Ontario Construction Secretariat

COMPLETION COUNTS:

RAISING APPRENTICESHIP COMPLETION RATES IN ONTARIO'S CONSTRUCTION INDUSTRY

MAY 2013

OCS
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PREFACE

This apprenticeship study was commissioned by the Ontario Construction Secretariat (OCS) and conducted by Professor Morley Gunderson at the Centre for Industrial Relations and Human Resources at the University of Toronto, Ipsos Reid and Prism Economics and Analysis.

Prof. Gunderson is recognized internationally for his research on labour markets and education as well as his Canadian research on training and on construction labour markets.[1] Prof. Gunderson is Research Advisor on the study.

Ipsos-Reid is a leading international research and survey firm and has studied apprenticeship and conditions in the Ontario construction industry for the OCS. Ipsos-Reid is an advisor on survey techniques that can be applied to apprentices and employers in Ontario.

Prism Economics is Canada's leading human resource research firm having conducted dozens of studies across Canada related to construction labour markets and apprenticeship.

This report presents findings from an exhaustive review of apprenticeship literature and primary research conducted during the course of this study.

This study was made possible with cooperation and input from construction industry stakeholders and the Ministry of Training Colleges and Universities.

[1] Morley Gunderson holds the CIBC Chair of Youth Employment at the University of Toronto where he is a Professor at the Centre for Industrial Relations and Human Resources, the Department of Economics and the School of Public Policy and Governance. He is also a Research Associate at the Centre for International Studies, and the Institute for Human Development, Life Course and Aging, and a Fellow of the Royal Society of Canada.

EXECUTIVE SUMMARY

For over twenty years governments and businesses have focused on innovation and rising productivity as the main factors that drive economic development. Investments in machinery, equipment and infrastructure, needed to reach these goals, require a skilled work force to design, build, install, integrate and operate new systems. Shortages of skilled trades and occupations are often cited as barrier to the success of economic development plans.

This focus on innovation and productivity shifts the attention of government and employers to the apprenticeship programs where the skilled trades are trained and certified. The importance of apprenticeship to Ontario's economy has been recognized in provincial policy. For example apprenticeship was highlighted in the 2012 Ontario budget: *"Ontario's apprenticeship system is a key part of building the well-educated and highly skilled workforce the Province needs to compete in the current and future economy."*[2]

Construction has been leading other industries in job creation for over a decade and apprenticeship is the main source of skilled labour. Indeed, the skilled construction trades make up the largest single group of apprentices and these trades often work in other industries.[3]

Government and industry initiatives have resulted in significant growth in construction apprenticeship registrations and an expansion in the number of recognized trades. Figure 1 tracks the rapid gains in employment and apprenticeship registrations since 1994. Note that new apprenticeship enrolments lagged the employment recovery. The dominant feature, however, has been low apprenticeship completion and certification rates. Low completion rates signal a limited return on investment in the apprenticeship system as the certified, skilled workforce has not kept pace with demands.

This pattern, which is apparent in all trades and provinces, is often highlighted as a priority problem. For example, the Jobs and Prosperity Council, a group of private sector leaders reporting to the Ontario government on actions needed to take advantage of global opportunities, has focused on low completion rates in apprenticeship and the skilled trades.[4]

"….too few young Ontarians pursue the skilled trades as a career and only half of those that select apprenticeship will actually complete the training and receive a certificate of qualification."

The Jobs and Prosperity Council goes on to describe the advantages of collaboration between Local Business and Education Councils to overcome these challenges. Collaboration between employers, trainers and apprentices is the key to success in apprenticeship.

OCS research, presented here, highlights the success of Joint Apprenticeship Training Trusts (JATT) programs as an example of these "Best Practices". The research provides insights into the important role of JATTs in supporting and training apprentices and suggests that this collaborative industry approach may serve as the cornerstone for the development of a new apprenticeship strategy.

2 Ontario Budget, 2012

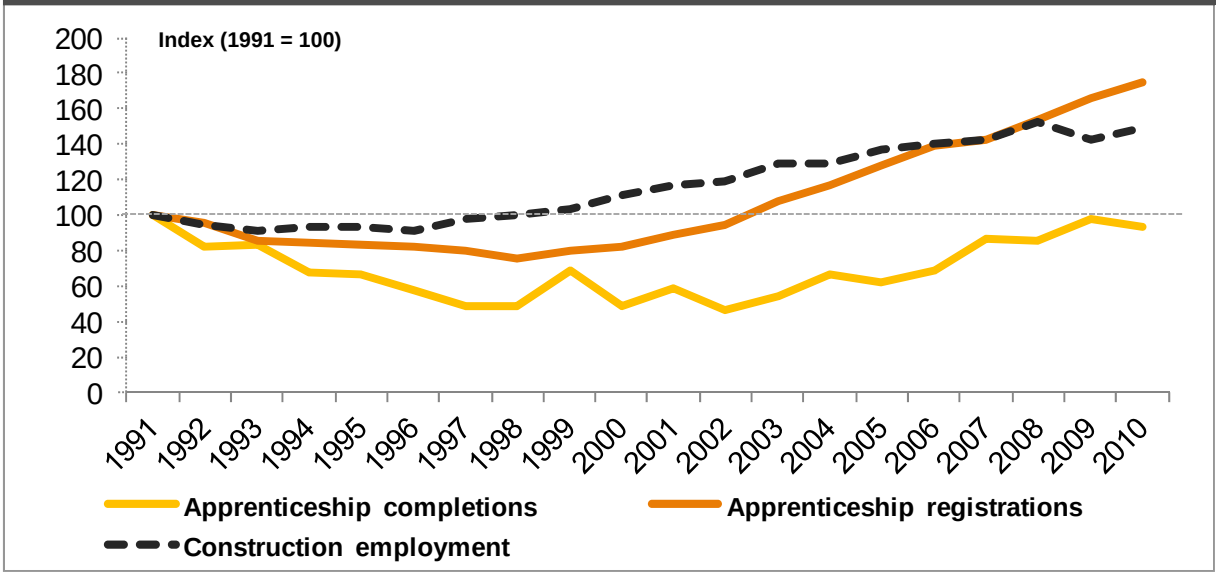
3 There are several examples of closely related skill sets that are shared by the trades in construction and other industries including, for example; equipment and crane operators, electricians, millwrights and heavy duty equipment mechanics and welders.

4 See "Advantage Ontario", Jobs and Prosperity Council, 2012

As evidenced by this study, the collaborative approach leverages the significant investments made by individual employers to maximize the impact of available government funds. This results in improved outcomes for apprentices and a greater return on investment for employers and government which stem from the higher rates of apprenticeship completions.

Previous studies have found that completion rates average only about 50 percent among Ontario apprentices. Figure 1 tracks the cumulative change in construction employment, apprentice registrations and completions. Despite rapid gains in employment and apprenticeship, the number of apprentices completing construction programs each year remains at or below 1990 levels.

Figure 1: Index of construction apprenticeship and employment in Ontario



Source: Statistics Canada, RAIS, CANSIM

Higher completion rates are especially important for construction trades where tradespersons with a Certificate of Qualification (C of Q) can earn more money, are more productive and, with a Red Seal endorsement, enjoy increased mobility and greater job opportunities.[5] Mobility is increasingly needed to reallocate labour from declining to expanding sectors and regions. Apprenticeships with the Red Seal designation can foster such mobility. Impending and actual skill shortages, especially with the expanding resource sectors and mega projects, can be mitigated by apprenticeships with the Red Seal designation and emphasis on skill development.

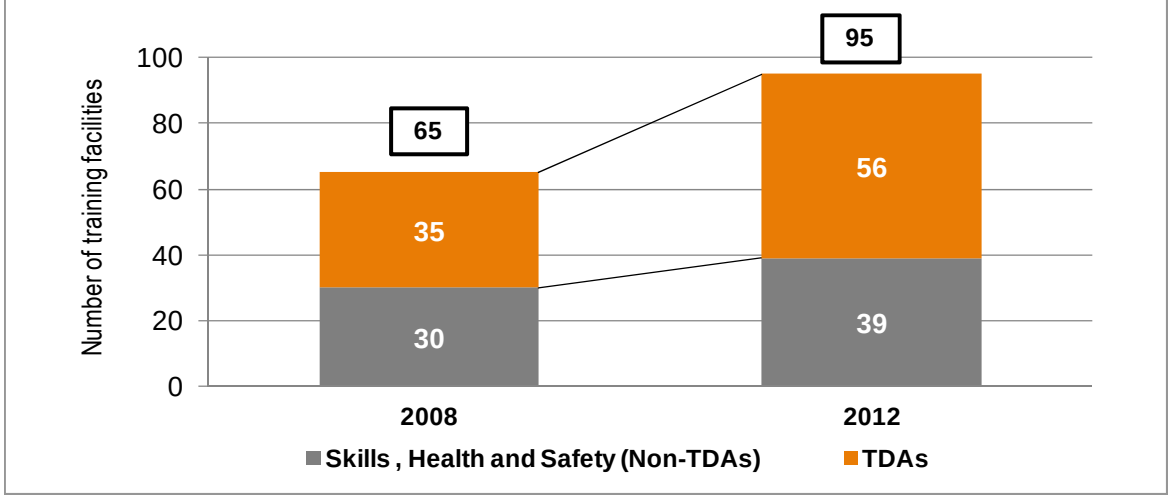
The unionized construction industry plays a leading role through investments in apprenticeship trades training that improve the outcomes for apprentices and uphold the high standard of Ontario's highly skilled and qualified construction workforce.

Through Joint Apprenticeship Training Trusts (labour-management partnerships) and cooperation with government, the unionized construction industry has collectively invested over $260 million dollars in 95 training facilities across the province. This investment makes possible the delivery of 3 million hours of apprenticeship, skills upgrade and health and safety training to youth, apprentices and journeypersons across Ontario each year.

[5] Stoll and Baignee (1977); Sweet and Lin (2000); Gunderson and Krashinsky (2011)

Ontario's union-employer training centres are an integral and growing part of the province's apprenticeship trades training infrastructure. Figure 2 reports the recent growth in training centres. Since 2008 the number of facilities has grown from 65 to 95 (46%). Industry training facilities can be administered by union locals, employer associations or JATTs. Facilities accredited by the Ministry of Training, Colleges and Universities (MTCU) as Training Delivery Agents (TDAs) deliver the formal in-school portion of apprenticeship training, while non-TDA facilities deliver only skills upgrade and health and safety training that supplement apprenticeship curriculum.

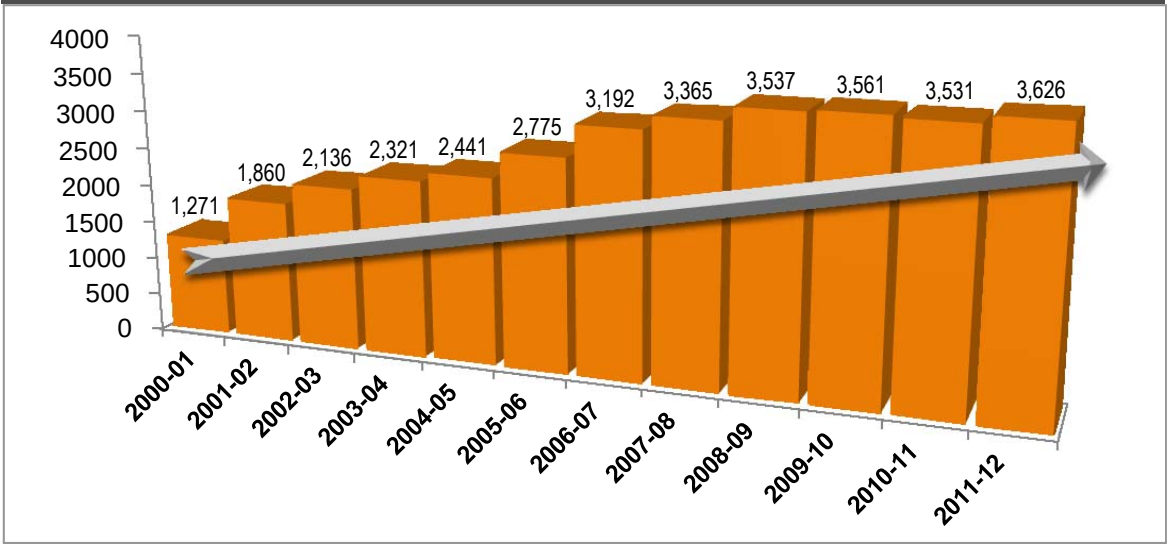
Figure 2: Growth in unionized construction sector training facilities



Source: Prism Economics, OCS

These investments are driven by the 185% gain in apprenticeship enrolment in union/employer training facilities from 2000 to 2012 shown in Figure 3. This rise in enrolments in JATT facilities has increased their share of the total construction apprenticeship program in Ontario.

Figure 3: Apprenticeship enrolment at Ontario union/employer training facilities



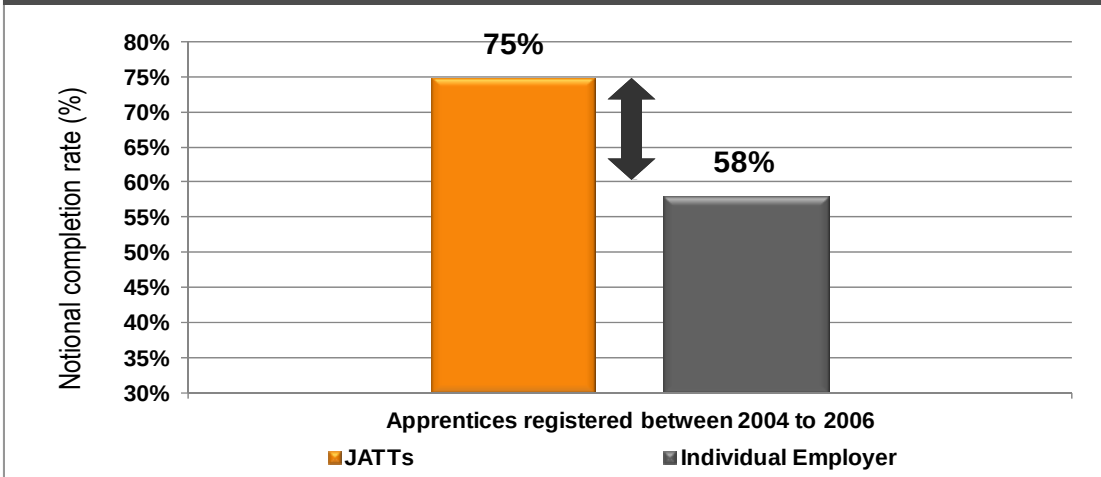
Source: MTCU, Prism Economics

Measuring Success

There has long been anecdotal evidence that the investments and unique practices by JATTs result in higher completion rates for union apprentices. Analysis, done for this study using detailed MTCU apprentice registration and completion data provides initial evidence confirming higher completion rates in the unionized sector.

Figure 4 compares estimates of completion rates for apprentices indentured to Joint Apprenticeship Training Trusts (a proxy for union apprentices) and those indentured to individual employers (proxy for non-union) and shows estimates of union completion rates to be 30% higher than non-union.

Figure 4: Notional completion rates (average duration of 7 years)



* based on four trades: plumber, steamfitter, sheet metal worker worker and electrician (construction and maintenance)

Source: Prism Economics, MTCU

The Union Advantage

The union advantage in achieving higher completion rates stems from the significant investment in facilities and the unique system of supports provided in the delivery of apprenticeship training. Through partnership and commitment to a strong training culture, the JATT system provides resources for screening apprentice candidates, preparing apprentices for their training, and supporting them during the training period. The unionized approach focuses on work experience with multiple employers; providing both a depth and breadth of skills and experience. In some trades, union locals support night school programs to prepare union apprentices for trade school. Many Locals also provide apprentices with refresher training to prepare them for the Certificate of Qualification (C of Q) examination.

Results from OCS research and the National Apprenticeship Survey (NAS)[6] show higher completion rates in the unionized environment can be explained by the experience of apprentices who are;

- more likely to attend the technical in-school portion of apprenticeship training,
- more likely to complete when their work experience is extended beyond the prescribed program duration,
- starting their apprenticeship with higher levels of education
- less likely to change employers to seek better employment opportunities during the course of their apprenticeship, and exposed to work with a larger number of employers.

[6] The National Apprenticeship Survey was conducted by Statistics Canada in 2007

This preliminary research provides an initial understanding of why completion rates are higher among apprentices in the unionized construction industry in Ontario. The evidence of significantly higher rates of completion among union apprentices indentured to JATTs suggests the significant investments made by the industry are paying off.

This evidence points the way to a *new apprenticeship strategy* that can be linked to emerging policy initiatives and achieving higher completion rates. In particular, strategic goals would be achieved by leveraging government investments in training with private funds so that the fiscal impact is minimized. Three objectives of the strategy would be to:

1. Increase the proportion of registered apprentices who complete their program with a Certificate of Qualification,
2. Negotiate Ontario's participation in the Canada Job Grant Program, announced in the Federal Budget, with the objective of increasing completion rates, and
3. Increase apprenticeship and training in related areas like health and safety and supervisory skills through incentives to multiple employer training programs to leverage government initiatives.

These objectives for a new apprenticeship strategy could be met through a number of immediate and long-term policy initiatives.

Immediate Initiatives

1. With the intention of complementing the implementation of the Canada Job Grant program, Ontario could advance plans for:

    a. An Ontario Job Grant initiative that specifically recognizes the success of multi-employer programs by increasing the leverage of employers in the matching grant process. JATTs and multi-employer groups that indenture apprentices should be fully eligible to receive all apprenticeship employment grants. The employers in the Ontario Job Grant who participate in multi-employer apprenticeship programs would have their contribution matched by an additional amount of government funding over and above the basic grant.

    b. A more broadly based use of procurement processes to encourage work for apprentices on all infrastructure projects including provincially funded projects in municipalities, hospitals, universities and colleges. Further, procurement in these provincial projects and in the Affordable Housing Program and the Building Canada plan would be designed to recognize the contribution of multiple employer programs. For example, procurement criteria could be structured to provide added support for bidders who participate in these programs.

    c. Provincial and federal infrastructure initiatives should incorporate apprenticeship targets and completions into the procurement process.

2. Applications for Training Delivery Agency (TDA) status and the allocation of new training seats could be evaluated giving preference to the JATT / multiple employer training providers. Adding more TDA trainers in the JATT system would raise completion rates.

3. Grant programs patterned after the Skills Training Investment Program and the Ontario Skills Training Enhancement Program could be introduced with features and criteria that encourage JATT and multi-employer applicants.

4. Grant programs targeted at employers should be contingent on the apprentice attending the in-school training.

5. Seat funding could be increased for JATT apprentices in recognition of the significant investments these organizations make to their programs and the success that they achieve, and

6. Finally MTCU programs that promote apprenticeship could highlight the advantages of the JATT system; encouraging apprentices to seek out employment in the JATT programs.

Longer term Initiatives

7. Measuring Success

   You can't change what you can't measure. New measures of completion rates must be built up from administrative records and surveys that track the experience of each apprentice from start to completion. Once these individual histories are measured, specific reasons for the success of the JATTs will be clearer -- identifying which practices are making a difference. It will take many years to build up a true database, but there are interim survey methods that can add new, detailed insights sooner.

   The first step is putting in place a survey program with MTCU data that will create more accurate measures of completion rates for trades and will include the experience and role of employers in the process. The outcome of this step will be detailed measures of completion rates by trade and by single and multiple employer systems. Higher completion rates measured for the JATT systems will become new targets for the overall success rate of all apprenticeship programs.

8. Setting Targets for Success

   Findings in this report and in a subsequent round of analysis will identify realistic targets for completion rates for all apprenticeship programs. Current completion rates can be raised by increasing the proportion of apprentices in the JATT programs. For example, if 25% of apprenticeship registrations are now in JATT programs, a target rate of registrations might be set for 30% or 40% in four years. As the new group of JATT apprentices move through the system, the overall completion rates will rise.

As we move forward, the incentives set in place in the immediate steps proposed above could be refined and targeted to support specific trades and populations. This process of setting targets for registrations and completions will need to be established by trade and based on the more accurate measures. As more complete measures are gathered for other trades, through the survey process described above, the targets for JATT registrations and higher completions can be refined. The tracking and survey systems proposed above will create a more complete understanding and measurement of successful completions. Findings will highlight the trade-specific potential for a multi-employer model as well as identifying the attributes of the multi-employer systems that drive higher completions.

Findings reported in this report anticipate some of the features that contribute to higher completions. With the appropriate evidence we will be able to confirm the impact of more rigorous screening, mentoring, financial support, night school and exam preparation courses. This more complete picture of which features work best for individual trades can guide targeted incentives.

INTRODUCTION AND BACKGROUND

The Ontario Construction Secretariat has a mandate to provide research on construction labour markets and to guide union, employer, government and industry initiatives to build a strong skilled workforce that meets the needs of the economy. This is a significant challenge. Growth in construction employment has been leading other industries for over fifteen years and unions and employers have worked together to expand the training and certification to keep pace. This report documents the investments and the best practices that have emerged.

The construction industry is not alone in its need to expand the skilled workforce. Industry and government plans to promote economic development through innovation and rising productivity often focus on the availability of skilled trades as a critical enabling factor.

Construction is among the largest employers of skilled trades and their experience in developing industry led training programs to maintain and grow a highly skilled workforce has much to offer. Labour market and human resource policies addressing these issues focus on apprenticeship. Apprenticeship programs are the most important source of skilled trades and the construction trades represent the largest single group of apprentices.

Government and industry are focused on building the skilled trades workforce. The Ontario Government, in the 2012 Budget, takes up this topic *"Ontario's apprenticeship system is a key part of building the well-educated and highly skilled workforce the Province needs to compete in the current and future economy."*

With so much interest and investment, there is a high expectation of success and success must be measured by the number of apprentices who complete their training and earn a Certificate of Qualification as a journeyperson. Recognizing completions as defining success gets to the heart of current efforts to improve apprenticeship. The 2012 Ontario Budget points to the challenge; *"Studies have found that completion rates average about **50 percent among Ontario apprentices**. The strength of the apprenticeship system needs to be measured both by: the proportion of apprentices who complete and, the growth of the number of new registrations."*

Independent views offered by industry reach the same conclusion. The Jobs and Prosperity Council, a group of senior industry and labour advisors recently highlighted the role of apprenticeship in building the skilled trades workforce in "Advantage Ontario".[7] Picking up on the current concern about success in the programs, the report observes *"few young Ontarians pursue the skilled trades as a career; only half of those that select apprenticeship will actually complete the training and receive a certificate of qualification."*

The OCS has years of experience working with and preparing research on construction training programs and offers new insights into these discussions. The OCS has prepared this comprehensive assessment of the state of construction apprenticeship in Ontario. Research presented here is intended to add to stakeholder understanding of apprenticeship issues, successes and challenges. Insights gathered here will assist government policy makers in making better decisions with respect to key features and characteristics of apprenticeship training.

[7] See Jobs and Prosperity Council "Advantage Ontario" Page 16.

This report is divided into six parts with this introduction followed by a review of the current situation. Part three covers the structure of the training and certification system. Part four reviews the distinct contribution of union/employer training centers in Ontario's construction industry and part five reports new data on higher completion rates in these union/employer training programs. The final section proposes a new apprenticeship strategy and recommends a number of policy considerations.

CURRENT STATE OF APPRENTICESHIP IN ONTARIO'S CONSTRUCTION INDUSTRY

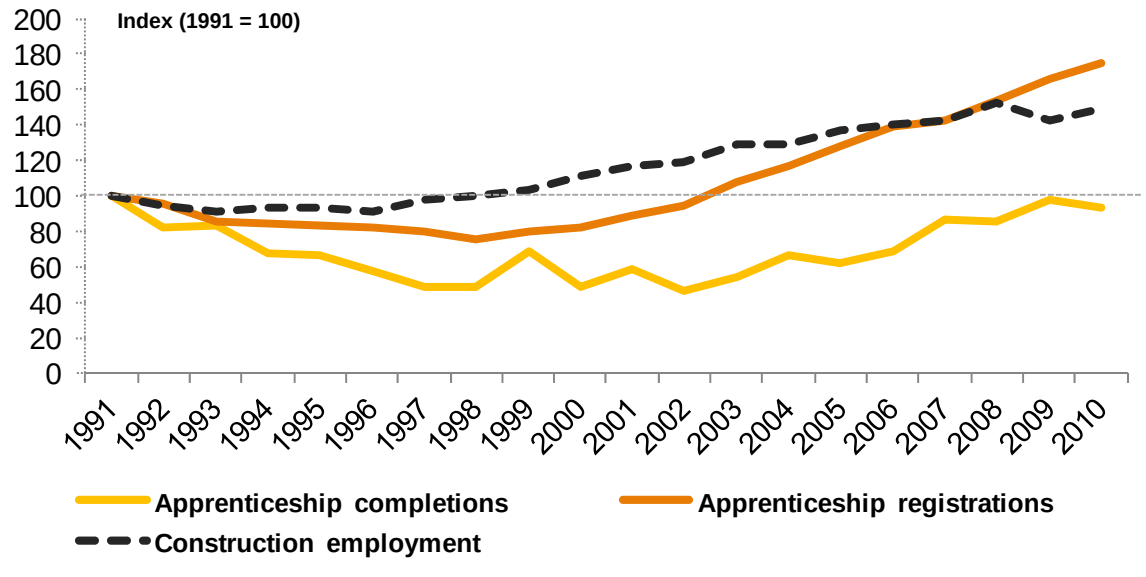
This section explores the current state of apprenticeship in Ontario's construction industry through the lens of registrations, completions and key demographic characteristics of construction apprentices. These findings have important implications in terms of designing programs to ensure success as well as marketing construction apprenticeship programs to potential apprentices. The impact of regulatory factors including compulsory and non-compulsory certification is examined.

Trends in Apprenticeship Registrations and Completions

By 2002, strong construction employment growth had reversed the losses of the 'building bust' of the early 1990s. Propelled by a strong expansion in construction activity, employment rose from a low of 262,000 in 1996, to 428,000 in 2010. This represents a 63% increase, or an average annual increase of 5%. This rapid growth caused some shortages for qualified construction workers in various segments and regions of the province. Figure 5 tracks the combined response of industry and government to increasing demand for skilled workers and growth in Ontario's apprenticeship system.

The growing need for well trained, qualified workers to meet expansion requirements revived demand for apprenticeship training and sparked a resurgence in registrations which had declined by about 25% through the early 1990s. By 2003 the number of registered apprentices surpassed 1991 levels; rising by 80% to a record high by 2009.

Figure 5: Index of construction apprenticeship and employment in Ontario



Source: Statistics Canada, RAIS, CANSIM

However, as evidenced by Figure 5, completions have not kept pace. In fact, while construction employment began to recover as early as 1997, the number of apprentices completing programs continued to decline until 2002. By the early 2000s the number of apprentices completing construction programs was less than half (46%) the number of completers at the beginning of the 1990s. Completions only began to rise in 2003 - corresponding with the rise of registrations in the four years prior. As of 2010, the number of apprentices completing construction programs was still below the number of completions twenty years prior.

The delayed response is related in part to the length of time it takes apprentices to complete their training as well as a number of labour market dynamics.

Contributing factors to delayed labour supply response

- During construction downturns the number of apprentices can fall quickly, as contractors lay-off workers due to lack of work, and individuals are less likely to register as new apprentices
- During periods of expansion in construction activity, a rise in apprenticeship registrations can lag an increase in employment requirements by a few years as experienced, unemployed workers are re-hired.
- In-school apprenticeship training capacity takes time to adjust. A set number of 'training seats' are funded and allocated by MTCU across colleges and private training delivery agents (TDAs)
- Given the length of time it takes to complete a construction apprenticeship program, it may take close to a decade from an initial rise in construction activity before newly trained and certified workers begin to enter the supply pool.

Recent history offers important lessons to governments and training providers on how to manage the construction labour force.

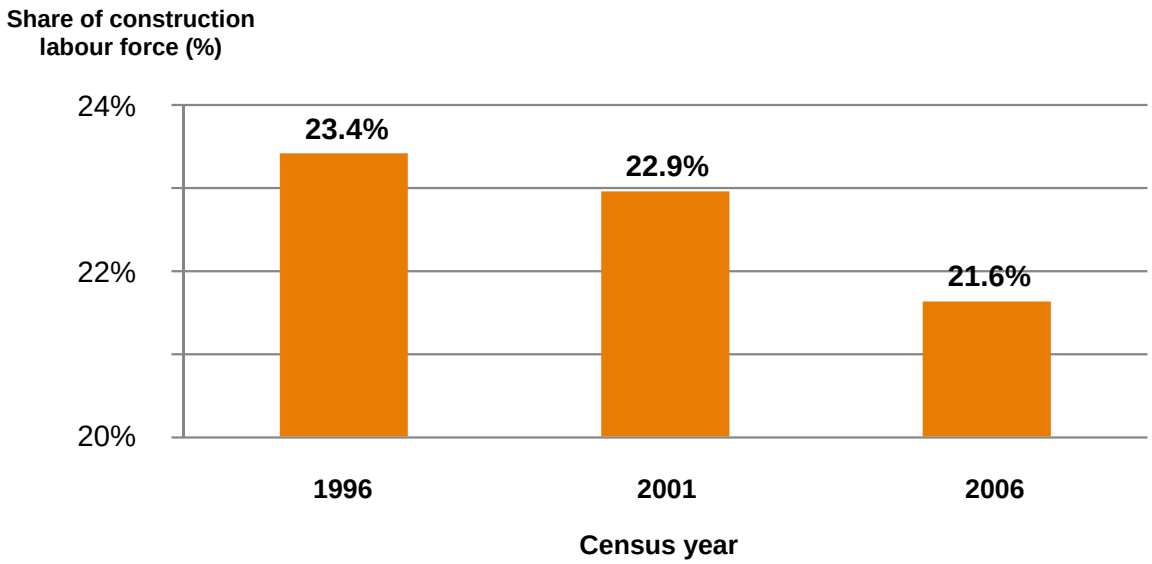
The significant lag in construction completions restricts the supply of qualified trades men and women and dilutes the breadth and depth of skills in the workforce. Research has shown that employment opportunities for workers who fail to complete apprenticeship programs are more limited compared to certified journeypersons.[8] Fewer certified workers in the labour force can impede workforce mobility and exacerbate labour market shortages during peaks in construction activity.

A comparison of 1996, 2001 and 2006 census data show evidence that fewer construction apprenticeship completions reduced the share of certified workers in the construction workforce. Figure 6 shows the share of the construction labour force with apprenticeship or trades certificate diploma as the highest level of education.[9] A decline in the share of workers in the construction labour force with a trade certificate is to be expected given the prolonged period of growing employment and stagnant completions. The failure of completions to match the pace of employment growth means a smaller share of the construction workforce is reaping the compensation and mobility rewards of associated with trade certification. Fewer fully qualified journeypersons will also limit the identifiable pool of skilled workers available for employers.

8 Stoll and Baignee (1977)

9 Part of this decline may also be related to a rising share of the workforce with higher levels of educational attainment such as College and University. Census data do not indicate what share of the workforce holds both a CofQ and college or university degree.

Figure 6: Share of construction labour force with a trade certificate

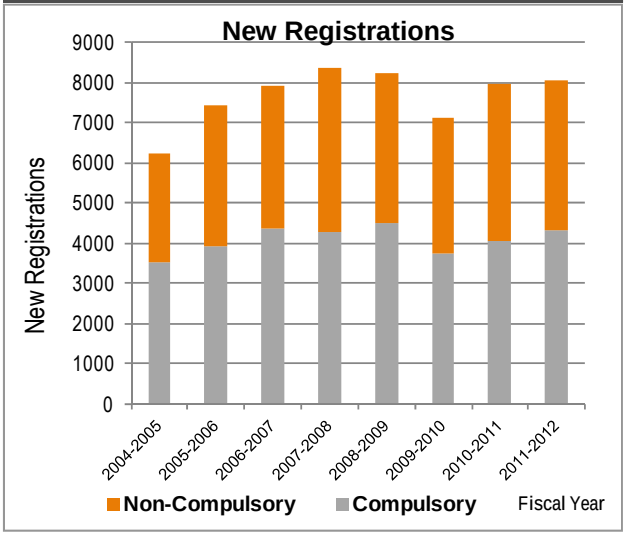


Source: Statistics Canada, 1996, 2001 and 2006 Census

Recent MTCU data shows a continued rise in both new registrations and completions with a modest gain of completions relative to registrations. As can be seen from Figure 7, new registrations in both compulsory and non-compulsory construction apprenticeship programs climbed steadily over the five year period 2004 - 2008 and then retreated in 2009/10 with the onset of the recession.

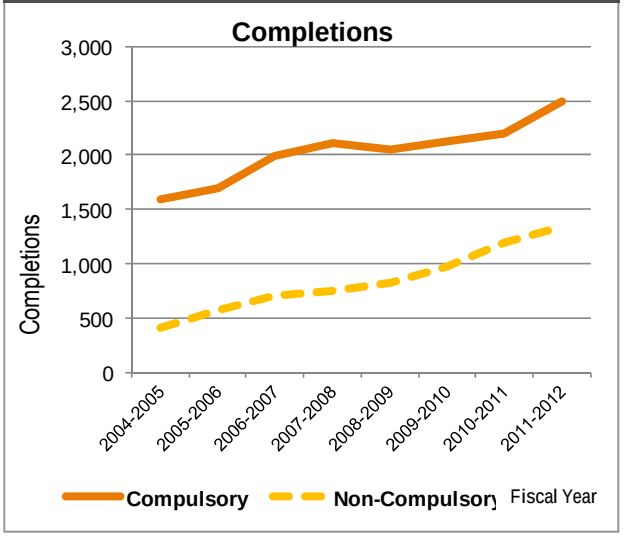
Figure 8 shows growth in the total number of completions in construction apprenticeship programs over the same time period for both compulsory and non-compulsory programs. However, the peak in completions occurs in 2011/12, lagging the peak in registrations by about 4 to 5 years. This reflects the (average) four year duration of most apprenticeship programs.

Figure 7: Total number of new registrations construction apprenticeship, Ontario



Source: MTCU, Prism Economics

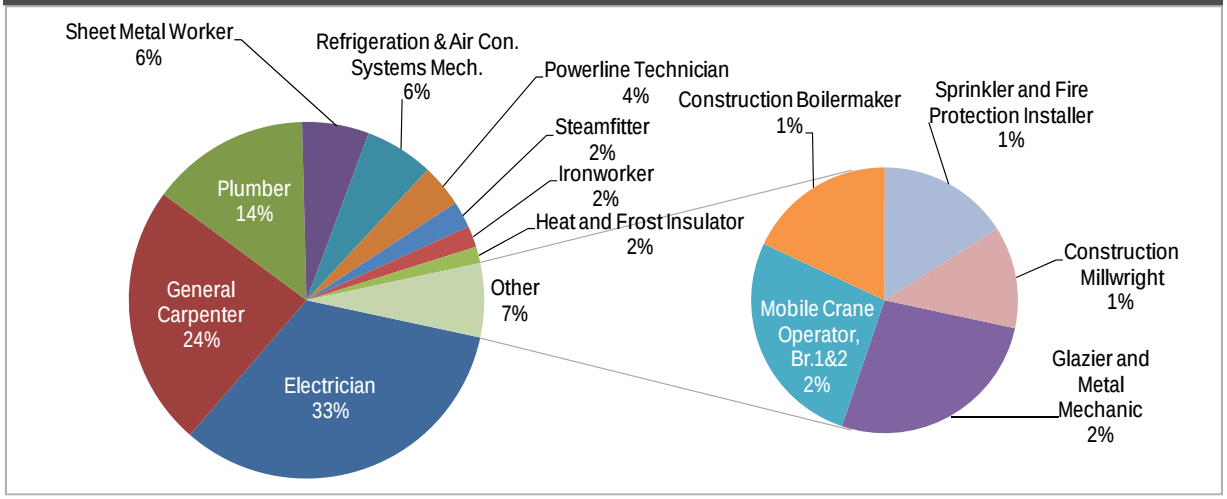
Figure 8: Total number of completions construction apprenticeship, Ontario



Source: MTCU, Prism Economics

MTCU data also provides some insights into trends for individual trades. There are 43 apprenticeable construction trades in Ontario; however the majority of apprentices are concentrated in only a handful of compulsory certified trades. Figure 9 below shows the average distribution of total new registrations between 2008 and 2011 by trade. Over this period new registrants in the five largest trades: Electrician, Carpenter, Plumber, Sheet Metal Worker and Refrigeration and Air Conditioning Mechanic accounted for 83% of total new registrations.

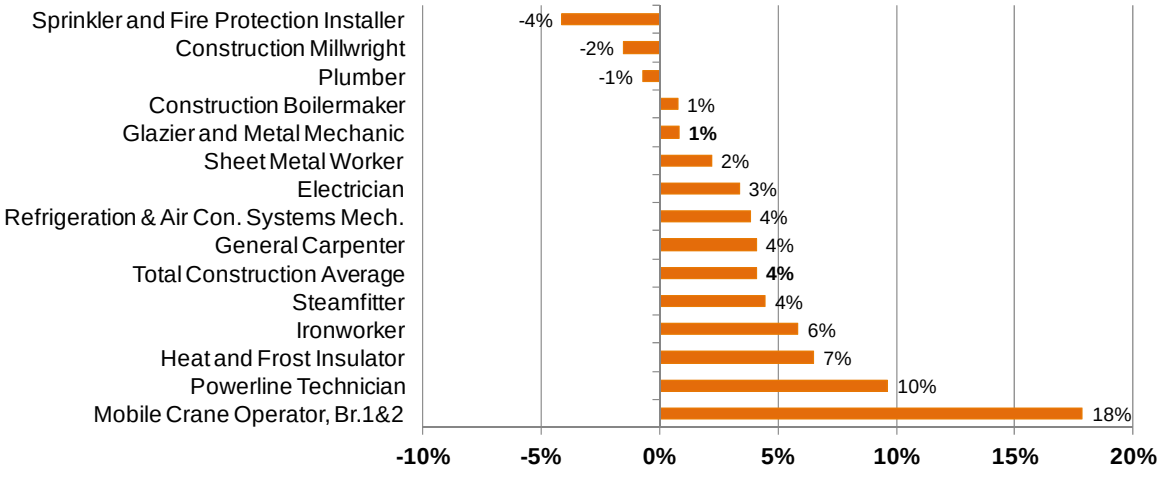
Figure 9: Average distribution of new registrations, 2008/09 - 2011/12



Source: MTCU, Prism Economics

This distribution of registrations may very well change over the remainder of the decade. The 2009 recession caused the number of new registrations to recede from their peak in 2008. In 2012, several trades showed a marked drop in the number of new registrations. Despite the economic slowdown, registrations have continued to grow at a rapid pace in many of the smaller and more recently established trades. Figure 10 exhibits the strong growth in registrations for Powerline Technicians and Mobile Crane Operators. Registration in both programs grew in excess of 10% per year since 2004.

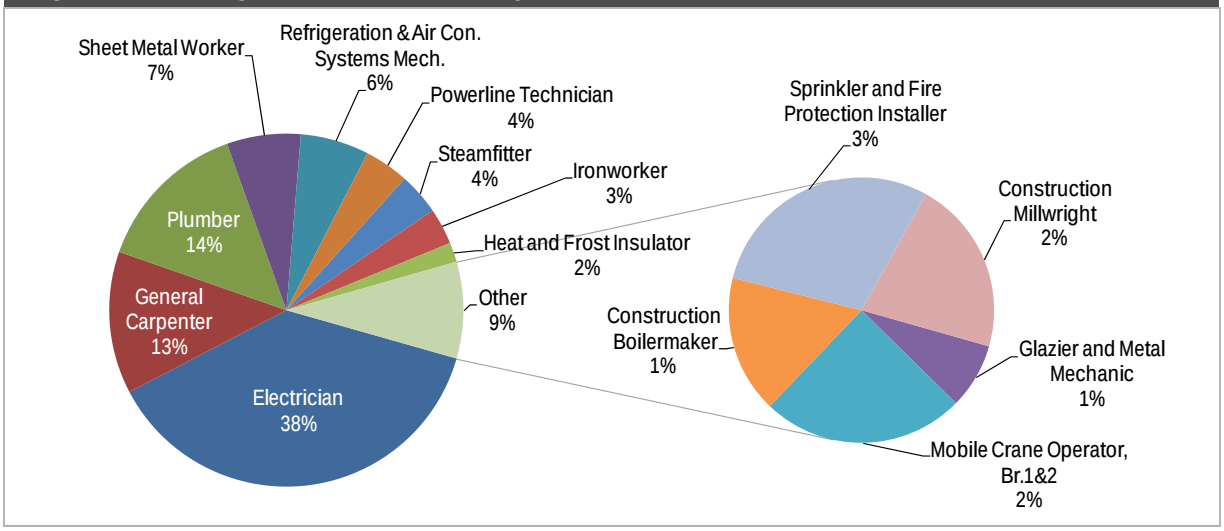
Figure 10: Average annual growth in new registrations, 2004/05 and 2011/12



Source: MTCU, Prism Economics

The explosive rise in new apprenticeship registrations in the early 2000s has helped sustain a steady rise in completions in recent years. As would be expected, the overwhelming majority (78%) of apprenticeship completions are also concentrated in the five trades with highest average registrations. Figure 11 shows the average distribution of total program completions, by construction trade between 2008/09 to 2011/12.

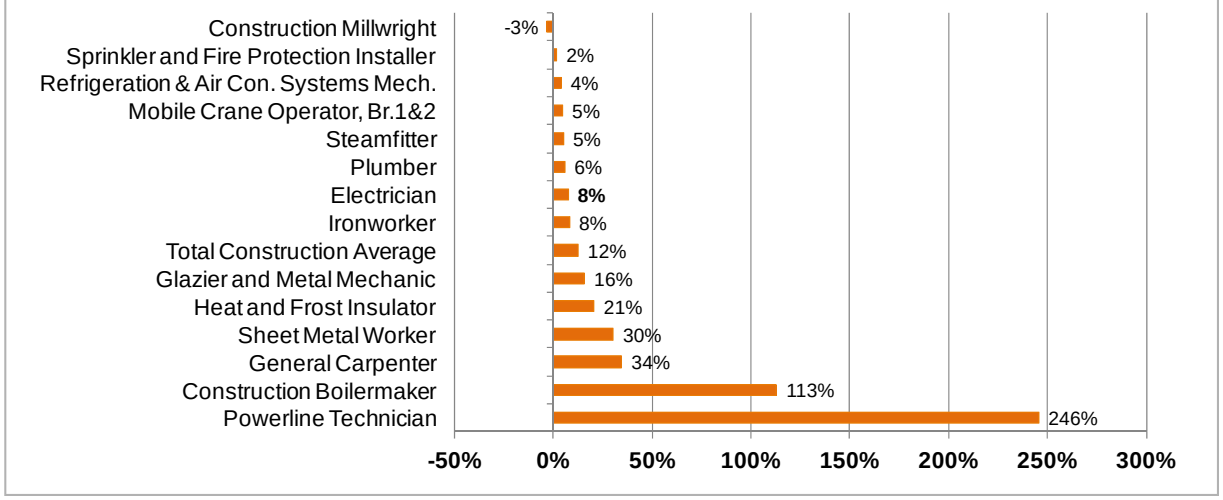
Figure 11: Average distribution of completions, 2008/09 - 2011/12



Source: MTCU, Prism Economics

Powerline Technicians and Construction Boilermakers experienced the strongest increase in completions. The Powerline Technician trade is a relatively new and growth in registrations and completions reflects the significant investments made in Ontario's electricity infrastructure over the past several years. Completions also rose sharply for Carpenters and Sheet Metal Workers, increasing by 34% and 30% respectively. The unionized sector has most likely contributed to this increase in completions as they have made significant investments in training facilities for both these trades in recent years.

Figure 12: Average distribution on completions, 2004/05 - 2011/12



Source: MTCU, Prism Economics

Demographic Profile of Apprentices

The demographic profile of apprentices provides important insights for governments and apprenticeship stakeholders interested in shaping policy to better support apprentices and increase their likelihood of success.

According to the 2010 Registered Apprentice Information System (RAIS) data, the typical construction apprentice in Ontario is a 29 year old, white male with a high school education.[10] Females make up only 2% of registered construction apprentices. This underrepresentation of women is unique to construction trades (see Table 1) as the share of women in apprenticeship programs outside of construction trades approaches 40%.[11]

Table 1: Gender representation of apprentices registered in major construction trade apprenticeship programs

Construction Trade	(% share of total) Males	Females
Carpenters	97.5%	2.5%
Electricians	97.9%	2.1%
Exterior finishing	98.7%	1.3%
Heavy duty equipment mechanics	98.4%	1.6%
Heavy equipment and crane operators	98.0%	2.0%
Interior finishing	96.5%	3.5%
Millwrights	97.9%	2.1%
Plumbers, pipefitters and steamfitters	98.9%	1.1%
Refrigeration and air conditioning mechanics	99.3%	0.7%
Sheet metal workers	98.3%	1.7%
Welders	95.0%	5.0%
Total	98.0%	2.0%

Table 2: Age distribution apprentices registered in major construction trade apprenticeship programs

Age Group	Age Distribution
Under 20 years	7%
20 to 24 years	31%
25 to 29 years	25%
30 to 34 years	15%
35 to 39 years	9%
40 to 44 years	6%
45 to 49 years	4%
50 years and over	3%

Source: Table 477-0053 RAIS, by age groups, sex and major trade groups, 2010

RAIS data also shows that close to two-thirds (62%) of apprentices are above the age of 25. Today's average apprentice is no longer a recent high school graduate. Rather he is transitioning to a new career path after working for a number of years and/or attending traditional post-secondary school. This older age profile contradicts with commonly held view that apprenticeship is a transition from 'school-to-work'.

Findings from the 2007 National Apprenticeship Survey (NAS) suggest that apprenticeship is best understood as a second career path for young independent adults. Understood in this way, apprenticeships in Canada "provide an avenue of re-entry into the training systems"[12] and often a "second-chance" for some who have dropped out of academic streams.

[10] Registered Apprentice Information System (RAIS)

[11] Registered Apprentice Information System (RAIS)

[12] O' Grady 1997, p.1

Key apprenticeship profile findings from the NAS include:

- 50% of male apprentices reported having three jobs before they entered an apprenticeship;
- 50% apprentices were not aware of apprenticeships when they were in high school; and
- 40% of male apprentices have children

This is in contrast to countries like Germany where the average starting age of an apprentice is 18 and there is a seamless transition from school to work. As most German apprentices live at home they can afford to live on the low apprenticeship wage.[13]

Construction trades continue to be brushed with a negative perception. Results from the NAS revealed that many people still viewed construction trade apprenticeships as a career path for students with lower aptitudes or appetites for scholarship and traditional forms of post-secondary education. However, the data does not support this perception. According to the survey, over a third (36%) of apprentices have attended or completed some form of post-secondary education.

Table 3: Highest level of education attained prior to start of apprenticeship

Highest Level of Education	% share of total
Some high school	11%
Completed high school	52%
Some training in other or same trade/pre-employment/course related to trade	1%
Some college, CÉGEP, institute of technology or nursing school	14%
Completed college, CÉGEP, institute of technology or nursing school	16%
Some university	3%
University certificate, diploma or degree	3%

Source: National Apprenticeship Survey, 2007

These findings suggest that strategies aimed at increasing completion rates and attracting individuals to the skilled trades should keep their sights set on transitioning, older workers as well as young workers transitioning from school. In addition to the important efforts to market apprenticeship to youth, demographics suggest that policy makers should also target and provide supports for workers wishing to transition from other occupations later in life. Programs that target older workers might screen these candidates differently and recognize their prior work experience and maturity.

[13] Sharpe and Gibson 2005, p.27

DELIVERY OF APPRENTICESHIP TRAINING IN ONTARIO - ROLES AND PARTNERS

Acts and Regulations

Ontario's modern apprenticeship system began to take shape in the late 1920s. Led by Joseph Piggott, the Building Trades addressed shortfalls in the training of workers and advocated the passing of Ontario's first Apprenticeship Act in 1928. The Act provided for the regulation and support of apprenticeship. This first Act only applied to minors between the ages of 16 and 21, but aimed to increase the level of training of Ontario workers by legislating training requirements and working conditions.

The Apprenticeship System was re-examined in 1962, when the Ontario Legislature appointed a Select Committee on Manpower Training. The Committee's work led to the replacement of the *Apprenticeship Act* with the *Apprenticeship and Tradesmen's Qualification Act* (ATQA) in 1964. The new Act introduced the concept of compulsory trades to the apprenticeship system. In succeeding years, the Act was amended to allow for exemptions in the industrial sector, removing the requirement for compulsory certification in the manufacturing environment.

The late 1960s and early 1970s saw the introduction of the system of Colleges and Applied Arts and Technology in Ontario and the expansion of apprenticeship training beyond construction to the industrial and manufacturing sectors. The regulatory framework for apprenticeship remained essentially unchanged until the late 1990s when the ATQA was renamed the *Trades Qualifications and Apprenticeship Act (TQAA).*

The *Trades Qualifications and Apprenticeship Act* provided a regulatory framework for 35 construction trades of which 11 were designated as "Compulsory Certified Trades". Compulsory trades required an individual to hold a Certificate of Qualification or to be a registered apprentice to work in that trade. The TQAA contained trade-specific regulations outlining almost every aspect of the apprenticeship program and defining the specific skills, tasks and scope of work associated with each trade. These regulations were intended to protect the apprentice from exploitation, while preserving the integrity of the learning experience.

In 1998, the concept of skills sets was introduced to the apprenticeship system with the *Apprenticeship and Certification Act, 1998* (ACA). The ACA governed the remaining 8 construction trades, as well as the service, industrial and motive power trades. This competency-based model differed from the time-based model of the *TQAA*.

Features of the Competency-Based Model:

- apprenticeship contract is called a Training Agreement
- sponsor refers to the trainer, who may or may not be the apprentice's employer
- minimum age of 16
- academic and training standards prescribed by affiliated Industry Committees
- grade 12 minimum if no standard is prescribed

In 2009, the *Ontario College of Trades and Apprenticeship Act* (OCTAA) was enacted. This new Act replaces the two previous pieces of legislation that set out the regulatory framework for the trades in

Ontario – the *Trades Qualification and Apprenticeship Act* (TQAA) and the *Apprenticeship and Certification Act* (ACA). OCTAA and regulations made under OCTAA now set out the legislative and regulatory framework for the trades in Ontario. The College is currently consulting stakeholders to develop standardized regulations on apprenticeship programs. In the meantime, the TQAA regulations on wage rates, ratios and training hours continue in until such time as they may be revised or repealed by regulations under OCTAA.

Evolution of Apprenticeship Regulation

1928 The *Apprenticeship Act* enacted

1962 Select Committee on Manpower Training (Simonett Committee)

1963 Compulsory Certification recommended by Simonett Committee

1964 *Apprenticeship and Tradesmen's Qualification Act* (ATQU) replaces *Apprenticeship Act*

1965 Ontario Colleges of Applied Arts and Technology (CAATs) created

1990 ATQU was renamed the *Trades Qualification and Apprenticeship Act* (TQAA)

1998 The *Apprenticeship and Certification Act* (ACA) receives Royal Assent

2000 *Apprenticeship and Certification Act*, *Restricted Skill Set Regulation* comes into force.

2007 Compulsory Certification Review Announced

2009 The *Ontario College of Trades and Apprenticeship Act, 2009* (OCTAA) enacted

Today, Ontario's apprenticeship system is the primary resource for maintaining an adequate supply of well-skilled, well-trained construction tradesmen and women. In 2012, there were over 60,000 active construction trade apprentices in the province, of which 15,565 were enrolled in the in-class portion of apprenticeship training at a community college or accredited union/employer training centre.

An apprenticeship is a job that has an "in-class" training component as well as an "on-the-job" component. The mandatory on-the-job training component makes up 90% of the total of 5,700 to 9,000 hours of training required for most construction trade apprenticeship programs. On-the-job training is designed to pass practical, hands-on skills and knowledge from a journeyperson to an apprentice.

The in-school training portion of the apprenticeship is delivered off the job site by a MTCU approved Training Delivery Agent (TDA). TDAs are certified by the MTCU and may be either a community college or a private training centre that has been contracted by MTCU.

The Apprentice

Ontario's construction trades apprenticeship system is supported by a number of key construction industry stakeholders. Unions, employers, colleges, government and various supporting apprenticeship organizations all play integral roles in the delivery of high quality apprenticeship training throughout the province. The most important stakeholders are the apprentices who invest in tuition, tools and equipment and time to learn the skills of the trade.

Apprentices face many barriers to entering and completing apprenticeship programs. Some barriers identified in past research and through the National Apprenticeship Survey include:

- opportunity costs & foregone wages during the in-school period,
- wages set too low - especially in the first and second year,
- length of time to complete (especially for older persons with a family, as is common for apprentices in Canada)
- risks of cyclical employment and job loss,
- low social status sometimes associated with apprenticeship,
- system complexity,
- lack of information on duration and rewards, and
- career path not clearly defined

Set against these barriers are also a number of advantages:

- having a job while training,
- access to on-the-job training with skilled journeypersons,
- good wages,
- career prospects, and
- family or peer group encouragement and past success.

Employers

It is the responsibility of the employer/sponsor to deliver the on-the-job training component of the apprenticeship while adhering to the regulations and standards set out in the TQAA. In addition, the employer bears the on-the-job training costs of apprenticeship, including the wages and benefits paid to the apprentice and the additional opportunity costs associated with journeyperson time spent training.

Various research studies have identified key factors that encourage employers to take on a registered apprentice. Key advantages from the employer's perspective include:

- Employers value the reputation they gain by being recognized as a learning organization with a defined training culture and commitment to their employees. This culture helps to facilitate employee recruitment, retention and commitment.
- Both the apprentice and the employer have an opportunity to evaluate each other to see if there is a good match.
- Journeyperson credentials provide assurance to all employers that a prospective trades person has received a certain quantity and quality training.
- Training journeypersons bring a breadth of key skills and experience that allow employers to quickly adjust their labour requirements in response to cyclical peaks and labour shortages.

However, employers have also identified a number of barriers that may generate reluctance in signing an apprenticeship agreement.

- The time to completion is long; apprenticeship is not effective in alleviating immediate shortages
- Poaching by competitors eliminates the employer's investment in the apprentice.
- Employers may perceive that training costs outweigh the benefits
- In-school training cycle may interfere with the employer's work schedule especially if the in-school portion comes during peak demand thereby generating a shortage of workers.

The cost-benefit analysis of apprenticeship is a frequent concern for the employer. According to a Canadian Apprenticeship Forum (CAF) study on the return on training investment to employers, the average total cost to an employer of a construction trade apprentice over the span of a four year program was $227,382. However, the study's findings also concluded that the total benefit of apprenticeship training outweighs the cost, with an average net return close to $66,000, or about $1.30 benefit for every $1 dollar invested.[14] The study found that the advantages to individual employers were highest when shared among a group of employers who, together, employ an apprentice across the entire program.

Joint Apprenticeship Training Trusts

In the unionized sector apprentices are frequently indentured to a joint labour-management apprenticeship training trust (JATT) which has direct responsibility for the apprentice's progress.[15] The JATT encompasses three central roles of apprenticeship:

- Employer
- Training Provider
- Apprenticeship Administrator

Approaching apprenticeship through each of these roles creates an environment where the apprentice has the best opportunity for success. The JATT is able to develop an all-encompassing program for the apprentice. Unions and their employers, through the collective agreement, have a direct role in defining working conditions as well as providing mentoring opportunities on-the-job and during training.

A significant number of JATTs also run independent training centres delivering the in-school portion of apprenticeship training to union and non-union apprentices. These facilities are primarily funded through unionized sector joint labour and management training trust funds.

Previous research and literature provide evidence that JATTs can have an especially positive influence on outcomes for apprentices in the construction sector. Based on US data, Cihan Billingsoy at the University of Utah documents that completion rates in construction are about twice as high in programs that are jointly sponsored by unions and employers compared to those sponsored only by employers.[16]

Provincial Government

The Ontario government, through the Ministry of Training Colleges and Universities (MTCU), is the administrative hub of Ontario's apprenticeship system. In addition to its custodial role over the Acts

[14] CAF-FCA Return on Training Investment for Employers.

[15] A 2012 survey of Ontario union construction locals revealed 85% of Locals reported most or all of their apprentices were indentured to Joint Labour - Management Apprenticeship Training Committees.

[16] Cihan Billingsoy, "Delivering Skills; Apprenticeship Program Sponsorship and Transition from Training" See Industrial Relations Vol. 64, Number 4 (October 2007)

which govern apprenticeship, the Ministry is also the administrator and the primary funder of the system. The provincial government also supports apprentices and the apprenticeship system through a wide array of entrance programs and funding instruments aimed to encourage greater participation.

Although the administration of apprenticeship and the funding for apprenticeship training remains with the Ministry of Training, Colleges and Universities, the new College of Trades is responsible for the regulation of individual trade standards.

MTCU funds the in-class training portion of apprenticeship through the purchase of 'seats' at training providers certified by MTCU as designated Training Delivery Agents (TDAs). In 2011-12, MTCU funded a total of 15,565 in-school construction apprenticeship seats at a cost of approximately $32.8 million.[17]

Colleges of Applied Arts and Technology

Ontario's Colleges of Applied Arts and Technology (CAAT), created in 1965, play an important role in the delivery of apprenticeship training in Ontario. Most colleges run a variety of programs that focus on the technology and service sectors. Of the 24 colleges in Ontario, 21 offer apprenticeship programs in construction trades. A list of colleges and construction apprenticeship programs is detailed in the Appendix.

The colleges are funded by the provincial government and have received significant public funds to build the infrastructure and programs to provide skills training.

The Ontario College of Trades

The College of Trades (COT) became operational in 2012 and will become fully operational in a regulatory capacity in 2013. The goal of the College of Trades is to encourage more people to work in the trades and to give industry a greater role in governance, certification and training. The College of Trades is a unique institution that will be a self-regulating professional body for the skilled trades. It will assume responsibility for many of the powers over the trades and apprenticeship that were previously exercised by the provincial government through MTCU.

The College of Trades was established in 2009 thorough the *Ontario College of Trades and Apprenticeship Act, 2009* as a result of consultations with the trades stakeholders and two reports concerning the governance of the trades in Ontario. The Armstrong Report (2008) provided recommendations on the governance of compulsory certification of trades in Ontario and recommended a framework for dealing with applications for compulsory trade status. One of the key recommendations of this report was the establishment of a College of Trades. The Whitaker Report (2009) made recommendations on the implementation of the Ontario College of Trades and its governance structure, scope and mandate.

The College of Trades has the mandate and powers to regulate all approved trades in Ontario and will fulfill similar functions as other self-governing professional regulatory bodies including:

- Issuing licences and certificates of membership
- Protecting the public interest through investigation and discipline mechanisms
- Setting standards for training and certification
- Conducting research and collecting data to support future apprenticeship and certification policies
- Removing barriers and increasing access for internationally trained workers

[17] Estimate assumes average seat cost of $2,110

The scope of practice for the 43 construction trades is provided in regulations associated with the Act (Ontario Regulation 275/11).

The College of Trades is presided over by a 21 member Board of Governors that manages and administers the affairs of the College. The Board is comprised of four members from each of the construction, motive power, industrial and service sectors, with two members selected as employee representatives and two selected as employer representatives. Four board members represent the public and one member represents the Colleges of Applied Arts and Technology.

Four Divisional Boards (each representing the construction, motive power, industrial and service sectors) advise the Board of Governors on issues related to trades within their respective sectors. Each Divisional Board comprises four members selected from their sector, two of whom are employee representatives, two are employer representatives, and is chaired by a member of the Board of Governors from the sector.

In turn, Trade Boards advise the Divisional Boards on sector issues related to a trade or group of trades. Each Trade Board is constituted of equal numbers of members selected as employee and employer representatives from the relevant group of trades. Currently, 28 Trade Boards represent the construction trades.

The Trade Boards replace the Provincial Advisory Committees (PAC) and are an integral component for the functioning of the apprenticeship system and its ability to react to industry requirements. Prior to the implementation of the College of Trades, PACs were appointed by the Minister of Training, Colleges and Universities to advise the Minister on matters related to the establishment and operation of apprenticeship training programs and trades certifications regulated under the TQAA. The Trade Boards now fulfill a similar function, however, they advise the Divisional Boards and through them the Board of Governors of the College of Trades.

In addition to Trade Boards, Local and Joint (labour and management) Apprenticeship Committees (LACs/JAC's) provide guidance on specific local area needs or concerns. LACs are instrumental in the creation and promotion of local apprenticeship training opportunities and facilitate access to training opportunities for both apprentices and their employers.

ROLE OF THE UNIONIZED CONSTRUCTION INDUSTRY

Historical Role

The tradition of apprenticeship, as a form of education has existed in one form or another for thousands of years. Variations on the apprenticeship model can be traced back to Western Europe during the middle ages, when craftsmen began organizing themselves into associations or guilds based on their trades. The guild system, named for gold deposits of common funds, was the equivalent of modern day business associations and functioned to influence labour, production and trade, and to maintain control over the trade secrets of traditionally imparted technology. The guilds passed on craft traditions and knowledge through a hierarchy based on lifelong progression from apprentice to journeyman to master. In this system master craftsmen, along with representation of town authorities, administered all aspects of the guild activity including regulations surrounding the long schooling process of apprenticeship. The apprenticeship began with the establishment of a binding contract of rights and obligations between an apprentice, who agreed to obey the master and work on his behalf and the master, who agreed to reveal the secrets of the trade and provide sustenance to the apprentice, usually in the form of food, shelter and in some cases a small salary. Like today, the apprenticeship period would last years, with guilds setting the standardized periods and standards for training.

Once the apprentice had mastered all the craft's techniques and gained the trust of the guild's masters and craftsmen, he could rise to the level of journeyman. The title 'journeyman' derives from the French words for 'day' (jour and journée) and translates to "day labourer." Once the apprentice was granted the rank of journeyman and was given documents (letters or certificates from his master and/or the guild itself), he was allowed to travel and work for masters in other jurisdictions. These 'journeys' allowed the journeyman to gain a wider scope of experience and also acted to spread new techniques and methods throughout Europe.

The traditional guild system also played an important social function; supporting infirm or elderly members, as well as widows and orphans of guild members, funeral benefits, and a 'tramping' allowance for those needing to travel to find work. However, as the laissez-faire free market system gained popularity in Europe, guilds began to be perceived as a hindrance to the free market and technological innovation, and grew unpopular politically and witnessed a decline in the early 19th century.

Toward the end of the 19th century with the advent of steel frame skyscrapers and the shift to skeleton construction, the role of apprenticeship became instrumental within the construction trades. Subsequent innovations required by the towering buildings, such as high-speed elevators, electric motors, and steam-heating systems, launched a revolution in building construction, and put an emphasis on the need to develop new sets of skills required to build them. New technologies, materials and building techniques required rapid and widespread training of new skills and the establishment of new trades.

Training was enhanced by experienced union apprentices who used their journals to publish expert discussions of technical matters. This information was passed on to new members, who were then expected to pass technical exams. The early efforts to control entrance to the trades and enforce rigorous training requirements paid off. Through their ability to train and supply well skilled tradesmen, the building trades unions established their central role in the modern era of construction.

To meet the complex training requirements associated with modern construction, unions have invested heavily in the development of North American-wide training infrastructure to meet the skills and safety training requirements of dozens of specialized construction trades.

Commitment to Funding

Investments in training by the unionized construction industry are primarily funded through hourly-based financial contributions from both employer and union members to training trusts and local education funds. Contributions are defined in each trade's negotiated collective agreements. The unionized construction sector's annual contribution to training is estimated to be just over $40 million in 2011.[18] This is an increase of 11% from the annual contribution estimated by the OCS in 2006.

Table 4 below shows a comparison of the unionized construction sector's estimated annual investment in training trust funds and education funds in 2006 and 2011. The table also provides a breakdown of annual industry work-hours and the average hourly training contribution.

Table 4: Annual union contributions to training and education funds

Year	Estimated Union Work-Hours		Hourly training contribution		Estimated Annual Investment in Training
2006	101,896,225	X	$0.36/hour	=	$ 36.6 million
2011	103,733,615	X	$0.40/hour	=	$40.6 million

Source: Prism Economics, OCS

There are also significant contributions to training made by the industry outside the ICI sectors. Work hour contributions in sectors such as engineering and residential, which also make substantial contributions to training funds, were not incorporated in this analysis. This makes the $40.6 million estimate the lower boundary of the unionized construction sector's total investment in trades training in 2011.

The annual investment estimate is based on the training contribution rates defined in ICI agreements and work-hours data collected on a union local-by-local basis. This "bottom-up" methodology has two distinct advantages. First, the estimate is objective and arrived at independently. Secondly, it ensures the estimate takes into account the significant differences in both the contribution rates and hours worked between trades and individual union locals. These calculations likely underestimate total union contributions because some locals do not identify training allocation in their accounting or contribute to training through hours worked outside ICI construction.

The unionized construction industry's long-term commitment to funding trades training is evidenced by the industry's substantial skills training infrastructure. Decades of investment in trades training has resulted in a network of specialized training centers across the province which significantly contributes to Ontario's trades training capacity. The monetary value of this decade's long collective investment is difficult to measure.

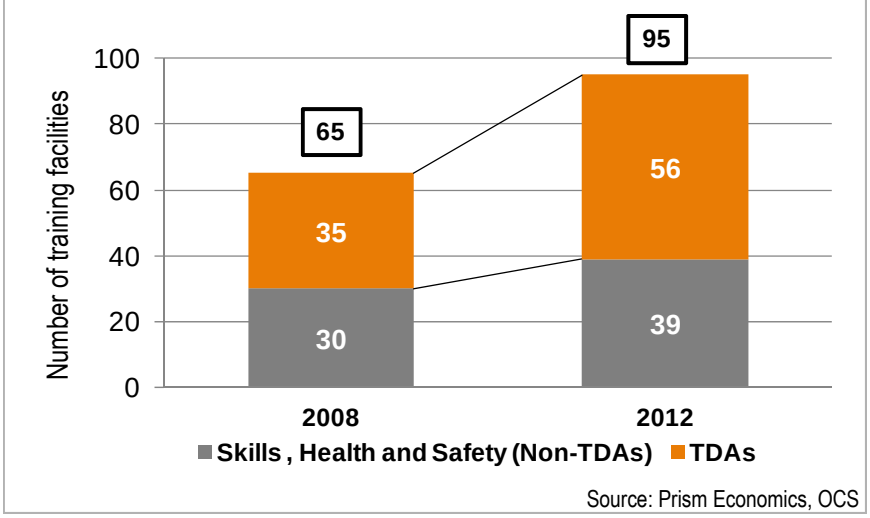
For the purposes of this report, the unionized construction industry's investment in training is assessed and reported in two specific dimensions: the number and type of union and employer sponsored training facilities across the province; and the total dollar investment represented by those training facilities and equipment.

[18] Estimate is based on OCS analysis of collective agreements and ICI work hours data collected from union locals through a survey conducted as part of this study. Estimate may include some man hours from non-ICI sectors.

Inventory of Unionized Training Facilities

Ontario's union/employer training centres are an integral part of the province's apprenticeship trades training infrastructure. Furthermore, their role in expanding Ontario's trades training capacity is growing. A provincial scan of training facilities, conducted as part of this research, revealed a total of 95 union local, employer and union/employer jointly administered facilities. This represents a 46% increase from the 65 facilities documented by the OCS in 2008. A complete list of all 95 training facilities is included in the Appendix.

Figure 13: Expanding role of union/employer training facilities



Source: Prism Economics, OCS

Of the 95 training facilities identified in this study, 39 (41%) had TDA status. There has been a significant increase in the number of union/employer TDAs over the past few years, up 30% over four years. Table 5 shows number of union/employer training facilities organized by associated trade and Table 10 (see appendix) details each of the TDA facilities.

Table 5: Summary of union/employer training facilities

Trade Group	Non-TDA Facilities	TDA Facilities	Total
Boilermakers	4		4
Bricklayers (OMTC)		3	3
Bricklayers (IUBAC)	1		1
Carpenters and Allied Trades	10	2	12
Carpenters & Painters (OWCTC)		2	2
Carpenters & Painters (IFSTC)		2	2
Cement Masons	1	1	2
Electricians (IBEW)	10	1	11
Elevator Mechanic		3	3
Insulators		1	1
Ironworkers	3	3	6
Labourers	1	11	12
Millwrights	7		7
Operating Engineers		2	2
OWCTC (carpenters/painters)		2	2
Painters and Allied Trades	3	1	4
Plumbers (UA)	11	5	16
Sheet Metal Workers	5	1	6
Tile and Terrazzo		1	1
Total	56	39	95

Source: Prism Economics, MTCU

Training facilities deliver the formal in-school portion of apprenticeship training and skills upgrade and health and safety training. Facilities documented in this study are owned and administered by jointly by labour / management training trust funds, or individually by either an employer association or the local union. The industry-based nature of training is a defining characteristic of union/employer training facilities and underpins key benefits to the quality of training they deliver.

The industry led approach to apprenticeship training often provides a high degree of trade specialization and creates a training culture. Stakeholders seek to improve safety, the quality of work, competitiveness of the industry and work practices favoured by employers. The result is custom built facilities that are designed and equipped to provide the optimal conditions for delivering trade specific training.

Investment in Unionized Training Facilities

The 95 Unionized construction industry training facilities identified in this study range from multi-million dollar state-of-the-art training centres, delivering apprenticeship programs for union and non-union apprentices, to union locals with designated space for delivering an array of specialized in-house skills, safety training and certification courses. Based on a survey of training facilities the total collective capital investment in the 95 facilities identified is estimated at $260 million,[19] with an average capital investment of $2.74 million. This is a significant increase from the $190 million estimated by the OCS in 2008.

Table 6: Capital investment in union/employer training facilities and equipment

	Total ($)	Over last 5 years ($)
Average	$2.74 million	$1.21 million
Median	$1 million	$457,000
Total	$260.3 million	$114.6 million

Source: Prism Economics, OCS

The survey also asked training facilities to report their total investment in facilities and equipment over the last 5 years (2008 to 2012). Based on the survey responses the collective investment in facilities and equipment between 2008 and 2012 is estimated at $114.6 million.

An important catalyst behind these investments has been government funding made available through the Ontario Government's *Skills Training Investment Program (STIP)* and the *Ontario Skills Training Enhancement program (OSTEP).* In 2008, STIP made $25 million available to union/employer training centres to replace or expand existing facilities and to refurbish or purchase new equipment. OSTEP followed in 2009 with $15 million in funding over three-years for union/employer training centres to expand facilities and acquire new equipment.[20] Together these programs made $40 million available to union/ employer training centres to invest in trades training infrastructure. Clearly the programs achieved their objective. The $40 million in government funding was leveraged by unionized industry to a collective investment of over $114 million during the five year period. This investment has resulted in a significant expansion of the Province's capacity to deliver apprenticeship and skills training.

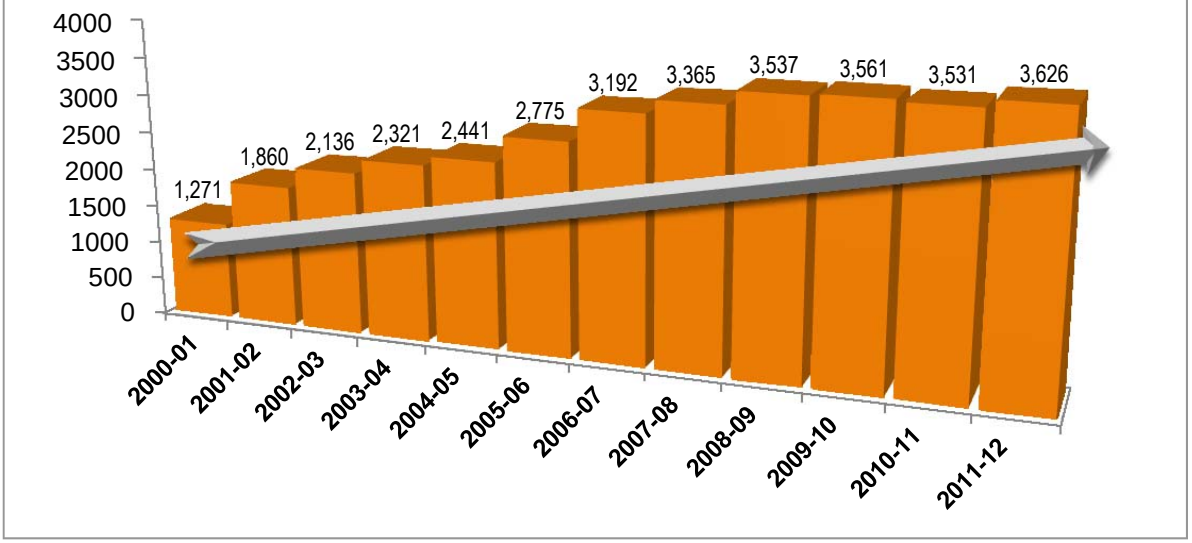
[19] The estimate of the 95 identified training institutions is based on size and facility value data gathered on 69 facilities documented through a combination of visits, interviews and surveys

[20] MTCU http://www.edu.gov.on.ca/eng/tcu/ostep/index.html

A Growing Role in Delivering Apprenticeship Training

The unionized construction industry's significant investments in expanding trades training infrastructure has been accompanied by rising apprenticeship enrolment in union/employer training facilities. Figure 14 shows apprenticeship enrolment in union/employer training facilities between 2001 and 2012. As can be seen from the chart, enrolment in union/employer training facilities has risen 185% since 2000-01, to just over 3,600 in 2012.

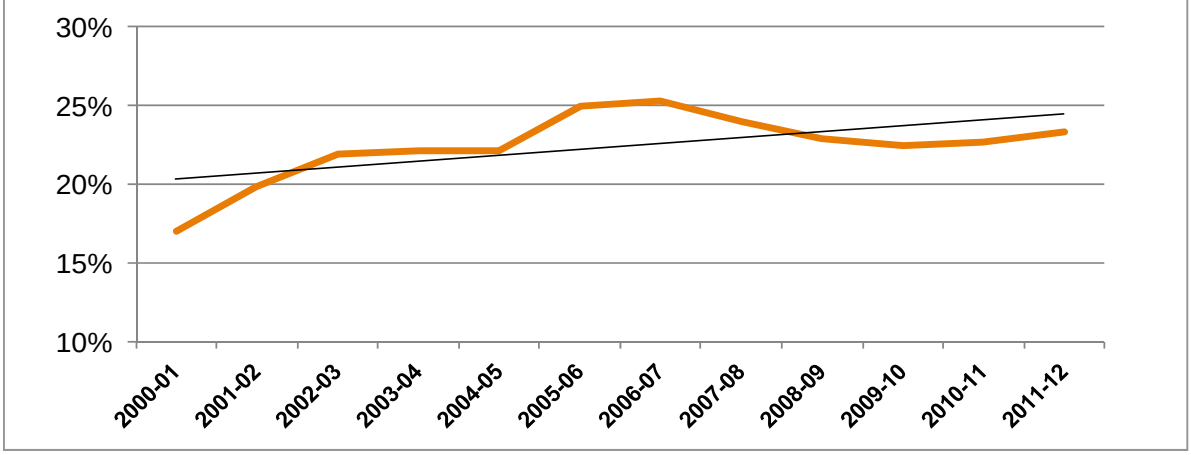
Figure 14: Apprenticeship enrolment at Ontario union/employer training facilities



Source: MTCU, Prism Economics

Figure 15 shows the share of apprenticeship training seats allocated to union/employer training centres over the past decade. In 2011/12, union/employer training centres accounted for about one-quarter (23%) of total in-school construction apprenticeship seats funded by MTCU. This represents a significant increase from 2001, when union/employer training centres accounted for 17% of the total funded construction apprenticeship training seats.

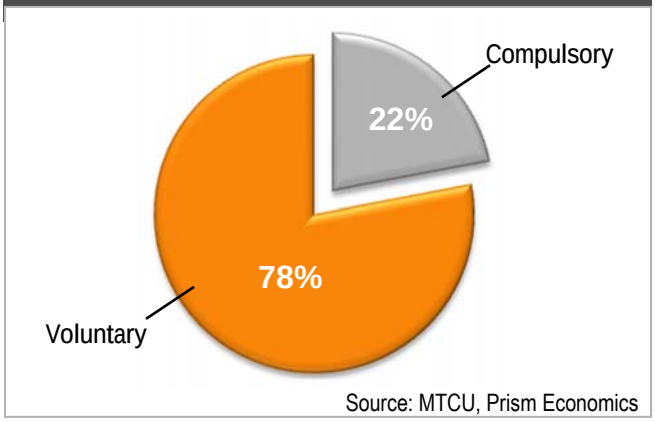
Figure 15: Union/employer training centres as a share of construction apprenticeship training seats



Source: MTCU, Prism Economics

Union/employer facilities deliver the in-class portion of apprenticeship training for 28 construction apprenticeship programs, including most compulsory and restricted trades. However, much of the rise in apprenticeship enrolment at union/employer facilities can be attributed to growth in non-compulsory construction programs. In fact, over three-quarters (78%) of apprenticeship enrolments in union/employer training centres are in non-compulsory trades. By contrast, although the college system delivers the majority (77%) of in-school construction apprenticeship training, about three-quarters (73%) of those enrolments are concentrated in compulsory trades.[21] This is disproportionally high relative to overall enrolment. Compulsory trade programs constitute 59% of total construction program enrolments.

Figure 16: Distribution of MTCU apprenticeship training seats to private TDAs



Source: MTCU, Prism Economics

Union/employer training centres are also the exclusive TDA for 12 voluntary construction apprenticeship programs (see Table 7 below). In some cases union/employer training facilities are the sole deliverers of these programs because colleges choose not to deliver them because of limited registrations. In other cases some programs were developed by union/employer facilities in conjunction with industry.

Table 7: Non-compulsory programs delivered exclusively by union/employer training centres

Architectural Glass and Metal Technician	Exterior Insulated Finishing Systems Mechanic
Cement (Concrete) Finisher	Floor Covering Installer
Cement Mason	Hazardous Materials Worker
Concrete Pump Operator	Heat and Frost Insulator
Drywall Finisher and Plasterer	Sprinkler and Fire Protection Installer
Drywall, Acoustic and Lathing Applicator	Terrazzo, Tile and Marble Setter

The development and establishment of new construction apprenticeship programs is an important and often overlooked contribution of union/employer training centres. Their partnership with industry enables them to serve as the incubators for niche training requirements that respond to ever changing industry demands.

[21] There are 10 trades designated as "Compulsory Certified Trades" under the TQAA: Electrician (1.Construction and Maintanence, 2. Domestic and Rural), Plumber, Pipe Fitter, Sheet Metal Worker, Refrigeration and Air Conditioning Mechanic, Residential Air Conditioning Systems Mechanic, Tower Crane Operator and two Branches of Mobile Crane Operator.

Table 8 provides a summary of construction apprenticeship enrolments in 2011-2012 by program and delivery agent type; college versus union/employer training centre.

Table 8: Construction apprenticeship enrolments in 2011-2012, by training delivery agent

Apprenticeship Program	Enrolment by Training Delivery Agent Type		
	College	Union / Employer	Total
Architectural Glass and Metal Technician	X	155	155
Brick and Stone Mason	201	223	424
Cement (Concrete) Finisher	X	45	45
Construction Boilermaker	225	X	225
Construction Craft Worker	X	433	433
Construction Millwright	173	X	173
Drywall Finisher and Plasterer	X	37	37
Drywall, Acoustic and Lathing Applicator	X	273	273
Electrician: Construction and Maintenance*	4,841	X	4,841
Floor Covering Installer	X	54	54
General Carpenter	2,097	416	2,513
Hazardous Materials Worker	X	102	102
Heat and Frost Insulator	X	269	269
Heavy Equipment Operator: Dozer	38	27	65
Heavy Equipment Operator: Excavator	43	34	77
Heavy Equipment Operator: Tractor Loader Backhoe	92	108	200
Hoisting Engineer: Mobile Crane Operator, Br.1	55	160	215
Hoisting Engineer: Mobile Crane Operator, Br.2	X	12	12
Hoisting Engineer: Tower Crane Operator, Br. 3*	X	38	38
Ironworker - Structural and Ornamental, Br. 2	58	152	210
Ironworker - Structural and Ornamental, Br. 3	X	104	104
Painter and Decorator Branch 1 - Commercial and Residential	X	46	46
Painter and Decorator Branch 2 - Industrial	X	18	18
Plumber*	1,943	83	2,026
Refrigeration and Air Conditioning Systems Mechanic*	634	172	806
Reinforcing Rod worker, Br. 3	X	92	92
Reinforcing Rod worker, Br. 4	X	29	29
Residential Air Conditioning Systems Mechanic*	38	X	38
Roofer	47	X	47
Sheet Metal Worker*	467	248	715
Sprinkler and Fire Protection Installer	X	160	160
Steamfitter*	225	100	325
Terrazzo, Tile and Marble Setter	X	32	32
Total Enrolment	11,177	3,622	14,799

* indicates a compulsory certified or restricted trade

Source: MTCU

Supporting Apprentices

Another important role played by the unionized sector is the delivery of a diverse set of supports provided to apprentices. Although this dimension is much more difficult to quantify than dollars spent, it has an equally important impact on improving the outcomes for apprentices.

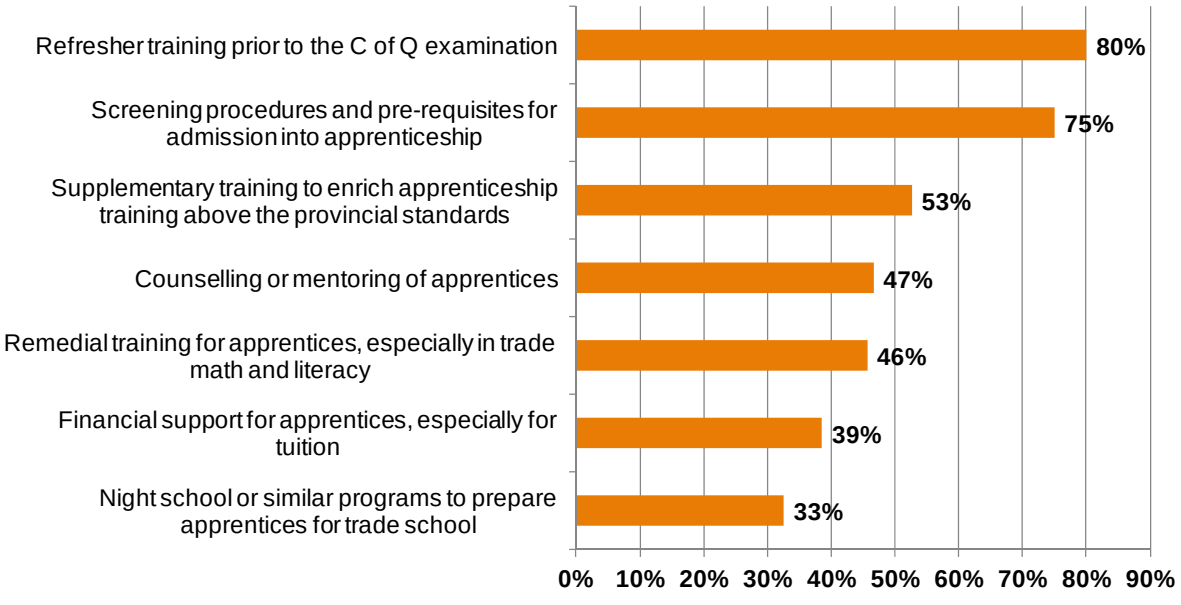
A survey conducted as part of this research asked training directors to provide information on supports offered to apprentices. The findings show that many JATTs actively invest in their apprentices through the following initiatives:

- Development of screening programs to assess apprentice candidates
- Preparing apprentices for their on-the-job training
- Supporting apprentices throughout their training period
- Providing night school programs to prepare apprentices for trade school
- Providing refresher training in preparation for the C of Q examination and
- Subsidizing or waiving college tuition fees

It is also common for JATT apprentices to be sponsored by joint committees that include union members as well as employers. This arrangement directly ties the union to the apprentice and allows the union to monitor the apprentice's progress throughout their apprenticeship.

Figure 17 below shows results from the survey of union locals with respect to the supports they offer to apprentices.

Figure 17: Incidence of union locals support to apprentices



Source: Prism Economics, Survey of Union Locals

MEASURING SUCCESS

Ontario has made significant progress in increasing the number of registrants in apprenticeable trades. However, as the 2008 Provincial Auditor's Report observed "increasing the number of registered apprentices will not meet the demand for skilled workers unless apprentices complete their programs." Studies cited by the Provincial Auditor indicate that Ontario's completion rate is lower than the rate in other provinces and that construction has an especially low completion rate.[22] Furthermore, the Auditor's report noted "Ontario does not have a reliable methodology for tracking and analyzing completion rates."

The absence of reliable measures of apprenticeship completion rates impedes the ability to make evidence-based decisions regarding apprenticeship program development, policies and best practices. An objective of this research is to measure differences in completion rates between programs and sectors based on available administrative data. These measures add insight into which practices and supports may lead to higher rates of completion.

Completion Rates

The term *completion rate* is often used in research literature on apprenticeship, but there is no consistent application of the concept. To add clarity three alternative measures of completions are proposed.

Actual Completion Rate

'Actual completion rates' can only be calculated by tracking a specific cohort over time and monitoring whether the individuals in that cohort actually completed their training (i.e., obtained a C of Q) and how long it took them to do so. The lack of administrative data linking completions with registrations of individual apprentices impedes establishing a measure of actual completion rates.

Completion Ratio

Another common conceptualization of completion rates is a completion ratio. The term completion ratio can be used in two senses. The first is the ratio of C of Qs issued to apprenticeship completers in a particular year to the number of new apprentices registered in that year. The second sense in which the term is used is the ratio of C of Qs issued to apprenticeship completers in a particular year to the total number of registered apprentices. This concept is useful to show changes in trends over time, but provides limited insight over the short run, especially if registrations are rising or falling rapidly. This measure does not account for the lag between the time an apprentice registers and completes. As a result, during a period of strong growth in registrations– as experienced in recent years – a completion ratio deflates, or underestimates the actual rate of completion because the completers would have registered when the cohort of registrants was smaller. Conversely, when registrations are in decline, completion ratios would overestimate the actual completion rate.

Notional Completion Rate

The notional completion rate (NCR) improves the accuracy of the completion ratio by accounting for the lag between the time an apprentice registers and completes. For this reason it was chosen as the conceptual measure of completion rates in this study.

[22] In the absence of a reliable tracking system in Ontario, the 2008 Report cited earlier studies by the Canadian Centre for the Study of Living Standards (CSLS) and Statistics Canada. The CSLS study reported that Ontario's completion rate was 32% and that this was the third lowest in Canada. The Statistics Canada reports cited by the Provincial Auditor used a different methodology to estimate completion rates. For Ontario, the Statistics Canada report estimated an overall completion rate of 47%. The Statistics Canada report echoed the conclusion of the CSLS report in finding that Ontario's completion rate was lower than the rate in other provinces

A 'notional completion rate' is calculated by taking as the denominator the number of new apprentices registered in 'year X' (e.g., 2000) and as the numerator the number of C of Qs issued to apprenticeship completers in 'year X plus 4' (e.g. 2004) or 'year X plus 5' (e.g. 2005), depending on the expected length of the apprenticeship program.

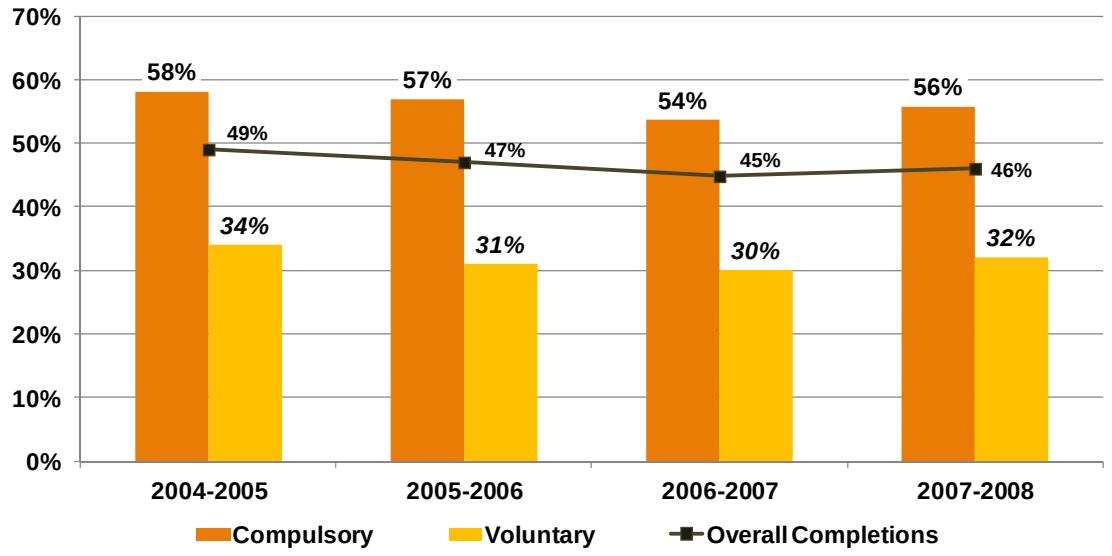
Most studies of completion rates utilize a 'notional completion rate', but often represent the findings as if they were based on 'actual completion rates'. Notional completion rates differ from 'actual completion rate' to the extent that the actual duration of the program is not known. The expected time to complete used in this research was set equal to the prescribed duration of each respective program.

Notional completion rates were calculated with registration and completion data provided by MTCU. The rates were calculated for all apprentices in 17 construction programs.

Figure 18 shows the NCRs for compulsory and non-compulsory construction apprenticeship programs for apprentices that registered between 2004 and 2008. The overall notional rate of completion for all construction programs is denoted by the black line in the middle.

As can be seen, the overall NCR for construction apprenticeships in Ontario is just under 50%. That is, less than half of registrants complete the programs they began. The analysis also shows much higher completion rates in compulsory trades compared to non-compulsory.

Figure 18: Notional completion rates for compulsory and non-compulsory construction apprenticeship programs, by year of registration



Estimated rates calculated as the number of completions, as a share of total registration lagged by the number of years required to complete reach respective programs. Estimate based on 17 construction apprenticeship trades ; 2 year blended average applied for completions and registrations.

Source: MTCU, Prism Economics

In addition to a wide gap between completion rates for compulsory and non-compulsory programs, the research reveals evidence of significant differences in completion rates across individual construction apprenticeship programs. Table 9 shows the average notional completion rate for individual construction apprenticeship programs. Interestingly programs with higher rates of completion tend to be smaller, more specialized trades and those that tend to have higher union densities.

Table 9: Average notional completion rate by construction apprenticeship program

Trade Code	Trade Description	Length (yrs)	2004 to 2008 Average
	COMPLETION RATE FOR SELECT COMPULSORY TRADES		56%
339A/B	Hoisting Engineer: Mobile & Tower	3	84%
306A	Plumber	5	49%
313A	Refrigeration and Air Conditioning Systems Mechanic	5	47%
308A	Sheet Metal Worker	5	53%
307A	Steamfitter	5	67%
309A	Electrician Construction Maintenance	5	61%
	COMPLETION RATE FOR SELECT VOLUNTARY TRADES		32%
401A	Brick and Stone Mason	4	13%
428A	Construction Boilermaker	4	53%
426A	Construction Millwright	4	77%
453A	Drywall Finisher and Plasterer	4	15%
451A	Drywall, Acoustic and Lathing Applicator	3	18%
253A	Heat and Frost Insulator	4	51%
420A	Ironworker	3	58%
434A	Power line Technician	4	44%
427A	Sprinkler and Fire Protection Installer	4	57%
403A	General Carpenter	4	26%
	OVERALL COMPLETION RATES		46.8%

Source: MTCU, Prism Economics

The Union Effect - Evidence of Higher Rates of Completion

The reported experience of Joint Apprentice Training Trusts is that their completion rates are higher than the notional rates reported above. This experience is tied to the significant investment and program features reported above. However, a direct link between construction union membership and higher apprenticeship completion rates has not been previously been substantiated. This is primarily due to a lack of reliable registration and completion data and because many data sources do not identify whether an apprentice belongs to a union or not.

An estimate, or proxy, for union and non-union completion rates is made possible by MTCU data that identifies apprentices indentured to an individual employer or joint labour-management apprenticeship training trust (JATT). This distinction provides a strong proxy for union membership because the overwhelming majority of unionized apprentices are indentured to JATTs, while apprentices outside the unionized sector are indentured exclusively to individual employers.[23]

Research conducted in the US provides evidence to support the hypothesis that there are higher rates of completion for apprentices who are "jointly sponsored by unions compared to ones that are sponsored only by employers."[24]

[23] In a survey of construction union locals conducted as part of this research 85% reported "All" (72%) or "Most" (13%) of their apprentices as indentured to a Local or Joint Apprenticeship committees

[24] Bilginsoy (2003), documents that completion rates in construction are about twice as high in programs that are jointly sponsored by unions compared to ones that are sponsored only by employers.

To accomplish similar analysis for Ontario, a request to MTCU for data reporting registrations and completions for apprentices indentured to JATTs and those indentured to individual employers was made. For privacy concerns JATTs were identified and differentiated from individual employers by MTCU. Data was suppressed where incidences were too low to report for privacy reasons.

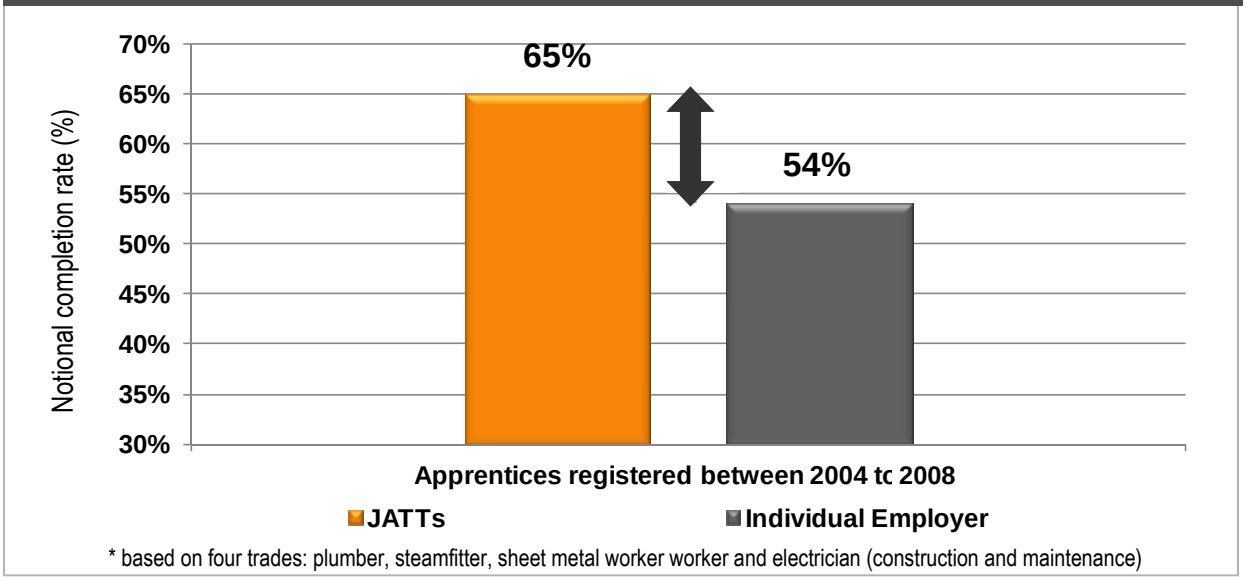
Data obtained from MTCU allowed for a direct comparison of notional apprenticeship completion rates for apprentices indentured to JATTs (mostly unionized apprentices) and those indentured to individual employers (proxy for non-union) in four compulsory trades:[25]

- Sheet Metal Workers
- Plumbers
- Steamfitters
- Electricians

Notional completion rates for apprentices indentured to JATTs were compared to apprentices indentured to individual employers. The analysis of the four largest construction apprenticeship programs found notional completion rates for apprentices indentured to JATTs to be significantly and consistently higher compared to apprentices indentured to individual employers.

Figure 19 shows the average notional completion rates for apprentices indentured to JATTs compared to those indentured to individual employers for apprentices that registered between 2004 and 2008. The data showed a notional completion rate of 65% for apprentices indentured to JATTs compared to 54% for apprentices indentured to individual employers. Apprentices indentured to JATTs show a notional completion rate that is 11 percentage points, or 20% higher.

Figure 19: Notional completion rate for four largest compulsory construction trade apprenticeship programs (average duration of 5 years assumed)



* based on four trades: plumber, steamfitter, sheet metal worker worker and electrician (construction and maintenance)

Source: Prism Economics, MTCU

The above NCR is based on the assumption that the majority of apprentices complete their respective programs in the minimum prescribed program duration of 5 years. The duration prescribed by program requirements was selected as the denominator in the calculation of the notional completion rate because

[25] An analysis on additional trades was not possible due to an insufficient number of apprentices from each group to make a direct comparison.

the actual average time an apprentice takes to complete each program is not known. There is, however, strong anecdotal evidence that the average duration of an apprenticeship is longer.[26]

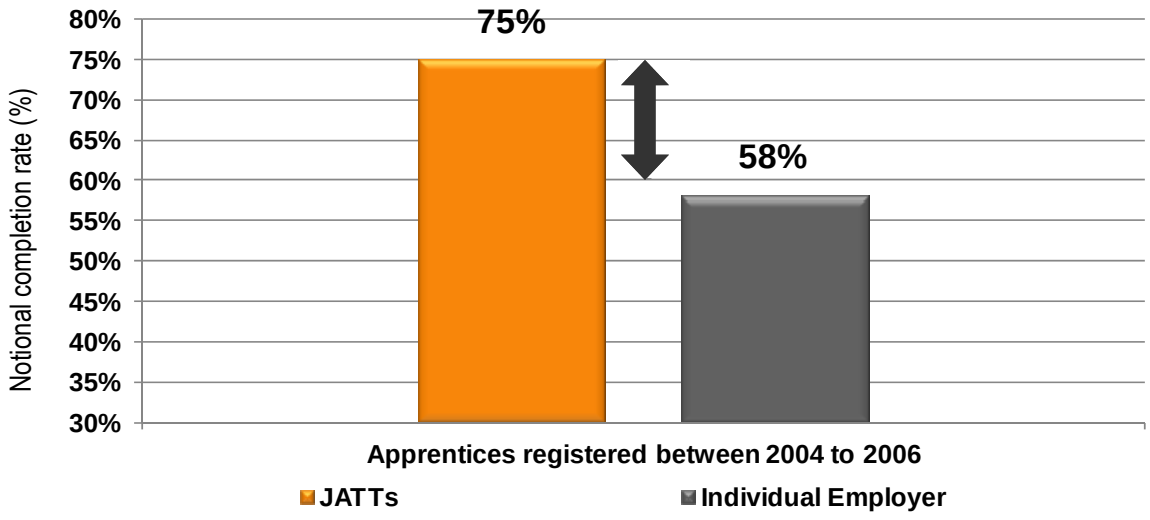
Findings from the National Apprenticeship Survey (NAS) show a significant proportion of apprentices complete their apprenticeship well past the prescribed duration. The NAS found that on average 40% of apprentices who were long term completers between 2000 and 2004 completed their respective programs by 2007.

The same survey also showed that a larger proportion of union apprentices who were long-term completers went on to complete more than non-union between 2000 and 2004. Apprentices belonging to a union were found 10% more likely to complete than non-union apprentices.[27]

As mentioned earlier, the assumptions made about the duration can significantly impact the NCR estimate; especially during periods of rapidly rising registrations. To assess the impact of a longer duration the notional rates were re-calculated with the assumption that the average apprentice takes two years longer than the prescribed period to complete.

As can be seen in Figure 20, with the revised average duration assumption of 7 years, the notional completion rate for apprentices indentured to JATTs rises significantly to 75 % yet only marginally (58%) for apprentices indentured to individual employers. Although the rate rose for both groups, the rise was significantly higher for apprentices indentured to JATTs.

Figure 20: Notional completion rate for four largest compulsory construction trade apprenticeship programs (average duration of 7 years assumed)



* based on four trades: plumber, steamfitter, sheet metal worker worker and electrician (construction and maintenance)

Source: Prism Economics, MTCU

[26] The National Apprenticeship Survey (NAS) estimates that on average the average time to complete is a year longer than the prescribed program duration.

[27] The share of union long-term completers between 2000 and 2004 that were Completers by 2007 was 43% and 39% for non-union.

These measures of notional completion rates offer some initial insights;

1. The results of the analysis confirm higher rates of completion in the unionized sector in selected compulsory construction programs.
2. Measured notional completion rates are higher when the assumed average time to complete is extended.
3. The real gap between completion rates for union and non-union apprentices may be greater than measured by notional completion rates as:
    - a greater proportion of union apprentices are more likely to complete, although frequently beyond the prescribed duration and,
    - Union apprentices indentured to individual employers (proxy for non-union) may inflate the notional completion rate estimate for non-union apprentices.

The Union Effect - Insights from the National Apprenticeship Survey

The National Apprenticeship Survey reviewed the experience of 30,000 apprentices across Canada registered in apprenticeship programs from 2002 to 2004. The survey identified three groups of apprentices: completers, long term continuers and discontinuers and asked apprentices in each group about their experiences over the course of their apprenticeship careers.

In order to shed additional light on the role of the unionized construction industry, a special data request was made to Statistics Canada to assess any discernible differences between the experiences of union and non-union apprentices. The NAS data was filtered for those apprentices who belonged to a construction union at the beginning of their apprenticeship.

Results from the NAS show that union apprentices are:

- more likely to attend the technical in-school portion of apprenticeship training,
- more likely to complete, albeit beyond the prescribed program duration,
- have higher levels of education prior to starting their apprenticeship,
- less likely to change employers to seek better employment opportunities during the course of their apprenticeship,
- more likely to have a larger number of employers
- less likely to change employers to seek improved work conditions or better training opportunities during the course of their apprenticeship.

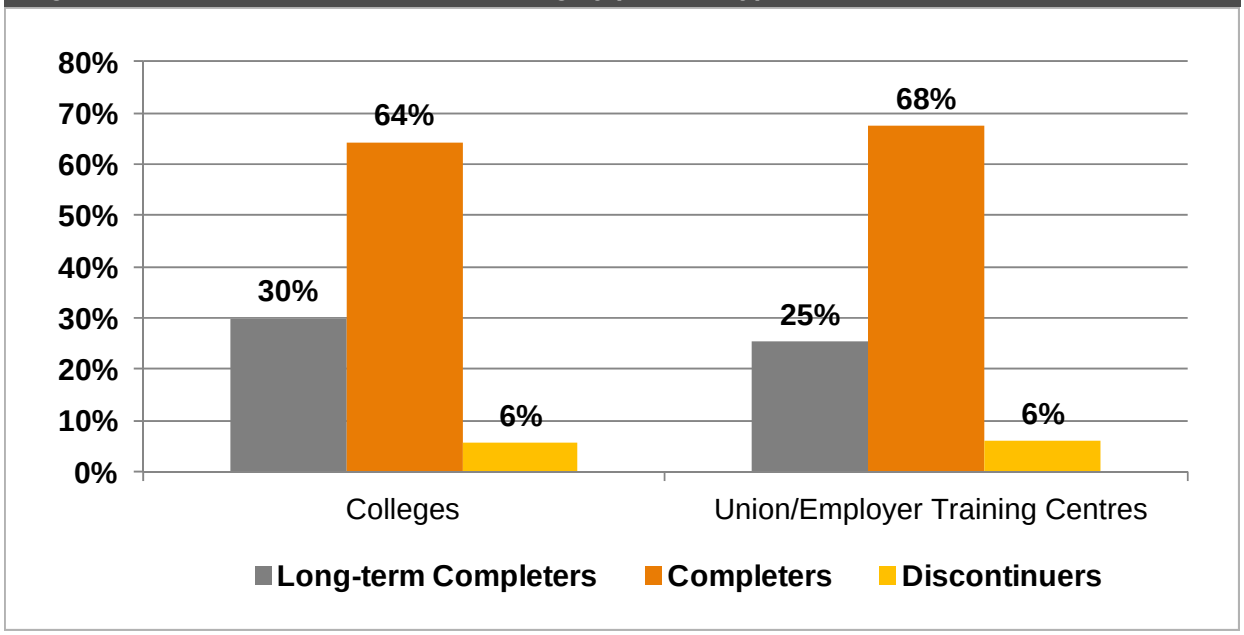
The most compelling explanation for higher union completion rates is that a higher proportion of union apprentices report attending the required in-school portion of apprenticeship training. Findings from the NAS show that only 58% of apprentices reported taking technical training related to the program after starting their apprenticeship program. Of the remaining 42%, half go on to complete as trade qualifiers[28], while the rest either discontinue the apprenticeship or remain in the apprenticeship system as long term completers.

[28] The term "trade qualifiers" refers to journeypersons who earn their Certificate of Qualification by challenging the final exam without taking the in-school apprenticeship training.

According to the NAS apprentices who were members of union at the start of their apprenticeship were 20% more likely to attend the technical training than non-union apprentices. A full two thirds (66%) of union apprentices attended technical training at a college or union/employer training centre, compared to 55% of non-union apprentices.

Another factor may impact completions is where the apprentice receives their in-school technical training. Union and non-union apprentices that attended in-school technical training at a union/employer training centre were slightly more likely to be completers and less likely to be long-term completers than apprentices that attended technical training at a college.

Figure 21: Distribution of technical training by provider type



Source: National Apprenticeship Survey, 2007

Apprentices cite the 'lack of work experience' as the single-most common reason for not completing their apprenticeship. Results from the NAS show union apprentices were more likely to work for multiple employers over the course of their apprenticeship. When asked how many different employers apprentices worked for during the total length of their program, union apprentices reported an average of five employers, while non-union apprentices averaged only three employers.

The Joint Apprentices and Training Trust model enables union apprentices to work for multiple employers under a single apprenticeship contract. This allows for increased work opportunities and more diverse employment experiences and may contribute to higher completion rates in the unionized sector.

Although working for a greater number of employers, union apprentices were much less likely to change employers to seek better employment or better work conditions. The results from the NAS show that 33% of non-union apprentices that changed employers over the course of their apprenticeship did so to seek an employer offering better work conditions or improved training opportunities. Union apprentices were half as likely to change employers for reasons related to better work conditions or improved training opportunities.

Reasons Cited for Changing Employers	Union	Non-Union	Difference
Seeking better employer / started own business	4%	9%	-5%
Seeking better working conditions / better income / benefits / full-time job	5%	15%	-10%
Seeking employer with more diverse training opportunities	7%	10%	-3%
Total	16%	34%	-18%

Source: National Apprenticeship Survey, 2007

NAS data also reveals that union apprentices were more likely to have higher levels of education before starting an apprenticeship program. Furthermore, a greater proportion of union apprentices had completed high school or some level of post-secondary education. This may reflect the stringent screening procedures and prerequisites for admission into apprenticeship programs in the union environment.

Highest Level of Education Attained	Union	Non-Union
Less than high school	6.5%	12.0%
Completed high school	54.0%	51.4%
Some training in other or same trade/pre-employment	3.2%	2.1%
Completed or partially completed college and university	36.3%	34.5%

Source: National Apprenticeship Survey, 2007

CONCLUSIONS

Skilled trades build the foundations of economic development. Apprenticeship programs train Ontario's skilled trades and Ontario needs more successful apprentices. Previous policy has focused on increasing the number of apprentices. This increase in apprentices has a positive economic benefit itself. However, the greater benefit lies in apprentices completing their training and becoming fully certified in their trade.

A Certificate of Qualification gives the successful apprentice a ticket to higher earnings, portable credentials and improved career prospects. Employers recognize and reward journeypersons for their advanced technical skills and on-the-job leadership. Low completion rates for apprentices signal a fault in this process and a missed opportunity for a successful investment. Research, to date, has failed to provide a clear policy option that will raise completion rates.

The Ontario Construction Secretariat has moved the yardstick forward with this study of the labour-management Joint Apprenticeship Training Trust programs. This report documents the $260 million invested in the training facilities, the rapid growth in apprentice registrations and their success.

Ontario's union/employer training centres are an integral and growing part of the province's apprenticeship trades training infrastructure. These investments are driven by the 185% gain in apprenticeship enrolment in union/employer training facilities over the past decade. This rise in enrolments in JATT facilities has increased their share of the total construction apprenticeship program in Ontario.

The analysis presented offers some initial insights:

- There are higher rates of completion in the unionized sector in selected compulsory construction programs.
- Completion rates rise as the average estimated duration for apprenticeship completion is lengthened.
- There is evidence that the advantage associated with JATTs is greater than has been measured in this analysis as:
    - a greater proportion of union apprentices are more likely to complete, although frequently beyond the prescribed duration and,
    - union apprentices indentured to individual employers (proxy for non-union) may inflate the notional completion rate estimate for non-union apprentices.

Findings show that completion rates are higher in the JATT (multi-employer) model than in single employer arrangements. These findings are preliminary and further research would allow extending these findings to a wider range of trades. However, the findings are built on a strong MTCU data set and are consistent with recent U.S. research that confirms the success of multi-employer models. Indeed, non-union employers in the U.S. are starting to adopt the multi-employer model.

This evidence points the way to a *new apprenticeship strategy* that can be linked to emerging policy initiatives aimed at achieving higher completion rates. In particular, strategic goals would be achieved by

leveraging government investments in training with private funds so that the fiscal impact is minimized.

Three objectives of the strategy are:

1. Increase the proportion of registered apprentices who complete their program with a Certificate of Qualification
2. Negotiate Ontario's participation in the Canada Job Grant Program, announced in the Federal Budget, with the objective of increasing completion rates
3. Increase apprenticeship and training in related areas like health and safety and supervisory skills through incentives to multiple employer training programs to leverage government initiatives.

Policy Implications: A New Apprenticeship Strategy

Features of the Competency-Based Model:

1. With the intention of complementing the implementation of the Canada Job Grant program, Ontario could advance plans for:
    a. An Ontario Job Grant initiative that specifically recognizes the success of multi-employer programs by increasing the leverage of employers in the matching grant process. JATTs and multi-employer groups that indenture apprentices should be fully eligible to receive all apprenticeship employment grants. The employers in the Ontario Job Grant who participate in multi-employer apprenticeship programs would have their contribution matched by an additional amount of government funding over and above the basic grant.
    b. A more broadly based use of procurement processes to encourage work for apprentices on all infrastructure projects including provincially funded projects in municipalities, hospitals, universities and colleges. Further, procurement in these provincial projects and in the Affordable Housing Program and the Building Canada plan would be designed to recognize the contribution of multiple employer programs. For example, procurement criteria could be structured to provide added support for bidders who participate in these programs.
    c. Provincial and federal infrastructure initiatives should incorporate apprenticeship targets and completions into the procurement process.
2. Applications for Training Delivery Agency (TDA) status and allocation of new training seats could be evaluated giving preference to the JATT / multiple employer training providers. Adding more TDA trainers in the JATT system would raise completion rates.
3. Grant programs patterned after the Skills Training Investment Program and OSTEP could be introduced with features and criteria that encourage JATT and multi-employer applicants.
4. Grant programs targeted at employers should be contingent on the apprentice attending the in-school training.
5. Seat funding could be increased for JATT apprentices in recognition of the significant investments these organizations make to their programs and the success that they achieve.
6. Finally, MTCU programs that promote apprenticeship could highlight the advantages of the JATT system; encouraging apprentices to seek out employment in the JATT programs.

Longer term Intiatives:

7. Measuring Success

   You can't change what you can't measure. New measures of completion rates must be built up from administrative records and surveys that track the experience of each apprentice from start to completion. Once these individual histories are measured, specific reasons for the success of the JATTs will be clearer -- identifying which practices are making a difference. It will take many years to build a complete database, but there are interim survey methods that can add new, detailed insights sooner.

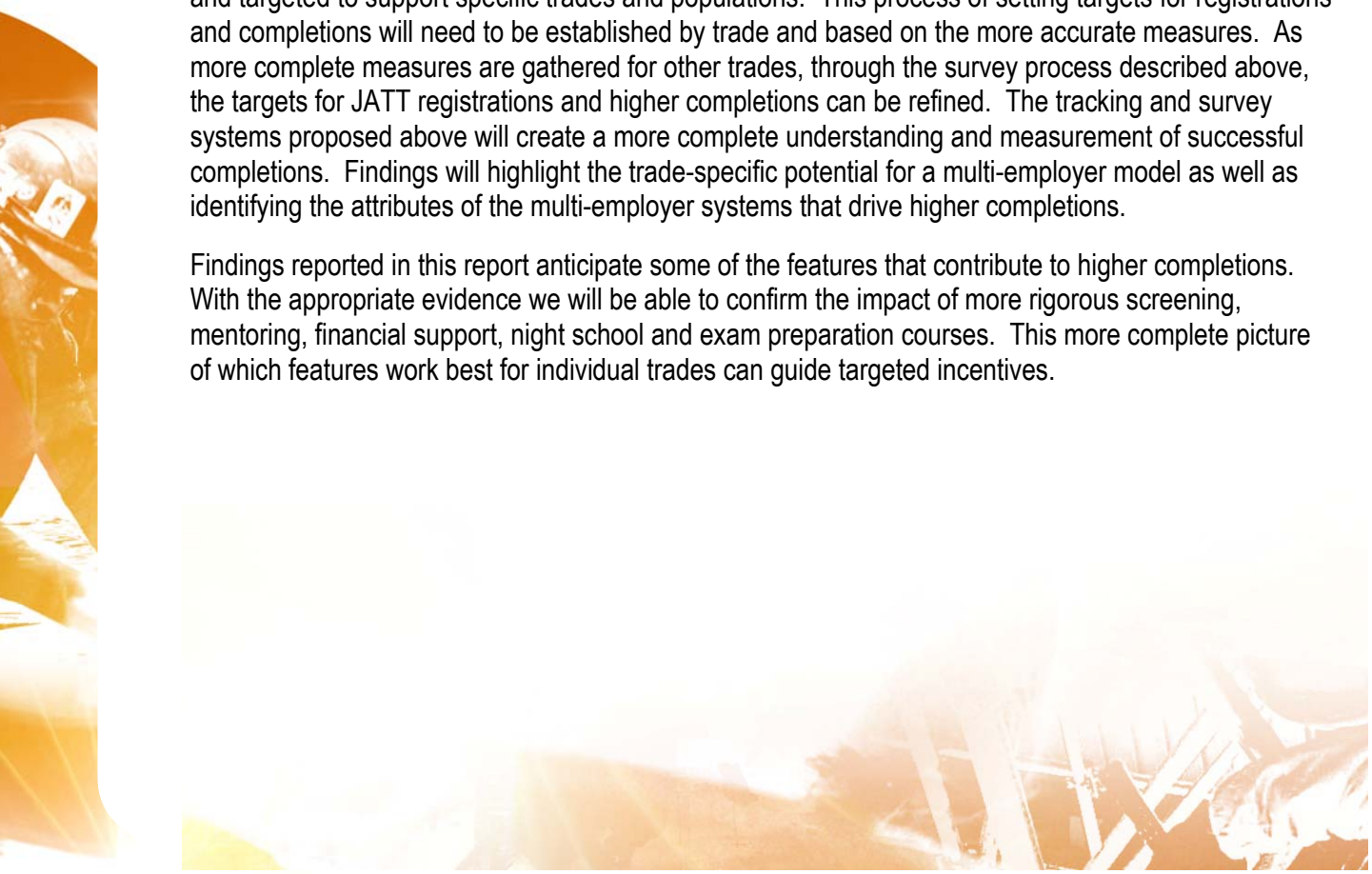
   The first step is putting in place a survey program with MTCU data that will create more accurate measures of completion rates for trades and will include the experience and role of employers in the process. The outcome of this step will be detailed measures of completion rates by trade and by single and multiple employer systems. Higher completion rates measured for the JATT systems will become new targets for the overall success rate of all apprenticeship programs.

8. Setting Targets for Success

   Findings in this report and in a subsequent round of analysis will identify realistic targets for completion rates for all apprenticeship programs. Current completion rates can be raised by increasing the proportion of apprentices in the JATT programs. For example, if 25% of apprenticeship registrations are now in JATT programs, a target rate of registrations might be set for 30% or 40% in four years. As the new group of JATT apprentices move through the system, the overall completion rates will rise.

As we move forward, the incentives set in place in the immediate steps proposed above could be refined and targeted to support specific trades and populations. This process of setting targets for registrations and completions will need to be established by trade and based on the more accurate measures. As more complete measures are gathered for other trades, through the survey process described above, the targets for JATT registrations and higher completions can be refined. The tracking and survey systems proposed above will create a more complete understanding and measurement of successful completions. Findings will highlight the trade-specific potential for a multi-employer model as well as identifying the attributes of the multi-employer systems that drive higher completions.

Findings reported in this report anticipate some of the features that contribute to higher completions. With the appropriate evidence we will be able to confirm the impact of more rigorous screening, mentoring, financial support, night school and exam preparation courses. This more complete picture of which features work best for individual trades can guide targeted incentives.



APPENDIX:

Table 9: Construction Trades - Compulsory, Voluntary, ACA

Compulsory Trades

309A	Electrician Construction and Maintenance (Construction Electrician) RS
309C	Electrician Domestic and Rural
339A	Hoisting Engineer Mobile Crane Operator Branch 1 (Mobile Crane Operator) RS
339C	Hoisting Engineer Mobile Crane Operator Branch 2 RS
339B	Hoisting Engineer Tower Crane Operator RS
306A	Plumber RS
313A	Refrigeration and Air Conditioning Systems Mechanic (HVAC technician) RS
313D	Residential Air Conditioning Mechanic
308R	Residential (Low Rise) Sheet Metal Installer
308A	Sheet Metal Worker RS
307A	Steamfitter (Steamfitter/Pipefitter) RS

Voluntary Trades

424A	Architectural Glass & Metal Technician (Glazier) RS
401A	Brick and Stone Mason (Bricklayer) RS
244G	Cement (Concrete) Finisher
419A	Cement Mason
428A	Construction Boilermaker (Boilermaker) RS
426A	Construction Millwright
451A	Drywall, Acoustic and Lathing Applicator (Lather [Interior Systems Mechanic])
453A	Drywall, Finisher and Plasterer
448A	Floor Covering Installer RS
403A	General Carpenter (Carpenter) RS
253A	Heat and Frost Insulator (Insulator [Heat and Frost])
420B	Ironworker Generalist Branch 1 RS
420A	Ironworker Structural and Ornamental Branch 2 RS
404C	Painter and Decorator Branch 1 Commercial and Residential RS
404D	Painter and Decorator Branch 2 Industrial RS
434A	Power line Technician RS
244K	Precast Concrete Erector RS
244G	Precast Concrete Finisher
410R	Refractory Mason
452A	Reinforcing Rod worker Br 3
244H	Restoration Mason RS
449A	Roofer RS
427A	Sprinkler System Installer (Sprinkler and Fire Protection Installer) RS
241A	Terrazzo, Tile and Marble Setter (Tilesetter) RS

RS denotes Red Seal Trade

Table 9 *continued*

Trades Designated Under the Apprenticeship and Certification Act, 1998

637C	Concrete Pump Operator
450A	Construction Craft Worker RS
455A	Exterior Insulated Finishing Systems Mechanic (EIFS)
253H	Hazardous Materials Worker (HAZMAT)
636C	Heavy Equipment Operator – Dozer
636B	Heavy Equipment Operator – Excavator
636A	Heavy Equipment Operator - Tractor Loader Backhoe
296A	Native Residential Construction Worker

RS denotes Red Seal Trade

Table 10: Union/Employer Training Facilities - Apprenticeship Training Delivery Agents

Training Centres		Location	Apprenticeship Programs
1	Ontario Masonry Training Institute	Ottawa	Brick and Stone Mason
2	Ontario Masonry Training Institute	Mississauga	Brick and Stone Mason
3	Terrazzo, Tile & Marble Trade School Inc.	Concord	Tile, Terrazzo and Marble Setter
4	Carpenters Local 18	Hamilton	Drywall, Finisher and Plasterer
5	Carpenters Local 27	Vaughan	General Carpenter Floor Covering installer Drywall, Acoustic and Lathing Applicator
6	Ottawa Walls & Ceilings Training Centre – East	Ottawa	Drywall, Acoustic and Lathing Applicator
7	Ottawa Walls & Ceilings Training Centre – North	Sudbury	Drywall, Acoustic and Lathing Applicator
8	OPCMIA Local 598	Etobicoke	Cement Mason
9	IBEW 353 West Training Centre	Mississauga	Electrician (Construction and maintenance) - pending
10	Elevator Constructors Local 50	Ajax	Elevating Devices Mechanic
11	Elevator Local 90	Hamilton	Elevating Devices Mechanic
12	Elevators Constructors Local 96	Nepean	Elevating Devices Mechanic
13	Int'l Association of Heat & Frost Workers Local 95	Markham	Heat and Frost Insulator
14	Ironworkers Local 700	Maidstone	Ironworker - Structural and Ornamental Br 2 Reinforcing Rod Worker Br 3
15	Ironworkers Local 721	Etobicoke	Ironworker - Generalist Br 1 Reinforcing Rod Worker Br 3
16	Ironworkers Local 736	Hamilton	Ironworker - Structural and Ornamental Br 2 Reinforcing Rod Worker Br 3
17	LIUNA 183 Barrie	Barrie	Construction Craft Worker
18	LIUNA 183 Cobourg	Cobourg	Construction Craft Worker Brick and Stone Mason
19	LIUNA 183 Vaughan	Vaughan	Construction Craft Worker Cement Mason Brick and Stone Mason
20	LIUNA local 1059	London	Construction Craft Worker Cement Mason Brick and Stone Mason
21	LIUNA Local 1089	Sarnia	Construction Craft Worker

Table 10 *continued*

Training Centres		Location	Apprenticeship Programs
22	LIUNA Local 493 Training Centre	Val Therese	Construction Craft Worker
23	LIUNA Local 506	Downsview	Construction Craft Worker
24	LIUNA Local 527	Ottawa	Construction Craft Worker
25	LIUNA Local 607	Thunder Bay	Construction Craft Worker
26	LIUNA Local 625	Oldcastle	Construction Craft Worker Asbestos Abatement Worker
27	LIUNA Local 837	Hamilton	Construction Craft Worker Cement (Concrete) Finisher
28	Operating Engineers Training Institute of Ontario	Morrisburg	Heavy Equipment Operator: Excavator Heavy Equipment Operator: Dozer Heavy Equipment Operator: Tractor Loader Backhoe
29	Operating Engineers Training Institute of Ontario	Oakville	Hoisting Engineer : Mobile Crane Operator, Br. 1 Heavy Equipment Operator: Excavator Hoisting Engineer: Mobile Crane Operator, Br. 2
30	Interior Finishing Systems Training Centre (Ottawa)	Ottawa	Drywall, Acoustic and Lathing Applicator
31	Interior Finishing Systems Training Centre (Toronto)	Woodbridge	Drywall, Acoustic and Lathing Applicator Drywall, Finisher and Plasterer Hazardous Materials Worker
32	Ontario Industrial & Finishing Skills Centre	Toronto	Painter and Decorator Br 1 Commercial & Residential Painter and Decorator Br 2 Industrial P & D Architectural Glass and Metal Technician
33	UA Local 46 Joint Training Apprenticeship Committee	Scarborough	Plumber Welder Steamfitter
34	UA Local 552	Windsor	Plumber
35	UA Local 67	Hamilton	Plumber Steamfitter
36	UA Local 787 (Refrigeration Workers)	Brampton	Refrigeration & Air Conditioning Systems Mechanic
37	Ontario Sheet Metal Training Centre	Burlington	Sheet Metal Worker
38	Sheet Metal Workers & Roofers Local 285 Training Centre	Etobicoke	Sheet Metal Worker
39	UA Local 853 (Sprinkler Fitters)	Markham	Sprinkler and Fire Protection Installer

Table 11: Union/Employer Non-TDA Training Facilities

Non- TDA Training Centres		Location
1	Boilermakers Local 128	Burlington
2	Boilermakers Satellite (Local 128)	Sarnia
3	Boilermakers Satellite (Local 128)	ThunderBay
4	Boilermakers Satellite (Local 128)	Sudbury
5	Carpenters Local 1256	Sarnia
6	Carpenters Local 1669	Thunder Bay
7	Carpenters Local 1946	London
8	Carpenters Local 2486	Azilda
9	Carpenters Local 249	Kingston
10	Carpenters local 397 (Oshawa)	Oshawa
11	Carpenters Local 494	Tecumseh
12	Carpenters Local 785	Cambridge
13	Carpenters Local 93	Ottawa
14	Carpenters Local 2222	Goderich
15	IBEW Local 105	Hamilton
16	IBEW Local 115	Kingston
17	IBEW Local 586	Ottawa
18	IBEW Local 804	Kitchener
19	IBEW 530	Sarnia
20	IBEW Local 120	London
21	IBEW Local 353 North Training Centre	Barrie
22	IBEW Local 773	Windsor
23	IBEW Local East Training Centre	Bowmanville
24	IBEW Toronto Local 353	North York
25	Ironworkers Local 759	Thunder Bay
26	Ironworkers Local 765	Nepean
27	Ironworkers Local 786	Sudbury
28	IUBAC Local 6	Windsor

Table 11 ***continued***

Non- TDA Training Centres		Location
29	IUPAT Local 200	Ottawa
30	LIUNA Local 183	Toronto
31	Millwrights Local 1007	St. Catharines
32	Millwrights Local 1151	Thunder Bay
33	Millwrights Local 1244	Windsor
34	Millwrights Local 1410	Kingston
35	Millwrights Local 1592	Sarnia
36	Millwrights Local Union 1916	Hamilton
37	Millwrights Local Union 2309	Toronto
38	Ontario Industrial & Finishing Skills Centre	Ancaster
39	Ontario Industrial & Finishing Skills Centre	Nepean
40	OPCMIA Local 124	Nepean
41	Sheet Metal Workers 397	Thunder Bay
42	Sheet Metal Workers Local 235	Windsor
43	Sheet Metal Workers local 30	Scarborough
44	Sheet Metal Workers local 539	Sarnia
45	Sheet Metal Workers Local 562	Waterloo
46	UA Local 221	Kingston
47	UA Local 463	Bowmanville
48	UA Local 508	Sault Ste. Marie
49	UA Local 527	Waterloo
50	UA Local 593	London
51	UA Local 599	Barrie
52	UA Local 628	Thunder Bay
53	UA Local 663	Sarnia
54	UA Local 666	Thorold
55	UA Local 71	Ottawa
56	UA Local 800	Sudbury

Table 12: Private Organizations Designated by MTCU as Training Delivery Agents

Union/Employer Training Centre	Number of Training Facilities
Canadian Elevator Industry Education Pro	3
Carpenters Local 27	1
Cement Masons Water proofers and Steeplejacks' Local 598 Training Centre	1
Construction & Allied Workers Local 607	1
Interior Finishing Systems	2
International Association of Heat & Frost Insulators and Allied Workers, Local 95	1
Ironworkers Local 700	1
Ironworkers Local 721	1
Ironworkers Local 736	1
Joint Training and Apprenticeship Committee - Local 46 Plumbers/Steamfitters	1
Labourers International Union of North America (LIUNA), Local 625	1
Labourers International Union of North America (LIUNA)-Local 1059	1
Labourers International Union of North America (LIUNA)-Local 506	1
Labourers International Union of North America (LIUNA)-Local 837	1
Labourers International Union of North America (LIUNA) Local 493	1
Labourers International Union of North America (LIUNA) Local 1089	1
Labourers International Union of North America (LIUNA) Local 247	1
Labourers International Union of North America (LIUNA) Local 527	1
Ontario Electrical Industry Training Trust Fund	1
Ontario Industrial & Finishing Skills	1
Ontario Masonry Training Centre	2
Ontario Sheet Metal Workers Training Centre	1
Operating Engineers Training Institute	2
Ottawa Walls & Ceilings Training Centre - Northern	1
Ottawa Walls and Ceilings Training Centre - East	1
Refrigeration Workers Local 787	1
Sheet Metal Workers' Int'l. Association	1
Terrazzo, Tile & Marble	1
U.A. Local 67/M.C.A. Zone 9/9A Apprenticeship Committee	1
U.A. Local 853 Sprinkler & Fire Protection	1
U.A Local 552	1
United Brotherhood of Carpenters & Joiners-Local 18	1
Universal Workers Union, Local 183, Life Long Learning Centre Incorporated	2
Total	39

Table 13: Ontario Colleges of Applied Arts & Technology Delivering Construction Sector Apprenticeship Programs

COLLEGE	LOCATION/CONTACT	PROGRAM	DETAILS
ALGONQUIN COLLEGE	www.algonquincollege.com Woodroffe Campus 1385 Woodroffe Avenue Ottawa, Ontario Canada K2G 1V8 Phone : (613) 727-4723	Carpenter	Basic (8 weeks), intermediate (8 weeks), advanced (8 weeks)—each 30 hours/week in class 40% of class – on campus in carpentry shops – practical, hands-on training.
		Refrigeration and Air Conditioning Systems Mechanic	Program length is 24 weeks consisting of 3 levels Level 1 (8 weeks) – Level 1 can be taken as an independent / separate 8 week course. Level 2 & 3 (8 weeks each) Program divided approx. 70/30 – theoretical instruct. / practical work Students attend classes 30 hrs per week
		Electrician (Construction and Maintenance)	Program length is 28 weeks consisting of 3 levels: Basic (8 weeks), Intermediate (10 weeks) and Advanced (10 weeks) – 30 hrs / week.
		Plumber	Program length is 24 weeks consisting of 3 levels. Each level is eight-weeks in duration, at 30 hours per week Basic / Intermediate / Advanced Levels.
		Sheet Metal Worker	Program length is 24 weeks consisting of 3 levels. Each level is eight-weeks in duration, at 30 hours per week 30% of class time spent in shop learning practical hands-on skills
CAMBRIAN COLLEGE	www.cambriancollege.ca Main Campus 1400 Barrydowne Road Sudbury, Ontario Canada P3A 3V8 (705) 566-8101 Toll free in Ontario: 1-800-461-7145	Carpentry Apprenticeship (CGAP)	Program length is 24 weeks consisting of 3 levels. Each level is eight-weeks in duration, at 30 hours per week Basic, intermediate and advanced levels
		Sheet Metal Worker Apprenticeship (SMAP)	Program length is 24 weeks consisting of 3 levels. Each level is eight-weeks in duration, at 30 hours per week Basic, intermediate and advanced levels
CANADORE COLLEGE	www.canadorecollege.ca Main Campus 100 College Drive P.O. Box 5001 North Bay, Ontario Canada P1B 8K9 (705) 474-7600 ext. 5628	Carpenter	Levels 1, 2 and 3 offered in block release

Table 13 *continued*

COLLEGE	LOCATION/CONTACT	PROGRAM	DETAILS
CENTENNIAL COLLEGE	www.centennialcollege.ca Progress Campus 941 Progress Ave. Toronto, Ontario M1G 3T8 Tel: 416-289-5000 ext. 2356	Electrician Construction & Maintenance	Basic, intermediate and advanced level
		Refrigeration & Air Conditioning Systems Mechanic	Basic, intermediate and advanced level
COLLEGE BOREAL	www.collegeboreal.ca Main Campus - Sudbury 21, boulevard Lasalle Sudbury, Ontario P3A 6B1 1-800-361-6673 ext. 3003 apprentissage@borealc.on.ca	Construction Craft Worker	Programs offered in French Program Length is 480-hours This program will provide Level 1 and Level 2 in-school training
		Electrician Construction & Maintenance	Programs offered in French Program Length is 840-hours This program will provide Level 1 and Level 2 and Level 3 in-school training
CONESTOGA COLLEGE *Apprenticeships are offered in 2 formats: 1)Traditional block format consists of 3 eight-week segments (of full time schooling) over the 3-4 years of apprentice-ship* *2) Day release format: apprentices are in school 1 day a week for 40 weeks each year over a 3 year period and working as an apprentice for the other four days of the week*	www.conestogac.on.ca Doon Campus 299 Doon Valley Drive Kitchener, Ontario N2G 4M4 Tel. 519-748-5220 Waterloo Campus 108 University Avenue East Waterloo, Ontario N2J 2W2 Tel. 519-885-0300 Guelph Campus 460 Speedvale Ave West Guelph, Ontario N1H 6N6 Tel. 519-824-9390 Cambridge Campus 850 Fountain St. South Cambridge, Ontario N3H 0A8 Tel. 519-748-5220	Brick and Stone Mason	Program length is 24 weeks consisting of 3 levels. Each level is eight-weeks in duration, at 30 hours per week Basic, intermediate and advanced levels Location: Waterloo Campus
		Construction Craft Worker	Length: 480-hour This program will provide Level 1 and Level 2 in-school training Location: Waterloo
		Electrician Construction & Maintenance	Program length is 28-week/840-hours Available in day release or block format. Location: Doon Campus, ATS Centre
		General Carpenter	Program length is 24 weeks delivered in three components Location: Waterloo Campus
		Heavy Equipment Operator – Dozer Operator	Ontario College Certificate program – 90 hours in-school and 150 hours at work site. Location: Guelph Campus
		Heavy Equipment Operator – Excavator Operator	Ontario College Certificate program - 90 hours in-school and 150 hours at work site. Location: Guelph Campus
		Heavy Equipment Operator – Tractor Loader Backhoe	Ontario College Certificate program - 90 hours in-school and 150 hours at work site. Location: Guelph Campus
		Plumber	Program 24-week / 720-hour program delivered in 3 eight-week components: levels – basic/intermediate/advanced Location: Waterloo Campus
		Roofer	Length: 480-hour Certificate program delivered in two components Location: Waterloo

Table 13 *continued*

COLLEGE	LOCATION/CONTACT	PROGRAM	DETAILS
CONESTOGA COLLEGE *continued*		Welder	Length: 720-hour; provides "in-school" training for the regulated and non-regulated welding Location: Cambridge
CONFEDERATION COLLEGE	www.confederationc.on.ca Main Campus—Thunder Bay 1450 Nakina Drive P.O. Box 398, Thunder Bay, Ontario, Canada P7C 4W1	Brick and Stone Mason	Block release only 3 levels: Basic (8 weeks), Intermediate (8 weeks), Advanced (8 weeks)
		General Carpenter	Block release only 3 levels: Basic (8 weeks), Intermediate (8 weeks), Advanced (8 weeks)
		Electrical Construction and Maintenance	Block release only 3 levels: Basic (10 weeks), Intermediate (10 weeks), Advanced (8 weeks)
		Millwright	Block release only 3 levels: Basic (8 weeks), Intermediate (8 weeks), Advanced (8 weeks)
		Welding	Under "Program Renewal" process
DURHAM COLLEGE	www.durhamcollege.ca Whitby Campus 1610 Champlain Avenue, Whitby, Ontario L1N 6A7 Tel: 905.721.3300 Fax: 905.721.3335	Electrician – Construction & Maintenance	Block or Day Release formats 3 levels: beginner (8 weeks), intermediate (10 weeks), advanced (10 weeks)
		Hoisting Engineer (Branch I and II)	Block only 3 levels: Beginner (6 weeks), Intermediate (6 weeks), Advanced (6 weeks)
		Plumber	Block only 3 levels: Beginner (6 weeks), Intermediate (6 weeks), Advanced (6 weeks)
FANSHAWE COLLEGE	www.fanshawec.ca London Campus 1001 Fanshawe College Blvd London, Ontario N5Y 5R6 Tel: 519 452-4430 Fax: 519 452-4420 St. Thomas/Elgin Campus 120 Bill Martyn Parkway St. Thomas, Ontario N5R 6A7 Tel: 519 633-2030 Fax: 519 633-0043	General Carpenter	Block release, 3 levels; beginner (8 weeks), intermediate (8 weeks), advanced (8 weeks) Offered at: London Campus
		Plumber	Block release, 3 levels; beginner (8 weeks), intermediate (8 weeks), advanced (8 weeks) Offered at: London Campus
		Electrician – Construction & Maintenance	Block release, 3 levels; beginner (8 weeks), intermediate (10 weeks), advanced (10 weeks) Offered at: London and St. Thomas Campuses
		Brick & Stone Mason	Block release, 3 levels; beginner (8 weeks), intermediate (8 weeks), advanced (8 weeks) Offered at: London Campus

Table 13 *continued*

COLLEGE	LOCATION/CONTACT	PROGRAM	DETAILS
FANSHAWE COLLEGE *continued*		Sheet Metal Worker	Block release, 3 levels; beginner (8 weeks), intermediate (8 weeks), advanced (8 weeks) Offered at: London Campus
		Residential Air Conditioning Systems Mechanic	Block release Woodstock Campus
FLEMING COLLEGE	www.flemingc.on.ca Sutherland Campus 599 Brealey Drive Peterborough, Ontario K9J 7B1 Ph: (705) 749-5530 Fax: (705) 749-5507	Carpenter	3 levels – Basic, Intermediate, and Advanced - 240 hours each
		Electrician: Construction and Maintenance	3 levels – Basic, Intermediate and Advanced
GEORGE BROWN COLLEGE	www.georgebrown.ca Casa Loma Campus 160 Kendal Avenue Toronto, Ontario, Canada M5R 1M3 416-415-2000	Electrician	Block release 3 levels – Basic (8 weeks), Intermediate (10 weeks) and Advanced (10 weeks)
		General Carpenter	Block release 3 levels – Basic (8 weeks), Intermediate (8 weeks) and Advanced (8 weeks)
		Plumber	Block release 3 levels – Basic (8 weeks), Intermediate (8 weeks) and Advanced (8 weeks)
		Sheet Metal Worker	Block release 3 levels – Basic (8 weeks), Intermediate (8 weeks) and Advanced (8 weeks)
		Steamfitter	Block release 3 levels – Basic (8 weeks), Intermediate (8 weeks) and Advanced (8 weeks)
		Refrigeration and Air Conditioning Systems Mechanic	Block release 3 levels – Basic (8 weeks), Intermediate (8 weeks) and Advanced (8 weeks)
GEORGIAN COLLEGE	www.georgian.on.ca Apprenticeship Office 1-866-224-9232 Midland Campus 649 Prospect Blvd Midland, Ontario, Canada L4R 3K6	General Carpenter	Level 1, 2 and 3 offered Location: Muskoka and Owen Sound Campuses
		Electrical Construction and Maintenance	3 levels: Basic, Intermediate Location: Midland Campus

Table 13 *continued*

COLLEGE	LOCATION/CONTACT	PROGRAM	DETAILS
GEORGIAN COLLEGE *continued*	Muskoka Campus 111 Wellington Street Bracebridge, Ontario, Canada P1L 1E2 Owen Sound Campus 1450 8th Street East Owen Sound, Ontario, Canada N4K 5R4	Plumber	3 levels: Basic, Intermediate Location: Midland Campus
HUMBER COLLEGE	www.humber.ca Humber North Campus 205 Humber College Blvd., Toronto, Ontario, Canada M9W 5L7 416.675.5000	Construction boilermaker	Program length is 6,600-hour with 720 hours allocated to three levels of in-school training. 3 levels of in school training; basic (30 hours/week), Intermediate (30 hours/week), advanced (30 hours/week)
		Electrician: construction and maintenance	Apprentices attend either day-release schooling (one day per week from August to May for all three levels) or block-release (8 week Basic, 10 week Intermediate, and 10 week Advanced)
		Plumber	3 levels; basic, intermediate, advanced Apprentices attend either day-release schooling (one day per week from September to June for all three levels) or block release (eight-week Basic level, eight -week Intermediate level, and eight-week Advanced level).
LA CITE COLLEGIALE	www3.lacitec.on.ca 801, walk of the Aviation Ottawa, Ontario K1K 4R3 Tel: 613 742-2483 Toll free: 1 800 267-2483 Fax: 613 742-2481	Carpenter	3 levels of training; basic, intermediate, advanced
		Electrician: Construction and maintenance	Levels 1, 2, 3
		Plumber	3 levels of training; basic, intermediate, advanced
		Bricklayer	Length: 24 weeks (3 level of 8 weeks) Campus Orleans
LAMBTON COLLEGE	http://www.lambton.on.ca 1457 London Road, Sarnia, Ontario, N7S 6K4 Phone: (519)542-7751 Fax: (519)541-2446	Carpenter	3 levels of block release training; basic (8 weeks) intermediate (8 weeks), advanced (8 weeks)
		Electrician: Construction and maintenance	3 levels of block release training; basic (8 weeks), intermediate (10 weeks), advanced (10 weeks)

Table 13 *continued*

COLLEGE	LOCATION/CONTACT	PROGRAM	DETAILS
MOHAWK COLLEGE	www.mohawkcollege.ca Skilled Trades and Apprenticeship Research, Resources and Training (STARRT) Institute (previously Stoney Creek Campus) 481 Barton Street Stoney Creek, Ontario, Canada L8E 2L7 Phone: (905) 575-1212 x 5000 Fax: (905) 575-2549	Electrician: Construction and maintenance	3 levels of training; basic (8 weeks), intermediate (10 weeks), advanced (10 weeks)
		General carpenter	3 levels of training; basic, intermediate, advanced
		Plumber	3 levels of training; basic, intermediate, advanced
		Roofer	3 levels of training; basic, intermediate, advanced
		Sheet metal worker	3 levels of training; basic, intermediate, advanced
		Steamfitter	3 levels of training; basic, intermediate, advanced
		Refrigeration and Air Conditioning Systems Mechanic	3 levels of training; basic, intermediate, advanced
		Welding	3 levels of training; basic, intermediate, advanced
NORTHERN COLLEGE	www.northernc.on.ca Porcupine Campus 4715 Highway 101 East South Porcupine, ON P0N 1H0 705-235-3211 James Bay Education Centre First Ave Box 130 Moosonee ON P0L 1Y0 705-336-2913 Kirkland Lake Campus 140 Government Rd E Kirkland Lake ON P2N 3L8 705-567-9291	Construction Maintenance Electrician	3 levels of training; basic (8 weeks), intermediate (10 weeks), advanced (10 weeks) Located at: Porcupine Campus
		Construction Craft Worker (sporadic)	Level 1 and level 2 theory (8 weeks each)
		General Carpenter	Approximately 4 years. in school training as well as approximately 6000 hours of on the job training
		Heavy Equipment Operator - Dozer	Approximately 1-2 years; 2,260 hours, which includes 240 hours of in-class training
		Heavy Equipment Operator - Excavator	Approximately 1-2 years; 2,260 hours, which includes 240 hours of in-class training
		Heavy Equipment Operator - Tractor Loader Backhoe	Approximately 1-2 years; 2,260 hours, which includes 240 hours of in-class training
		Native Residential Construction Worker	2 – 3 years Both Level 1 and Level 2 are 240 hours each.
		Welder	Level I (10 weeks; 300 hours) – Block A

Table 13 *continued*

COLLEGE	LOCATION/CONTACT	PROGRAM	DETAILS
ST. CLAIR COLLEGE	www.stclaircollege.ca/ Windsor - Main South Campus 2000 Talbot Road West Windsor, ON N9A 6S4 Phone: (519) 966-1656 Fax: (519) 972-3811	Brick and Stone Mason	Levels 1, 2, 3 Offered full time or part time
		Electrician: construction and maintenance	Levels 1, 2, 3
		General Carpenter	Levels 1, 2, 3
		Plumber	Levels 1, 2, 3
ST. LAWRENCE COLLEGE	www.sl.on.ca/ Kingston 100 Portsmouth Avenue, Kingston, Ontario K7L 5A6 Phone: 613-544-5400 Fax: 613-545-3923 Cornwall 2 Belmont St., Cornwall, Ontario K6H 4Z1 Phone: 613-933-6080 Fax: 613-937-1523	Carpenter	3 levels of training offered: Basic (30 hours per week including a shop setting for a minimum of 13 hrs/week), Intermediate (30 hours per week including a shop setting for 10 hrs/week), (30 hours per week including a shop setting for 10 hrs/week) Location: Cornwall and Kingston campuses
		Electrician: Construction and Maintenance - apprenticeship	3 levels of training offered; Basic (8 weeks), intermediate (10 weeks), advanced (10 weeks) Location: Kingston campus
		Plumber apprenticeship	Training available at 3 levels; basic, intermediate, advanced; 8-week blocks for each level Location: Kingston campus
SAULT COLLEGE	www.saultc.on.ca/ 443 Northern Ave. Sault Ste. Marie, ON, Canada P6A 5L3 705.759.2554	Construction and maintenance electrician	3 levels of training offered; basic (8 weeks), intermediate (10 weeks), advanced (10 weeks)
		Iron worker	3 levels of training offered; basic (8 weeks), intermediate (8 weeks), advanced (8 weeks)
		Plumbing	3 levels of training offered; basic (8 weeks), intermediate (8 weeks), advanced (8 weeks)
		Reinforcing rodworker	2 levels of training offered; basic (8 weeks), advanced (4 weeks)
		Steamfitting	3 levels of training offered; basic (8 weeks), intermediate (8 weeks), advanced (8 weeks)
SHERIDAN COLLEGE	www1.sheridaninstitute.ca/ Skills Training Centre 407 Iroquois Shore Road Oakville, ON L6H 1M3 905-845-9430	Construction and Maintenance Electrician	Levels 1, 2, 3 Block release 8 weeks each

Completion Counts: Raising Apprenticeship Completion Rates in Ontario's Construction Industry

MAY 2013 - Ontario Construction Secretariat

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COMPLETION COUNTS: RAISING APPRENTICESHIP COMPLETION RATES IN ONTARIO'S CONSTRUCTION INDUSTRY

MAY 2013

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