



**CANADIAN  
TOOLING &  
MACHINING  
ASSOCIATION**

## *Discussion Paper*

# **Making A Case For Apprenticeship Training Tax Credits**

**November 6, 2002**  
Revision 5

**PUBLISHED BY:**

**Canadian Tooling & Machining Association**

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- *This study was conducted on behalf of, as well as funded by Human Resource Development Canada.*

## **Preamble:**

This proposal is national in scope and envelopes all apprenticeship training in Canada. Although, our main focus is the resolution of the systemic shortages of skilled tradespersons in the Canadian precision metal cutting trades, we believe that our proposal would be applicable in all of Canada's skilled trades.

This dialogue was initiated by the CTMA from 1999 to present. To address the skills shortage, which has persisted for many years, and continues to be exacerbated due to the aging of the current workforce and impending retirements. Current estimates are that 50,000 trades people will need to be replaced over the next few years in the automotive sector alone and, of this total, an estimated 5,000 skilled precision metal tradespersons will be required independent of the various economic cycles to be encountered.

Current estimates of this shortage are that the precision metal cutting trades could assimilate 1,000 qualified trades people immediately. In times when our economy is expanding, Canadian industry lose orders or do not quote on available work due to the shortage of capacity almost entirely caused by the shortage of skilled people in the precision metal trades. Contracts currently available across the globe to Canadian firms go to offshore suppliers. e.g. China, India, Spain, etc. thus creating and supporting unnecessary competition from lower wage countries. These lost contracts occur primarily because Canadian firms are unable to attract, train and / or retain skilled metal cutting trades persons. Canada has to date competed successfully in international markets through a process of technical development based on the combining of the old and the new economies. This has resulted in a requirement for more highly trained skilled metal cutting trades people for which a world wide shortage exists.

We are not sustaining our international position, and unless we create an environment that provides training for Canada's youth in sufficient numbers so to have an impact on the problem, we will continue to fall behind. Canada desperately requires additional trained people and the systems that industry currently relies on for this vital industry is relatively unsupported by governments at all levels.

The training of skilled workers for the precision metal cutting trades can only be done through a formal apprenticeship program. The precision metal trades' apprenticeship

programs that are currently in place have a capacity of 500 graduates per year. This rate has been consistently maintained for years and the chronic shortage of skilled precision metal tradespersons continues without abatement. In spite of our best efforts the situation is worsening.

Immigration is our historical crutch, and is not providing the skills required in sufficient numbers. The CTMA supports the plan put forth by the HRDC, for the fast-tracking of temporary foreign skilled workers in order to fill some of the immediate need. However, it must be understood that this is only a band aid solution to the problem and at this time does not seem to be of any help at all. The solution to end this skilled trades shortage can only be a permanent "Made in Canada" solution.

We believe that there is the potential to increase the throughput within the existing training systems to 800-1000 skilled metal tradespersons per year, from the estimated current throughput rate of 500 per year. However, even if we achieved this targeted increase, it would take many years to reach a balance against the current demand. The CTMA believes that this suggested increase is balanced, reasonable and achievable with the correct stimulus. This increased throughput is not taxing on the resources of the academic systems because they provide only 10% of the training for apprentices. Where as private industry bears 90% of the training costs.

Apprenticeship training is now viewed as the 3<sup>rd</sup> pillar of education, alongside our colleges and universities. There are few key differences. Our education system currently receives government assistance for providing career skills, and private industry providing 90% of an apprentices post secondary education does not. Another key difference, Canadians participating in formal apprenticeship training contribute to our economy throughout their education through income taxes, and do not rely on financial assistance to complete this form of post-secondary education.

The majority of employers currently conducting training are small to medium sized companies with 10 to 60 employees. Large corporations do not usually conduct training programs for apprentices because they do not find it cost effective and are able to poach journeypersons from the smaller employers. There are exceptions and several larger firms have excellent apprenticeship programs. As this problem is global in nature, all Canadian companies employing skilled labour, are becoming victims of poaching from

other countries. United States and Mexico are at this time actively pursuing our trades people to work in their countries. A Bill before the House of Representatives in the United States of America is also seeking tax credits for small employers. If acted upon, this will put Canada at an even less competitive position within the North American market. It must be pointed out that the shortage of skilled trades is not only a Canadian problem. It is an international problem. The situation is getting worse and Canada must act now to prevent our skilled people from becoming other countries "Temporary Foreign Workers".

In a recent third party study conducted by R.J. Sparks Consulting Ltd., and WGW Services Ltd, initiated by, and funded by Human Resources Development Canada, (Appendix E) entitled "The Cost of Apprenticeship Borne by Employers", the estimated net costs to the employer for training a Tool and Die apprentice over a 4 year period (8,000 hours) is \$125,910.00 (Cad). The study also found that it takes five years for the employer to fully recover these training costs. This places real economic pressures on the small and medium sized businesses carrying out the majority of apprenticeship training across the country. In addition, these firms frequently lose the developing skills, through the poaching process referred to previously, before they are able to recoup the cost of the training. Currently, there are no vehicles available to any company that trains apprentices to recover these training expenses.

What could bring about the changes necessary to alter trends and increase the rate of development of individual tradespersons in the precision metal trades? Before any effort is made to answer this question, we should first examine the nature of the shortage and the underlying causes of the shortages which have plagued the Precision Metal Trades for the better part of this century, independent of the economic cycles over this period.

The industry sector identified as the Precision Metal Trades has evolved for a century with a heavy reliance on the use of skilled immigrant workers, primarily European in origin. This took advantage of a European training system that developed skilled trades people through a process well developed apprenticeship programs. Two world wars stimulated the availability of immigrants with the skills and a strong desire to work and to achieve a better standard of living.

The continued expansion of the North American manufacturing economy has led to the increased demand for skilled labour and the development of training processes including apprenticeship training for skilled metal trades. Social attitudes in the past prevented students, parents and educators from identifying apprenticeship education as a viable career path. Although this is no longer the case, they viewed the trades as less desirable and attempted to misdirect the youth into other studies, thus reducing the numbers entering the system.

Ontario's former Minister of Education & Training , David Johnson, stated "*...we want more employers to train. We want more young people to become apprentices. By the year 2000 we intend to double the number of new apprentices entering the system annually - from 11,000 to 22,000.*" The CTMA supports Ontario and all other governments in this direction. **However, this did not happen. We believe that without some level of incentive, this will continue to not happen.** Please review CTMA's Policy Paper on Apprenticeship Training that was released on October 30th, 1996 (Appendix A).

The Federal Government has withdrawn all traditional funding of apprenticeship training. Provincial governments have reformed their own apprenticeship programs and downloaded costs onto the apprentices or employers in the way of user fees for the college portion of the apprentice's education. Our perception is that the outcome of this activity is decreasing - not increasing - the number of people within the apprenticeship system.

It is clear from the withdrawal of funding from apprenticeship training, that all levels of Government believe that private industry should provide the opportunities and also carry the burden for this training. If this approach was working, industry would not have these skilled shortages or problems finding qualified and motivated people to train; unemployment levels would be dropping, especially for young Canadians.

It should also be pointed out that Canadian manufacturers are not the only beneficiaries of training skilled trade's people. On average, Canadians employed in the skilled trades earn an above average income. And career earnings (from apprenticeship to retirement) rival the career incomes of many accredited professions. This adds to Canada's Federal Income Tax base. Also, these people rarely have reason to call on Canada's

Employment Insurance system. Statistics Canada currently indicates that the unemployment rate for Tool & Die Makers is less than .7%.

In a recent survey of CTMA members, it was found that 92% of respondents believe that their businesses are being constrained by the lack of skilled people. If there is this much need and there are now plenty of Canadian youth looking to enter into the skilled trades, why is this not happening? **Simply stated, companies that are currently training can not afford to train more.**

## **Proposal:**

The Canadian Tooling and Machining Association is of the opinion that a method should be developed to compensate companies for the post secondary education that they deliver. We are convinced that a system of tax credits is an effective stimulus. A system of tax credits for training an apprentice is an investment that improves Canada's performance and yields a more than satisfactory return on investment.

The short-term loss of tax revenues from profitable corporations that train apprentices flows quickly back to the government and society many times over, thus making apprenticeship training a long term, income generating activity. Governments who typically focus on the short term expense side of apprenticeship training, usually fail to give adequate consideration to apprenticeship as an investment in post secondary education. From the federal government's perspective, this creates high wage earning jobs. As well as the income tax base that goes along with those jobs and reduced dependence on the national employment insurance system. From the individual's perspective, it creates careers offering above average wages and employment security.

**We propose that a Tax Credit should be granted to any Canadian company obtaining prior approval for training apprentices in a provincially accredited apprenticeship program where a systemic shortage of skilled trades people exists. The cost of the training an apprentice will vary by trade, sector and region.**

**Using as a model, the current Research and Development tax credit system available to companies today, we believe that a tax credit of 75% of the regular wage cost for each approved apprentice being trained during a taxation year. Claimable upon completion of each year during which an approved program exists.**

### **EXAMPLE A:**

<i>Apprentice's 1<sup>st</sup> Yr. Annual Wages</i>	$\$8.00 \times 40 \text{ hours} \times 50 \text{ weeks} =$	$\$16,000.$
<i>Tax Credit @ 75%</i>	$\$16,000 \times 0.75 =$	$\$12,000.$

**EXAMPLE B:**

<i>Apprentice's 4<sup>th</sup> Yr. Annual Wages</i>	$\$16.00 \times 40 \text{ hours} \times 50 \text{ weeks} =$	$\$32,000.$
<i>Tax Credit @ 75%</i>	$\$32,000 \times 0.75 =$	$\$24,000.$

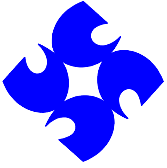
The extensive knowledge and the depth of skills required by a recognized practitioner in our industry are ever increasing. The rate of technological change is accelerating and will continue to do so. The skill requirement for trained persons is not abating and the skill demanded from employees is continuing to increase. The level of technology is what is differentiating tradespersons, employers, and even countries, now and in the future. If we as Canadians wish to continue to benefit from our high standard of living, then we need to invest in our ability compete now.

## **Footnotes:**

1. Qualified Apprentice: Any employed apprentice registered with their respective Provincial Apprenticeship Branch into the applicable government approved program of their choice.
2. Qualified Companies: A company employing an apprentice registered in a Provincial Apprenticeship Branch approved apprenticeship would qualify for application for a “Tax Credit”. endorsed to apply for the tax credit at the end of their fiscal year. A carry forward provision should also apply.
3. Qualifying Year: “Tax Credits” would apply to the fiscal year during which the training takes place.
4. Phase-In Period: A “Tax Credit” would only apply to companies that have had registered apprentices for a minimum of 4 years prior to the start-up date. Companies which have consistently trained apprentices will be able to access the tax credits immediately. Companies who have consistently foregone the opportunity to participate in the training of apprentices will need to begin training and will be eligible for tax credits in the fourth year.

**Appendix A:**

CTMA Policy Paper  
on Apprenticeship Training



## CANADIAN TOOLING & MACHINING ASSOCIATION

### **POLICY PAPER ON APPRENTICESHIP TRAINING**

The Canadian Tooling & Machining Association (CTMA) represents over 160 Canadian companies involved in producing tools-dies-moulds-machining (tooling), employing in excess of 9,000 employees and training approximately 1,000 Apprentices. This is the majority of the 14,000 to 15,000 employees Canada-wide involved within the tooling and machining industry.

#### **BACKGROUND:**

CTMA members generate in excess of 1.33 billion dollars in manufactured product. A large proportion of this production is exported or used in the production of products for export. The tooling and machining industry provides a beneficial growth potential for jobs in many other sectors such as automotive, machine building, stamping, aerospace, and household appliances, etc.

The members of CTMA have been, and will continue to be, one of the major providers of apprenticeship training to the tooling and machining industry. The extensive knowledge and the depth of skills required by a recognized practitioner in our industry are ever increasing. Ninety percent of the training to deliver these skills and knowledge is carried out at an industrial facility with the remaining 10% being delivered in the classroom. The cost to industry to deliver the minimum required 8,000 hours of apprenticeship training is calculated to be in excess of \$110,000.00 per apprentice. There is no opportunity available to any industry that trains apprentices to recover these training expenses. At the same time these industries have no way of protecting themselves from losing their trained employees to other industries (usually those industries that do not train apprentices or make the same investment in training). The cost of providing all industries with new highly skilled journeypersons is being unequally borne within the tooling and machining industry, in particular, our member companies.

The CTMA, along with educators, government representatives, trades people, and other stakeholders in the apprenticeship system, have developed Provincial apprenticeship training standards for all the precision metal cutting trades. These documents are viewed by all the stakeholders in apprenticeship training as the best training program available in this

country. These apprenticeship standards unfortunately are not widely used. The institutions empowered and financially remunerated to deliver these curricula have not delivered it as it was intended.

The tooling and machining industry, over the last three to four years, was one of the leading industrial growth sectors. Yet, we are not able to fully capitalize on the growth potential available to us, due to continuing severe skilled labour shortages. The industry sees no other solution to these chronic shortages other than the development and continued expansion of a good, ongoing apprenticeship training program.

As a result of the government's current fiscal constraints with regard to apprenticeship training, the CTMA finds it necessary to express its position on apprenticeship training. While we generally support the current fiscal direction of the Ontario Legislature, we are deeply concerned that policy currently under consideration will result in the deterioration of our apprenticeship training programs and ultimately the supply of highly skilled tradespeople as a whole. Highly skilled trades personnel are essential for Canadian manufacturers to continue to lead the economy in the tooling and machining and related industries.

In order to maintain our leading edge and continue to develop some of the most highly skilled trades people, the following policy statements have been formulated for the future viability of the apprenticeship training program.

**CTMA POLICY STATEMENTS:**

- a) We believe in and support an apprenticeship system, which in our opinion, is the best way of developing the highly skilled trades people required by our industry and the manufacturing sector in general.
- b) We support the enforcement of Canada-wide standards. Proof of training standard competencies and Grade 12 equivalency should be prerequisites for an apprentice writing the Certificate of Qualification (C of Q).
- c) We believe that the current system of on-the-job-training, supplemented by institutional training, is the best vehicle to accomplish apprenticeship training.

- d) We maintain that effective apprenticeship training requires a minimum of 8,000 hours.
- e) The institutional component of the apprenticeship training program must be delivered concurrently with the training delivered by industry.
- f) The completion of current training and curriculum standards developed in co-operation with CTMA, Government, Industry, and other stakeholders should be required for a Certificate of Qualification (C of Q). CTMA, Industry, and other stakeholders must be involved in a meaningful way in the current and future apprenticeship program updating.
- g) The apprenticeship program for the highly skilled precision metal working trades should be reviewed every five years with the involvement of CTMA, Industry, Government and other stakeholders. CTMA to assume the lead agency role.
- h) We support an apprenticeship training ratio in the workplace of not less than one certified trades person (journey person) for each apprentice.
- i) A method should be developed to compensate companies for the apprenticeship training they deliver. We favour a system that takes the form of a tax credit for qualified companies rather than grants or government funding approaches. This will provide more entry level opportunities for our youth into a constantly growing world class industry.

**RECOMMENDATION:**

CTMA is urging both the Federal and Provincial Governments to start an immediate dialogue with CTMA and other stakeholders to guarantee the aforementioned basic policy is considered.

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As approved by the Board of Directors of the Canadian Tooling & Machining Association, this 30th Day of October, 1996.

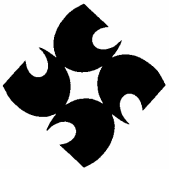
*Original signed by:*

Ronald B. McKittrick  
President

Canadian Tooling & Machining Association  
140 McGovern Drive, Unit #3  
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## **Appendix B:**

### Economic Impact of the Tooling Industry in Canada



## CANADIAN TOOLING & MACHINING ASSOCIATION

January 2000

### ***ECONOMIC IMPACT OF THE TOOLING INDUSTRY IN CANADA***

- 23,000 Employees in 1,000 Establishments
- \$3.5 Billion in Gross Sales
- 4 : 1 Ratio of Spin-Off Employment to Canada's Economy
- 60% Value Added Contribution to Canada's Economy - this is indicative of a highly skilled sector

### ***ECONOMIC IMPACT OF CANADIAN TOOLING & MACHINING ASSOCIATION MEMBERS***

- 14,275 Employees in 185 Establishments
- \$2.1 Billion in Gross Sales
- 84% of CTMA Member Companies Export
- Profitable Networking: 4 out of 5 CTMA Members Buy from & Sell to Each Other
- 1,000 Apprentices in the Tooling Sector
- 92 CTMA Member Companies Participated in a Recent Benchmarking Wage & Business Survey (representing 7,098 employees)
- Typical Annual Salary of \$58,500.00 per Employee

*Sources: 1) Statistics Canada 2) CTMA Wage & Business Survey (Nov. '99)*

## **Appendix C:**

### United States Tax Credit Bill Information

- U.S. House of Representatives Letter to Support Tax Cuts for Job Training
- NTMA's Skilled Workforce Enhancement Act Overview
- Bill H.R. #3110 - To amend the Internal Revenue Code of 1986 to allow small employers a credit against income tax for certain expenses for long-term training of employees in highly skilled metalworking trades.

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Congress of the United States  
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January 22, 1997

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<http://www.house.gov/talent/>

## Support Tax Cuts For Job Training: Cosponsor The Skilled Workforce Enhancement Act!

\*\*\*FINAL NOTICE\*\*\*

Dear Colleague:

For too long, we have relied on inefficient, big-government programs to keep America's workforce well-trained. At the same time, the federal government has suffocated small business with burdensome levels of taxation and excessive regulation. This tax and spend approach has failed, and it's time for Congress to look for new and more effective ways to train American workers.

On January 27<sup>th</sup>, I will be introducing "The Skilled Workforce Enhancement Act," a bill to return power and resources back to the hands of employers so that they can train their workers. Currently, because taxes are so high, many small businesses simply can't afford to adequately train their employees.

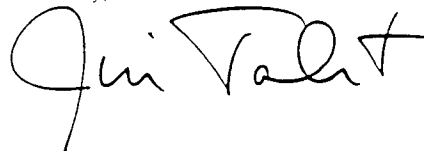
This problem has become particularly troublesome for certain highly skilled metalworking trades, such as precision mechanists, die makers, mold makers, as well as tool and die designers. In fact, the precision machining industry is so heavily taxed that it is becoming cost-prohibitive for employers to train new workers in this field. As a result, the industry is rapidly aging (the average age of a precision machinist is 55). Within 10 years, there will be a dramatic shortage of skilled workers in these metalworking trades. Although the Department of Labor estimates that the need for these skilled trades is 2% annually of the current workforce, the annual need climbs to 5% when the aging factor is taken into account. If Congress fails to provide relief soon, this crucial American industry will no longer be able to compete with overseas businesses.

To alleviate the impending crisis, "The Skilled Workforce Enhancement Act" would allow an employer who trains employees in these skills to receive a tax credit equal to 80% of the training expenses, up to a \$100,000 credit. In exchange for this credit, the employer must agree to: 1) provide 8,000 hours of shop training, as well as classroom training, necessary to produce a skilled employee, and 2) retain the employee for one full year following the completion of training. The credit would be allowed for the employer in 20% increments beginning in the sixth year of the program and would be allowable through the tenth year.

This legislation provides much-needed tax relief for many struggling small businesses. It also would shift the responsibility of training employees away from the bureaucracy and back to the private sector. Finally, the bill would provide a crucial incentive to train workers in our own country instead of looking overseas to hire skilled people. This, in turn, will enhance the creation of high-paying jobs which will stimulate the economy and broaden the base of taxpayers. For these reasons, I urge you to become a cosponsor of "The Skilled Workforce Enhancement Act."

For more information, or to become an original cosponsor, please call Andy Barr on my staff at 5-2561.

Sincerely,



Jim Talent  
Member of Congress



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### ISSUE

#### SKILLED WORKFORCE ENHANCEMENT ACT

(H.R. 3110)

#### STATUS

The Skilled Workforce Enhancement Act has been introduced by Rep. Jim Talent (R-MO) to assist the metalworking industry in alleviating the shortage of skilled workers. H.R. 3110 would give small manufacturers a tax credit for training workers on site.

#### BACKGROUND

The metalworking industry covers precision machinists, die makers, mold makers, as well as tool and die designers. Without them, mass production of manufactured goods would not be possible. The owners of these shops are facing a severe shortage of skilled workers, yet most have plenty of jobs to offer at high pay. The tax burdens placed on these small firms makes it nearly impossible for most to even consider taking on the high costs of training individuals themselves.

The Department of Labor estimates that the need for skilled labor in these trades is 2% annually of the current workforce. But with little new blood entering the industry, that percentage climbs to 5% when you take into account the aging of the current workforce. The majority of individuals in the industry are fast approaching retirement age.

If our country doesn't alleviate this shortage of skilled workers, we will see business disappear overseas to foreign competitors.

#### IMPACT/ANALYSIS

The Skilled Workforce Enhancement Act would give small employers the needed incentive to train individuals. The bill states that any employer taking advantage of the tax credit must train the individual in a four-year, 8000 hour, apprentice program. After the employee has become a certified journeyman, he must be hired on for a minimum of one year before the employer receives the tax credit. The credit would be 80% of the wages paid to the apprentice during the four-year program, up to \$100,000, and would be applied in 20% increments beginning the sixth year.

#### OUTLOOK

The bill has two original cosponsors, Representatives Steve LaTourette (R-OH) and Ron Paul (R-TX). NTMA will be working to gather cosponsors and get this bill passed. The shortage of workers must be alleviated.



**H.R.3110**

**SPONSOR:** Rep Talent (introduced 01/27/98)

**24 COSPONSORS:**

Rep LaTourette - 01/27/98    Rep Paul - 01/27/98  
Rep Myrick - 02/05/98    Rep English - 02/05/98  
Rep Davis, T. - 03/10/98    Rep Wolf - 03/10/98  
Rep McIntosh - 03/10/98    Rep Calvert - 03/25/98  
Rep Upton - 03/25/98    Rep Johnson, N. - 03/25/98  
Rep Snowbarger - 04/21/98    Rep Ehlers - 04/21/98  
Rep Manzullo - 04/21/98    Rep Klink - 04/21/98  
Rep Lofgren - 04/21/98    Rep Shays - 04/21/98  
Rep Wynn - 04/21/98    Rep Emerson - 05/06/98  
Rep Murtha - 05/06/98    Rep Peterson, J. - 05/06/98  
Rep Kolbe - 06/09/98    Rep Hall, T. - 06/09/98  
Rep Blagojevich - 06/09/98    Rep Mascara - 06/09/98

105TH CONGRESS  
2D SESSION

# H. R. 3110

To amend the Internal Revenue Code of 1986 to allow small employers a credit against income tax for certain expenses for long-term training of employees in highly skilled metalworking trades.

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## IN THE HOUSE OF REPRESENTATIVES

JANUARY 27, 1998

Mr. TALENT (for himself, Mr. LATOURETTE, and Mr. PAUL) introduced the following bill; which was referred to the Committee on Ways and Means

---

## A BILL

To amend the Internal Revenue Code of 1986 to allow small employers a credit against income tax for certain expenses for long-term training of employees in highly skilled metalworking trades.

1 *Be it enacted by the Senate and House of Representa-*  
2 *tives of the United States of America in Congress assembled,*

3 **SECTION 1. SHORT TITLE.**

4 This Act may be cited as the “Skilled Workforce En-  
5 hancement Act of 1998”.

1 **SEC. 2. CREDIT FOR EXPENSES FOR TRAINING EMPLOYEES**  
2 **IN HIGHLY SKILLED METALWORKING**  
3 **TRADES.**

4 (a) IN GENERAL.—Subpart D of part IV of sub-  
5 chapter A of chapter 1 of the Internal Revenue Code of  
6 1986 (relating to business-related credits) is amended by  
7 adding at the end the following new section:

8 **“SEC. 45D. EXPENSES FOR TRAINING EMPLOYEES IN HIGH-**  
9 **LY SKILLED METALWORKING TRADES.**

10 “(a) GENERAL RULE.—For purposes of section 38,  
11 the highly skilled metalworking trades training credit de-  
12 termined under this section is an amount equal to 80 per-  
13 cent of the training expenses paid or incurred by the tax-  
14 payer during the training period with respect to each  
15 qualified trained employee of the taxpayer. Twenty per-  
16 cent of the credit determined under the preceding sentence  
17 shall be taken into account under section 38 for each of  
18 the first 5 taxable years after the taxable year in which  
19 the training period ends.

20 “(b) LIMITATIONS.—

21 “(1) MAXIMUM CREDIT PER EMPLOYEE.—The  
22 total amount of credit determined under this section  
23 with respect to each qualified trained employee for  
24 all taxable years shall not exceed \$100,000.

25 “(2) EMPLOYER MUST BE SMALL EMPLOYER.—  
26 Training expenses may be taken into account under

1 subsection (a) only if the taxpayer is a small em-  
2 ployer for the taxable year in which such expenses  
3 are paid or incurred.

4 “(c) DEFINITIONS.—For purposes of this section—

5 “(1) QUALIFIED TRAINED EMPLOYEE.—

6 “(A) IN GENERAL.—The term ‘qualified  
7 trained employee’ means any employee (or  
8 former employee) of the taxpayer if—

9 “(i) the employee received at least  
10 8,000 hours of training (including on-the-  
11 job training) from the taxpayer (or any  
12 predecessor) during the training period as  
13 an apprentice in any highly skilled metal-  
14 working trade, and

15 “(ii) the employee is employed by the  
16 taxpayer in a journeyman capacity in any  
17 highly skilled metalworking trade on a full-  
18 time basis throughout at least the 1-year  
19 period beginning at the end of such em-  
20 ployee’s training period.

21 “(B) HIGHLY SKILLED METALWORKING  
22 TRADES.—For purposes of subparagraph (A),  
23 the term ‘highly skilled metalworking trades’  
24 means the trades traditionally recognized as  
25 such, including precision machinists, die mak-

1           ers, mold makers, and tool and die designers in  
2           the tooling and machining industry.

3           “(2) TRAINING EXPENSES.—

4                 “(A) IN GENERAL.—The term ‘training ex-  
5                 penses’ means wages paid or incurred to an em-  
6                 ployee of the taxpayer for services performed in  
7                 a highly skilled metalworking trade while the  
8                 employee is an apprentice in such trade.

9                 “(B) WAGES.—The term ‘wages’ has the  
10                meaning given such term by section 3401(a).

11           “(3) TRAINING PERIOD.—The term ‘training  
12           period’ means the period of 4 years beginning on the  
13           date that the employee begins employment with the  
14           taxpayer as an apprentice in a highly skilled metal-  
15           working trade.

16           “(4) SMALL EMPLOYER.—

17                 “(A) IN GENERAL.—The term ‘small em-  
18                 ployer’ means, with respect to any taxable year,  
19                 any employer who employed an average of 500  
20                 or fewer employees on business days during  
21                 such taxable year.

22                 “(B) CONTROLLED GROUPS.—For pur-  
23                 poses of subparagraph (A), all persons treated  
24                 as a single employer under subsection (b), (c),

1 (m), or (o) of section 414 shall be treated as 1  
2 employer.

3 “(d) COORDINATION WITH OTHER CREDITS.—  
4 Wages taken into account under subsection (a) shall not  
5 be taken into account in determining the credits under  
6 sections 51(a) and 1396(a).”.

7 (b) CREDIT MADE PART OF GENERAL BUSINESS  
8 CREDIT.—Subsection (b) of section 38 of such Code is  
9 amended by striking “plus” at the end of paragraph (11),  
10 by striking the period at the end of paragraph (12) and  
11 inserting “, plus”, and by adding at the end the following  
12 new paragraph:

13 “(13) the highly skilled metalworking trades  
14 training credit determined under section 45D(a).”.

15 (c) DENIAL OF DOUBLE BENEFIT.—Section 280C of  
16 such Code is amended by adding at the end the following  
17 new subsection:

18 “(d) CREDIT FOR TRAINING EXPENSES FOR EM-  
19 PLOYEES IN HIGHLY SKILLED METALWORKING  
20 TRADES.—No deduction shall be allowed for that portion  
21 of the expenses otherwise allowable as a deduction for the  
22 taxable year which is equal to the amount of the credit  
23 determined for such taxable year under section 45D(a).”.

24 (d) CLERICAL AMENDMENT.—The table of sections  
25 for subpart D of part IV of subchapter A of chapter 1

1 of such Code is amended by adding at the end the follow-  
2 ing new item:

“Sec. 45D. Expenses for training employees in highly skilled met-  
alworking trades.”.

3 (e) **EFFECTIVE DATE.**—The amendments made by  
4 this section shall apply to expenses paid or incurred after  
5 the date of the enactment of this Act in taxable years end-  
6 ing after such date.

○

## **Appendix D:**

### Typical Letters of Support For This Proposal

- Arlen Tool Co. Ltd.
- Automotive Parts Manufacturers' Association (APMA)
- Canadian Association of Moldmakers (CAMM)
- Canadian Plastics Industry Association (CPIA)
- Ryka Blow Molds Ltd.
- Valiant Machine & Tool Inc.

# ARLEN TOOL CO. LTD.

PLASTIC INJECTION MOLDS

AREA CODE 519  
OFFICE: 944-4444  
FAX: 944-2022

3305 DEZIEL DRIVE  
WINDSOR, ONTARIO N8W 5A5  
CANADA

October 15, 1999

Federal Standing Committee on Finance  
House of Commons, Room 603, Wellington Building  
180 Wellington Street  
Ottawa, Ontario  
K1A 0A6

RECEIVED

OCT 20 1999

CTMA

**Re: Making a Case for Apprenticeship Training Tax Credits**

Dear Sir or Madam:

We would like to formally ask that the government give serious consideration and support to the Canadian Tooling & Machining Association's proposal for Apprenticeship Training Tax Credits as related to the precision metal cutting trade.

As a medium size company and in business for over 25 years, we are continuously dealing with excessive costs of the shortage of skilled labour in our industry, the costly training provided to apprentices as well as the loss of these developed skills to larger companies within our industry.

We are firm proponents of a tax credit system as an appropriate stimulus, within a provincially accredited pre-approved apprenticeship program. This is preferred to grants and funding due to its direct nature and maximization of benefits. We urge you to seriously consider the CTMA's proposal due to its accuracy and seriousness.

Yours truly,



Lou Villalta  
General Manager

Cc Arnold Manias, President  
Arlen Tool Company Limited



Automotive Parts  
Manufacturers' Association

Association des fabricants  
de pièces d'automobile

195 The West Mall, Suite 516, Toronto, Ontario, Canada, M9C 5K1 Tel: (416) 620-4220 Fax: (416) 620-9730

October 13, 1999

**Mr. Russell Gorham**  
Canadian Tooling & Machining Association  
140 McGovern Dr., Unit #3  
Cambridge, Ontario  
N3H 4 R7

RECEIVED

OCT 18 1999

CTMA

**Re: Endorsement of the Apprenticeship Training Tax Credits Program**

Dear Mr. Gorham,

On behalf of the Automotive Parts Manufacturers' Association (APMA), it is my pleasure to endorse the Apprenticeship Training Tax Credits program presented in your discussion paper dated June 1, 1999. This program is a stepping stone for the government to recognize the urgent need of stabilizing the future supply of skilled workers and assisting employers with their cost competitiveness.

Like many industry associations, the APMA believes in and supports skilled trade development programs. A shortage of skilled workers has been one of our major concerns. According to our 1998 study, we projected that the global automotive market will grow about 25% between 1998 to 2007 and that there will be a shortage of skilled tradespeople of about 15,000 in the parts industry alone in Canada. The whole manufacturing sector is facing a similar skilled labour shortage.

Be it as it may, young people today lack the right information to make an intelligent career choice as well as having the technical skills to enter into one of the most challenging, exciting and rewarding careers available in our industry. In addition, employers are faced with the challenge of attracting young people to enter into the industry and training them once they do. The program, as suggested, would be key to help employers reduce their cost of training apprenticeships. Also, it would allow employers the opportunity to expand their apprenticeship programs and hence, resolve part of the shortage of the skilled labour supply issue. This would be especially so for small and medium sized companies that often lack the capitol base to finance long term training programs. The tax credit system would allow them to pay as they train.

In short, the Apprenticeship Training Tax Credits program would be a positive, value added and welcome initiative. We, at the APMA, on behalf of our members, fully support the proposed programs and would be willing to participate in any presentations you are planning to further discuss this proposal with governments. We look forward to hearing from you and its progress.

Yours truly,

Gerry Fedchun  
President

## Apprenticeship Training Credit Program (ATTC)

### Issues:

One of the major factors that underline the competitiveness and success of the auto parts industry is the skilled labour supply which the industry has. Recently, the number of skilled workers has been declining and this trend is expected to escalate further into the near future. The concern is that there is not enough skilled workers entering into the industry as compared to the number of workers expected to exit from the industry. According to the APMA 1999 Compensation and Human Resource Practices Survey, about 41% of the companies with less than 250 employees have a current deficit of skilled trades employees, 29% of the companies between 250 and 999 employees have a current deficit and 17% of the companies with over 1000 employees have a deficit. Medium to small size are mostly affected and they would be worse off in the near future.

Also, about 40% of the auto parts workforce will be retiring within 5 to 10 years. (See table below). The percentage of retirees is similar for the whole manufacturing sector. As the baby-boomers prepare to retire, the need to have skilled workers to replace them is detrimental to stabilizing the national output, capital flow and investment.

Age Groups	Percent of Skilled Trades Employees
Under 29	11.5%
Between 30-39	35.7%
Between 40-49	<b>34.7%</b>
Between 50-59	<b>14.7%</b>
60 and over	3.4%

Hence, the need to have a rational program to address the shortage of skilled workers has become critically important to the auto parts industry as well as in other manufacturing industry sectors. The Canadian Tooling and Machining Association (CTMA) initiative is one of the programs that address this concern and we fully support the CTMA program.

### Position:

On the issue of ATTC program, the APMA recognizes the following:

1. The APMA fully support the CTMA's proposed program and we would be willing to work and collaborate with the CTMA and other participants
2. The program is a value added initiative that would secure the future economic benefits and skilled labour supply in Canada
3. Return on investment and net present value would be high and positive. The spillover effect would be an increase in the number of workers contributing to the economy and the rise in investments and consumption
4. The programs presents an opportunity for young people to establish their career early
5. Allows the industry to expand their apprenticeship programs (able to take more apprentices)
6. The program would amplify the technical skills and expertise of the manufacturing sector and the Canadian workers in Canada
7. Overall, the program would have many more linkages and benefits and it would increase Canada's competitiveness in the manufacturing sector

# **Apprenticeship Training Tax Credit (ATTC):**

**A Canadian Tooling and Machining  
Association (CTMA)  
Draft Proposal**

**Automotive Parts Manufacturers'  
Association (APMA)**

# **ISSUES:**

**40% of the companies with less than 250 employees have a current deficit of skilled trades employees and it is going to get worse**

**The pipeline to replace the workers is too small**

**Overall, shortage of skilled and technical workers is going to get worse unless we do something about it**

# **POSITIONS:**

**Fully support the CTMA proposed program on tax credit for apprenticeship training**

**APMA recognizes the following:**

**a value added initiative that would secure future economic benefits and skilled labour supply**  
**return on investment and net present value would be high and positive (increase in the number of workers contributing to the economy and more investment and consumption**  
**the program presents an opportunity for young people to establish their career early**

# **POSITIONS (continue):**

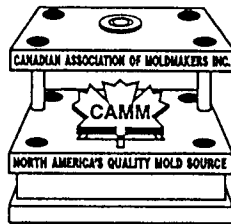
**APMA recognizes the following:**

**the program allows industry to expand their apprenticeship programs (able to take more apprentices)**

**the program would amplify the technical and expertise of the manufacturing sector and the Canadian workers in Canada**

**Overall the program would have many more linkages and benefits and increases Canada's competitiveness in the manufacturing sector**

Canadian Association of Moldmakers  
424 Tecumseh Road, East  
Windsor, Ontario  
N8X 2R6  
Canada



Web Site: [www.cdnmolds.com](http://www.cdnmolds.com)  
Email: [cdnmolds@mnsi.net](mailto:cdnmolds@mnsi.net)  
Ph: (519) 255-7863  
1-800-567-CAMM  
Fax: (519) 255-9446

November 1, 1999

RECEIVED

NOV 04 1999

CTMA

Federal Standing Committee on Finance,  
House of Commons,  
Room 603, Wellington Building,  
180 Wellington Street,  
Ottawa, Ontario K1A 0A6

Federal Standing Committee on Finance,

The Canadian Association of Moldmakers (CAMM) strongly supports the CTMA and the entire Metal Working Industry on efforts to obtain Corporation Tax Credits. CAMM sees this as an important "First Step" method to increase the number of apprentices entering the Tool, Die and Mold Trades. Tax Credits would also assure a level playing field with our U.S. competitors, that have introduced "The Skilled Work Force Enhancement Act" on January 27, 1997 - Proposing Tax Credits.

Presently, Both the Canadian Association of Moldmakers and the Windsor-Essex County Development Commission have commissioned a "Precision Metal Trades Apprentice and Journeyman Survey" to gauge ways to increase the number of journeymen in Industry.

Results of this Survey will be examined and an Action Plan proposed that will address Industry concerns regarding Apprentice Training improvement.

Sincerely,

Jamie Rivait,  
CAMM Vice President

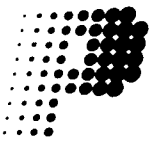
Ed Regan,  
CAMM Director

c.c. Burt Kenney, CAMM President

Canadian Plastics Industry Association  
Association canadienne de l'industrie des plastiques  
Ontario Region

November 8, 1999

Standing Committee on Finance



The lack of sufficient numbers of well-trained workers has been identified by The Canadian Plastics Industry Association as a priority issue of its members. This shortfall is especially serious in the high-technology areas of mould making and machinery manufacturing. Insufficient human resources cause a decrease in company productivity, an inability to accept or honour contracts and hampers growth and new investment.

We endorse the initiative taken by the Canadian Tooling and Machining Association in bringing forth to the Minister of Finance, the request to provide tax credits for companies who train apprentices. CTMA's background paper states the current situation facing this sector and we concur with the urgency expressed for a solution..

CPIA also endorses a more broad-based training tax credit and is currently working to have such a tax credit introduced in Ontario.

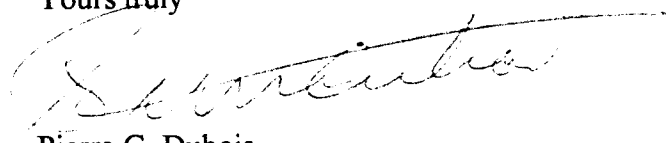
Canada's plastics industry employs 132,000 people many of whom are in highly skilled occupations. The aging of the workforce creates opportunities for Canada's youth to be trained to assume these high skilled, well paid positions.

Other key points to consider:

- Business investment decisions are often based on the availability of well trained people. Having a highly skilled workforce will attract new investment to Canada
- The economic benefits and linkages of training are known to be significant for the economy
- Highly skilled people earn higher incomes resulting in higher income taxes paid for a return on government investment in training tax credits.

We would be pleased to discuss our position on this matter this with you or your officials.

Yours truly



Pierre G. Dubois  
President and C.E.O.

# **RYKA BLOW MOLDS LTD.**

## **Federal Standing Committee on Finance**

House of Commons, Room 603, Wellington Building  
180 Wellington Street  
Ottawa, ON K1A 0A6.

99.10.14.

RECEIVED

OCT 25 1999

➔ CTMA

Ref: **Apprenticeship Training Tax Credits.**

Dear Committee Members,

Today's skilled workforce in the Canadian precision metal trades is an aging population. Of this there can be no doubt. Yet the requirement for skilled personnel in the precision metal trades is growing and will reach critical point within the next 5 years.

As a company Ryka Blow Molds Ltd. has not failed to recognize these facts and indeed has actively promoted the training of personnel through the Apprentice program. We have trained more than 25 Apprentices over the past twenty years (from the founding of our company) and we consider ourselves a progressive company in the training of apprentices. At this time we have 5 apprentice mold makers out of a workforce of 47 (10%). Of the workforce in our manufacturing operations all but four of the personnel are classified as skilled personnel.

We have been subjected to the same attrition of our skilled personnel as other businesses who actively train employees through the Apprentice program incurring major costs in the process without relief.

As a member of the Canadian Tooling & Machining Association we fully endorse the initiative being taken by our association to stimulate further investment through a system of tax credits for training in the precision metal trades.

The return on investment to the industry, the short term tax loss through the tax credits will be returned many times over through the employment of skilled persons for their working lives. The training of an Apprentice is a career investment. It is post secondary education equivalent to going to university. In many instances the earnings potential of skilled personnel in the precision metal trades is higher than post secondary students from university.

In Europe where many of the skilled precision metal trades personnel have come from, an apprenticeship is a revered and coveted career path. It is the equal in every sense of a university education and is given the same credibility. Yet in North America it has somehow become neglected as a chosen career path. We must reverse this trend and

# **RYKA BLOW MOLDS LTD.**

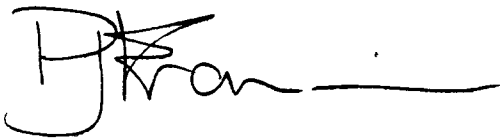
raise the standing of a career in the precision metal trades to its rightful position in industry and society in general.

At Ryka Blow Molds Ltd. we have gone further in our quest to meet the demands of acquiring skilled personnel, we have actively participated over the years as advisors to the Government of Ontario in the formatting of the curriculum for both Tool & Die Maker and Mold Maker and we are actively participating at this time in a major program with the Dufferin-Peel Catholic District School Board to identify potential students suitable for entry into the advanced manufacturing occupations.

We will continue to be proactive in the training of personnel for our industry. By doing so we will be able to provide more entry level jobs in a world class industry which in turn will increase our exports world wide (at this time more than 90% of our business is exported).

Canada as a nation, small business in the precision metal trades and Canadian youth will all benefit from a comprehensive system of Tax Credits for companies who actively promote training through Provincially accredited Apprenticeship Training programs.

Yours very truly,  
Ryka Blow Molds Ltd.,

A handwritten signature in black ink, appearing to read "Peter J. Francis", with a long horizontal line extending to the right.

Peter J. Francis.  
Plant Manager.

C: Mr. Michael Ryan, President, Ryka Blow Molds Ltd..  
Canadian Tooling & Machining Association.



November 3, 1999

Standing Committee on Finance - House of Commons  
Ottawa, Canada

Re: CTMA Discussion Paper for Apprenticeship Training Tax Credits

In it's 40 year history, the Valiant Group of Companies has long been a supporter of local education and training programs that further develop the youth of our communities, the economy and industry. In the past, well educated skilled trade personnel, who had the entrepreneurial spirit, started their own tool and mold shops giving Windsor's tooling industry the ability to expand and grow to the magnitude we see today. This growth has put stresses on the industry to supply and educate skill trade personnel for the future. As a result, Valiant is a strong proponent of the CTMA's Discussion Paper on Apprenticeship Training Tax Credits.

Valiant has been training apprentices since 1959 and currently maintains approximately 77 trade apprentices representing approximately 15% of the total labour force. This large group spans trades in electrical, mechanical, machining, robotics, pipefitting, welding and mold making. In support of the information provided in the proposal, Valiant's own turnover rate for skilled trade is approximately 7% for the first 10 months of this year, identifying a primary relocation to the big three automotive manufacturers.

The lack of sufficiently trained individuals is creating ongoing stresses on our business and is jeopardizing the growth and opportunities in this country. Being in such close proximity to the US market we have found that approximately 14% of our resignations are finding work in the United States. Additionally, Canadian Universities and Colleges have not been able to keep up with the demands of local industry to provide the training required to fill key trade and engineering roles. As a result, Valiant has established a US branch with 160 engineering personnel, recruited from the Detroit area where experienced personnel and college trainees are available in limited number, none available in the Windsor area.

The cost associated with apprenticeship training is based on the inexperience of the apprentice and the time associated in providing assistance by highly paid, skilled personnel. The accumulated time reduces productivity output, resulting in the inability to meet schedules in the regular work week. In an effort to satisfy the customer's delivery schedules overtime and double time is required increasing the cost while reducing the corporation's profitability.

The attrition rate and costs are evident but with the approval of tax credits discussed in the CTMA proposal, a larger base of apprentices can be developed to further implement a proper industrial strategy that would benefit Canada for years to come. With tax credit support, industries like ours will be encouraged to train larger groups of apprentices that will again take their place in further expansion of our economy.


In summary, the importance of skills are far reaching in both cost and qualification, and the CTMA apprenticeship training tax credit program is not only required but essential to encourage industry to increase its training programs and to expand the base of skilled trades.


Your favorable support and acceptance of the CTMA proposal is greatly appreciated.

Yours truly,

A handwritten signature in black ink, appearing to read 'Michael Solcz'.

Michael Solcz  
President

 **VALIANT MACHINE & TOOL INC.**  
9355 Anchor Drive  
Windsor, Ont., N8N 5A8 (519) 974-6200  
U.S. (313) 962-7429 Fax (519) 979-5532

 **VALIANT INTERNATIONAL INC.**  
1511 East Fourteen Mile Road  
Troy, Michigan, USA 48063-4621  
(248) 588-4510 Fax (248) 588-3910

## **Appendix E:**

# The Cost of Apprenticeship Borne by Employers

A Study funded by and conducted on behalf of Human Resource Development  
Canada

By

R.J. Sparks Consulting Inc.  
&  
WGW Services Ltd.

# **The Cost of Apprenticeship Borne by Employers**

**Machining and Tooling Trades  
Ontario**

**Discussion Paper**

**July 2002**

**R J Sparks Consulting Inc.  
WGW Services Ltd.**

## **Acknowledgements**

Appreciation is expressed to those employers that participated in this study either through completion of the survey or in speaking to us directly. Special thanks are extended to the staff, executive, and membership of the Canadian Tooling and Machining Association for their support and assistance on the project.

This project was commissioned and funded by Human Resources Development Canada.

Rosemary Sparks of  
R J Sparks Consulting Inc.

And

William Wolfson of  
WGW Services Ltd.

June 2002

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## **Preamble**

The apprenticeship system in Canada has been subject to close scrutiny and review for a number of years. Much attention has been paid to encouraging young people to consider a career in the apprenticeable occupations/ trades. However, in order to produce additional skilled tradespeople, there must also be a training infrastructure sufficient to accommodate more apprentices. Apprenticeship training involves both in-school and on-the-job training. In this study we look at the on-the-job training component with a view to quantifying the cost of this training.

Employers are a key element of the apprenticeship training system in Canada. They employ the apprentices and provide the on-the-job training that accounts for about 90% of the total training time received during an apprenticeship. In carrying out on-the-job training, employers are absorbing costs associated with lost productivity of both the apprentices and the journeypersons who train them. Additional indirect costs are also incurred and need to be understood as part of the total training cost borne by employers.

The purpose of this study was to identify and quantify the economic costs of apprenticeship training that are borne by the employer. The scope was the machining and tooling trades in Ontario. This group of trades includes: General Machinist, Tool & Die Maker, Tool Maker, Mouldmaker, Machine Tool Builder and Integrator, and Pattern Maker. As part of this study, we also set out to identify any issues related to determining the cost in order to inform any future work that may be done to quantify the cost of apprenticeship to employers.

## **Methodology**

We employed the following methodology in this study:

- Interviews with the Tooling and Machining Trades Consultant with the Ontario Ministry of Training Colleges and Universities, and an executive in the American Tooling and Machining Association (ATMA);
- A focus group of employers;
- Development of an algorithm to model the cost;
- Employer survey to gather data for the cost model and other information; and
- Validation of results with employers.

Each element of the methodology is described in more detail below.

### ***Interviews***

Our research began with an interview with the Tooling and Machining Trades Consultant with the Ontario Ministry of Training Colleges and Universities. This discussion helped to frame the project and provided an entrée to the Machining and Tooling Sector Industry Committee.

An interview with an executive of the ATMA, the American counterpart to the Canadian Tooling and Machining Association (CTMA), provided insights into what the Americans have been doing in trying to quantify the cost of apprenticeship borne by employers. The ATMA generously shared their experiences with cost modelling and provided us with the approach they had developed.

### ***Focus Group***

The focus group consisted of a session with the Precision Machining & Tooling Sector Industry Committee. We asked questions designed to gather sufficient information to enable us to prepare an effective survey instrument and to understand the issues associated with the estimation of the cost of apprenticeship to employers. See Appendix A for the focus group questions.

### ***Algorithm/Cost Model***

Based on the focus group with employer representatives and a review of the US approach, we developed an algorithm for calculating the costs of apprenticeship incurred by employers. The algorithm distinguishes between the “gross cost” of apprenticeship training and the “net cost”, as follows:

- The “gross cost” of training is the sum of the cost components borne by the employer: the cost of employing the apprentice during training; the cost of the journeyman who provides the training; the cost absorbed for any in-school training, and the incremental burden (operating and overhead costs) associated with employing the apprentice during the training period.
- The “net cost” of training recognizes that apprentices can contribute productive time to the business, thereby generating revenues. To find the “net cost” of apprenticeship, we deduct the net revenues from the gross costs.

Our initial research showed that the gross and net cost varied by the year of apprenticeship; accordingly, our cost model involves the above calculation for each year. The details of the costs and revenues will be discussed below.

## **Survey**

The survey instrument was designed to capture data from each employer about the cost elements and the revenue elements we had developed for the algorithm. See Appendix B for a copy of the survey instrument.

We distributed surveys to 300 employers who are members of the Canadian Tooling and Machining Association (CTMA) and the Canadian Association of Mouldmakers (CAMM).

We sent a follow-up fax to the 300 employers to remind them of the importance of completing the survey. In the end, we received 37 responses. Our data were enhanced by the results of the CTMA Wage and Business Survey (96 responses) which CTMA kindly provided to us.

## **Survey Respondents**

37 employers responded to the survey. Of these, 5 employers had never employed an apprentice and, as per the survey instructions, they did not complete the remainder of the questions. The remaining companies employ a total of 869 journeymen and 192 apprentices. Refer to Figure 1 for a breakdown of respondents by number of journeymen and apprentices employed.

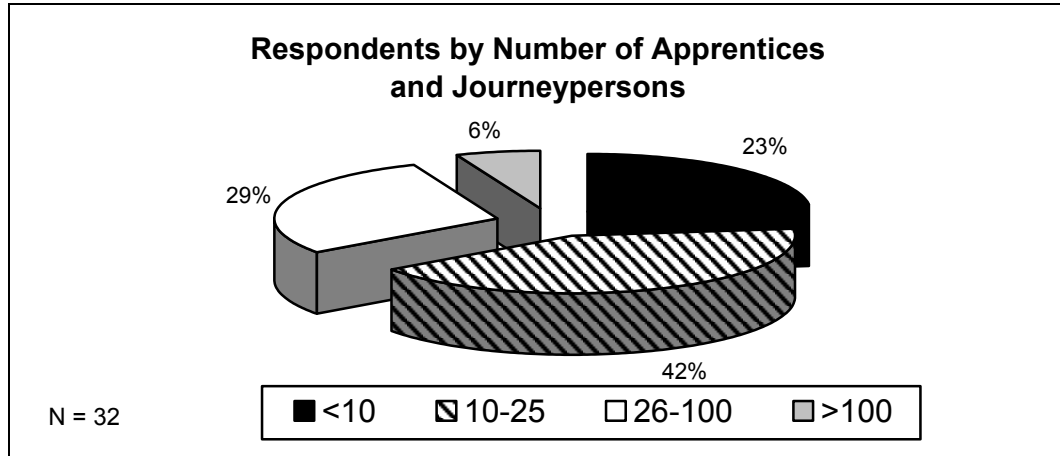


Figure 1

## Validation

To validate the approach and the resulting cost estimates, we went back to the Precision Machining & Tooling Sector Industry Committee for their comments. Given their knowledge of the trades, interest in the findings, support for the study, and participation in the survey, it was important to confirm we had factored in the correct components and that they could support the findings.

Those who attended the session unanimously supported the methodology used to estimate the cost of apprenticeship borne by employers. They stated that it accurately captured the realities facing machining and tooling employers. The cost estimates developed from the model for the Tool & Die Maker and the General Machinist were considered to be accurate reflections of the gross and net costs borne by employers. However, the estimate for Mouldmaker was seen to be too low. The Committee members had expected gross and net costs to be somewhat lower than that for Tool and Die. They suggested the “incremental burden” rate for Mouldmaker apprentices was likely low and that this low rate was driving the estimate down. Nevertheless, they fully supported the model and felt that further data collection would show that the true incremental burden rate was higher than that derived from our pilot survey of employers.

## What We Learned From Interviews and Focus Group

### Cost Elements

The focus group participants indicated it would not be possible to gather cost information at a detailed level. Additional costs incurred such as waste materials and wear and tear on tools

*A Survey respondent wrote that, "It is becoming more and more difficult to justify the cost to train an apprentice who has an 80% chance of leaving you to work for the automobile companies or move to another country (USA)."*

and equipment attributable to apprentices are not separately identified by employers. These costs are included in the "burden rate" which covers all overhead costs. They felt most employers would be able to quantify the burden rate and distinguish between the rate for a journeyman and for an apprentice. They suggested that we develop an approach that costed out unproductive time of the apprentice (including the burden, the training time of journeymen, and in-school costs contributed by the employer).

## **Apprentice Attrition**

Apprentices are free to leave one employer for another at any time throughout their apprenticeship. Given that the cost incurred by the employer is greater at the beginning of the apprenticeship, the employer is at a greater disadvantage if the apprentice leaves before completing the apprenticeship. Small employers are more likely to have apprentices lured away from them, as they find it difficult to offer wages and benefits sufficient to compete with larger companies.

## **Rationale for Training Apprentices**

Employers cited two reasons for training apprentices:

- To create the supply of skilled journeymen they require; and
- To give something back to the trade.

*A survey respondent wrote, "As my company grows and needs more skilled tradespeople, it is obvious that it is more cost effective to hire someone who is already trained versus the cost of training a new apprentice."*

In a tight labour market when the supply of skilled labour is limited, small employers must train apprentices as the only way of acquiring the skills they require. They can no longer rely on immigration as a source of skilled labour and they cannot offer wages sufficient to lure tradespeople away from the larger employers. For example, the core business of small Tier 3 machining and tooling companies is essentially the skilled labour to produce the dies that will produce auto parts. They sell these dies to the Tier 2 and 1 companies (larger employers such as Magna) who will generate the auto parts. They in turn sell the parts to end user companies (major manufacturers such as General Motors) who then produce automobiles. The Tier 3 companies must create the skilled labour they require as their core business relies on that labour. Tier 2 and 1 companies, although they may employ some skilled tradespeople, do not rely in the same way on skilled tradespeople, are in a position to purchase these skills when needed. Should the labour market for machining and tooling trades loosen up (i.e. more labour than work), some small employers would likely stop training apprentices and buy the skills they require in the marketplace because of the cost incurred to train apprentices.

*"Apprenticeship training is mostly done by smaller companies who can least afford these costs. Large companies often hire journeymen away from smaller companies at pay rates the smaller company cannot afford."*

Both in the focus group and on the survey, some employers spoke of their desire to train apprentices as a way of contributing to the next generation of skilled labour. An employer had provided them with this opportunity in the past; now they felt the obligation to do the same.

## The Cost Model

The Cost Model takes our algorithm for determining the employer cost of apprenticeship and applies the data we derived from our survey of employers to calculate the estimated employer cost of apprenticeship training.

### *The Elements of the Model*

The Cost Model contains three parts:

- The Gross Cost of Training an Apprentice;
- The Net Revenues Earned From an Apprentice; and
- The Net Employer Cost of Training an Apprentice.

The **Gross Cost of Training** an Apprentice has three components:

#### **1. The Non-Productive Time of an Apprentice**

The non-productive time of an apprentice is that portion of the paid work time that is spent on training. The annual cost formula, based on a 2000 hour year, is:

<p style="text-align: center;">The Cost of Non-Productive Time =</p> <p style="text-align: center;">% Unproductive Time * 2000 * Hourly Cost of Apprentice,</p> <p style="text-align: center;">where Hourly Cost of Apprentice = Wage Rate + Benefits + Incremental Burden.</p>
---

The burden reflects the material and other operating costs plus overhead; incremental burden is the additional burden associated with employing an apprentice.

The amount of the incremental burden reflects two opposing forces: 1. Some of the normal operating costs and overhead are already in place and captured through the burden associated with journeypersons (e.g. rent, utilities, head office staff); these burden costs are not assigned to an apprentice, thereby driving the apprentice burden rate down. 2. On the other hand, there are

increased costs associated with employing an apprentice (e.g. materials wastage, tool and machine wear, excessive machine time, added workers' compensation costs); these costs drive the apprentice burden rate up.

## 2. The Journeyman Time Training

Apprenticeship involves a journeyman instructing an apprentice. The proportion of journeyman time expended on training takes away from productive work, and represents a cost to the employer. The annual cost formula, based on a 2000 hour year, is:

$$\begin{aligned} \text{The Cost of JP Time Training} = \\ \% \text{ Training Time} * 2000 * \text{Hourly Cost of Journeyman}, \\ \text{where Hourly Cost of Journeyman} = \text{Wage Rate} + \text{Benefits} + \text{Burden}. \end{aligned}$$

As noted earlier, the burden reflects the material and other operating costs plus overhead.

## 3. In-School Costs

In some cases, employers assist apprentices with in-school costs. There is no formula involved with this cost element. Rather we use data on in-school costs derived from our survey work.

The **Net Revenues from an Apprentice** is an estimate of the value added from employing an apprentice. It recognizes that, for some portion of time, an apprentice is productive and helping the business to earn revenues. The formula for annual net revenues, based on a 2000 hour year, is:

$$\begin{aligned} \text{Net Revenues from Apprentice} = \\ \% \text{ Productive Time} * 2000 * (\text{Charge Out Rate} - \text{Hourly Cost}), \\ \text{where Hourly Cost of Apprentice} = \text{Wage Rate} + \text{Benefits} + \text{Incremental Burden} \end{aligned}$$

The **Net Employer Cost of Training an Apprentice** is the balance derived from deducting the net revenues from the gross cost. We anticipate that, in most cases, the balance will be a positive number i.e. the employer has a cost burden. If the balance is negative, net revenues outweigh the gross cost, and the employer is more than recovering the cost of training.

## Data Sets

In order to prepare estimates using the cost model, we surveyed employers to obtain the data elements required for each year of the apprenticeship. From the responses, we were able to develop the following data set for three of the six trades (General Machinist, Tool & Die Maker, Mouldmaker). See Table 1.

DATA SETS												
	General Machinist				Tool & Die Maker				Mouldmaker*			
	Yr 1	Yr 2	Yr 3	Yr 4	Yr 1	Yr 2	Yr 3	Yr 4	Yr 1	Yr 2	Yr 3	Yr 4
Apprentice Unprod. Time	45%	30%	20%	10%	50%	35%	25%	15%	33%	22%	15%	10%
Wage + Ben.	11.50	13.75	16.00	18.00	10.25	12.75	15.25	18.00	10.75	12.85	15.10	17.20
Incr. Burden	17.00	17.00	17.00	17.00	25.00	25.00	25.00	25.00	18.00	18.00	18.00	18.00
Charge Out	35.00	40.00	45.00	50.00	40.00	45.00	50.00	55.00	35.00	40.00	45.00	50.00
Journeyman Time Training	20%	15%	10%	5%	25%	20%	10%	8%	25%	17%	10%	7%
Wage + Ben.	27.00	27.00	27.00	27.00	28.50	28.50	28.50	28.50	28.00	28.00	28.00	28.00
Burden	31.50	31.50	31.50	31.50	35.00	35.00	35.00	35.00	27.00	27.00	27.00	27.00
In-School Cost	150	150	150	150	100	100	100	100	300	350	400	450

Table 1

\* Industry validation indicated the incremental burden for the Mouldmaker is likely low, resulting in a low estimate of the cost borne by employers.

We note the following about the data sets derived from employers:

- The percentage of unproductive time for apprentices falls as the apprentice gains more experience. In every one of the three trades, employers showed a decline, year by year, in unproductive time.
- Similarly, the percentage of time expended by a journeyman in training an apprentice falls as the apprentice gains more experience. In every one of the three trades, employers indicated that journeymen spend less time, year by year, in training an apprentice.
- There are clear differences among the trades in the proportions of unproductive time and in the proportions of journeyman time devoted to training. The Tool & Die trade has the largest figures in both categories.

- The wage rate for apprentice rises year by year. However, the level of the wage rate differs among the trades.
- Employers recognize that the burden associated with an apprentice is less than that for a journeyman. In every one of the three trades, employers reported a smaller burden for apprentices. It would appear that employers account for most of the overhead costs (e.g. payroll system, utilities, office administration, etc.) through the journeyman burden and attach to the apprentice only the incremental burden associated with this extra hire (e.g. workers compensation, materials, wear and tear on tools and equipment, errors).
- The charge out rate for apprentices is uniformly lower than for journeymen, reflecting their lower productivity when working. The charge out rate rises, year by year, as apprentices gain more experience.

In sum, we believe that the data sets provided through our survey exhibit the kind of information one might expect when describing apprenticeship training (e.g. an apprentice who gains productivity over time, leading to less training time by the journeyman; an apprentice who earns more over time, but contributes more too; an apprentice who adds to operating and overhead cost, but not at the average rate for other workers).

### **Cost of Training an Apprentice**

By applying the data sets to the cost model, we derive estimates of the employer cost of training in the three trades. Refer to Tables 3, 4, and 5 for the calculation of net cost for each trade. We summarize the results here:

	<b>General Machinist</b>	<b>Tool &amp; Die Maker</b>	<b>Mouldmaker*</b>
Gross Costs	\$123,400	\$175,110	\$115,919
Less Net Revenues	\$66,300	\$49,200	\$69,519
<i>Net Costs</i>	<i>\$57,100</i>	<i>\$125,910</i>	<i>\$46,400</i>

**Table 2**

\* Industry validation indicated the incremental burden for the Mouldmaker is likely low, resulting in a low estimate of the cost borne by employers.

<b>GENERAL MACHINIST</b>						
<b>PART ONE: GROSS COST OF TRAINING</b>						
A	Non Productive Time	Yr 1	Yr2	Yr 3	Yr 4	TOTAL
	% Time	45%	30%	20%	10%	
	Hours	900	600	400	200	
	Wage + Benefits	11.50	13.75	16.00	18.00	
	Incremental Burden	17.00	17.00	17.00	17.00	
	Hour Cost Apprentice	28.50	30.75	33.00	35.00	
	Cost	25,650	18,450	13,200	7,000	64,300
B	In School	150	150	150	150	600
C	Journeyman Time Training					
	# Trained	1	1	1	1	
	% Time	20%	15%	10%	5%	
	Hours	400	300	200	100	
	Wage + Benefits	27.00	27.00	27.00	27.00	
	Burden	31.50	31.50	31.50	31.50	
	Hour Cost for Journeyman	58.50	58.50	58.50	58.50	
	Cost	23,400	17,550	11,700	5,850	58,500
<b>TOTAL (A+B+C)</b>		<b>49,200</b>	<b>36,150</b>	<b>25,050</b>	<b>13,000</b>	<b>123,400</b>
<b>PART TWO: NET REVENUES FROM APPRENTICE</b>						
		Yr 1	Yr 2	Yr 3	Yr 4	TOTAL
	% Time	55%	70%	80%	90%	
	Hours	1100	1400	1600	1800	
	Charge Rate	35.00	40.00	45.00	50.00	
	Less Wage + Benefits	11.50	13.75	16.00	18.00	
	Less Incremental Burden	17.00	17.00	17.00	17.00	
	Net Rate	6.50	9.25	12.00	15.00	
	Net Revenues	7,150	12,950	19,200	27,000	66,300
<b>PART THREE: NET EMPLOYER COST OF TRAINING AN APPRENTICE</b>						
		Yr 1	Yr 2	Yr 3	Yr 4	TOTAL
D	Gross Cost	49,200	36,150	25,050	13,000	
E	Net Revenues	7,150	12,950	19,200	27,000	
<b>NET TRAINING COST (D - E)</b>		<b>42,050</b>	<b>23,200</b>	<b>5,850</b>	<b>-14,000</b>	<b>57,100</b>

Table 3

<b>TOOL &amp; DIE MAKER</b>						
<b>PART ONE: GROSS COST OF TRAINING</b>						
		Yr 1	Yr2	Yr 3	Yr 4	TOTAL
A	Non Productive Time					
	% Time	50%	35%	25%	15%	
	Hours	1000	700	500	300	
	Wage + Benefits	10.25	12.75	15.25	18.00	
	Incremental Burden	25.00	25.00	25.00	25.00	
	Hour Cost Apprentice	35.25	37.75	40.25	43.00	
	Cost	35,250	26,425	20,125	12,900	94,700
B	In School	100	100	100	100	400
C	Journeyman Time Training					
	# Trained	1	1	1	1	
	% Time	25%	20%	10%	8%	
	Hours	500	400	200	160	
	Wage + Benefits	28.50	28.50	28.50	28.50	
	Burden	35.00	35.00	35.00	35.00	
	Hour Cost for Journeyman	63.50	63.50	63.50	63.50	
	Cost	31,750	25,400	12,700	10,160	80,010
	<b>TOTAL (A+B+C)</b>	<b>67,100</b>	<b>51,925</b>	<b>32,925</b>	<b>23,160</b>	<b>175,110</b>
<b>PART TWO: NET REVENUES FROM APPRENTICE</b>						
		Yr 1	Yr 2	Yr 3	Yr 4	TOTAL
	% Time	50%	65%	75%	85%	
	Hours	1000	1300	1500	1700	
	Charge Rate	40.00	45.00	50.00	55.00	
	Less Wage + Benefits	10.25	12.75	15.25	18.00	
	Less Incremental Burden	25.00	25.00	25.00	25.00	
	Net Rate	4.75	7.25	9.75	12.00	
	Net Revenues	4,750	9,425	14,625	20,400	49,200
<b>PART THREE: NET EMPLOYER COST OF TRAINING AN APPRENTICE</b>						
		Yr 1	Yr 2	Yr 3	Yr 4	TOTAL
D	Gross Cost	67,100	51,925	32,925	23,160	
E	Net Revenues	4,750	9,425	14,625	20,400	
	<b>NET TRAINING COST (D - E)</b>	<b>62,350</b>	<b>42,500</b>	<b>18,300</b>	<b>2,760</b>	<b>125,910</b>

Table 4

<b>MOULDMAKER*</b>						
<b>PART ONE: GROSS COST OF TRAINING</b>						
		Yr 1	Yr 2	Yr 3	Yr 4	TOTAL
A	Non Productive Time					
	% Time	33%	22%	15%	10%	
	Hours	660	440	300	200	
	Wage + Benefits	10.75	12.85	15.10	17.20	
	Incremental Burden	18.00	18.00	18.00	18.00	
	Hour Cost Apprentice	28.75	30.85	33.10	35.20	
	Cost	18,975	13,574	9,930	7,040	49,519
B	In School	300	350	400	450	1,500
C	Journeyman Time Training					
	# Trained	1	1	1	1	
	% Time	25%	17%	10%	7%	
	Hours	500	340	200	140	
	Wage + Benefits	28.00	28.00	28.00	28.00	
	Burden	27.00	27.00	27.00	27.00	
	Hour Cost for Journeyman	55.00	55.00	55.00	55.00	
	Cost	27,500	18,700	11,000	7,700	64,900
	<b>TOTAL (A+B+C)</b>	<b>46,775</b>	<b>32,624</b>	<b>21,330</b>	<b>15,190</b>	<b>115,919</b>
<b>PART TWO: NET REVENUES FROM APPRENTICE</b>						
		Yr 1	Yr 2	Yr 3	Yr 4	TOTAL
	% Time	67%	78%	85%	90%	
	Hours	1340	1560	1700	1800	
	Charge Rate	35.00	40.00	45.00	50.00	
	Less Wage + Benefits	10.75	12.85	15.10	17.20	
	Less Incremental Burden	18.00	18.00	18.00	18.00	
	Net Rate	6.25	9.15	11.90	14.80	
	Net Revenues	8,375	14,274	20,230	26,640	69,519
<b>PART THREE: NET EMPLOYER COST OF TRAINING AN APPRENTICE</b>						
		Yr 1	Yr 2	Yr 3	Yr 4	TOTAL
D	Gross Cost	46,775	32,624	21,330	15,190	
E	Net Revenues	8,375	14,274	20,230	26,640	
	<b>NET TRAINING COST (D - E)</b>	<b>38,400</b>	<b>18,350</b>	<b>1,100</b>	<b>-11,450</b>	<b>46,400</b>

Table 5

\* Industry validation indicated the incremental burden for the Mouldmaker is likely low, resulting in a low estimate of the cost borne by employers.

## ***Return on Investment***

Hiring an apprentice can be seen as an investment by the employer in creating a skilled workforce for his enterprise. Going forward with an investment is predicated on receiving a return on the invested amount. When do employers see a return from investing in an apprentice? We turn now to an analysis of this question, from two perspectives: a) what employers indicated in responding to certain questions on our survey, and b) what we can deduce from the data we have collected.

On our survey, we asked a direct question about the return on investment by the end of the apprenticeship period. We provided three options to consider:

- a) the return outweighed the cost burden;
- b) the cost burden outweighed the return; or
- c) the two were equal.

Slightly less than half (43%) said the return exceeded the cost, and the majority of these respondents said they began to see the return in the 3<sup>rd</sup> or 4<sup>th</sup> year. About one-third (32%) selected the second option, indicating that at the end of the apprenticeship period, they still had absorbed a net cost burden. The majority in this group said that it took another two years beyond the apprenticeship before they began to see a positive return. One-quarter of the respondents selected the third option, in which the cost and the returns were balanced by the end of the apprenticeship.

The answers to this question support the nature of the cost model we have created. Employers agree that apprentices are more costly in the beginning, that they contribute net revenues which grow over time, and that they eventually begin to add net value to the enterprise, thereby bringing a return on investment. The results of our cost model are in concordance with the one-third group of respondents who selected the second option above: our analysis from the model indicates that, at the end of the apprenticeship period, employers have not yet received a return on investment that exceeded their cost of training in any of the three trades studied in this pilot project.

When do employers in these three trades finally get to the balance point i.e. to recover the total amount of their investment? We extend our cost model to calculate this point, by determining the net revenues derived from a journeyperson in each of the three trades. The data used here on the wage and benefits rate and the charge out rate for a journeyperson are derived from a survey by the Canadian Tool Manufacturers Association. The survey shows that employers continue to graduate the wages of a new journeyperson over time, reflecting the continued development of skills.

Our analysis shows considerable differences in the three trades before the gains from a journeyperson overtake the outstanding cost arising from the apprenticeship. In the case of General Machinist, it will take about 3 years; for Tool & Die, it will take 5 years; and for Mouldmaker, it will take a bit more than 1 year. Table 6 provides the details of our analysis.

<b>YEARS TO RECOVER EMPLOYER COST OF APPRENTICESHIP</b>				
		<b>General Machinist</b>	<b>Tool &amp; Die Maker</b>	<b>Mouldmaker*</b>
A	Employer Cost of Apprenticeship	57,100	125,910	46,400
	Journeyperson Charge Rate	63.00	70.00	67.00
	Wages + Benefits	22.50**	22.50**	22.00**
	Burden	31.50	35.00	27.00
	Net Rate	9.00	12.50	18.00
	Annual Hours	2,000	2,000	2,000
B	Annual Net Contribution	18,000	25,000	36,000
<b>C</b>	<b>Years To Recover Costs (post apprenticeship period)</b>	<b>3.2</b>	<b>5.0</b>	<b>1.3</b>

Table 6

\* Industry validation indicated the incremental burden for the Mouldmaker is likely low, resulting in a low estimate of the cost borne by employers and a low estimate of the years required to recover the employer costs of apprenticeship training.

\*\* Average of 1<sup>st</sup> four years of journeyperson wages & benefits; data from CTMA Survey

## Cost to the System

Taking these calculations one step further we can use the results to estimate the cost for the apprenticeship system as a whole of the on-the-job component for one apprentice who completes all 4 years. To do so requires that we account for the retention rate in each year. In this calculation we have used the average annual retention rates of 85% in first year, 90% in second year, 95% in third year, and 100% in fourth year, as derived from the Registered Apprenticeship Information System. Based on the net training cost presented earlier in this report, and the retention rates we estimate that employers contribute approximately \$67,000 to provide on-the-job training to create one General Machinist, \$143,000 to train one Tool & Die Maker, and \$55,000 to train one Mouldmaker. Refer to Table 7 for the calculations.

<b>SYSTEM COST TO PROVIDE ON-THE-JOB TRAINING TO PRODUCE ONE GRADUATE OF APPRENTICESHIP TRAINING (EMPLOYER COST ONLY)</b>					
<b>Net Training Cost</b>	Yr 1	Yr 2	Yr 3	Yr 4	<b>Total</b>
General Machinist	42,050	23,200	5,850	-14,000	<b>57,100</b>
Tool & Die	62,350	42,500	18,300	2,760	<b>125,910</b>
Mouldmaker*	38,400	18,350	1,100	-11,450	<b>46,400</b>
<b>System Retention</b>					
System Annual Retention Rate	85%**	90%**	95%**	100%**	
System Graduation Rate					<b>72.7%</b>
<b>System Cost to Complete On-The-Job Training For One Graduate</b>					
General Machinist	49,471	25,778	6,158	-14,000	<b>67,406</b>
Tool & Die	73,353	47,222	19,263	2,760	<b>142,598</b>
Mouldmaker*	45,176	20,389	1,158	-11,450	<b>55,273</b>

Table 7

\* Industry validation indicated the incremental burden for the Mouldmaker is likely low, resulting in a low estimate of the cost borne by employers and the system cost to complete on-the-job training for one graduate.

\*\* Derived from the Ontario data in the Registered Apprenticeship Information System.

## Conclusions

It is clear from our discussions with key informants and from our cost model that employers engaged in training apprentices are taking on a significant cost burden in all three trades studied in this pilot project.

This cost burden is front-end loaded meaning the cost decreases each year of the apprenticeship program. Further, the net revenues from an apprentice rises each year. The investment risk also diminishes the longer the apprentice works for the employer. Our analysis shows that if the apprentice remains with the employer for 3 years after completing his/her apprenticeship program in the case of the General Machinist, 5 years for Tool & Die Maker, and 1 year for Mouldmaker\*, employers will recoup their investment.

*\* Industry validation indicated the incremental burden for the Mouldmaker is likely low, resulting in a low estimate of the cost borne by employers and a low estimate of the years required to recover the employer costs of apprenticeship training.*

*A survey respondent suggested that, "If all companies did their share of training there would be less stealing of tradespeople. Since this is difficult to enforce and unlikely to occur naturally, then those that take on the burden of training should be encouraged to continue to participate in training."*

However, we are told that some apprentices do leave their employers for higher wages and benefits during and after their apprenticeship. Small employers find it difficult to compete with larger companies with respect to wages and benefits and so the flow of apprentices is, for the most part, one-way, from small to large employers. When an apprentice leaves "early" (i.e. before the investment is recouped), the employer is left with a net loss on the apprenticeship investment.

Nevertheless, small employers are forced to train apprentices as they have no alternative source of skilled labour. They must produce the workers they require. The large employers have the option of "buying" the skills they require. This situation is compounded in times of skill shortages as there is not a ready pool of skilled labour for either small or large employers to draw from.

The cost burden and the risk of not getting a return on their investment are disincentives to employers who are considering participation in apprenticeship training. Some employers suggest they would opt out of the apprenticeship system if there was any other alternative.

This pilot project has demonstrated that it is feasible to engage employers in a process leading to estimation of the employer cost of apprenticeship training. With respect to developing a model to calculate the cost of apprenticeship borne by employers, we feel this

report presents a realistic approach that could be adapted to other apprenticeable occupations/ trades. It uses language and concepts that are understood by the trades involved in this project. This model could easily be duplicated using different language appropriate to other sectors.

Collecting the necessary data from employers presents the usual set of survey challenges. These include:

- Making the survey sufficiently compelling to engage employers in participating in the study;
- Ensuring the language of the survey is commonly used in the sector and where it is not possible to find common language, providing adequate definition of terms to ensure understanding; and
- Capturing a sufficiently large sample of data to ensure accuracy of results.

There have been numerous calls recently for expansion in the apprenticeship system. To accomplish this would require greater participation by employers. That in turn would require them to take on additional risk and potential costs, unless inducements are provided.

## **Appendix A: Focus Group Questions**

### **Objectives:**

- ✓ To identify the elements of direct and indirect costs
- ✓ To determine if cost elements can be quantified
- ✓ To consider how best to quantify the cost elements
- ✓ To obtain commitment to validate the findings

### **Questions:**

1. We have identified the following potential costs of apprenticeship (beyond the wages paid to apprentices) that are borne by employers. Please confirm, add or subtract to make this list complete.
  - Lost productivity of journeypersons working with apprentices
  - Additional health and safety costs (e.g. WCB rates, lost time injury claims)
  - Additional material wastage
  - Disruption of work for in-school training - additional scheduling, orientation and documentation costs to backfill apprentice positions
  - Purchase of tools for apprentices
  - Additional wear and tear on tools and equipment
2. Are any of the above costs optional?
3. If yes, why do some employers incur these costs?
4. What variables (e.g. segment of machining/tooling trades, company size, location, number of apprentices) need to be factored into a cost model?
5. What challenges, if any, will there be in trying to assign a dollar value to these costs?
6. Do you have any suggestions as to the best way to approach valuing each of the cost elements?
7. At what point, if any, does the employer achieve a return on his/her investment?
8. The following cost model was used in the USA and we would be interested in your comments on this approach.

Year in Trade	% of Time Requiring Training	Hourly Wage	Direct Wage Cost	Instructor JP or Supv. % of Time Required <sup>(1)</sup>	Indirect Wage Cost <sup>(2)</sup>	Outside Training	Total Yearly Training Cost
1 <sup>st</sup> year	80%	\$11.00/hr.	\$62,400	23%	\$22,080	\$200	\$84,680
2 <sup>nd</sup> Year	50%	\$13.00/hr.	\$41,000	18%	\$17,280	\$200	\$58,480
3 <sup>rd</sup> Year	30%	\$15.00/hr.	\$25,800	14%	\$13,440	\$200	\$39,440
4 <sup>th</sup> Year	10%	\$15.00/hr.	\$9,000	10%	\$9,600	\$200	\$18,800
TOTAL			\$138,200		\$62,400	\$800	\$201,400

Based it would appear on:

3:1 ratio

1) Average cost of \$20.00/hr. for Journey person or Supervisor

2) \$28.00/hr. shop overhead cost

9. We are contemplating the following model and would like your comments on this approach.

Year of Appr.	REVENUE	COSTS						Net Cost (Revenue – Total Costs)
	Revenues/Sales from Apprentices (\$/year)	Apprentice Wages (\$/hour) <sup>(1)</sup>	Billable Hours Lost by JPs (\$/hour) <sup>(2)</sup>	Additional Health & Safety Costs (\$/year)	Additional Material Waste Costs (\$/year)	Tools and Equipment (purchase, replacement) (\$/year)	Administrati on of Apprentices (\$/year)	
Year 1								
Year 2								
Year 3								
Year 4								
Total								

Notes:

<sup>(1)</sup> We will need to know the hourly wage as well as the number of hours worked annually to calculate this cost.

<sup>(2)</sup> We will need to know the billable hourly rate as well as the hours of work lost while training an apprentice to calculate this cost.

10. Do you think employers would be willing to complete this costing exercise by completing a survey?

11. We are interested in holding one focus group with Journey persons and one with Apprentices. Do you have any suggestions as to how we could accomplish this?

12. Would you be willing to meet again to discuss and validate our findings?

## **Appendix B: Survey Instrument**

## DETERMINING THE COST OF APPRENTICESHIP TO EMPLOYERS

This survey is designed to determine the cost of apprenticeship to employers in the machining and tooling trades. Your information is essential in enabling us to present an accurate picture of your contribution to the training of skilled workers in Ontario. Please be assured that your information will be kept confidential; only summary data will be reported. If you have any questions please contact Rosemary Sparks of R J Sparks Consulting Inc. at (905) 852-4628.

### INSTRUCTIONS

1. Provide responses for all of the machining and tooling trades that you employ.
2. Once you have completed the survey please return it in the postage-paid envelope provided.
3. If you have never employed apprentices, please complete question #1 only and return the survey in the postage paid envelope.

**1. Does your company employ apprentices (now or in the past five years)?**

Yes                       No

**If yes, proceed to question #2.**

**If no, please explain why.**

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**2. How many machining and tooling tradespersons do you currently employ?**

Trade	Apprentices	Journeypersons
General Machinist		
Tool & Die Maker		
Tool Maker		
Mould Maker		
Machine Tool Builder and Integrator		
Pattern Maker		

3. What is the non-productive lost time for one apprentice due to training? This should be shown as a percentage of annual hours (2000 hours) for one apprentice.

Non-productive Lost Time for One Apprentice Due to Training (% of 2000 hours)				
Trade	1 <sup>st</sup> Year (%)	2 <sup>nd</sup> Year (%)	3 <sup>rd</sup> Year (%)	4 <sup>th</sup> Year (%)
General Machinist				
Tool & Die Maker				
Tool Maker				
Mould Maker				
Machine Tool Builder & Integrator				
Pattern Maker				

4. Please explain what you took into consideration in arriving at the percentage.

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5. What is your current hourly wage for an apprentice?

Hourly Wage for an Apprentice				
Trade	1 <sup>st</sup> Year	2 <sup>nd</sup> Year	3 <sup>rd</sup> Year	4 <sup>th</sup> Year
General Machinist				
Tool & Die Maker				
Tool Maker				
Mould Maker				
Machine Tool Builder & Integrator				
Pattern Maker				

6. What in-school costs do you incur annually for training one apprentice? Please estimate the dollar cost for one apprentice only. See question #9 for possible types costs you may incur.

In-School Costs for One Apprentice				
Trade	1 <sup>st</sup> Year (\$)	2 <sup>nd</sup> Year (\$)	3 <sup>rd</sup> Year (\$)	4 <sup>th</sup> Year (\$)
General Machinist				
Tool & Die Maker				
Tool Maker				
Mould Maker				
Machine Tool Builder & Integrator				
Pattern Maker				

7. Please indicate which of the following were included in your estimation of the in-school costs for training an apprentice. Check as many as apply.

- Top up Employment Insurance
- Pay full wages and benefits while apprentice in-school
- Tuition Fees
- Other (specify) \_\_\_\_\_

8. If the in-school costs differ by trade or by year of apprenticeship, please describe the differences below.

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9. For a journeyman you assign to training, how many apprentices does the journeyman typically train at one time? Please enter only single numbers (not a range).

Number of Apprentices a Journeyman Typically Trains at One Time				
Trade	1 <sup>st</sup> Year	2 <sup>nd</sup> Year	3 <sup>rd</sup> Year	4 <sup>th</sup> Year
General Machinist				
Tool & Die Maker				
Tool Maker				
Mould Maker				
Machine Tool Builder & Integrator				
Pattern Maker				

10. What is the non-productive lost time for a journeyman associated with training the number of apprentices you indicated in question #9? This should be shown as a percentage of annual hours (2000 hours).

Non-productive Lost Time for a Journeyman Associated With Training the Number of Apprentices Indicated in Question #9 (% of 2000 hours)				
Trade	1 <sup>st</sup> Year (%)	2 <sup>nd</sup> Year (%)	3 <sup>rd</sup> Year (%)	4 <sup>th</sup> Year (%)
General Machinist				
Tool & Die Maker				
Tool Maker				
Mould Maker				
Machine Tool Builder & Integrator				
Pattern Maker				

**11. Please explain what you took into consideration in arriving at the percentage.**

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**12. What is your current average hourly wage and benefits for a journeyperson?**

Average Hourly Wage and Benefits for a Journeyperson		
Trade	Average Hourly Wage (\$)	Average Hourly Benefits (\$)
General Machinist		
Tool & Die Maker		
Tool Maker		
Mould Maker		
Machine Tool Builder & Integrator		
Pattern Maker		

**13. What is the overhead/burden rate for a journeyperson? Please provide an hourly rate.**

\$ \_\_\_\_\_ per hour

**14. What is the overhead/burden rate for an apprentice? Please provide an hourly rate.**

\$ \_\_\_\_\_ per hour

**15. What is your charge out rate per hour for an apprentice?**

Charge Out Rate Per Hour For An Apprentice				
Trade	1 <sup>st</sup> Year (\$)	2 <sup>nd</sup> Year (\$)	3 <sup>rd</sup> Year (\$)	4 <sup>th</sup> Year (\$)
General Machinist				
Tool & Die Maker				
Tool Maker				
Mould Maker				
Machine Tool Builder & Integrator				
Pattern Maker				

**16. What is your charge out rate per hour for a journeyperson?**

<b>Charge Out Rate Per Hour For A Journeyperson</b>				
<b>Trade</b>	<b>1<sup>st</sup> Year (\$)</b>	<b>2<sup>nd</sup> Year (\$)</b>	<b>3<sup>rd</sup> Year (\$)</b>	<b>4<sup>th</sup> Year (\$)</b>
General Machinist				
Tool & Die Maker				
Tool Maker				
Mould Maker				
Machine Tool Builder & Integrator				
Pattern Maker				

**17. Indicate which of the following statements reflects your experience with apprenticeship.**

At the end of the apprenticeship period, does the:

- Return on investment outweigh the cost burden of apprenticeship?  
If yes, in what year did you begin to see a return on investment? \_\_\_\_\_
- Cost burden of apprenticeship outweigh the return on investment?  
If yes, how many years after the apprenticeship period do you begin to see a return on investment? \_\_\_\_\_
- Return on investment and the cost burden balance each other by the end of the apprenticeship period.

**18. Please explain what you considered when determining at what point you see a return on investment.**

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**19. Do you have any further comments about the costs and returns to apprenticeship training?**

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**Please return the completed survey in the postage-paid return envelope provided.**

**THANK YOU.**