Labour Market Partnership: Phase 2 – Final Labour Market Information Research Report

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Table of Contents

List of Tables 3
List of Figures 3
Acknowledgements 5
Executive Summary 6
1. Introduction - About this Report 9
2. Overview of the LMI Research Project 9
2.1. Research Methodology 9
2.2. Research Questions 9
2.3. Sector Analysis: Background Research 11
2.4. Selected Research Literature 11
2.4.1. Canada 11
2.4.2. United States 12
2.4.3. Europe 13
2.4.4. Australia and New Zealand 15
2.5. Secondary Background Data 16
2.5.1. Number and Size of Manufacturing Companies 16
2.5.2. Employment in Manufacturing 18
2.5.3. Economic Data 22
2.6. Sample Company Profiles 23
2.6.1. Viking (Victoria) (Transportation Equipment Manufacturing – NAICS 336) 23
2.6.2. Reliable Controls (Victoria) (Computer and Electronic Product Manufacturing – NAICS 334) 24
2.6.3. VMAC (Nanaimo) (Machinery Manufacturing – NAICS - 333) 24
2.6.4. Nanaimo Forest Products (Nanaimo) (Wood Product Manufacturing – NAICS 321) 24
2.6.5. Town Site Brewing (Powell River) (Beverage & Tobacco Product Manufacturing – NAICS 312) 25
2.6.6. Plastics Plus Fabricating (Campbell River) (Plastics & Rubber Products Manufacturing – NAICS 326) 25
3. Primary Research: Employer Survey and Interviews 26
3.1. Online Survey Results 26

3.1.1. Background of Companies Responding to the Survey 26
3.1.2. Characteristics of the Workforce 29
3.1.3. Employer Training 32
3.1.4. Projected Growth 37
3.1.5. Labour and Skill Shortages 39
3.1.6. Strategies to Address Skill Shortages 42
3.2. Summary of Themes Emerging from Employer Interviews 45
4. Summary: Key Issues and Strategies 52
4.1. Key Issues 52
4.2. Strategies to Address Issues 54
Appendix 1: Vancouver Island/Coastal Region Manufacturing Company Database 56
Appendix 2: List of Companies Interviewed 63
Bibliography 64

List of Tables

Table 1: Manufacturing Industry by NAICS Codes 16
Table 2: Number and Size of Manufacturing Companies in Canada by Province 17
Table 3: VI/Coastal Region Manufacturing Sector Employment 2010 – 2015 (in thousands) 20
Table 4: Gross Domestic Product and Growth 22
Table 5: Vancouver Island/Coastal Region Manufacturers Responding to the Online Survey 26
Table 6: Trades Designations Reported by VI/Coastal Manufacturing Companies 30
Table 7: Employer Comments about the Effectiveness of Training 35
Table 8: Employer Comments Concerning Employment Growth of Decline 37
Table 9: Difficult to Fill Positions 39
Table 10: Summary of Employer Comments Concerning Sectoral Strategies 43
Table 11: Themes Emerging from Interviews with Vancouver Island/Coastal Region Manufacturing Companies 47

List of Figures

Figure 1: Length of Time in Operation in the VI/Coastal Region 28
Figure 2: Number of Workers Employed by Companies Responding to the Survey 28
Figure 3: Credentials or Professional Designations Required by Companies 29
Figure 4: Age Range of Workforce 31
Figure 5: Reasons for Staff Turnover 32
Figure 6: Training Provided to Manufacturing Operations Employees 33
Figure 7: Training Providers 33

Figure 8: Training for Administration and Manufacturing Support Employees....34
Figure 9: Effectiveness Ratings for Training Activities....35
Figure 10: Employment Growth or Decline over the past 3 years....37
Figure 11: Anticipated Employment Levels in Next 3 Years....37
Figure 12: Difficulty in Hiring Qualified Workers....39
Figure 13: Reasons for Failure of Job Applicants to Meet Position Requirements....41
Figure 14: Factors Contributing to Future Skill Shortages....42
Figure 15: Actions to Address Skill Shortages....43

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Executive Summary

This labour market information (LMI) report provides the results of research related to the Vancouver Island/Coastal region manufacturing sector conducted from January – June 2016. The research was undertaken as a part of Phase 2 of a labour market partnership (LMP) involving companies in the sector and region with the support of the BC Ministry of Jobs, Tourism, and Skills Training.

Phase 2 of the LMP for the region involved the analysis of existing labour market information, a brief review of some pertinent research literature related to skills and training issues, and the collection of data from employers in the region using an online survey tool and through a series of interviews with key manufacturing sector executives and managers. This report provides highlights of the key labour market issues that emerged from that research.

A database of 169 manufacturing companies (with 10 or more employees) was developed to undertake the online survey research. A total of 64 responses were received representing a completion rate of 40.25%. One hour interviews with 16 key company executives and senior managers were conducted between April 25 and June 7, 2016. The companies involved in these interviews represented a cross-section of the manufacturing sector in the region.

Based on the research conducted, the following key issues were identified for the manufacturing sector in the VI/Coastal region:

1. **Skill Shortages**

   The region's manufacturers identified a number of positions with skills that are difficult to fill. Among the positions most often identified were machine operators (CNC and PLC), qualified tradespersons (metal fabrication, machinists, heavy equipment operators), and engineers with various specializations to name a few. Manufacturers in the region are also challenged to find individuals with LEAN training or backgrounds and other specialized skills related to electronics and a range of positions requiring soft skills (i.e. communication, collaboration, teamwork, and cross-cultural negotiation).

   There is also a general concern expressed by companies that there is a lack of qualified candidates in the region with sufficient technical experience and education (e.g. electrical and mechanical engineering and the operation of CNC and PLC equipment as noted above) to effectively operate within local manufacturing environments.

2. **Quality and Availability of Training**

   Manufacturers responding to the survey and providing comments through the interview process are generally dissatisfied with the quality and availability of training in the region and more broadly in the province. Manufacturers question the quality of graduates of BC's educational institutions and their readiness to work on the job in a manufacturing

environment. As a result employers find themselves having to invest a great deal of time and money for internal training which has an impact on productivity and, in some cases, on profitability. Manufacturers cite a lack of collaboration on the part of BC's educational institutions as a part of the problem and are concerned that institutions are not working with industry to understand their needs and customize programs to address these needs.

It is important to note that in this phase of the labour market partnership sector partners did not raise these issues with representatives from post-secondary institutions directly. Given the importance of this issue to both the region's manufacturers and post-secondary institutions, efforts to achieve greater communication and collaboration between industry and the post-secondary education system will be initiated as a part of the work undertaken in Phase 3.

3. **The Changing Nature of the Workforce**
   Manufacturing companies in the region are feeling the impacts of working with a mix of generations from 20 year olds to those beyond 65 and this presents significant operational and training challenges. The ability of companies to adapt to the shifting expectations of a diverse workforce while at the same time maintaining a culture that values high levels of performance and quality is also a challenge. Attracting and retaining workers was also mentioned as a significant issue that is impacting VI/Coastal manufacturers.

While the data collected as a part of this LMI research study suggests that VI/Coastal region manufacturers are not entirely satisfied with post-secondary programs in the region companies acknowledge the importance of defining their needs in ways which enable post-secondary institutions to respond to their needs.

Regional manufacturers are very interested in working with BC institutions and involving them in the design of offerings that address specific high priority needs. Companies recognize the importance of speaking with a single voice so that post-secondary institutions are not trying to respond to individual company needs. It has been difficult for institutions to adapt their programs to meet the needs of individual companies since typically the volume that is necessary to justify the development of customized training solutions has not been present.

To overcome the barriers that were identified through this LMI research project and to help the manufacturing sector in the region grow and become more productive, it is important for manufacturers, the region's post-secondary institutions, and government to collaborate to address the important skills gaps that have been identified. Collaboration needs to look different than it has in the past. Industry must be seen as an equal partner with institutions. Government has (through initiatives such the Canada-BC Job Grant Program) played an important role in providing support and removing barriers that inhibit the creation of training programs that will address high priority skills issues identified by industry. These efforts need to continue and expand.

Manufacturers in the region are action oriented and want to move forward on addressing the issues that they raised. They suggested a number of strategies in three areas: improving the quality of

training, supporting and promoting regional manufacturers, and increasing collaboration among regional manufacturers.

Preliminary strategies identified through this LMI research project including the potential development of a Manufacturing Centre of Excellence can be used to create the collaborative framework that is needed by the manufacturing sector in the region. Structures, mechanisms and details concerning how to move forward on strategies will be undertaken as a part of Phase 3 of the LMP with the VI/Coastal manufacturing sector.

1. Introduction - About this Report

During 2015, Harbour Digital Media (HDM) collaborated with manufacturers on Vancouver Island and with the support of the Ministry of Jobs, Tourism, and Skills Training established a labour market partnership (LMP) for the Vancouver Island/Coastal region. During Phase 1 of this partnership, the Vancouver Island Manufacturing sector Advisory Board (VIMAB) was established as a part of the engagement strategy for the sector. The Advisory Board consists of manufacturers from a number of manufacturing sub-sectors including food, metal, fabricated metal, machinery, electrical, plastics, and transportation manufacturing.

Phase 2 of the LMP for the region involved the analysis of existing labour market information and the collection of data from employers in the region using an online survey tool and through a series of interviews with key manufacturing sector executives and managers. This report provides highlights of the key labour market issues that emerged from that research.

2. Overview of the LMI Research Project

2.1. Research Methodology

Research undertaken in Phase 2 is consistent with best practice social science research methods and survey design, and includes both quantitative and qualitative methods and analysis. The approach involved a triangulation of primary and secondary data sources. This was done to determine the degree to which the information from these sources provides a consistent view of current labour market issues affecting the manufacturing sector of the Vancouver Island/Coastal region.

The research approach taken for this project included:

- A review of selected relevant literature;
- A review of existing secondary data sources;
- Development of a company database focused on companies with 10 or more employees[1];
- Development, administration, and analysis of an online survey; and
- Development of an interview protocol including conduct and analysis of a set of interviews.

2.2. Research Questions

The following set of research questions was developed in consultation with the Vancouver Island Manufacturing Advisory Board (VIMAB). These questions were used to frame both the secondary and primary research and to frame the literature review.

1. What types of businesses are included in the Vancouver Island/Coastal region manufacturing sector? How many people do they employ and what is the nature of the economic activity that they engage in (i.e. output in terms of GDP)? What sub-sectors are

[1] Although the target audience for the online survey was companies employing 10 or more employees it was often not possible to determine company size prior to approaching them to complete the survey.

included in the island/coastal region manufacturing sector? NOTE: Both NOC (occupational) and NAICS (industry) codes will be used in this analysis.

2. What are the characteristics of the workforce that is employed in the manufacturing sector in the Vancouver Island/Coastal workforce region? (Workforce characteristics include, age, gender, education and training levels, certification requirements, workforce occupational breakdown, length of service, etc.)
3. What are the current labour market conditions and outlook for the Vancouver Island/Coastal region?
4. What are the short term and long term issues affecting the manufacturing sector in the Vancouver Island/Coastal region?
5. What are the key trends affecting the skill requirements of employers in the region? What future trends will affect the labour market for manufacturers in the Vancouver Island/Coastal region?
6. What cross-generational issues are the region's employers observing in the workplace (i.e. what are the differences attitude towards work that employers observe between long-term and newer employees; what differences are observed in a multi-generational workplace; how has the 'non-retirement' of the workforce affected productivity?)
7. To what extent are recruitment and retention issues for manufacturing sector employers in the region?
8. What are the most common recruitment and retention barriers experienced by manufacturing sector employers in the region?
9. What are the most common education, training, and skills gaps experienced by manufacturing sector employers in the region?
10. To what extent do the region's employers observe skills gaps in their employees in the following areas:
    a. Business knowledge and/or business acumen?;
    b. Knowledge and application of LEAN manufacturing processes?;
    c. Ability to lead change?;
    d. Ability to take accountability for actions?;
    e. Ability to communicate effectively?; and
    f. Ability to meet industry-specific trades requirements?.
11. What are the observed skills gaps?
12. How do employers intend on addressing the observed skills gaps?
13. To what extent are the region's employers interested in the development of a sector-wide, customized, and coordinated approach to program development to address identified needs?
14. Are manufacturing sector employers in the region interested in working with training providers to establish:
    a. Common metrics to assess return on training investment (i.e. assess the linkage between training and improved efficiency and productivity)?;
    b. Programs to deal with cross-generational issues in the workplace?; and
    c. Sector information resources (i.e. information about and for the sector)?

2.3. Sector Analysis: Background Research

2.4. Selected Research Literature

An important part of research into the manufacturing sector in the Vancouver Island/Coastal Region is a consideration of other recent studies and commentary, particularly those that consider the relationship between skills gaps, training and learning, and company performance. This brief review focuses on recent research from British Columbia, Canada, the United States, Australia, the UK, New Zealand, and other international sources which looks at these issues. In the Canadian context a range of other issues are also presented.

2.4.1. Canada

The most recent LMI research study directly related to the BC manufacturing sector was undertaken in 2012 by the BC branch of the Canadian Manufacturers and Exporters organization. While discussion concerning manufacturing in the Vancouver Island/Coastal region is limited there are a number of the conclusions reached by the CME that are worth noting since they have implications for manufacturers in the VI/Coastal region. The conclusions that are most relevant are:

- Employers, selected experts and secondary sources anticipate that conditions will likely tighten somewhat over the next few years, which could create shortages amongst skilled workers and semi-skilled workers. Growth of existing manufacturing operations and the aging of the workforce are contributing factors. (Canadian Manufacturers and Exporters British Columbia, 2012, p. iii);
- Manufacturing in BC is growing at a rate of 1.3 to 3% per year in terms of employment and this means that the sector will need to attract upwards of 88,000 new workers by 2020. (p. iv);
- Occupational skills shortages will likely be most significant in the trades (journeypersons), managers and supervisor positions, technicians, engineers, and machine operators and assemblers. (p. v);
- Some shortages will result from simply not having enough workers with the needed education, training or certifications (e.g. an anticipated shortage of engineers or journeypersons in particular trades). However, most shortages will be a consequence of the fit between the experience, education or training of applicants and the unique needs of the employer. (p. vi); and
- The future strength of the manufacturing sector in BC will be determined, in large part, by the ability of the sector to attract, develop and retain skilled workers and improve productivity. (p. vii)

Other Canadian studies have looked more broadly at the manufacturing sector in Canada and how it has grown and evolved and the key issues that it faces. In spite of changing economic conditions over the past eight years, Burt and Poulin's 2008 report on the economic and labour forces facing Canada's manufacturing sector still contains a number of useful observations that should be highlighted. The key issues highlighted are that:

- Canada's manufacturing sector is "undergoing significant changes as a result of ...globalization....and the pace of technological change";
- The sector faces human resources challenges including an aging workforce, a reduced ability to attract young workers, and changing skill requirements; and
- Manufacturers need to respond by undertaking more research and development and making better use of their existing workforce. (Burt & Poulin, 2008, p. i)

2.4.2. United States

The American Society for Training and Development (ASTD) provides a number of useful insights into the issue of skills gaps that many Amercian organizations including those in the manufacturing sector are facing. In the US context, the ASTD has identified middle-skills industries such as manufacturing, construction and healthcare as the ones facing the most significant skills shortages. At the same time, high skills fields requiring engineering skills with at least an undergraduate degree are also going to be in demand.

The trends noted by the ATSD in its report (2012) are not dissimilar to those playing out in Canada in the manufacturing sector. Automation has transformed many manufacturing operations with the resulted reduced demand for jobs in the sector. At the same time the types of jobs and the training required to operate sophisticated computer driven and robotic machinery have grown. There is a growing skills gap between the types of operational positions manufacturers have to offer and the skills available in today's workforce.

Amercian employers are also seeing a "critical lack of soft skills – such as communication, collaboration, creativity, and critical thinking in today's workforce" (p. 7). The kind of skills gaps observed in the US context are very familiar to BC manufacturers. The four highest ranked skills gaps found by the ASTD were:

- Leadership and executive skills;
- Managerial and supervisory skills;
- Industry specific skills; and
- Process and project management skills.

Other significant findings in the manufacturing sector included:

- Skills deficiencies in production roles are impeding the sector's ability to expand and improve productivity;
- There is less of an interest in educational options that lead to careers in the manufacturing sector; and
- Manufacturing careers are not being promoted as a viable career choice by parents and teachers.

As a result of findings such as these, the Manufacturing Extension Partnership within the US Department of Commerce was established to address the skills gap and other related issues for the manufacturing sector. They have been doing this through a series of leadership institutes that

teach "manufacturers and their key employees the importance of innovation and how to instill it in to the culture of their company, so that every manufacturing employee is innovating in their job every day". (p. 18)

2.4.3. Europe

A number of recent European studies have focused on the relationship between skills development and business performance.

Patrignani and Conlon (2012), provided an overview of the impact of training undertaken at the firm or company level on productivity. In their review of relevant research three studies were found that demonstrated an impact on productivity that was greater than that on wages. Put another way productivity increases at a company level were greater than the increase of wages for better trained employees. While the link between productivity and training investment is often intuitively thought to exist, the authors wanted to test the linkage through longitudinal research over a timeframe of at least four years. At the time of writing this report, this research is still underway but it does hold promise and would be useful to consider replicating it within the Canadian manufacturing sector.

One longitudinal study that has considered the relationship between company training and company profitability was reported in 2014 by Kim and Ployhart. Their study integrates research from strategy, economics, and applied psychology to examine how organizations may leverage their human resources to enhance company performance and competitive advantage.

The authors used 12 years of longitudinal profit data from 359 UK companies and concluded that selective staffing and internal training directly and interactively influence company profit growth through their effects on labour productivity. This finding implies that staffing and training contribute to the generation of slack resources that helped the company buffer and then recover from the effects of the Great Recession. The study also concluded that internal training that creates specific human capital resources is more beneficial for prerecession profitability, but staffing is more beneficial for post-recession recovery, apparently because staffing creates generic human capital resources that enable firm flexibility and adaptation. Staffing and training are key human resource management practices that can be used to achieve company performance through acquiring and developing human capital resources.

Gosling (2009) in a position paper for the City and Centre for Skills Development (an independent not-for-profit research centre) also explored the links between skills and business performance. It also considers how training should be tailored, together with the way in which it interacts with other factors impacting on business performance. In her paper, she cites the work of the New Zealand Workplace Productivity Working Group (p. 2) and highlights a number of key drivers of productivity. These are:

- Building leadership capability to inspire others to pursue opportunities, and building management capability to enable adaptation to a changing environment, including organizational and management skills, people and communication skills, and learning through experience;

- Creating productive workplace cultures in which engaged employees are willing to 'go the extra mile';
- Encouraging innovation and the use of technology, leading to higher productivity, greater market share and employment growth;
- Investing in people and skills to enable innovative behaviour and the use of higher levels of technology;
- Organizing work to extract the greatest value out of firms' investment in new technology and skills, work processes and/or products and services, including ensuring that the activities which create value within a firm are aligned with overall business strategy;
- Networking and collaborating to help share good practice and improve the exchange of knowledge and ideas; and
- Measuring what matters; there 'needs to be a commitment to measurement throughout the firm(company) and to communicating the results in a transparent way that relates individual and team performance to the overall business performance and helps employees to take leadership roles in making appropriate changes to improve productivity'. (Harvey & Harris, 2008, pp. 15-16)

Gosling (p. 4) also comments on a number of other aspects of training that are likely to have an impact on business performance. These are:

- The tailoring of staff training plans to business strategy;
- The balance of training given between basic, soft, generic and technical skills development;
- The extent to which training is bespoke/standard, delivered in-house/externally, is delivered in conjunction with other businesses in the sector, whether it is directed at admin staff/technicians/middle management/senior management;
- The ability of managers to follow up on the training received by their team members both to ensure it is being implemented and to identify what further training is needed;
- Quality assessment given to training packages; and
- The length and breadth of training, including whether it is incremental or one-off.

The International Labour Office (ILO) of the OECD has published numerous reports that link skills and training to growth and development of various sectors of the economy. G20 partners have adopted a framework for sustainable development and growth that acknowledges the role of skills development. The G20 has been working with the ILO on a training and development strategy that involves employers and workers. What is of greatest interest in relation to the current LMI research is the sectoral approaches or strategies that the ILO has built through a consensus process. The key elements of the strategies proposed are:

- The importance of basing sectoral skills development strategies on close collaboration between partners at the national and local levels;

- Using sectoral councils to match a sector's demand for skills with training provision, anticipate future labour market needs, and assess the quality and relevance of training programs;
- Recognize each stakeholder's roles, rights, and responsibilities in promoting a life-long learning approach to meet the sector's skill needs; and
- Embed sectoral approach to skills development with long-term national growth strategies. This can effectively link national [or provincial and federal in the case of Canada] top-down and sectoral bottom-up training strategies. (International Labour Office, 2010, p. 25)

2.4.4. Australia and New Zealand

Researchers and organizations in Australia and New Zealand have also been considering the relationship between skills development, skills gaps and company productivity. Harvey and Harris (2008), reviewed the literature related to links between skills, their application and productivity and arrived at three conclusions:

- Improved productivity and organizational performance has been attributed to a number of "interventions": better training, enhanced managerial capability, employee engagement, improved employee recognition and reward, innovative production practices and more. The key finding is that any one intervention is likely to have limited impact. In other words, the additive effects of interventions must be recognized;
- Interventions of this nature do add cost. They are more likely to add value in firms that have a competitive strategy based on the delivery of high-value products and services, and to have limited (or net negative) returns in high volume business models that rely on minimizing cost; and
- It is not just the nature of the interventions that matter, but the manner in which they are deployed. (Harvey & Harris, 2008, p. 10)

The Australian Workforce and Productivity Agency has also undertaken a review of literature that, among other issues, looked at the effect of learning/training on company productivity. The key findings outlined by the Agency in its 2013 report are:

- The association between learning and productivity is not as well established at the company level but in general there is a positive correlation between learning and productivity;
- Foundation skills are likely to have the largest impact on productivity. These skills provide the basis for further learning and productive activity in workplaces. Studies examining interventions designed to develop foundation skills highlight that they are also some of the most difficult skills for adults to develop; and
- Management and leadership skills contribute to productivity by improving resource allocation within firms. In particular, research suggests that management and leadership skills are associated with improved firm performance and rates of innovation. For example, one way that good management contributes to productivity is by ensuring that skills are properly utilized within workplaces and are complemented by technology.

2.5. Secondary Background Data

Secondary research using existing data sources was conducted as a way of describing the manufacturing sector for British Columbia and to look for information that specifically referred to the Vancouver Island/Coastal region. Documents used in this review process are listed in the reference section of this document.

Secondary research provides useful background information that was used to inform the development of the online survey and interview questions that were posed to manufacturers in the Vancouver Island/Coastal region. The primary and secondary data taken together help to determine the issues facing VI/Coastal region manufacturers and will be used as the basis for developing strategies to address issues. These strategies will be developed as a part of the third phase of this labour market partnership.

2.5.1. Number and Size of Manufacturing Companies

The North American Industry Classification System (NAICS) is used to classify the manufacturing industry into a set of sub-sectors. These sub-sectors provide a useful way of considering the breadth of manufacturing activity in the province. The following table provides a list of the NAICS codes for the 20 manufacturing sub-sectors that were of interest in this LMI research project.

Table 1: Manufacturing Industry by NAICS Codes

Manufacturing Sub-sectors	NAICS Codes[2]
Food manufacturing	311
Beverage and tobacco product manufacturing	312
Textile mills	313
Textile product mills	314
Clothing manufacturing	315
Leather and allied product manufacturing	316
Wood product manufacturing	321
Paper manufacturing	322
Printing and related support activities	323
Petroleum and coal product manufacturing	324
Chemical manufacturing	325
Plastics and rubber products manufacturing	326
Non-metallic mineral product manufacturing	327
Primary metal manufacturing	331

[2] **Source:** Statistics Canada http://www23.statcan.gc.ca/imdb/p3VD.pl?Function=getVD&TVD=118464&CVD=118465&CPV=31-33&CST=01012012&CLV=1&MLV=5

Manufacturing Sub-sectors	NAICS Codes[2]
Fabricated metal product manufacturing	332
Machinery manufacturing	333
Computer and electronic product manufacturing	334
Electrical equipment, appliance and component manufacturing	335
Transportation equipment manufacturing	336
Furniture and related product manufacturing	337

Innovation, Science and Economic Development Canada (formerly Industry Canada) routinely collects data on the number and size of companies according to their NAICS codes. The following table[3] shows the number of manufacturing businesses by province in four size categories. The primary research for this project was targeted at a sub-set of BC manufacturing companies (i.e. those with 10 or more employees). Estimating the size of the population of companies for the Vancouver Island/Coastal region was challenging since region-specific data was not available. More will be said about this later in the section of this report dealing with the online survey results.

Table 2: Number and Size of Manufacturing Companies in Canada by Province

Number of employer establishments by employment size category and province/territory: December 2014 Manufacturing (NAICS 31-33)				
Province or Territory	Employment Size Category (Number of employees)			
	Micro 1-4	Small 5-99	Medium 100-499	Large 500+
Alberta	1,906	3,128	297	23
British Columbia	2,880	3,957	304	16
Manitoba	401	911	99	15
New Brunswick	314	486	72	7
Newfoundland and Labrador	144	240	44	3
Northwest Territories	1	14	0	0
Nova Scotia	370	594	69	5
Nunavut	1	4	0	0
Ontario	7,098	11,709	1,364	134
Prince Edward Island	75	124	18	0

[3] **Source:** Innovation, Science and Economic Development Canada
https://www.ic.gc.ca/app/scr/sbms/sbb/cis/establishments.html?code=31-33&lang=eng

Number of employer establishments by employment size category and province/territory: December 2014 Manufacturing (NAICS 31-33)				
Province or Territory	Employment Size Category (Number of employees)			
	Micro 1-4	Small 5-99	Medium 100-499	Large 500+
Quebec	4,536	8,111	817	71
Saskatchewan	358	673	60	2
Yukon Territory	13	17	0	0
CANADA	18,097	29,968	3,144	276
Percent Distribution	35.2%	58.2%	6.1%	0.5%

2.5.2. Employment in Manufacturing

Overall employment in the manufacturing sector in BC has been relatively stable over a 6 year period (2011 – 2015) as reported by BC Stats[4]. As can be seen in the following table, food and wood product manufacturers employ the greatest numbers. The annual average growth rate for the manufacturing sector in British Columbia over the 6 year period was 1.5%. In the two years for which sector data is available, the growth rate was 5.2%.

Table 3: BC Employment by Manufacturing Sub-sector (2010-2015) (in thousands)

Manufacturing Sub-sector	2010	2011	2012	2013	2014	2015	%age change (2014-15)
Food Manufacturing	20.6	22.6	24.6	21.9	21.9	26.6	21.5%
Beverage and Tobacco Product Manufacturing	4.3	6.1	4.4	4.8	6.2	6.4	3.2%
Textile Mills & Textile Product Mills	2.1	2.2	-	-	2.6	-	-
Clothing Manufacturing & Leather & Allied Production	3.2	4.4	3.6	3.1	4.2	3.3	-21.4%
Wood Product Manufacturing	30.8	29.4	25.2	26.4	29.3	36.0	22.9%
Paper Manufacturing	9.4	8.7	11.4	10.5	12.2	10.1	-17.2%
Printing and Related Support Activities	6.0	7.3	7.9	6.5	5.5	8.5	54.5%

[4] Source - BC Stats:
http://www.bcstats.gov.bc.ca/StatisticsBySubject/BusinessIndustry/BusinessCountsEmploymentByIndustry.aspx

Manufacturing Sub-sector	2010	2011	2012	2013	2014	2015	%age change (2014-15)
Petroleum and Coal Products Manufacturing	1.8	-	-	-	-	-	-
Chemical Manufacturing	4.8	4.4	6.5	6.5	7.1	8.7	22.5%
Plastics and Rubber Products Manufacturing	3.8	4.1	4.5	6.4	4.3	4.8	11.6%
Non-Metallic Mineral Product Manufacturing	6.7	6.8	5.8	4.6	5.1	5.0	-2%
Primary Metal Manufacturing	6.7	5.8	5.5	5.0	2.3	5.0	117.4%
Fabricated Metal Product Manufacturing	12.2	11.2	13.8	11.1	12.3	15.7	27.6%
Machinery Manufacturing	7.0	9.0	9.7	9.4	8.6	7.9	-8.1%
Computer and Electronic Product Manufacturing	6.9	6.2	7.0	6.2	8.0	7.2	-10%
Electrical Equipment, Appliance & Component Manufacturing	2.4	1.7	3.9	2.9	3.8	3.6	-5.3%
Transportation Equipment Manufacturing	8.6	8.8	10.9	8.5	9.6	8.2	-14.6%
Motor Vehicle, Body, Trailer & Parts Manufacturing	2.6	4.3	3.6	4.0	4.2	3.9	-7.1%
Other Transportation Equipment Manufacturing	6.0	4.5	7.3	4.5	5.4	4.3	-20.4%
Furniture and Related Product Manufacturing	4.9	6.5	7.9	6.9	7.6	3.9	-48.7%
Miscellaneous Manufacturing	12.5	11.0	9.9	9.8	10.0	10.0	0%
Totals	**163.3**	**165.0**	**173.4**	**159.0**	**170.2**	**179.1**	**5.2%**

BC Stats[5] reports provide limited data related to employment in manufacturing Vancouver Island/Coastal region. The following table provides an overview of employment in the region for four sub-sectors of manufacturing with the greatest employment. The percentage change over the 2014/15 timeframe is deceiving and should be interpreted cautiously given the lack of availability of data from other sub-sectors. When only these four sub-sectors are considered the average change in employment during this period is -1.0%. The growth rate over the 6 year period is -2.4% which is less than the overall growth rate for the sector across the province. As noted above, the average provincial annual growth rate for the sector was +1.5%.

Table 3: VI/Coastal Region Manufacturing Sector Employment 2010 – 2015 (in thousands)

Manufacturing Sub-sector	2010	2011	2012	2013	2014	2015	%age change (2014-15)
Food Beverage and Tobacco Product Manufacturing	2.9	2.0	2.8	1.7	3.1	2.7	-14.8%
Wood Product Manufacturing	3.3	4.0	3.1	2.6	3.4	2.9	-17.2%
Paper Manufacturing	3.5	3.3	3.1	3.0	3.4	2.5	-36.0%
Transportation Equipment Manufacturing	1.6	2.1	2.0	1.8	-	1.7	N/A
Totals	**11.3**	**11.4**	**11.0**	**9.1**	**9.9**	**9.8**	**-1.0%**

Employment in the manufacturing sector represents the four national occupation classification categories (i.e. NOC skill levels A, B, C, and D). Percentages of employees in each category are broadly known for the Canadian employed population but a breakdown for the manufacturing sector is not available. In terms of the Canadian employed population, 29.9% are employed in positions that require NOC skill level A (management and professional occupations requiring a university degree), 31.5% in NOC skill level B positions (positions requiring college education or apprenticeship training), 27.7% in NOC skill level C positions (secondary school or occupation-specific training), and 11% in NOC skill level D positions (positions requiring on-the-job training)[6].

The *British Columbia 2025 Labour Market Outlook* report[7] indicates that many of the occupations that manufacturing companies employ are ones where demand will be high over the next nine years. These occupations include engineers (with various specializations), computer programmers, and customer service representatives.

[5] Source: BC Stats: http://www.bcstats.gov.bc.ca/StatisticsBySubject/BusinessIndustry/BusinessCountsEmploymentByIndustry.aspx

[6] **Sources:** Statistics Canada: http://www12.statcan.gc.ca/nhs-enm/2011/as-sa/99-012-x/99-012-x2011002-eng.cfm - 2011 Census
See also http://www.statcan.gc.ca/pub/12-583-x/12-583-x2011001-eng.pdf for detailed classification of occupations (NOC descriptions)

[7] See (Government of British Columbia - WorkBC, 2016)

Overall, the *British Columbia 2025 Labour Market Outlook* report indicates that 52,200 job openings (due primarily to replacement and a small amount of expansion (i.e. 900 jobs) can be expected in the manufacturing sector across the province over the 2015 – 2025 period. Food manufacturing and wood product manufacturing are expected to "post the largest numbers of job openings" in the next 9 years (p. 18). The manufacturing sector in British Columbia represents 7.5% of total employment or approximately 175,000 jobs.

The general outlook for the Vancouver Island/Coastal region in terms of job growth across all sectors/industries is positive with an anticipated 147,900 job openings to 2025. However, the number of jobs related manufacturing in the Vancouver Island/Coastal region is expected to decline from 30,238 to 25,615 workers which is an 18% drop. A detailed review of the data underpinning the *British Columbia 2025 Labour Market Outlook* report indicates that from 2016 through 2025, the following manufacturing job categories are expected to experience the greatest decline in the region:

- Facility operations and maintenance (45% decline)
- Industrial electricians (37% decline);
- Wood processing machine operators (32% decline)
- Wood products assemblers and inspectors (25% decline)
- Power engineers and power systems operators (46% decline)
- Pulp mill machine operators (50% decline)
- Pulping, paper making and coating control operators (51% decline)
- Sawmill machine operators (28% decline)
- Supervisors, forest products processing (38% decline)

Many of the jobs listed above are in traditional manufacturing wood and pulp and paper industries. A small number of job categories related to manufacturing are expected to grow in the region but only very modestly over the timeframe outlined in the report. These include:

- Administrative officers (3% growth)
- Corporate sales managers (3% growth)
- Fish and seafood plant workers (4% growth)
- Industrial painters, coaters, and metal finishing process operators (3% growth)
- Labourers in food, beverage and associated products processing (4 % growth)
- Products assemblers, finishers and inspectors (4.5% growth)
- Process control and machine operators (food and beverage) (4% growth)
- Residential and commercial installers and servicers (3% growth)
- Senior managers (3% growth)
- Structural metal and platework fabricators and fitters (6% growth)
- Technical sales specialists (3% growth)

Highlights of the *British Columbia 2025 Labour Market Outlook* report are also outlined on the WorkBC[8] website.

2.5.3. Economic Data

During the period of 2010 through 2015, the value of the manufacturing industry to the BC economy has been constant with the 2014-15 year over year growth outpacing manufacturers in the other major provinces (i.e. Alberta, Ontario, and Quebec) in Canada. The following table shows the growth patterns in GDP for provinces and territories. As pointed out by Statistics Canada, GDP is an important measure of the short term stability or instability of the economy.

Table 4: Gross Domestic Product and Growth

	Gross Domestic Product by province: 2010 - 2015 Manufacturing (NAICS 31-33)[9]						
	Value in chained 2007 $ (millions)						**% Change**
Province or Territory	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2014 - 2015**
Newfoundland and Labrador	932	910	1,022	987	937	985	4.8%
Prince Edward Island	371	376	393	430	475	479	0.9%
Nova Scotia	2,705	2,763	2,651	2,562	2,532	2,626	3.6%
New Brunswick	2,884	2,870	2,794	2,883	2,746	2,864	4.1%
Quebec	43,237	43,849	43,944	43,858	45,250	45,720	1.0%
Ontario	72,846	74,958	76,494	75,567	78,399	79,572	1.5%
Manitoba	4,876	5,176	5,376	5,560	5,579	5,472	-2.0%
Saskatchewan							-2.9%

[8] See https://www.workbc.ca/Labour-Market-Information/Regional-Profiles/8#section-overview

[9] **Source:** Statistics Canada. Table 379-0030 - Gross domestic product (GDP) at basic prices, by North American Industry Classification System (NAICS), provinces and territories, annual (dollars) http://www5.statcan.gc.ca/cansim/a26?lang=eng&id=3790030

	Gross Domestic Product by province: 2010 - 2015 Manufacturing (NAICS 31-33)[9]						
	Value in chained 2007 $ (millions)						% Change
Province or Territory	2010	2011	2012	2013	2014	2015	2014 - 2015
	3,306	3,506	3,710	3,965	3,940	3,830	
Alberta	16,095	17,766	17,746	18,238	18,828	17,520	-7.5%
British Columbia	13,255	13,710	14,115	14,120	14,625	14,996	2.5%
Yukon	15	17	21	14	14	14	-0.7%
Northwest Territories	6	11	11	12	10	11	4.7%
Nunavut	3	2	7	8	8	8	-5.3%

2.6. Sample Company Profiles

Manufacturers in the Vancouver Island/Coastal region represent a diverse array of manufacturing processes and products. The following company profiles illustrate the range of activity that is taking place in the sector in the region.

2.6.1. Viking (Victoria) (Transportation Equipment Manufacturing – NAICS 336)

Viking is the manufacturer of the Series 400 Twin Otter, the best-selling next generation turbo-prop aircraft in its class. Viking aircraft have been sold and delivered to 26 countries worldwide, with the company providing OEM support for the global fleet of de Havilland legacy aircraft (DHC-1 through DHC-7).

In 2012, Viking received the award for Exporter of the Year along with the Premier's Award for Job Creation at the BC Export Awards, hosted by the Canadian Manufacturer and Exporters (CME). With a current production rate averaging one new aircraft delivered every 15 business days, the Twin Otter Series 400 is now confirmed as the best-selling next generation 19-passenger aircraft available today.

2.6.2. Reliable Controls (Victoria) (Computer and Electronic Product Manufacturing – NAICS 334)

Reliable Controls Corporation is a privately held, Canadian corporation that designs, develops, and manufactures Internet-connected building controls. The products are used to monitor and control the energy of mechanical and electrical equipment found in every kind of building.

The company has grown steadily as a high tech manufacturer, and currently serves over 150 Authorized Dealers in 20 countries around the world. In 2008, Reliable Controls Authorized Dealers were awarded over 130 million dollars in controls contracts. Over 2 million points of measurement and control are hardwired to Reliable Controls products.

2.6.3. VMAC (Nanaimo) (Machinery Manufacturing – NAICS - 333)

VMAC (Vehicle Mounted Air Compressors), founded in 1986, is the world-leading manufacturer of truck mounted mobile air compressors, used in a wide spectrum of industries: oil and gas, mining, transportation, mobile tire service, municipal operations and public works.

Their success comes from designing and manufacturing the most compact mobile air compressors available, which provide high power and demonstrate extraordinary quality, durability and fuel-efficiency.

The company operates globally and has a wide international network of 400 dealers, distributing VMAC's products to the Americas, Europe, the Middle East, Africa, Asia Pacific and Australia.

2.6.4. Nanaimo Forest Products (Nanaimo) (Wood Product Manufacturing – NAICS 321)

Harmac Pacific operates a Northern Bleached Softwood Kraft (NBSK) pulp mill located on the east coast of Vancouver Island near Nanaimo, British Columbia. Nanaimo Forest Products Ltd., the owner of the Harmac Pacific trademark, restarted the mill with a single production line on October 3, 2008, producing NBSK at the rate of 226,000 tonnes per year. In 2009, a second production line was restarted and capital upgrades in 2010 and 2011 brought the mill's production capacity up to 365,000 tonnes of pulp per year.

The Harmac mill produces high quality craft pulps made from custom blends of Douglas fir, western hemlock, balsam fir, interior SPF and western red cedar. The pulp is sold in Asia, Europe, North America, and Latin America. With its strategic location on a deep water port, the mill is well situated for cost effective export of pulp and receipt of raw materials such as wood fiber.

2.6.5. Town Site Brewing (Powell River) (Beverage & Tobacco Product Manufacturing – NAICS 312)

Townsite Brewing Inc. is a microbrewery located in the historic Townsite district of Powell River, at the top of the Sunshine Coast.

Townsite Brewing is a local manufacturer that makes, sells, and distributes high quality craft beer with a Belgian influence. This Powell River brewer manufactures a number of craft beers that have received numerous awards in the highly competitive craft beer sector.

Townsite started operations in 2012 in an industry that is highly competitive but has been able to acquire a loyal following and has grown along with the industry. B.C.'s microbreweries have enjoyed sustained growth of more than 20 per cent a year since 2006.

2.6.6. Plastics Plus Fabricating (Campbell River) (Plastics & Rubber Products Manufacturing – NAICS 326)

Plastics Plus Fabricating is an industry leader in all types of plastics fabrication offering design, fabrication, rebuilds and repairs. The Campbell River based manufacturer has provided plastics custom fabricating services since 1999 and has grown to become the most diversified plastic shop on Vancouver Island that serves all of Canada.

Along with fabricating plastics, HDPE pipe docks and projects for their clientele they cut precision plastic parts, create 2D & 3D plastic signage and business features with their Z7 CNC Machine.

3. Primary Research: Employer Survey and Interviews

To undertake primary survey and interview research for the manufacturing sector in the Vancouver Island/Coastal region it was necessary to first develop a database of manufacturing companies operating in the region, their size (in terms of number of employees), and the type of manufacturing conducted (as defined by the North American Industry Classification System or NAICS). Developing the database involved contacting all of the municipal authorities, Chambers of Commerce and Economic Development Agencies in the region to acquire lists of licensed businesses. These lists were then reviewed and potential manufacturers that could be contacted (i.e. an email, web URL and/or telephone number could be found) were included in a final list. This list was used as the basis for email contact with key personnel concerning the online survey. A total of 169 companies were included in the list as potential respondents to the online survey or for in-person interviews (see Appendix 1 for a list of the companies in the database and their location).

An initial email was sent on April 25, 2016 to the manufacturers included in the database. This was followed by reminder emails and phone calls on a weekly basis until June 2, 2016. The online survey was closed on June 10, 2016. A total of 64 responses[10] were received to the online survey which took respondents 45 minutes on average to complete. This resulted in a completion rate of 40.25%[11] which given the nature of the business operations surveyed and their size is quite high.

One hour interviews with 16 key company executives and senior managers were conducted between April 25 and June 7, 2016. The companies involved in these interviews represented a cross-section of the manufacturing sector in the region. A list of the companies involved in the interviews is provided in Appendix 2.

3.1. Online Survey Results[12]

3.1.1. Background of Companies Responding to the Survey

The 64 individuals completing the online survey represented companies in 14 sub-sectors of the manufacturing sector as shown in Table 1 below.

Table 5: Vancouver Island/Coastal Region Manufacturers Responding to the Online Survey

Manufacturing Sub-sectors by NAICS code	Number of Respondents[13]	Percentage of Respondents
Food manufacturing (311)	5	6.25
Beverage and tobacco product manufacturing (312)	2	2.5

[10] In two cases more than one contact from a company completed the survey. Review of these cases suggested that the responses were unique and so they were retained in the database of responses. One company did not self identify.

[11] The Canadian Manufacturers and Exporters (albeit with a larger province-wide sample) reported a survey completion rate of approximately 16% (see (Canadian Manufacturers and Exporters British Columbia, 2012))

[12] It is important to note that in some cases the number of respondents for a specific question is less than the total number of respondents to the survey as a whole (i.e. although there were 64 company responses some questions were responded to by less than that number; graphs and tables reflect the actual number of responses received)

[13] Respondents could select more than one sub-sector so the total number of respondents exceeds the number of companies responding to the survey.

Manufacturing Sub-sectors by NAICS code	Number of Respondents[13]	Percentage of Respondents
Clothing manufacturing (315)	2	2.5
Wood product manufacturing (321)	6	7.5
Chemical manufacturing (325)	1	1.25
Plastics and rubber products manufacturing (326)	1	1.25
Non-metallic mineral product manufacturing (327)	1	1.25
Fabricated metal product manufacturing (332)	10	12.5
Machinery manufacturing (333)	12	15
Computer and electronic product manufacturing (334)	7	8.75
Electrical equipment, appliance and component manufacturing (335)	6	7.5
Transportation equipment manufacturing (336)	4	5
Furniture and related product manufacturing (337)	1	1.25
Miscellaneous manufacturing (339)	4	5
Other	18	22.5
Total	80	100

The most predominant types of manufacturing activity reported are machinery manufacturing (15%) and fabricated metal product manufacturing (12.5%). Respondents who indicated 'other' included manufacturers that are engaged in the following types of manufacturing activities:

- Aquaculture net manufacturing
- Aerospace
- Biotech equipment manufacturing
- Window manufacturing
- Personal care products
- Semi-conductor sensor manufacturing
- Plastic fabrication
- Ship building/manufacture

Manufacturing companies in the region have generally been in operation in the region for some time with most reporting that they have been in business for over 20 years. The following figure provides an overview of the time companies have been operating in the region.

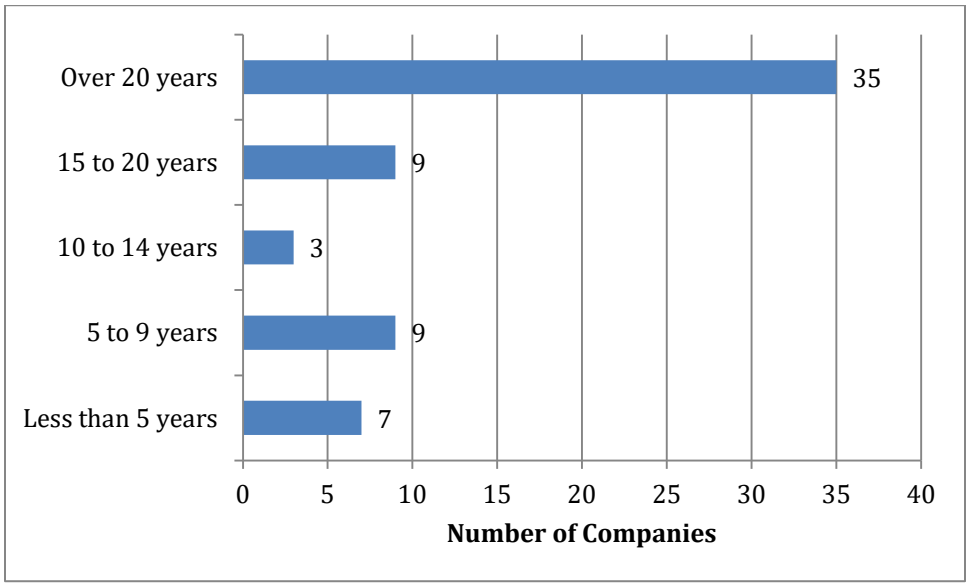


Figure 1: Length of Time in Operation in the VI/Coastal Region

Company size varied from large operations with over 500 employees to smaller companies with 13 reporting that they have fewer than 10 employees. Although these companies were not originally part of the target audience, they represent a number of unique manufacturing sub-sectors so they were retained as a part of the analysis. The following figure illustrates the range of manufacturing company size in the region.

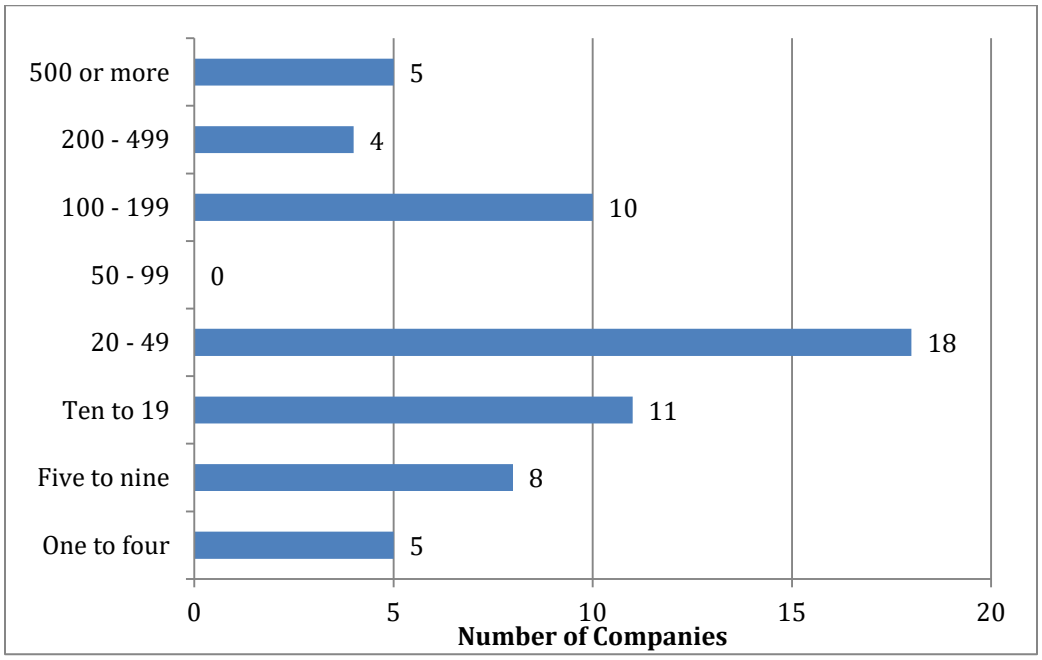


Figure 2: Number of Workers Employed by Companies Responding to the Survey

3.1.2. Characteristics of the Workforce

Companies were also asked to provide a breakdown of the number of male and female workers they employ. Companies responding reported employing a total of 3108 male workers and 733 female workers which represents a ratio of 4.2 males for every female employed in the sector. Historically, manufacturing has been a male dominated industry so this finding is not surprising. The average company workforce reported was 64.

Manufacturing companies in the region have an expectation that their workers are well qualified and trained. The following figure indicates the types of credentials or professional designations that are required for jobs in the sector. As can be seen, of the 60 companies responding to the question about required qualifications 50% reported that they require engineering degrees and over half require some other form of credential or professional designation for work in their companies.

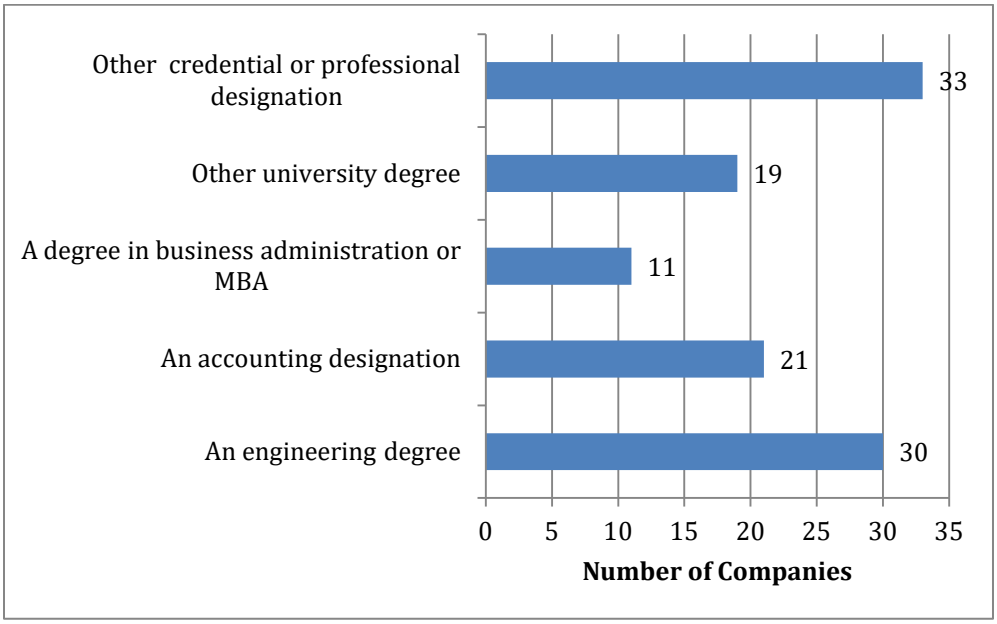


Figure 3: Credentials or Professional Designations Required by Companies

In addition to professional credentials and designations, companies were asked to indicate what percentage of their workforce is working in an apprenticeable trade and have received or are working toward a Canadian credential such as a Red Seal trades credential. Two-thirds of the companies reported that up to 20% of their workers are apprentices. Half of the companies reported that up to 20% of their workers are journeypersons. Over half of the companies also have workers who are working in a trade but are neither a journeyperson nor apprentice.

Employers were also asked about the percentage of their workforce that has received a foreign credential. 75% of employers indicated that up to 20% of their workforce has journeyperson credentials from another country. Two-thirds of the employers reported that they have up to 20%

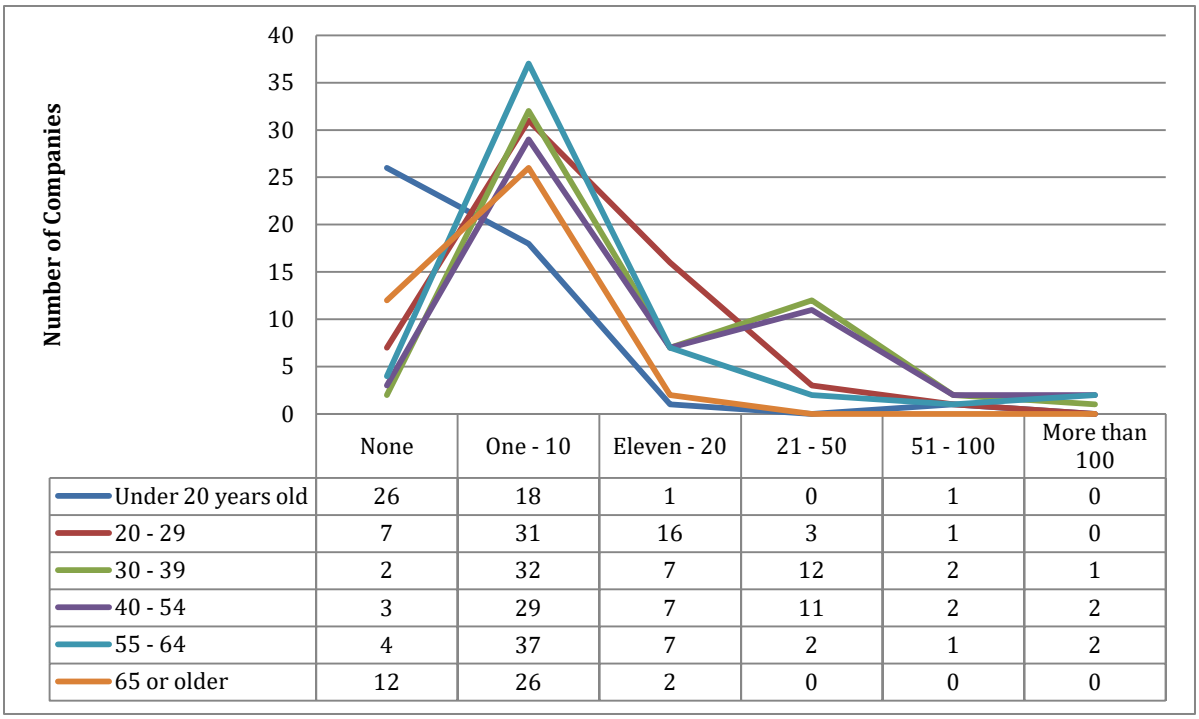
of their workforce working in a trade with a foreign credential but the credential is not necessarily related to a Canadian apprenticeable trade.

The most common trades reported by Vancouver Island/Coastal region manufacturers are listed in the following table.

Table 6: Trades Designations Reported by VI/Coastal Manufacturing Companies

	Number Responding	Percentage Responding
Welder	21	35
Machinist	17	28.3
Industrial Mechanic (Millwright)	6	10
Metal Fabricator (Fitter)	14	23.3
Electrician	11	18.3
Heavy Duty Equipment Mechanic	4	6.7
Sheet Metal Worker	6	10
Industrial Instrument Mechanic	1	1.7
Truck & Transport Mechanic	3	5
Heavy Equipment Operator	2	3.3
Mechanical Assembler	9	15

Companies were asked to report the age ranges of their workforce. It is not surprising that nearly half of the companies responding to the survey reported between one and ten employees in each of the age ranges. What is surprising is that 26 out of 60 companies (43%) indicated that they have workers who are 65 or older. The figure on the next page shows the breakdown of age ranges reported by companies.



	None	One - 10	Eleven - 20	21 - 50	51 - 100	More than 100
Under 20 years old	26	18	1	0	1	0
20 - 29	7	31	16	3	1	0
30 - 39	2	32	7	12	2	1
40 - 54	3	29	7	11	2	2
55 - 64	4	37	7	2	1	2
65 or older	12	26	2	0	0	0

Figure 4: Age Range of Workforce

Survey respondents indicated that a total of 242 of their staff (out of a total of 3,841) would likely retire within the next 5 years. This represents 6.3% of the total number of workers in the sample. It should be noted that one employer in the forest products sub-sector indicated that approximately one-third of its 300 employees would be retiring in the next five years. This company was clearly an outlier in terms of the anticipated impact of retirement on its workforce.

Companies generally do not experience high rates of turnover in their staff. Nearly 70% of the companies indicated that their staff turnover was between 1 and 10% during the past year. When asked about the factors that influence staff turnover, employers found most of the reasons listed as unimportant or very unimportant. The issues that they found important reasons for turnover were issues such as poor work performance or attitude, seasonal fluctuation in the volume of work, and competition for workers from employers in other regions or provinces. The figure on the next page provides a breakdown of how companies responded to the issue of staff turnover.

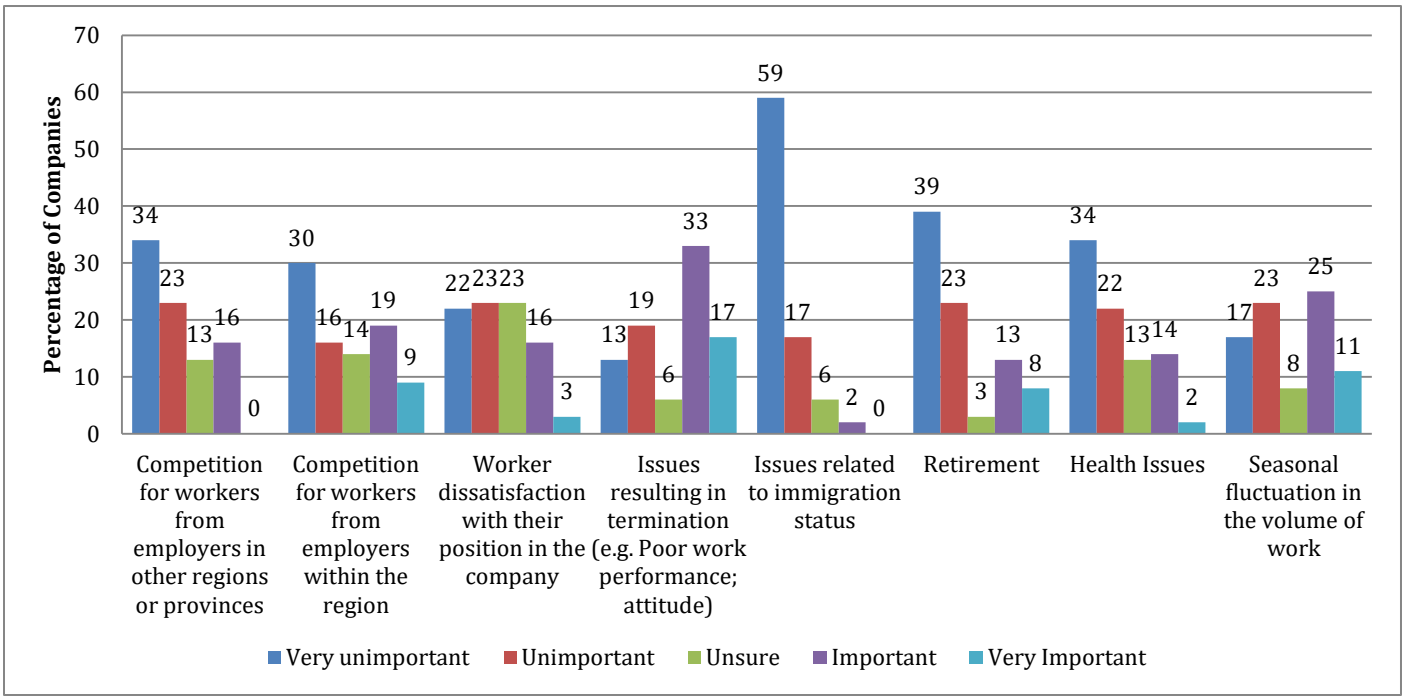


Figure 5: Reasons for Staff Turnover

Although one-third of employers surveyed do not track the prior employment status of new hires, companies that do report that most often new employees are new to the workforce (63%), have been working in another sector (63%), or working for another manufacturing employer in the region (57%).

3.1.3. Employer Training

Employers were asked a number of questions related to their training activities. These questions were broken out into training activities for manufacturing operations employees and administration and manufacturing support employees. Questions were asked about the specific type of training that employees receive and who provides the training. The figure on the following page provides an overview of the types of training that manufacturing operations employees receive. For example, 58 companies reported providing new employee training.

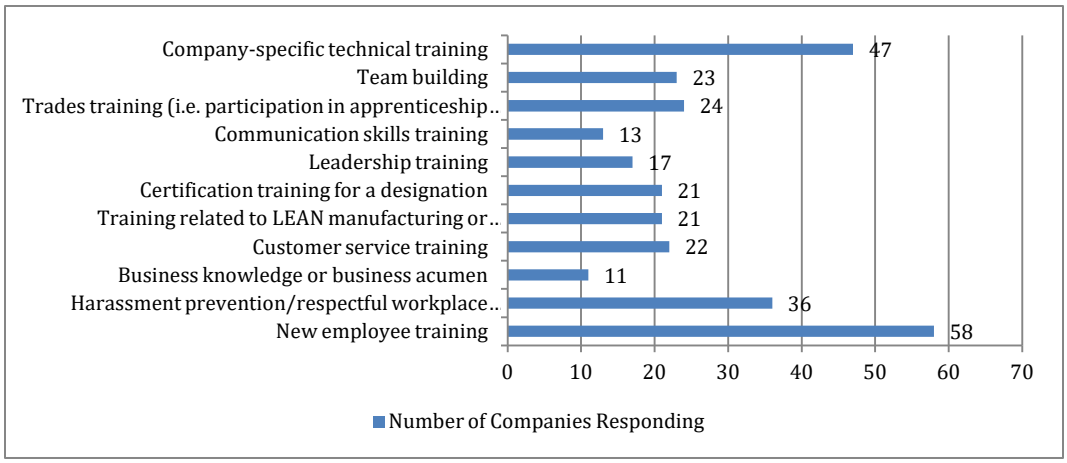


Figure 6: Training Provided to Manufacturing Operations Employees

The following figure indicates that a strong majority of companies undertake needed training as an in-house activity. This is particularly true for new employee training, harassment prevention, company specific technical training, and team building. Only 23% of companies indicated that they worked with a college or technical institute for trades training.

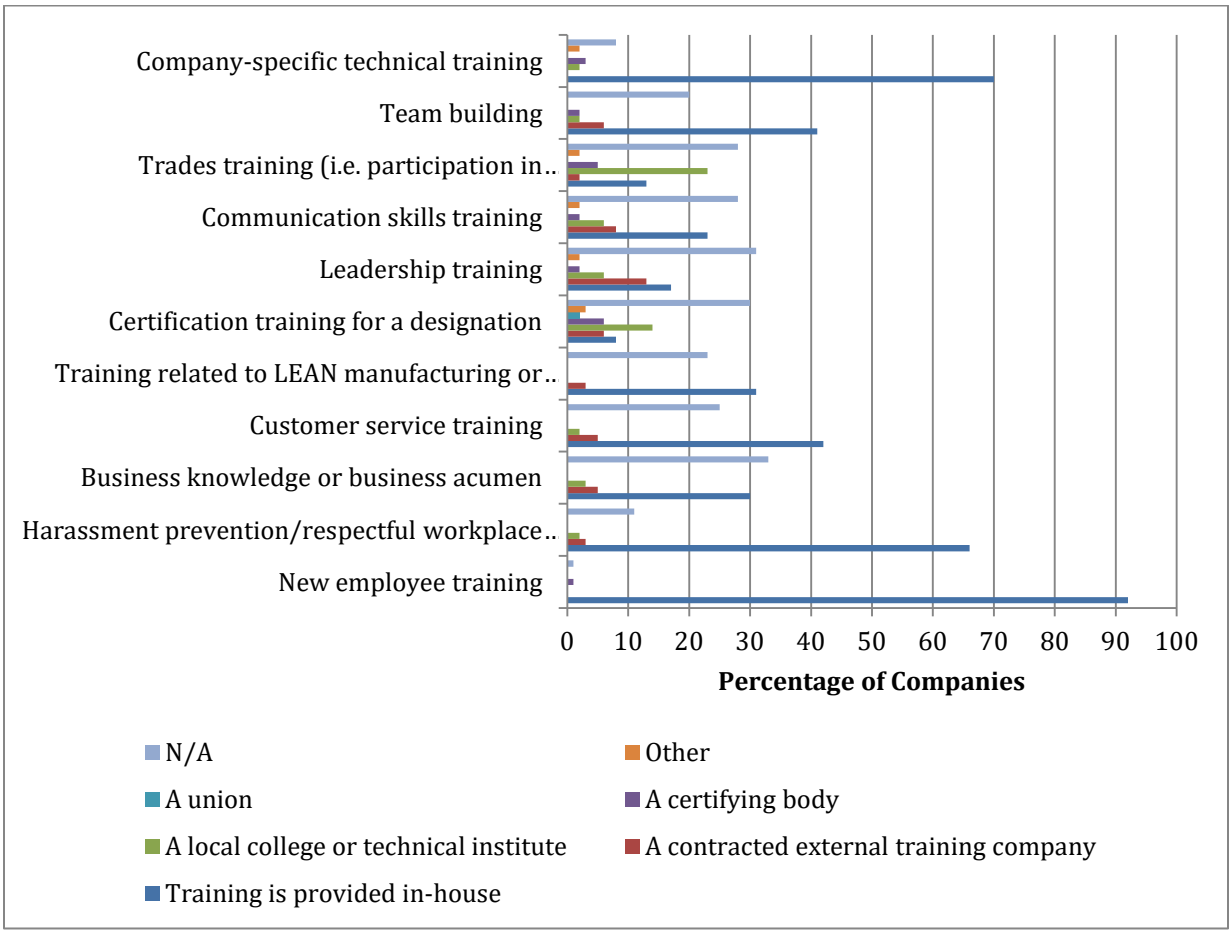


Figure 7: Training Providers

The following figure provides an overview of the types of training that administration and manufacturing support employees receive. The pattern of response is almost identical to the response to the question about training for manufacturing operations employees. New employee training and company specific technical training are the most commonly cited by employers.

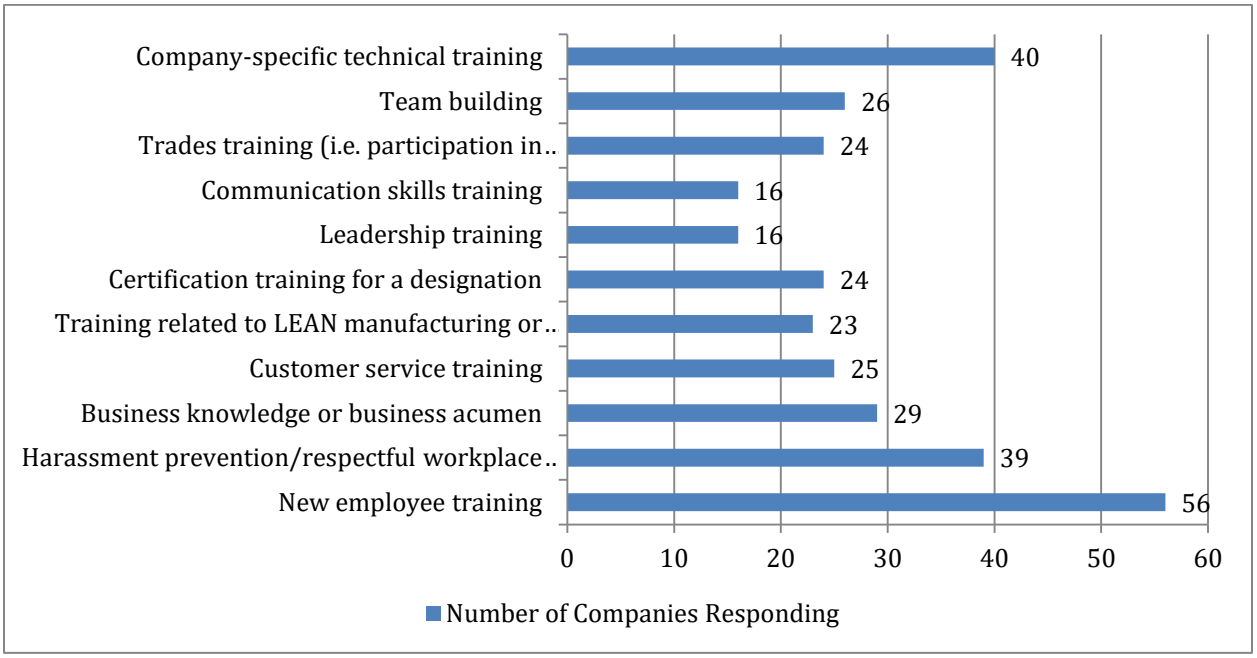
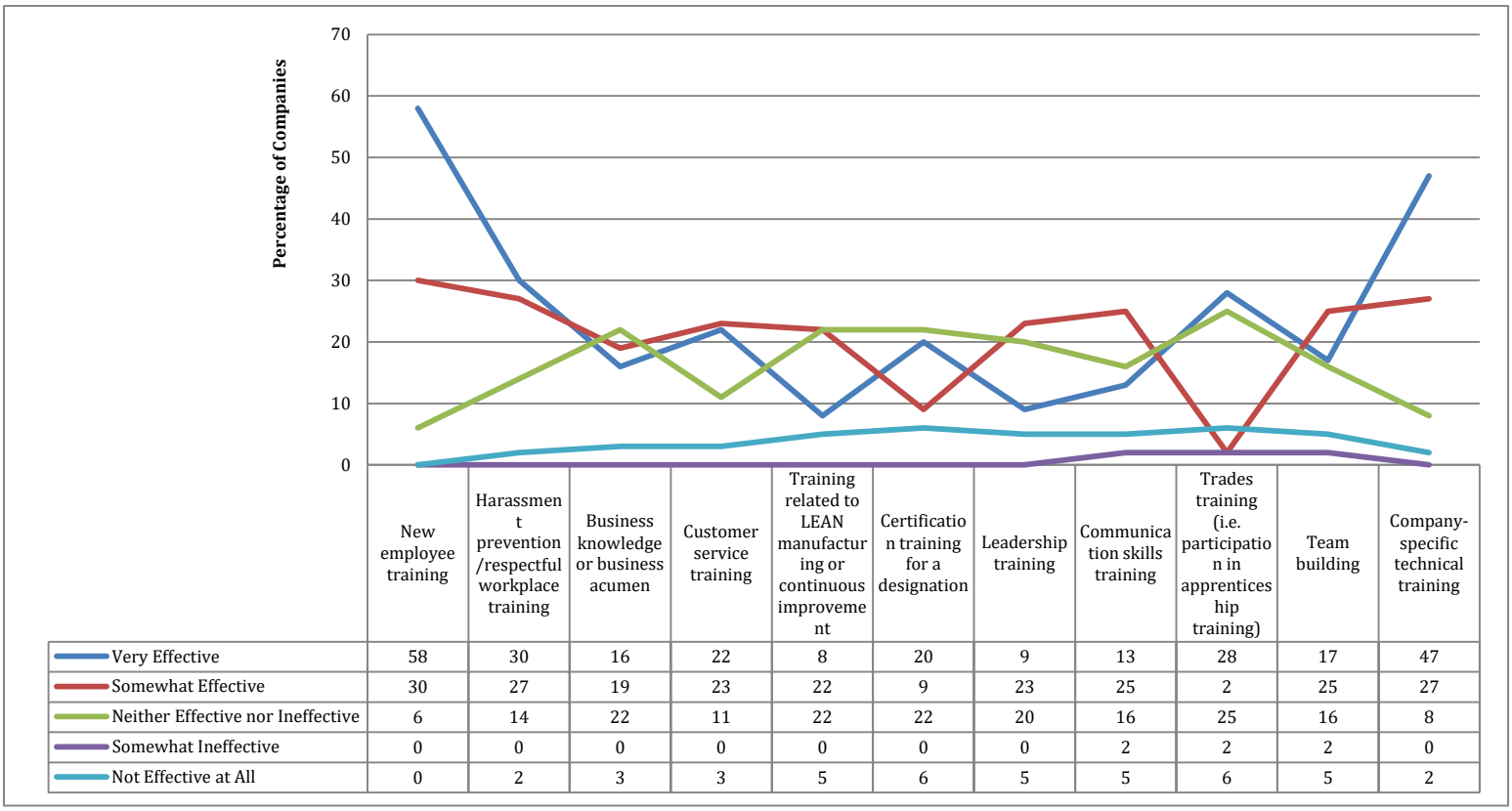


Figure 8: Training for Administration and Manufacturing Support Employees

The pattern of who provides training for employees in this category is also similar to the one described for manufacturing operations employees. Local colleges and technical institutes are rarely mentioned as training providers. Manufacturers typically either undertake the training in-house or hire an external consultant to provide training on site.

Companies were asked about the effectiveness of the training that employees take. Not surprisingly, the effectiveness of company provided technical training and new employee training was rated as either very or somewhat effective by a majority of the companies. Training provided by colleges and institutes or others was generally not rated as either effective or ineffective. The following figure provides an overview of how companies rated the effectiveness of the training received by their employees.



	New employee training	Harassment prevention /respectful workplace training	Business knowledge or business acumen	Customer service training	Training related to LEAN manufacturing or continuous improvement	Certification training for a designation	Leadership training	Communication skills training	Trades training (i.e. participation in apprenticeship training)	Team building	Company-specific technical training
Very Effective	58	30	16	22	8	20	9	13	28	17	47
Somewhat Effective	30	27	19	23	22	9	23	25	2	25	27
Neither Effective nor Ineffective	6	14	22	11	22	22	20	16	25	16	8
Somewhat Ineffective	0	0	0	0	0	0	0	2	2	2	0
Not Effective at All	0	2	3	3	5	6	5	5	6	5	2

Figure 9: Effectiveness Ratings for Training Activities

The comments about training effectiveness revealed the rationale and thinking behind some of the ratings. The following table provides a sample of the comments received in three categories: comments about training providers, internal training, and LEAN and continuous improvement.

Table 7: Employer Comments about the Effectiveness of Training

Comments About Training Providers
As a provincial apprenticeship requirement our employees have to attend provincial training but the value is not that great for what we do.
It would be nice to see a better quality standard from BC institutions.
We have had great success with UBC's Sauder School of Business for management courses. The rest of our external training has been hit and miss.
Apprenticeship training is becoming less relevant every year. The training sessions are taking employees away from home longer than ever before. There is no training available on Vancouver Island in the machinist trade and the extra weeks spent in Vancouver is very expensive.
Trades training programs offered at local colleges are in need of significant updating to contribute meaningfully to needs of employers. The Vancouver Island Construction Association offers training that better fits our needs.
University Degree programs for professional designations provides very good preparation for assuming job function responsibilities. Trades training provided by BC institutions develop very

good tradesmen when supported by in-house development programs. Correspondence training for Power Engineers is effective at progressively developing individuals in this occupation. BC has very good institutional training for defined occupations. The challenge for our business is developing operators that run complex process control production systems. This training is done all in-house.
Internal Training
The internal training is effective, though it has been somewhat parochial to this point. There is a move afoot to help train line operators to complete changeovers to better utilize resources and free-up mechanics time. This is also being done internally, and needs to be evaluated regularly. The simple equipment set up here does not justify using external resources, except when new equipment is installed.
We're continually having to 'in-house train' 80% of our new hires to do industry specific needs of our company. For example, welding & fabricating. With Aluminum, the local trades and other trades schools don't touch nearly enough on what is needed to weld, form & fabricate from Aluminum. We also do not have access to any recent graduates locally from a Naval Architecture program. So in turn we end up spending lots of resources & time on training engineers to adapt to the marine manufacturing environment. All in all, the training that is provided externally for us can end up costing us more to train new hires the way we need things to be done versus us training in house.
Would consider going in with other companies for training to expand our training envelope and keep costs down.
Training related to LEAN and Continuous Improvement
We have been on this Lean Journey for some time now and it seems to be taking hold finally after splitting the company up into Value Streams, and somewhat due to a stable work force, not going up and down with the cycles. We have had some really good training that has helped us move down the path we want. We have a lot of resources available to us on line however very little on the island in regards to Lean related training programs. Being a Union environment it has also come with some challenges, specifically with the Boilermakers Union, very old school and unfortunately it is rubbing off on the young people we have here.
Training is the key to continuous improvement. Workers who are trained to communicate and share ideas are more likely to be hired. When you can rely on your workers to provide a safe and effective learning environment for new workers, the company can grow and promote experienced workers into managers who can be relied upon to carry out day to day operations.
Training is critical for any manufacturing business. We believe that although third party training is extremely helpful, leadership on a day to day basis in terms of teaching and setting work ethic and service (internal and external) are foundational to success. This means owners/managers have to be well trained to ensure a healthy and successful work environment.

Many employers also stressed that on-the-job training that emphasized specific skills needed to do a particular job were more effective than programs offered through institutions.

3.1.4. Projected Growth

Employers were asked to indicate employment growth (or decline) for their company over the past three years. 58% indicated that employment had grown over the past three years. The breakdown of responses to the question related to employment growth is found in the following figure.

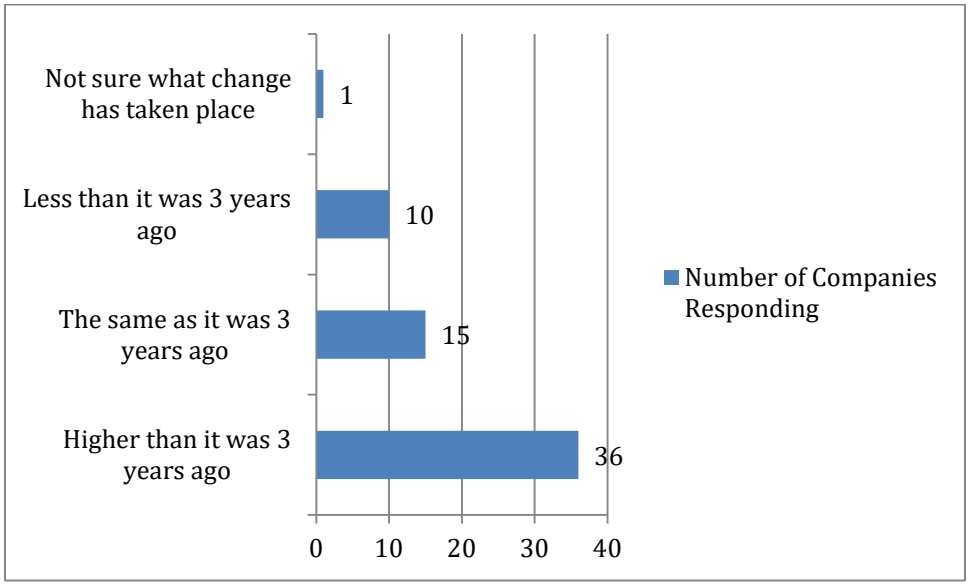


Figure 10: Employment Growth or Decline over the past 3 years

At the same time, employers expressed optimism that their companies would, in general continue to grow. The figure on the next page shows that more employers are expecting that the employment levels of their company will be higher in 3 years time.

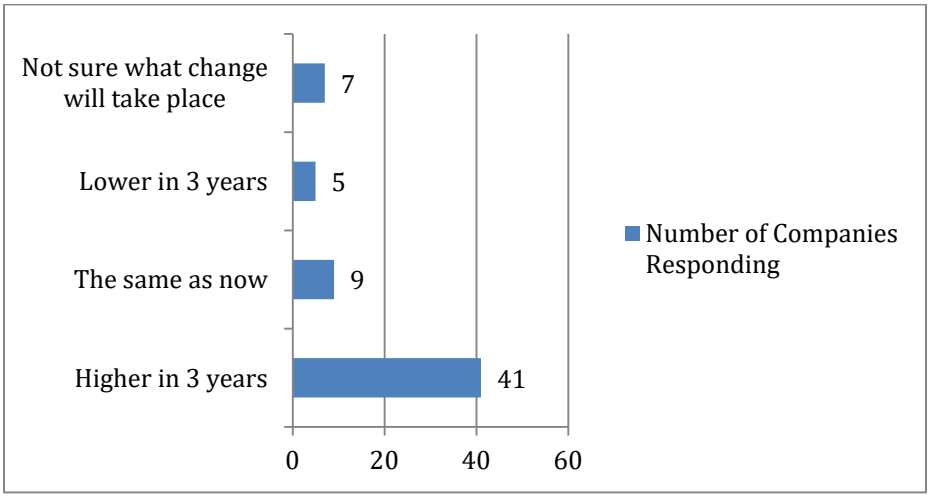


Figure 11: Anticipated Employment Levels in Next 3 Years

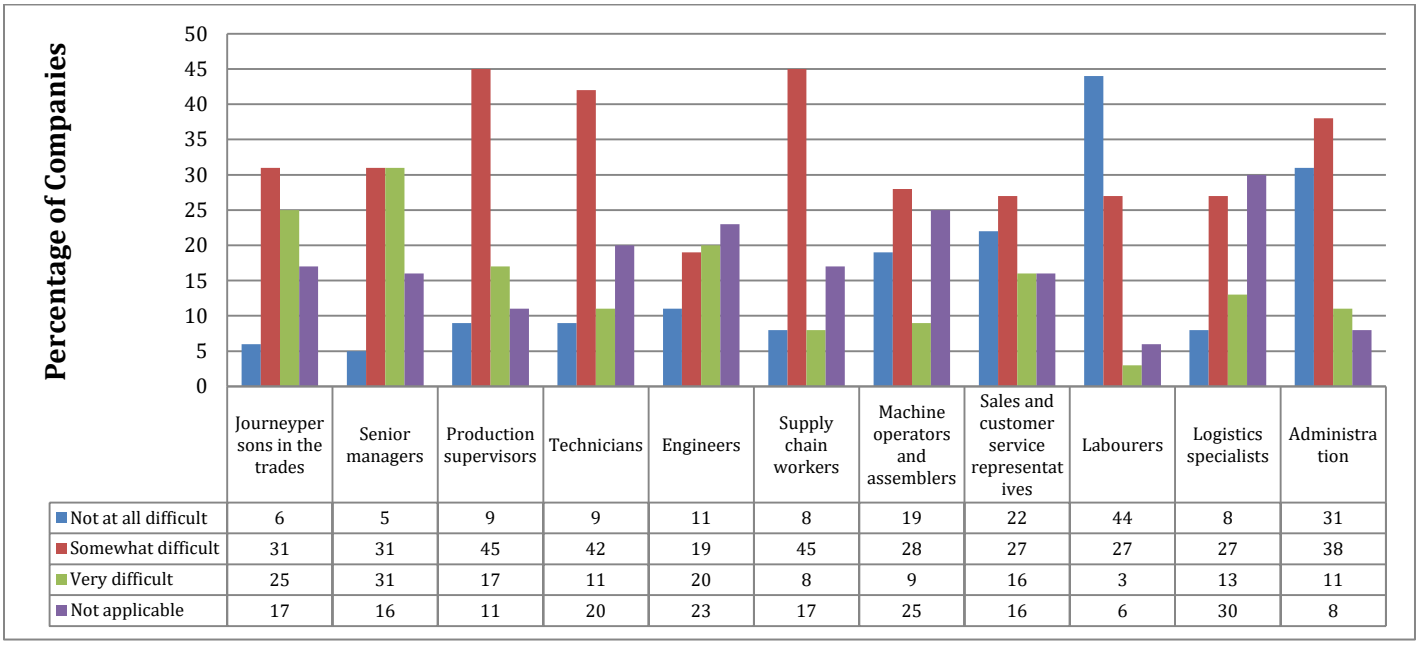
Employers were asked to comment on the reasons behind the growth or decline in their company's employment. A sample of their comments is provided in the following table:

Table 8: Employer Comments Concerning Employment Growth of Decline

Change in Business Model
In the past we did more manufacturing where in the future we will be doing more engineering
Business growth offset by better productivity
Company growth expanding our markets and our product lines.
Entering new markets + additional investment for R&D
Our whole premise to going to Value Streams and the Lean Journey was to be able to produce more with the same. VELOCITY of product flow is important for us to achieve this goal. So we have grown revenue with the same numbers we had 3 years ago and that was even with purchasing a whole new product.
The employment is based on changing the basis of the organization through processes and systems, to plan for a major growth initiative. This growth initiative has required some new employees, and many with different skill sets learned elsewhere. The skill sets internally prior to the addition of team members over the past two years were built internally, so preparing for growth was difficult. In bring some extra resources, but certainly newer highly skilled resources have allowed us to prepare for future growth.
Cost management; Evolution of our product line; Productivity improvements
Have added people to prepare for succession as the large demographic of aging employees moves towards retirement.
Change in Sales
Sales growth
Increased sales
Lower sales, employee turnover
Margins have been thinner, so an increase in sales is necessary to stay in business and manage a positive cash flow.
Increased product sales, which produce a higher demand on production.
Secured a long term contract with a particular customer which has ensured continuous work during this period. Prior to this there was nothing tying customer to us specifically.
The housing market is strong with a lot on new and old homes selling. This generates window sales.
General Aviation market has not fully recovered since 2009 leading to downsizing of development staff in 2014.
Government Programs or Policy Initiatives
Government programs such as IRAP and NSERC contributed to employment growth.
The Ministry Of Forest Lands and Natural Resources has caused a major decline in our company. We have found it harder and harder to secure fiber to support our operations and therefore had to lay off a large number of our workers.
Company required more employees to meet work requirements for the main submarine project. Organization is also growing in other areas/projects which required more staff as well.

3.1.5. Labour and Skill Shortages

While there appears to be a general climate of growth for the manufacturers in the region, companies are finding it difficult to hire qualified employees in some positions. For example, 62% of the companies reported having difficulty filling senior management positions and 56% had similar challenges finding qualified journeypersons. Other positions that are difficult to fill are technicians, supply chain workers, and production supervisors.



	Journeypersons in the trades	Senior managers	Production supervisors	Technicians	Engineers	Supply chain workers	Machine operators and assemblers	Sales and customer service representatives	Labourers	Logistics specialists	Administration
Not at all difficult	6	5	9	9	11	8	19	22	44	8	31
Somewhat difficult	31	31	45	42	19	45	28	27	27	27	38
Very difficult	25	31	17	11	20	8	9	16	3	13	11
Not applicable	17	16	11	20	23	17	25	16	6	30	8

Figure 12: Difficulty in Hiring Qualified Workers

Employers indicated that they expect to have difficulty finding individuals with the required skills in the positions outlined in the following table.

Table 9: Difficult to Fill Positions

Skill Categories	Difficult to Fill Positions
Journeypersons in the Trades	• Journeyperson metal fabricators • Carpenters • Millwright • Electricians • Steel Fabricators • Toolmakers • Upholsterers
Senior Managers	• Experienced Plant Supervisors • Senior managers
Production Supervisors	• Production Managers
Technicians	• Administrative Technical Support • Sewing machine repair and seamstress • CCTV Installation Technicians

	• Sign manufacturer • Shop Manufacturer
Engineers	• Qualified Refrigeration Engineers and Refrigeration Mechanics • Electrical engineers • Quality Engineers • Aerospace avionics design engineers • Embedded software (firmware) developers (software engineers) • Power Engineer Supervisors/Managers
Supply Chain Workers	• Supply chain specialists • Supply Chain managers
Machine Operators and Assemblers	• Machinists and mechanical technologists • Machine Operators • Fabricators • AutoCAD operators
Sales and Customer Service Representatives	• Sales people • Customer Service Representatives
Labourers	• Log Scalers
Logistics Specialists	• Logistics specialists
Administration	• Administrative support • Quality Assurance/Food Safety Manager • Project managers

Employers also selected areas that they believe prospective employees fail to meet the requirements for positions offered by their companies. The most frequently mentioned reasons that job applicants fall short relate to company-specific knowledge and skills and experience with a specific manufacturing operation. When these issues are set aside applicants typically fall short in terms of their attitude, business knowledge, and work experience. The following figure provides a breakdown of the reasons job applicants fail to meet position requirements. These reasons apply to all occupations offered by the region's manufacturers.

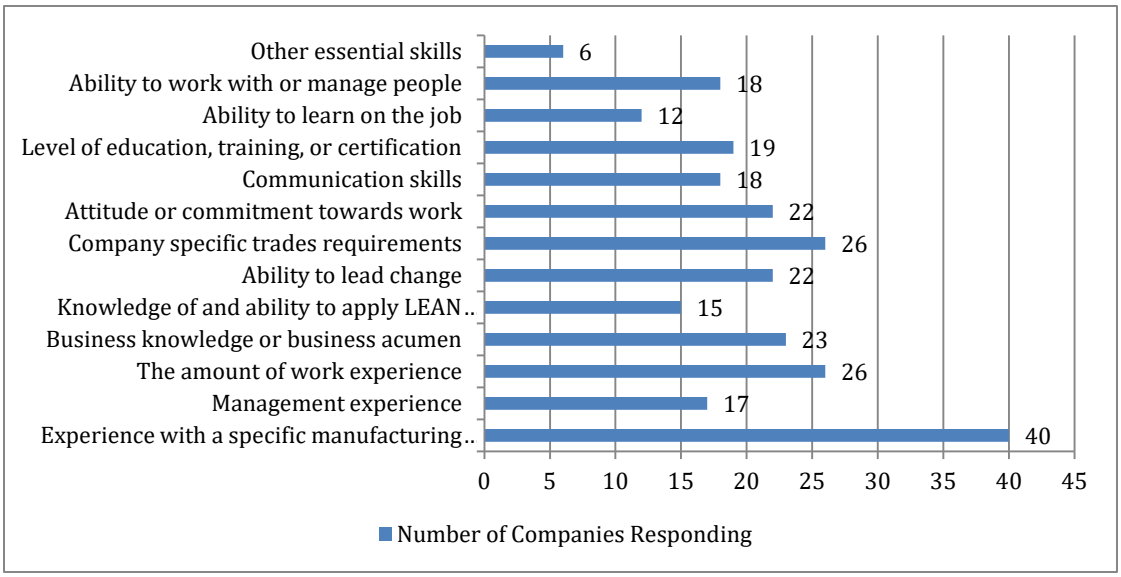
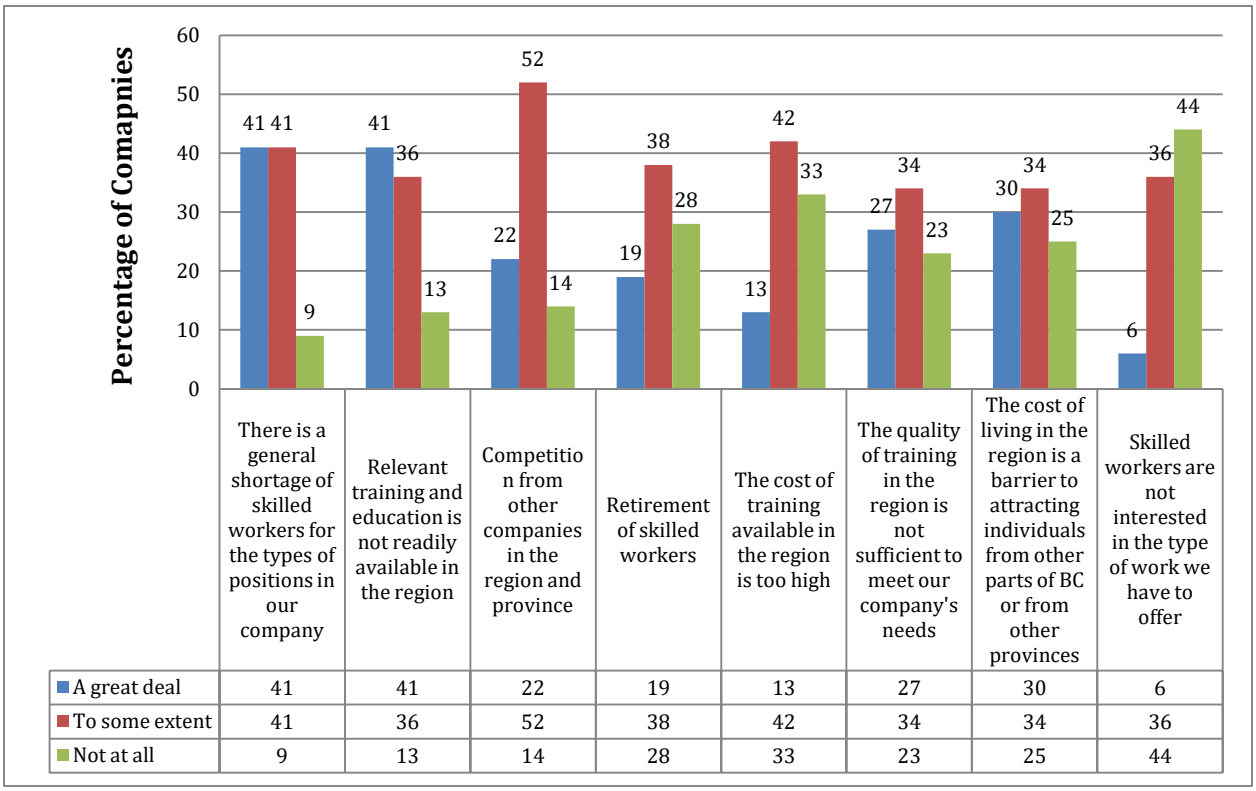


Figure 13: Reasons for Failure of Job Applicants to Meet Position Requirements

Employers were asked to consider a number of factors that they think will contribute to future skill shortages that they expect to experience. While all of the factors listed were considered to impact future skill shortages either a great deal or to some extent, employers seem to be most concerned about the general skill shortage for the types of positions they have (82%), that relevant training and education is not available in the region (76%), that other companies in the region and province are competing for skilled workers (74%), and that the cost of living is a barrier to attracting individuals from other parts of the province and the country in general (64%). The following figure provides a breakdown of the factors that companies think will contribute to future skill shortages.



	There is a general shortage of skilled workers for the types of positions in our company	Relevant training and education is not readily available in the region	Competition from other companies in the region and province	Retirement of skilled workers	The cost of training available in the region is too high	The quality of training in the region is not sufficient to meet our company's needs	The cost of living in the region is a barrier to attracting individuals from other parts of BC or from other provinces	Skilled workers are not interested in the type of work we have to offer
A great deal	41	41	22	19	13	27	30	6
To some extent	41	36	52	38	42	34	34	36
Not at all	9	13	14	28	33	23	25	44

Figure 14: Factors Contributing to Future Skill Shortages

3.1.6. Strategies to Address Skill Shortages

The final section of the survey asked employers to consider actions that could be considered by the manufacturing industry, training providers, or government to address identified and future skills shortages. While there was general support for many of the actions listed in the survey, the top three actions supported by employers were:

- Increase the amount of internal training provided to employees
- Increase the amount of formal training provided by external training providers
- Develop initiatives to retain workers who are trained in the region to work within the region

The following figure provides a breakdown of the responses from companies. It is also worth noting that hiring temporary foreign workers to address anticipated skill shortages was the least preferred strategy selected by companies.

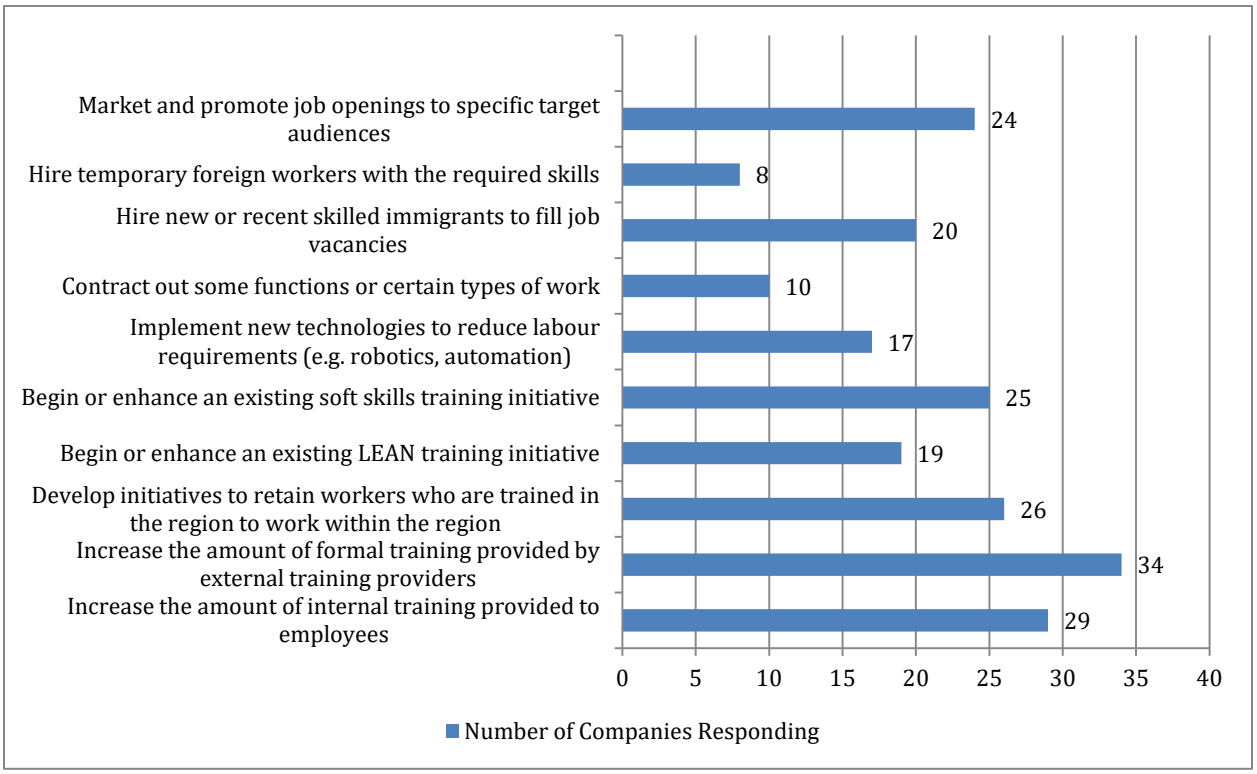


Figure 15: Actions to Address Skill Shortages

Employers also were asked to provide comments concerning strategies that Vancouver Island/Coastal region manufacturers and government could initiate to increase the sector's productivity. The following table provides a thematic summary of the comments provided.

Table 10: Summary of Employer Comments Concerning Sectoral Strategies

Develop industry specific training programs
Establish industry specific training programs that suit our business rather than through the BC apprenticeship system and have a mechanism for them to become certified in our sector.
There is not enough support for LEAN Programs on the island. Training should be developed in this area.
There is no training in Canada for the type of skilled workers we require and we look to European trained workers to fill our requirements. We can train in house, but the government training programs are for offsite training and don't help us.
We require more skills that are specific to e-commerce channel for our business. It is not hard for us to find production workers. It is difficult to find workers who are interested in providing in-house computer and administrative support.
For machinists, there will be a continued shortage of skilled labour. A lot of our machinists are aging and apprenticeships need to be encouraged. Dockyard should be part of a machinist training program (in addition to BCIT) where the facility is used to train new apprentices and then release them after a specified timetable. As it is now we compete with our own government to get and keep machinists in the local area. Not a good environment!

Lack of short duration skills upgrade courses such as electronic bench technician and electronic assembly to IPC standards is a problem. Presently, the only option seems to be to pay for a worker to travel to Washington state for several days to take an upgraded course or to hire a (expensive) consultant to lead an in-house training session. The latter is too expensive to do for just 1 or 2 people.
Improve local training
I think a key question is what are the pain points of small business in the region? What can be done to address these pain points? On the training front, I have not found local training for my employees. They may exist, but I have not found it easy to find information about them.
Promote and encourage soft skills training.
Affordable housing and transportation
Cost of housing is prohibitive for entry to mid-level employees. Better programs to accommodate this population base would assist in attracting and retaining qualified staff.
Better public transportation is needed in the area. Higher frequency and extended hours.
Government support for local manufacturers
Government initiatives to increase manufacturing in the area would be very beneficial. An increase in the manufacturing base would give us a larger pool of qualified candidates to draw from.
Continue programs such as the Canada Job Grant to promote internal/external training and make it cost effective.
Promote and profile the industry
Government and manufacturing associations could do a better job at highlighting and profiling what manufacturing is going on here. We export to Asia and USA but when government does a trade mission it seems to us that they are fronting for the big companies.
The government could help by advertising what coming to work in BC could mean to one's life, as well as one's career. The scariest part of people wanting to come and work here is the limitation of skilled worked on the island, or at least that is the perception. There may be a way to attract companies and skilled employees through tax incentives, or other benefits to make the relocation easier. The lack of individuals who have worked for larger organizations and can bring diverse skills sets can hamper the growth and expansion efforts of the company as a whole. Have an incentive to come to the island is a way to have growth of island companies. Bringing individuals here who have diverse and advanced skills sets would raise the level of the organizations on the island, and enhance that image of being on an island.
Promote networking in the industry
Promote and encourage a network within the manufacturing sector to share best practices and make training cost effective.
Manufacturing organizations should consider forming a more formalized manufacturing

association that had meetings and worked on strategies to create an environment that attracts skilled workers to Van Island - perhaps somewhat like VIATEC.
Organize a pool of recently retired industry veterans that could be available for ongoing consulting/training within businesses. Tighter cooperation between industry and educational institutions to serve each other's needs. Cooperation between employers to increase the pool of local expertise and keep schools accountable.
Financial Incentives
Government should consider providing financial incentives for employers to make investments in developing succession for employees in the manufacturing sector for the duration of the turnover period, which will occur over the next 10 years.

3.2. Summary of Themes Emerging from Employer Interviews

As mentioned earlier, 16 interviews of key manufacturing sector executives and senior managers were conducted during the April – June 2016 timeframe. A protocol (i.e. a set of interview prompts and questions) was used to guide the interview process. The resulting interviews were conversational in tone and interviewees were encouraged to express their opinions on a broad range of topics affecting the manufacturing sector in the region. Interviewees were asked to describe what they consider the 'burning issues' for their company and the sector, to describe any trends they are seeing in relation to skill requirements and productivity for the sector, and to suggest any strategies that might be undertaken by the sector in collaboration with other companies and government to address the issues identified.

The results of the interviews were subjected to a content analysis. A series of themes emerged from this analysis. Company executives and managers interviewed reported:

1. A general lack of qualified candidates when hiring for positions;
2. A number of skills areas that are hard to fill;
3. Issues of concern with the programs offered by BC institutions and the quality of graduates from BC programs;
4. A number of factors affecting the recruitment and retention of workers;
5. A number of factors that have an impact on the productivity of their companies;
6. The need for more industry collaboration;
7. Immigration and foreign worker issues that impact their companies;
8. The need for more training that is specifically targeted at industry needs;
9. A number of workplace trends that they are observing; and
10. Strategies that could be considered to address issues in the sector.

1. Lack of Qualified Candidates

A number of those interviewed referenced the difficulty finding candidates who had sufficient technical experience and education to operate equipment. This was particularly evident in the electrical and mechanical areas and in the operation of CNC and PLC equipment.

2. Hard to Fill Skill Areas

Interviewees reported that the following skill areas or positions requiring these skills were particularly difficult to fill:

- Supply chain negotiation;
- Purchasing and procurement across cultures;
- Supporting electronic networks (firmware and software);
- Leaders who can identify soft skills gaps;
- Root cause analysis skills;
- LEAN manufacturing issues and approaches; and
- Complex electronic design and testing.

3. Issues with BC Training Institutions

Company executives and senior managers were generally concerned about the degree to which BC training institutions were not addressing their needs for skilled workers. There were also concerns expressed about the availability of programs that incorporate specific skills or knowledge (e.g. LEAN, loss control measurement, communication skills). The quality of recent graduates was also cited as an issue. A major issue identified related to what industry representatives consider a lack of collaboration with manufacturers.

4. Factors Affecting Recruitment and Retention of Workers

A small number of interviewees mentioned issues that affect their ability to recruit and retain workers. The issues mentioned relate primarily to the high cost of living on the island and the ability (or inability) of workers to adapt to the workplace culture.

5. Factors Affecting Productivity

Two issues were frequently mentioned by interviewees as critical to their productivity. These were supply chain issues which dealt with the lack of local suppliers and indirectly to the low Canadian dollar. Challenges related to shipping products on and off the island and receiving supplies were also mentioned. A number of manufacturers in the region are using various technologies to automate aspects of their business operations to ensure that they remain competitive.

6. The Need for Industry Collaboration

Interviewees expressed the need for greater collaboration and cooperation among regional manufacturers to address common problems. There was a general feeling that collaboration is needed but there isn't currently a vehicle to ensure that this happens.

7. Immigration and Foreign Worker Issues

The majority of interviewees indicated that they do not use foreign workers through government programs. The main reasons given are that the programs are too onerous to be worth the investment of time, particularly for smaller companies and concerns about how the skills of offshore workers have been validated.

8. Training to Meet Industry Needs

This theme is closely related to the issues raised about BC institutions. Interviewees are looking first for the right attitude and approach to working in their companies and secondly for the right skill set. Institutions do not appear to be addressing these issues.

9. Workplace Trends Observed

Interviewees were asked what trends they observed in terms of the workplace. The trends mentioned were related to the need for employees to have a strong sense of work-life balance, the challenges of managing in a multi-generational workplace and the need to ensure that new and younger workers understand how to work within the culture of a manufacturing company.

10. Strategies to Address Sectoral Issues

Although the focus of the interviews was primarily on the identification of important issues and trends, several interviewees did offer suggestions concerning strategies that could be used to address specific issues. There was really no common theme that emerged but promotion of careers in the sector and greater opportunity for secondary school students to participate in pre-apprenticeship training related to the sector were both given as possible ways to address future skill shortages in the sector.

Some illustrative comments for each of the themes noted above are provided in the following table.

Table 11: Themes Emerging from Interviews with Vancouver Island/Coastal Region Manufacturing Companies

Themes	Sample Statements
1. Lack of qualified candidates	• Problem finding qualified candidates in the security field • To remain competitive it is necessary to find qualified individuals in the electrical/mechanical areas that will qualify for work with military suppliers (ISO 10001 certified) • Need more qualified CNC (computer numerical control) operators • PMP (Project Management Professional) certified staff are needed but the programs are difficult to get into • There is a general labour shortage in the food industry • Production workers in the aerospace sector are in short supply • It is hard to find application engineers/programmers • We need to automate to remain competitive but can't find enough trained PLC (programmable logic controller) operators. Consequently we rely on vendor training to bring our staff up to speed on new technologies.

Themes	Sample Statements
	• Can't find enough journeyperson electricians to meet our needs • There is a shortage of industrial sewing machine operators - no college level training available so we have to do it in-house. This could be an area where an apprenticeship program would be helpful.
2. Skills that are hard to find	• We need people who are trained to do supply chain negotiation • Individuals with professional purchasing certification qualifications needed • Finding the right people for roles in supporting electronic networks (firmware and software) is very difficult • Leaders who are able to identify soft skills gaps is a common problem across the manufacturing sector • Need high level of technical skills to deliver custom solutions - key skill areas are in the design, development and manufacture of train electronics • Skills to provide root cause analysis are lacking - have to internally train staff to provide customer support that is both customer centric and technical at the same time • Procurement skill set is lacking - need individuals who are able to both purchase and negotiate cost across cultures • Need all staff to have a better understanding of LEAN manufacturing issues and approaches • Difficulty getting the right skill set - semi-skilled to highly skilled needed - 3 - 6 month training window for new hires - challenge is find staff on short notice. • Testing is a high end skill set that is hard to find.
3. Issues with BC institutions	• At least one college is competing with industry (Note: the interviewee offering this comment referred to the use of the college's facilities and equipment to meet the manufacturing needs of small companies in the region which was viewed as being in direct competition with companies that provide the same services) • Institutions are not listening to industry - collaboration is missing. • Recent graduates from institutions are not aware of

Themes	Sample Statements
	what impacts profitability in manufacturing (also knowledge of continuous improvement, LEAN and loss control measurement are not taught or learned) • Institutions are validating their own perspectives and as a result companies are addressing their own training needs rather than relying on the post-secondary system. • There are not enough apprenticeship seats on the island. • Manufacturers expressed concerns about the quality of grads in the steel/metal fabrication areas. • We look to Ontario (Conestoga College) and then Germany for individuals who are trained in wood manufacturing. • Students are learning 'old stuff' from 'old guys' - not contemporary in terms of what industry is doing. • We need CNC operators and the colleges aren't training them since there isn't a program on the island. • We have to go to Ontario for tool maker training.
4. Factors affecting recruitment and retention of workers	• Cost of living on the island is high (out of hundreds of candidates only one or two will relocate • Candidates must fit the culture of the company
5. Factors affecting productivity	• Supply chain issues (shipping on and off the island is challenging) • Supply chain issues re: industry requirements for organic BC products to use in wine manufacturing • Regulatory changes need to continue to be made in the wine industry in order for it to grow and become more productive • Shipping on and off the island is an issue • Supply chain presents challenges given the low Canadian dollar (most supplies are bought in US$) • Need to become more competitive through automating processes • Business has changed so that we now have to import raw and manufactured materials from upwards of 30 countries to make our products • We export most of our products but have to import raw materials - duty is a serious concern for the long term viability of our business.

Themes	Sample Statements
6. The need for industry collaboration	• We have outgrown VIATEC and need another vehicle to collaborate with industry partners • Need for collaboration among manufacturers • Needs to be more networking and collaboration in the industry • Need to be able to tap into a broader training, recruitment network to address the shortage of people with the skills and the shortage of training available
7. Immigration and foreign worker issues	• Current foreign worker process doesn't lend itself to easy hiring. We are not producing enough high tech grads to satisfy demand unlike in the US • Immigration - need a good understanding of immigration law to work in the sector • No direct hiring of immigrant or foreign workers • Immigration issues - Canadian based standards – need to validate the skills of off-shore workers in relation to Canadian standards. Applies to interprovincial as well as offshore workers.
8. Training to meet industry needs	• Trades programs don't train for soft skills • We hire for attitude and train for the position • A 'can do' attitude is most important when hiring • On the island training is difficult to acquire - LEAN training hard to find on the island - more costly • Recent graduates from institutions are not aware of what impacts profitability in manufacturing (also knowledge of continuous improvement, LEAN and loss control measurement are not taught or learned)
9. Workplace trends observed	• Work-life balance • Managing in a cross-generational workplace • Scalability is based on the development of stable workforce that work in project managed teams • A shift in culture is needed to accommodate a new generation of workers • The Manufacturing culture is foreign to young island employees
10. Strategies to address	• Cross-training workforce in a downsizing environment

Themes	Sample Statements
sectoral issues	• Grow the capacity and infrastructure to establish reliable supply chains for island/coastal manufacturers • Promotion of the manufacturing sector with young people is needed to increase awareness of the range of job opportunities that exist • There need to be more high school apprenticeship programs related to the marine trades and more co-op programs for the marine trades

4. Summary: Key Issues and Strategies

The online survey and interviews conducted as a part of the this LMI research study revealed several important training and skills development issues that are of general concern to manufacturing companies in the Vancouver Island/Coastal region. While there are other issues that are also of concern that affect the productivity of some companies such as supply chain issues and the low Canadian dollar, the focus of this section of the report is on skills training and development issues since that is the overall purpose behind the Labour Market Partnership project with VI/Coastal region manufacturers.

4.1. Key Issues

The skills training and development issues that are seen as important to the future development and growth of the manufacturing sector in the region can be summarized as follows:

1. **Skill Shortages**

   The region's manufacturers identified a number of positions with skills that are difficult to fill. These included: supply chain positions involving negotiation with offshore suppliers, procurement positions requiring purchasing and negotiation across cultures, a variety of management and operational positions requiring knowledge and application of LEAN manufacturing principles (including root cause analysis), positions involving complex electronic design and testing, and a range of positions requiring soft skills (i.e. communication, collaboration, teamwork, etc.). Design and other types of engineers, project managers, machinists, metal fabricators, and machine operators (CNC and PLC) were also difficult to find.

   There is also a general concern expressed by companies that there is a lack of qualified candidates in the region with sufficient technical and education experience (e.g. electrical and mechanical engineering and the operation of CNC and PLC equipment were often mentioned as skill sets that were difficult to find) to effectively operate within local manufacturing environments. As a result companies have had to train internally (or in some cases use vendor or third party consultants and trainers) to address skills issues since educational institutions do not appear to be offering programs and training that matches industry needs.

2. **Quality and Availability of Training**

   Both the survey results and the interviews revealed a general dissatisfaction with the quality and availability of training in the region and more broadly in the province. Concerns were expressed about the quality of graduates of BC's institutions and their readiness to work on the job in a manufacturing environment. Some concerns focused on technical preparedness (i.e. prospective employees did not have the requisite technical skills) while at other times it was a question of fit with the culture of the company and attitude.

As mentioned earlier in this report, companies in the region are generally concerned about the degree to which BC training institutions are addressing their need for skilled workers. There is a lack of availability of programs that incorporate specific skills or knowledge (e.g. LEAN, loss control measurement, communication skills) and the result is that graduates from BC institutions applying to work in the manufacturing sector are not prepared to do so 'out of the gate'. In other words, regional manufacturing employers find that graduates do have good general skills but not the ones that are specific to their industry. Employers finding candidates who are a fit with the company are then tasked with having to internally train these individuals so that they are ready to assume their roles on the shop floor or in the front office. This results in reduced productivity while new employees are being trained by existing employees or other parties who have been brought in to provide training.

Another major issue identified by companies was a lack of collaboration on the part of BC's educational institutions with manufacturers. There is a strong feeling that institutions are not working with industry to understand their needs and customize programs to address these needs. For VI/Coastal region companies this is a particular challenge since a number of the institutions that could address their skills training needs are not in the region. At the same time, it is important to note that in this phase of the labour market partnership sector partners did not raise these issues with representatives from post-secondary institutions directly. Given the importance of this issue to the province and the region's post-secondary institutions collaboration efforts will be initiated as a part of the work undertaken in Phase 3.

3. **The Changing Nature of the Workforce**

Companies involved in the research indicated that they employed workers across a range of ages including those who are 65 or older. For some companies, this mix of generations presents significant operational and training challenges. Younger workers have a strong need for work-life balance and want to work for employers who are prepared to provide them with working conditions that are compatible with their personal lifestyle choices. This represents a significant cultural shift for many manufacturing companies that have operated in more traditional ways. This shift affects the ability of companies to attract and retain workers and although the workforce for the companies involved in this research is generally quite stable (i.e. little turnover), going forward one can assume cultural workplace changes will have an impact on companies in the region. Manufacturers will need to be prepared to address these changes.

The data collected as a part of this LMI research study suggests that VI/Coastal region manufacturers are not entirely satisfied with post-secondary programs in the region. Manufacturers are concerning that available programs are not aligned with their priorities and needs for skilled workers. At the same time, regional manufacturers acknowledge the importance of defining their needs in a way which enables post-secondary institutions to respond to their

needs. Regional manufacturers have a strong desire to grow the sector but accessing training that helps them increase their productivity is a barrier.

At the same time, regional manufacturers are very interested and willing to work with BC institutions and involve them in the design of offerings that address specific high priority needs. Companies recognize the importance of speaking with a single voice so that post-secondary institutions are not trying to respond to individual company needs. It has been difficult for institutions to adapt their programs to meet the needs of individual companies since typically the volume that is necessary to justify the development of customized training solutions has not been present.

4.2. Strategies to Address Issues

To overcome these obstacles and to help the manufacturing sector in the region grow and become more productive, it is important for manufacturers, the region's post-secondary institutions, and government to collaborate to address the important skills gaps that have been identified. Collaboration needs to look different than it might have in the past. Industry must be seen as an equal partner with institutions. Government has (through initiatives such the Canada-BC Job Grant Program) played an important role in providing support and removing barriers that inhibit the creation of training programs that will address high priority skills issues identified by industry. These efforts need to continue and expand.

Of critical importance to the individuals surveyed and interviewed is that the information gathered through this LMI research project leads to positive action. As a result a number of strategies were suggested that could be used to address the issues identified above. While these strategies will have to be reviewed and 'fleshed out' in greater detail through Phase 3 of this Labour Market Partnership project, the ideas they represent should be highlighted here:

1. **Improve the Quality of Training**

   Areas that need to be addressed to deal with the skills gaps identified and the inability of manufacturers in the region are:

   - Develop industry-specific training programs. Clearly, this would have to involve a concerted effort on the part of government, BC institutions, and regional manufacturers and while there are some mechanisms in place to address aspects of training program development such as the ITA, these have not resulted in the types of programs that are required by local manufacturers;
   - Improve the availability to industry-specific training locally. Again, addressing the problem identified by regional manufacturers in terms of access to appropriate training is one that needs to involve government, educational institutions, and manufacturers; and
   - Develop initiatives to retain workers who are trained in the region to work within the region.
   - Increase the amount of formal training available in the region provided by external training providers

2. **<u>Support and Promote Regional Manufacturers</u>**
   A number of possible ways to attract potential employees to the sector (and thereby address current and anticipated skill shortages) were put forward. These included:
   - Working with government and industry in partnership to promote VI/Coastal manufacturers (promotion could take a number of forms but would be intended to profile the industry and make it more "visible" to prospective employees and the general public);
   - Providing more opportunities for secondary students to participate in pre-apprenticeship/apprenticeship training related to jobs in the sector; and
   - Providing financial incentives to employers to make investments in succession planning.

3. **<u>Increase Collaboration Among Regional Manufacturers</u>**
   Regional manufacturers expressed the desire for greater collaboration and cooperation among companies to address common problems including skills shortages but specifically in relation to skills training and development. This could be done through:
   - Developing and promoting a collaborative network of regional manufacturers (while industry associations exist, none seem to be addressing the issues commented on by those responding as a part of this research); and
   - Developing a regional manufacturing 'centre of excellence' which could serve as a hub for sourcing and providing expertise for regional companies and provide programs and training based on identified industry needs.

Structures, mechanisms and details concerning how to move forward on strategies will be undertaken as a part of Phase 3 of the LMP with the VI/Coastal manufacturing sector.

Appendix 1: Vancouver Island/Coastal Region Manufacturing Company Database

Company	Municipality/City	Web Address	NAICS Category
A&M Marine	Nanaimo	http://www.ammarine.ca/	339
AAA Rebar Only Ltd	Central Saanich	http://www.aaarebar.com/home.html	332
Abeego Designs	Victoria	http://abeego.com/	339
Accent Refrigeration	Victoria	http://www.accent-refrigeration.com/	339
Access Panel Solutions	Victoria	http://www.accesspanelsolutions.com/	321
Acoustics West Manufacturing	Saanich	http://www.acousti-trac.com/index.php	337
AGO Environmental	Esquimalt	http://www.agoenvironmental.com/home	339
Alliance Engineering Works	Victoria	http://www.alliance-works.com/	332
AML Oceanographic	Sidney	http://www.amloceanographic.com/	332
ASL Environmental	Victoria	http://www.aslenv.com/	332
Associated Sheet Metal	Central Saanich	http://associatedsheetmetal.com/	332
AXYS Technologies	Victoria	http://axystechnologies.com/	333
B&F Manufacturing / Quadra Jet	Nanaimo	http://quadrajet.ca/	333
Babcock Canada	Victoria	https://www.babcockinternational.com/Locations/Canada	336
Benson Industries	Central Saanich	http://www.bensonindustries.ca/index.php	321
CAMACC	Victoria	www.camacc.com	334
Campbell River Netloft	Campbell River	http://crnetloft.ca/	339
Canoe Brew Pub	Victoria	http://www.canoebrewpub.com/	312
Carmanah Technologies	Victoria	http://carmanah.com/	335
Catalyst Paper	Crofton / Powell River / Port Alberni	No web address	
Category 12 Brewing	Central Saanich	http://category12beer.com/	312
Cdn Bavarian	Chemainus	http://canbav.ca/	321

Canada BRITISH COLUMBIA

Funding provided through the Canada-British Columbia Labour Market Development Agreement.

Company	Municipality/City	Web Address	NAICS Category
CMI Custom Machining Ltd	Central Saanich	http://cmimachining.com/	332
Coastland Wood Industries	Nanaimo	http://coastlandwood.com/	321
Codan Radio Communications	Victoria	http://www.codanradio.com/	334
Coulson Group	Port Alberni	http://coulsoncedar.com/	339
CR Metal Fabricators	Campbell River	http://www.crmf.bc.ca/	332
Crest Sheet Metal	Victoria	http://www.crestsheetmetal.com/	332
Daigle Welding & Marine (Eagle Craft Boats)	Campbell River	http://eaglecraft.bc.ca/	336
De Vine Wineyards	Central Saanich	www.devinevineyards.ca	312
Discovery Trekking	Campbell River	http://www.discoverytrekking.com/	315
Duncan Iron Works	Duncan	http://www.diw.ca/	332
ElectroWear Manufacturing	Errington	http://electrowear.ca/index.php	315
EMCS Industries	Victoria	http://emcsindustries.com/	334
Epicure	Victoria	https://epicure.com/en	311
ESI Environmental Sensors	Sidney	http://www.esica.com/index.php	333
Express Custom Mfting	Port Alberni	http://www.expresscustom.ca/index.php	332
Fanny Bay Oysters	Union Bay	http://www.fannybayoysters.com/	311
Fast Signs	Victoria	https://www.fastsigns.com/652-victoria-bc-canada/	339
Firebozz	Nanaimo	http://www.firebozz.com/	339
First Light Technologies	Victoria	http://www.firstlighttechnologies.com/Index.aspx	335
FTS Environmental	Victoria	http://ftsinc.com/	334
Garside Signs & Displays	Victoria	http://www.garsidesigns.com/	339
Geo Tech	Crofton	http://www.geotechindustries.com/	332
Grant Signs	Campbell River	http://www.grantsigns.ca/	339
Graphic FX Sign Works	Victoria	http://www.382sign.com/	339
Great Little Box Company	Victoria	http://glbc.com/	339
Green Mountain Aviation	Sidney	http://www.greenmountainaviation.com/	336
Greg's Furniture & Upholstery	Victoria	http://www.greggsfurniture.com/	321
Harbour City Kitchens	Central Saanich	http://harbourcitykitchens.com/	321

Company	Municipality/City	Web Address	NAICS Category
Heo Works Industries	Langford	http://heoworks.com/corporate/	323
Hobson Woodworks	Langford	http://www.hobsonwoodworks.com/	321
Holdfast Metalworks	Nanaimo	http://www.holdfastmetals.ca/	332
Imperial Welding	Chemainus	http://www.imperialwelding.com/	331
Industrial Plankton	Victoria	http://industrialplankton.com/	
International Aeroproducts	Courtenay	http://www.intaero.net/	336
Inuktun	Nanaimo	http://www.inuktun.com/	333
Iris Dynamics	Victoria	https://vs3.irisdynamics.com/	335
Island Farms (Agropur Division Natrel)	Victoria	http://islandfarms.com/	311
Island Overhead Doors	Nanaimo	http://www.islandoverheaddoors.com/	337
Island Precision Manufacturing	Central Saanich	http://www.islandprecision.com/#home	321
Island Truss	Courtenay	http://islandtruss.ca/	321
Islands West	Saanich	http://www.islandswest.com/	311
JB Sheet Metal Ltd	Victoria	http://jbsheetmetal.com/	331
Jemico Enterprises	Chemainus	http://www.paulcan.com/jemico-enterprises-ltd	321
Jespersen Boat Builders	Sidney	http://www.jespersenboats.com/	336
JS Foster	Central Saanich	http://www.jsfoster.com/	332
K& S Railings	Nanaimo	http://www.kandsrailings.ca/index.php	332
Keltic Seafoods	Port Hardy	http://www.kelticseafoods.com/index.html	311
Landmark Sign	Victoria	http://www.landmarksign.net/	339
Lane Light	Victoria	http://www.itemltd.com/	335
Latitude Tech	Saanich	http://latitudetech.com/	336
Lifetimer Boats	Duncan	http://www.lifetimerboats.ca/	336
Lighthouse Brewing	Esquimalt	http://www.lighthousebrewing.com/	312
Live Edge Design	Duncan	https://www.liveedgedesign.com/	337
Market Group Ventures	Shawnigan Lake	http://www.mgvinc.com/	339
Merridale Estate Winery	Cobble Hill	http://www.merridalecider.com/	312
Metal Tech Industries	Chemainus	http://www.metaltech.ca/	332

Company	Municipality/City	Web Address	NAICS Category
Modern Aluminium & Vinyl Products	Powell River	http://www.modern.ca/	339
Modern Windows	Courtenay / Powell River	http://www.modern.ca/	339
Morinwood	Victoria	http://www.morinwood.ca/index.html	321
Nanaimo Forest Products (Harmac)	Nanaimo	http://www.harmacpacific.com/	321
Nanaimo Precast	Nanaimo	http://www.nanaimoprecast.ca/	339
Natural Glacier Waters	Fanny Bay	http://www.naturalglacialwaters.com/	312
Natural Pastures Cheese	Courtenay	http://www.naturalpastures.com/home/	311
Nelson Roofing & Sheet Metal	Cumberland / Powell River / Campbell River	http://www.nelsonroofing.com/	332
NFE Manufacturing	Chemainus	http://www.nanaimofoundry.com/	332
Nicholson Manufacturing	Victoria	http://www.debarking.com/index.html	333
Noboco Styro Containers	Campbell River	http://www.noboco.com/	339
NorthWest FabWorks CNC Machining & Fabrication	Parksville	http://www.northwestfab.com/	332
NSM Metal Fabricators	Nanaimo	http://www.nanaimosheet.com/	332
Oceanetic Measurement	Sidney	http://www.oceanetic.com/	332510
Oceanus Reinforced Plastics	Sidney	http://oceanusplastics.com/	326
Ooh La La Cupcakes	Victoria	http://www.oohlalacupcakes.ca/	311
Oughtred Coffee	Victoria	http://www.oughtred.com/	312
Pacific Energy	Duncan	http://www.pacificenergy.net/	333
Paradise Island Foods	Nanaimo	http://www.paradise-foods.com/	311
Peetz Manufacturing	Victoria	http://www.peetzoutdoors.com/	339
Peninsula Signs	Sidney	http://www.peninsulasigns.ca/	339
Philbrooks Boatyards	Victoria	http://www.philbrooks.com/	336
Plastics Plus Fabricating	Campbell River	http://www.plasticsplusfabricating.com/	326
Playsted Sheet Metal	Victoria	http://playsted.com/	332
Point Hope Maritime / RalMax	Victoria	http://pointhopemaritime.com/	332

Company	Municipality/City	Web Address	NAICS Category
Pollen Sweaters	Lund	http://www.pollensweaters.com/	315
Powell River Forest Products	Powell River	info@prforestproducts.com	321
Pro Elvis Jumpsuits	Nanaimo	http://www.proelvisjumpsuits.com/	315
Pro Mac Manufacturing	Duncan	http://www.promac.bc.ca/	332
Profab Manufacturing	Chemainus	http://www.profabmanufacturing.net/	336
Professional Components	Sidney	http://professionalcomponents.com/	333
Prototype Equipment	Victoria	http://pedcan.com/	332
Quality Box	Duncan	http://www.qualitybox.ca/	339
Quester Tangent	Victoria	http://www.questertangent.com/	336
Rack-A_Tiers	Saanich	http://www.rack-a-tiers.com/	335
Red Arrow Brewing	Duncan	http://redarrowbeer.ca/	312
Redlen Technologies	Victoria	http://redlen.ca/	334
Reliable Controls	Victoria	http://reliablecontrols.com/	334
Rockland Scientific	Victoria	http://rocklandscientific.com/	334
Rocky Creek Winery	Cowichan Bay	http://www.rockycreekwinery.ca/	311
Schneider Electric	Victoria	http://www.schneider-electric.ca/en/	334
Scott Plastics	Victoria	http://www.scottplasticsltd.com/	326
SCS Steel Container Systems	Nanaimo	https://scsinc.ca/	332
Sea Flora	Sooke	http://www.sea-flora.com/	339
Sealand Aviation	Campbell River	http://www.sealandaviation.com/	336
Seamor Marine	Nanaimo	http://seamor.com/	333
Seaspan Victoria Shipyards	Victoria	http://www.seaspan.com/victoria-shipyards	336611
Seastar Chemicals	Victoria		
Seaward Kayaks	Chemainus	http://www.seawardkayaks.com/	339
Shelter Point Distillery	Campbell River	http://www.shelterpointdistillery.com/	312
Sherwood Industries	Central Saanich	http://sherwoodindustries.ca/	332
Sign Wace Designs	North Saanich	http://signwavedesigns.com/index.html	339
Southside Welding	Campbell River	http://www.southsideweldingcr.com/	332
Specific Mechanical Systems	Central Saanich	http://specificmechanical.com/	332

Company	Municipality/City	Web Address	NAICS Category
Spinnaker's Brewpub	Victoria	http://www.spinnakers.com/	312
Starfish Medical	Saanich		
Sure Grip Controls	Victoria	http://www.suregripcontrols.com/	326
Surefloat Engineering - Engineered Concrete Docks & Marinas	Duncan	http://www.surefloat.com/	339
Swans BrewPub	Victoria	http://swansbrewpub.com/	312
Talon Signs	Victoria	http://talonsigns.com/index.html	339
Tara Precision	Central Saanich	http://taraprecision.com/	337
Terra Remote Sensing	Victoria	http://www.terraremote.com/	334
Thermoproof Windows	Chemainus	http://www.thermoproof.ca/	337
Thrifty Foods	Victoria	www.thriftyfoods.com	311
Tilly's Gallery	Campbell River	http://www.tillysgalley.ca/default.asp	311
Tilray	Nanaimo	https://www.tilray.ca/	311
Titan Boats	Victoria	http://www.titanboats.com/	336
Tower Fence	Victoria	http://www.towerfence.ca/	339
Tower Kitchen & Millwork	Sidney	http://tkmw.ca/	321
Town Site Brewing	Powell River	http://townsitebrewing.com/	312
Tran Sign	Langford	http://www.transign.com/traffic/index.php	339
UK Sailmakers	Sidney	http://www.uksails.ca/	336
United Engineering	Victoria	http://unitedengineering.ca/	332
Universal Sheet Metal	Central Saanich	http://www.universalsheetmetal.ca/index.htm	332
Unsworth Vineyards	Mill Bay	www.unsworthvineyards.com	312
Van Ilse Windows	Victoria	http://www.vanislewindows.com/	339
Van Isle Millwork & Kitchens	Courtenay	http://van-isle.com/	337
Vancouver Island Brewery	Victoria	http://vanislandbrewery.com/	312
Viberg Boot	Victoria	http://workboot.com/	315
VIH Aerospace	Victoria	http://www.vih.com/	336
Viking Air	Victoria	http://www.vikingair.com/	336

Company	Municipality/City	Web Address	NAICS Category
VMAC	Nanaimo	http://vmacair.com/	333
Walker Technologies	Courtenay	http://www.walkersys.com/index.html	334
Wescon Doors (Cedar)	Duncan	http://www.wescondoors.com/	321
West Isle Industries	Langford	http://www.westisle.net/	321
West Wind Hardwoods	Sidney	http://www.westwindhardwood.com/	321
Western Forest Products	Nanaimo (all Island)	http://www.westernforest.com/	321
White Sails Brewing	Nanaimo	http://whitesailsbrewing.com/	312
Wolf Boats	Courtenay	http://www.wolfboats.com/index.php	336
Wolf Brewing Company	Nanaimo	http://www.wolfbrewingcompany.com/	312
York Portable Machines	Campbell River	https://www.yorkmachine.com/index.php	332

Appendix 2: List of Companies Interviewed

Company	Date of Interview
CAMMAAC	June 7, 2016
Coastland Wood Industries	May 2, 2016
DeVine Vineyards	May 31, 2016
FTS Environmental	May 4, 2016
Morinwood	April 26, 2016
Peetz Reels	May 26, 2016
Peninsula Signs	June 1, 2016
Pro-Mac	May 2, 2016
Prototype Equipment Design	June 6, 2016
Quester Tangent	May 25, 2016
Reliable Controls	May 27, 2016
Scott Plastics	April 25, 2016
Suregrip Controls	April 29, 2016
Titan Boats	April 26, 2016
Viberg Boots	April 20, 2016
Viking Air	May 30, 2016

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Statistics Canada. (No date). *Table 282-0122 Labour force survey estimates (LFS) by provinces and economic regions based on 2011 Census boundaries, 3-month moving average, unadjusted for seasonality, monthly (Persons), Mar 2001 to Jan 2016*. CANSIM (database). Retrieved from http://www5.statcan.gc.ca/cansim/a26?lang=eng&retrLang=eng&id=2820122&pattern=2820122..2820123&tabMode=dataTable&srchLan=-1&p1=-1&p2=-1

Statistics Canada. (No date). *Table 282-0123 Labour force survey estimates (LFS), by provinces, territories and economic regions base on 2011 Census boundaries*. Retrieved from

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Statistics Canada. (No date). *Table 282-0007 Labour force survey estimates (LFS), by North American Industry Classification System (NAICS), sex and age group, unadjusted for seasonality, monthly (Persons), Jan 1976 to Jan 2016*. Retrieved from http://www5.statcan.gc.ca/cansim/a03?lang=eng&pattern=2820007..2820008

Statistics Canada. (No date). *Labour force survey estimates (LFS), employment by economic region based on 2011 Census boundaries and North American Industry Classification System (NAICS), 3-month moving average, unadjusted for seasonality, monthly (Persons), Mar 2001 to Jan 2016*. Retrieved from http://www5.statcan.gc.ca/cansim/a03?lang=eng&pattern=2820124..2820125

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Statistics Canada. (No date). *Labour force survey estimates (LFS), employment by economic region based on 2011 Census boundaries and National Occupational Classification for Statistics (NOC-S), annual (Persons), 2001 to 2015*. Retrieved from http://www5.statcan.gc.ca/cansim/a03?lang=eng&pattern=2820126..2820127

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Statistics Canada. (No date). *Table 379-0030 Gross domestic product (GDP) at basic prices, by North American Industry Classification System (NAICS), provinces and territories*. Retrieved from http://www5.statcan.gc.ca/cansim/a26?lang=eng&id=3790030