacturing sector is higher than that experienced by other sectors. These higher rates are an indicator of difficulties in filling vacancies, as well as difficulties in forming a good fit between employees and employers. However, the sector does show that when a good fit between employees and employers is formed that workers are more likely to remain with their company than those in other sectors.

Manufacturers need also be aware of the occupations that may be the hardest to replace. The replacement of the manufacturing workforce is primarily driven by the replacement of machine operators and assemblers, and labourers, as well as maintenance trades. These occupations are projecting the highest replacement rates than other occupations, and account for nearly three-quarters of the workforce. The replacement of lower skills occupations (e.g., labourers) is more of an administrative task; however, the replacement of more skilled occupations is a greater challenge in finding qualified applicants. The challenge of filling vacancies of

skilled occupations is compounded by some companies' preference to use only local labour markets to fill vacant positions.

Manufacturers need to also be aware that in Canada geography matters. Wages within Canada's manufacturing sector vary by province, with employers in Western Canada offering wages 18-24% higher than employers in Atlantic Canada. The disparity in wages could present a significant problem to manufacturers in Atlantic Canada as their local labour markets shrink as the more mobile qualified workers move west. This disparity in wages and loss of labour markets exacerbates the challenge small employers (1 to 49 employees) face in finding qualified workers. The vast majority of small employers only source workers from local labour markets, not looking outside their region or province.

Canada's educational institutions play an important role in the development of Canada's manufacturing sector's workforce. This is seen through the majority of workers employed in the manufacturing industry are trained within Canada. However, in interviews with educational institutions a shift was observed where the number of seats at post-secondary institutions is increasing for programs that are typically offered at universities, and decreasing for programs that are typically offered at colleges and trade schools. This shift could potentially exacerbate challenges employers face when trying to source individuals to fill maintenance trades positions.

Those in charge of HR have to make decisions about who to train and on what. Training plays an important role in keeping employees' skills up to date, and to meet regulations. However, not all employers engaged in training over the past year. In fact, one quarter of employers in the sector provided no training at all in the past year. Those who do engage in training are also investing less per worker than those in other sectors. The lower level of training is seen to be related to the size of the company where smaller companies are less likely to engage in training; indicating that their staff did not require training or that employers could not afford to provide such training. However, when smaller employers engaged in training the expenditure per person was higher than larger employers.

The manufacturing sector will encounter challenges over the next few years in replacing its workforce with highly qualified individuals. It is up to the industry to ensure that it adequately invests in its workforce to retain the highly qualified individuals that it currently employs, and to ensure that their skills are keeping up with technology. Employers need to engage training institutions to ensure that they have the access to recent graduates to fill their hiring needs, and to assist in the tailoring of educational programs to meet the needs of its jobs. Smaller employers will be facing larger challenges in meeting their workforce needs and will need to look beyond local labour markets and develop strategies in order to effectively compete with larger employers for workers.

ManufacturingGPS provides valuable LMI to help manufacturers understand their labour market. This information is particularly valuable to smaller

employers that may not have readily access to such information. ManufacturingGPS can provide insight allowing employers to address workforce trends before they become challenges. Tools such as ManufacturingGPS, and reports such as this, aim to highlight salient points for employers to act upon. LMI information is to be used as a decision making tool by employers; however, it is up to employers to decide what to do with this information and decide what strategies to implement, and how they are to be implemented.

ANNEX A: SURVEY METHODOLOGY

Administration of the ManufacturingGPS employer's survey began in March of 2015. Survey administration began with inviting companies that were included in Excellence in Manufacturing Consortium's (EMC's) client relationship management system, and later expanded to include those from company listing services (e.g., Scott's Directory, InfoCanada, etc.). Companies participating in the ManufacturingGPS employers survey all had at least one employee (or vacancy to be hired), and self-identified as a manufacturer.

Individuals were selected based upon their knowledge of the company's workforce (e.g., human resource specialists, senior management, etc.). Upon contacting a company survey agents would work with company staff to determine the most relevant individual within the company to respond to the survey.

Individuals were invited to participate (henceforth referred to as participants) in the survey either over the phone with the survey agent or online. Participants were asked to provide information specific to a manufacturing facility (i.e., an establishment). As a result, companies with multiple establishments in different parts of Canada may appear multiple times within the dataset. Collection of data at the facility level allowed for an analysis of Canada's manufacturing sector at the local level. This was done to provide deeper insight into the regional differences of Canada's manufacturing sector.

Participants were provided with login credentials to create an account with ManufacturingGPS. The login credentials allowed participants to respond to the survey, and provided access to the ManufacturingGPS reporting tool. The reporting tool provided participants with access to ready-made reports covering the vast majority of survey questions. Participants could view occupation specific wages, benefits, relative difficult of hiring, as well as barriers to recruitment. The reporting tool allowed participants to drill down within the dataset to view data pertaining to their sub-sector, size, and location (e.g., province or manufacturing hub).

Data provided by participants was validated to ensure internal consistency within their survey response, as well to exclude outliers. Data validation occurred periodically throughout survey administration, updating the database every few hundred responses. GPS is now a live reporting tool that encompasses data from more than 2,500 manufacturing establishments.

ManufacturingGPS also included an educators' survey; examining Canada's post-secondary institutions programs, and their involvement with the manufacturing sector. Educational institutions were selected to participate in the educators' survey based upon their offering of programs related to occupations appearing within the employers' survey. All relevant educational institutions were then contacted and offered the opportunity to participate in ManufacturingGPS. Individuals were selected within the institutions based on their familiarity with the institutions programs, and their employment outreach programs. In the end, more than 100 educational institutions, including universities, colleges and private training schools provided information for ManufacturingGPS.

TERMS USED IN THE REPORT

Within this report the manufacturing sector is examined in terms of employers and the workforce. Data on employers is presented at the establishment level (i.e., X% of establishments). As a result, it is possible for a single employer to appear multiple times within the database; once for each establishment. The terms employer, establishment, company and firm are used interchangeably within this body of text. Data on the manufacturing workforce is presented at the employee level (i.e., Y% of workers).

Employee ages are grouped into three separate categories; young, established, and mature.

Young workers are interpreted as those between the ages of 15 and 35. Established workers are interpreted as those between the ages of 36 and 54. Finally, mature workers are interpreted as those aged 55 and over.

ManufacturingGPS included an educator's survey. The educator's survey queried Canada's post-secondary educational institutions as to their programs, and their engagement in the manufacturing sector. Within the body of the report any reference to educational institution, or educator, pertains to post-secondary educational institutions.

EMPLOYER SURVEY - MISCELLANEOUS MANUFACTURING

Introduction

Thank you for agreeing to participate in a Survey for ManufacturingGPS. Excellence in Manufacturing Consortium (EMC) has engaged R.A. Malatest & Associates Ltd. to conduct research services to support the development of ManufacturingGPS.

Through EMC's Canadian Manufacturing Network, ManufacturingGPS will be an interactive online resource providing key information and benchmarking tools for HR, labour market, skills and capability needs. We are helping EMC to collect and analyze labour market information and HR benchmarks such as compensation levels and turnover rates. Once completed, ManufacturingGPS will be a trusted resource to help the sectors make sound human capital decisions.

EMC is seeking your input to kick-off this important resource. This information will remain anonymous and will help employers develop the workforce they require.

You have a number of options for completing the survey. You may:

- Complete the survey online at https://survey.manufacturinggps.ca/
- Fill out the survey and return it to us via...
  - Mail: #500-294 Albert Street, Ottawa, ON, K1P 6E6;
  - Fax at 1-866-288-1278; or
  - Email at manufacturing.GPS@malatest.com
- Call 1-855-688-1137 and complete the survey over the phone with a representative from R.A. Malatest.

Please provide your name, company and contact information in the space provided below:

Name: _____

Company: _____

Tel.: _____

E-mail: _____

Fax: _____

Company Profile

This first section deals with the characteristics of your company. All responses will be kept confidential.

Q1. What is the postal code of your company's manufacturing location?
(Please provide without a space in this format: A1B2C3)

_____

Q2. Which of the following industries most accurately reflects your company's manufacturing activities?
(Select only one)

- ☐ Aerspace
- ☐ Chemical, petroleum & coal
- ☐ Computer & appliances
- ☐ Fabricated metal
- ☐ Food, beverage & tobacco
- ☐ Furniture
- ☐ Machinery
- ☐ Motor vehicle & parts
- ☐ Non-metallic mineral
- ☐ Plastics & rubber
- ☐ Primary metal
- ☐ Printing
- ☐ Textiles, clothing & leather
- ☐ Wood & paper
- ☐ Miscellaneous

Q3. Where does your company manufacture its products, sell products, and recruit workers?
(Check all that apply within each column)

	a. Manufacture products?	**b.** Sell products	**c.** Recruit workers?
Locally	☐	☐	☐
Regionally	☐	☐	☐
Provincially	☐	☐	☐
Nationally	☐	☐	☐
Internationally	☐	☐	☐
Don't know/ No Response	☐	☐	☐

Q4. What are your company's annual revenues?

- ☐ Less than $1 million
- ☐ $1 million to less than $5 million
- ☐ $5 million to less than $10 million
- ☐ $10 million to less than $50 million
- ☐ More than $50 million
- ☐ Don't know/No Response

Benefits

Q5. What benefits does your company provide to its employees? *(Check all that apply)*

- ☐ Medical/health insurance
- ☐ Life insurance
- ☐ Retirement funding (pension)
- ☐ Stock options
- ☐ Enhanced vacation
- ☐ Paid sick time
- ☐ Training
- ☐ Employee supports *(Scholarships for close family members)*
- ☐ Flex benefits
- ☐ Wellness program
- ☐ Employee assistance programs
- ☐ Other *(please specify)* _____
- ☐ No benefits provided
- ☐ Don't know/No Response

Workplace Skills Development

Q6. In the past 12 months, did your company carry out structured learning activities to develop essential, technical or business skills?

- ☐ Yes
- ☐ No
- ☐ Don't know

Q7. What were the reasons for not developing employees' skills in the past 12 months? *(Check all that apply)*

- ☐ Staff did not need any training
- ☐ Employees can't afford the time to attend training
- ☐ Managers can't afford the time to organize training
- ☐ Lack of training offered in the area
- ☐ Cost of training
- ☐ Don't know/No Response

Q8. What are the reasons for developing employees' skills? *(Check all that apply)*

- ☐ To bring new hires' skills up to where they need to be
- ☐ To bring existing staff skills up to where they need to be
- ☐ To adopt new technology
- ☐ To support their career development
- ☐ To become certified or maintain certification
- ☐ To meet regulations
- ☐ Don't know/No Response

Q9. Which of the following skill sets does your company develop through these structured activities? *(Check all that apply)*

- ☐ Literacy *(reading, writing and numeracy)*
- ☐ Essential skills *(teamwork, problem solving skills, computer skills)*
- ☐ Technical skills related to manufacturing
- ☐ Business skills *(leadership, management, sales)*
- ☐ Health and safety
- ☐ Don't know/No Response

Q10. Over the past 12 months, how much did your company spend on these skills development activities *(this can include amounts spent on external courses, internal training staff, salaries for workers while on training and administrative time to organize the activities)?*

- ☐ Amount spent ($) _____
- ☐ Don't know/No Response

Q11. What are the causes of hard-to-fill vacancies? *(Please check all that apply)*

- ☐ Applicants lack the skills required
- ☐ Applicants lack the work experience required
- ☐ Not enough people trained / applicants lack the educational qualifications
- ☐ Low number of applicants
- ☐ Competition from other employers
- ☐ The skills we need are located in other regions
- ☐ Other reasons (please specify):
- ☐ Don't know/No Response

Workforce Overview

Q12. How many employees does your company employ? *(Please report in full-time equivalents)*

- ☐ Full-time:
- ☐ Part-time:
- ☐ Temporary:
- ☐ Contract:
- ☐ Total:
- ☐ Don't know/No Response

Q13. What proportion of your workforce falls within the following age categories? *(Please provide the percentage of full-time equivalents - FTEs)*

	Percent of FTEs	Don't Know/ No Response
a. Aged 15 to 35		☐
b. Aged 36 to 54		☐
c. *Aged 55+*		☐

Q14. What proportion of your workforce is/has... *(Please provide the percentage of full-time equivalents - FTEs)*

	Percent of FTEs	Don't Know/ No Response
a. Female		☐
b. Post-secondary education		☐
c. Foreign trained		☐
d. Unionized		☐

Employment

Q15. According to these nine functional groups, does your company employ any workers that would fall within them?
(Please check all that apply, both at the group level and any specific occupations listed within each group. These occupations of interest may not account for all your employees. Hold your cursor over any functional group or specific occupation for a description and examples of job titles.)

Functional Group	Employ
Q15a. Production Managers	☐
Q15b. Administration Managers	☐
Q15c. Sales and Business Development	☐
Q15d. Shipping and Receiving	☐
Q15e. Development, Engineering and Quality Control	☐
Q15f. Maintenance Trades	☐
Q15g. Production - Supervisors	☐
Q15h. Production - Machine Operators and Assemblers	☐
Q15i. Production - Labourers	☐

Q16. On a five point scale where 1 is "Not at all difficult to hire" and 5 is "Very difficult to hire" please rate how difficult it is to fill positions with qualified individuals for the following occupations.

Occupation	Not at all difficult to hire ***1***	***2***	***3***	***4***	Very Difficult to Hire ***5***	Don't Know/ No Response
Production Managers	1	2	3	4	5	☐
Administration Managers	1	2	3	4	5	☐
Sales and Business Development	1	2	3	4	5	☐
Shipping and Receiving	1	2	3	4	5	☐
Development, Engineering and Quality Control	1	2	3	4	5	☐
Maintenance Trades	1	2	3	4	5	☐
Production - Supervisors	1	2	3	4	5	☐
Production - Machine Operators & Assemblers	1	2	3	4	5	☐
Production - Labourers	1	2	3	4	5	☐

The following section asks about your current workforce, you may need to access your company's administrative data to provide answers.

Q17. According to the functional groups your company employs, as well as other specific occupations; please provide information on the size of your current workforce, current vacancies, voluntary and involuntary turnover over the past 12 months, and how many employees you expect to have employed within that category in 12 months' time?
*(Please report as number of full-time equivalents - FTEs. Note that the numbers of specific occupations **do not** need to add up numbers for each functional group. We are interested in overall information for each functional group, and for a select list of occupations in your industry.)*

Functional Group/ Occupation	Current Workforce		Current Vacancies			Voluntary Turnover *Past 12 months*		Involuntary Turnover *Past 12 months*		Expected Employment *in 12 months*	
	# of FTEs	Don't Know	# of FTEs	Average Length of Vacancy *(Months)*	Don't Know	# of FTEs	Don't Know	# of FTEs	Don't Know	# of FTEs	Don't Know
Production Managers		☐			☐		☐		☐		☐
Administration Managers		☐			☐		☐		☐		☐
Sales and Business Development		☐			☐		☐		☐		☐
Shipping and Receiving		☐			☐		☐		☐		☐
Development, Engineering and Quality Control		☐			☐		☐		☐		☐
Maintenance Trades		☐			☐		☐		☐		☐
Production - Supervisors		☐			☐		☐		☐		☐
Production - Machine Operators and Assemblers		☐			☐		☐		☐		☐
Production - Labourers		☐			☐		☐		☐		☐

Q18. According to the functional groups your company employs, as well as other specific occupations. Please provide for each functional group/occupation the minimum (starting) wage/salary, average wage/salary, maximum wage/salary, as well as the predicted average wage next year.
(Please indicate if the wage is annual or hourly. Please include any bonuses that apply)

Functional Group/ Occupation	Minimum Wage/Salary *(Starting Wage/Salary)*			Average Wage/Salary			Predicted Increase in Average Wage/Salary Over the Next 12 Months	
	# of FTEs	***Unit***	***Don't Know***	***# of FTEs***	***Unit***	***Don't Know***	%	***Don't Know***
Production Managers	☐	☐ $/Hour ☐ $/Year	☐		☐ $/Hour ☐ $/Year	☐		☐
Administration Managers	☐	☐ $/Hour ☐ $/Year	☐		☐ $/Hour ☐ $/Year	☐		☐
Sales and Business Development	☐	☐ $/Hour ☐ $/Year	☐		☐ $/Hour ☐ $/Year	☐		☐
Shipping and Receiving	☐	☐ $/Hour ☐ $/Year	☐		☐ $/Hour ☐ $/Year	☐		☐
Development, Engineering and Quality Control	☐	☐ $/Hour ☐ $/Year	☐		☐ $/Hour ☐ $/Year	☐		☐
Maintenance Trades	☐	☐ $/Hour ☐ $/Year	☐		☐ $/Hour ☐ $/Year	☐		☐
Production - Supervisors	☐	☐ $/Hour ☐ $/Year	☐		☐ $/Hour ☐ $/Year	☐		☐
Production - Machine Operators and Assemblers	☐	☐ $/Hour ☐ $/Year	☐		☐ $/Hour ☐ $/Year	☐		☐
Production - Labourers	☐	☐ $/Hour ☐ $/Year	☐		☐ $/Hour ☐ $/Year	☐		☐

EDUCATOR'S SURVEY EDUCATOR SURVEY - GENERAL

Introduction

Thank you for agreeing to participate in a Survey for ManufacturingGPS. Excellence in Manufacturing Consortium (EMC) has engaged R.A. Malatest & Associates Ltd. to conduct research services to support the development of ManufacturingGPS.

Through EMC's Canadian Manufacturing Network, ManufacturingGPS will be an interactive online resource providing key information and benchmarking tools for HR, labour market, skills and capability needs. We are helping EMC to collect information from organizations involved in the training of the manufacturing sector's labour force, seeking information on training capacity and partnerships with industry. Once completed, ManufacturingGPS will be a trusted resource to help the sectors make sound human capital decisions.

EMC is seeking your input to kickÐoff this important resource. This information will help employers and training organizations develop the workforce the manufacturing industry requires.

You have a number of options for completing the survey. You may:

- Complete the survey online at https://survey.manufacturinggps.ca/
- Fill out the survey and return it to us via…
    - Mail: #500-294 Albert Street, Ottawa, ON, K1P 6E6;
    - Fax at 1-866-288-1278; or
    - Email at manufacturing.GPS@malatest.com
- Call 1-855-688-1137 and complete the survey over the phone with a representative from R.A. Malatest.

Organization Profile

This first section deals with the characteristics of your organization.

Q1. Please provide the following information about your organization.

Name of your Organization: _____

Postal Code: _____

Q2. What type of educational organization do you represent?

- ☐ University
- ☐ College/CEGEP
- ☐ Institute
- ☐ Secondary school
- ☐ Private Training Organization
- ☐ Other *(please specify)*: _____

Q3. How many instructors *(full time equivalents)* are employed at your organization?

- ☐ None
- ☐ Please specify: _____
- ☐ Don't Know

Relations with the Manufacturing Industry

Q4. Do you have co-op programs that involves collaboration with the manufacturing industry?

- ☐ Yes
- ☐ No
- ☐ Don't know

Q5. Does your organization offer workplace training programs for manufacturers?

- ☐ Yes
- ☐ No
- ☐ Don't know

Q6. Does your organization offer online learning?

- ☐ Yes
- ☐ No
- ☐ Don't know

Q7. Do you have a job board that students can consult?

- ☐ Yes
- ☐ No
- ☐ Don't know

Q8. Does your organization have a placement program?

- ☐ Yes
- ☐ No
- ☐ Don't know

Q9. Do you promote your education programs in local high schools?

- ☐ Yes
- ☐ No
- ☐ Don't know

Q10. Do you hold career fairs?

- ☐ Yes
- ☐ No
- ☐ Don't know

If Yes to Q10:

Q11. When are your career fairs held? *(Select all that apply)*

- ☐ January
- ☐ February
- ☐ March
- ☐ April
- ☐ May
- ☐ June
- ☐ July
- ☐ August
- ☐ September
- ☐ October
- ☐ November
- ☐ December
- ☐ Year - round
- ☐ No set time/intermittent
- ☐ Don't Know

Q12. What manufacturing-related programs is your organization currently developing?

- ☐ Specify: _____
- ☐ Currently not developing new manufacturing - related programs
- ☐ Don't know

Program	Total program enrollement in 2015	Expected completion rate of program (%)	Expected enrollemnt as of September 2016	Program duration	Co-op Placement offered?
				☐ Weeks ☐ Years	
				☐ Weeks ☐ Years	
				☐ Weeks ☐ Years	
				☐ Weeks ☐ Years	
				☐ Weeks ☐ Years	
				☐ Weeks ☐ Years	
				☐ Weeks ☐ Years	

Enrollment and Graduation

Q13. Which manufacturing - related programs does your organization offer? For each, please indicate the number of students enrolled and expected to graduate.

Conclusion

Q14. The assessment of Canadian organizations' abilities to collectively address the educational needs of the Canadian manufacturing labour force is an ongoing process. Would you be willing to participate in future assessments to update information pertaining to your organization?

- ☐ Yes
- ☐ No
- ☐ Don't know

Thank you for contributing to ManufacturingGPS!