The Retirement of Skilled Trades In Urban Southern Ontario

Prepared for

Waterloo Wellington Training and Adjustment Board

by

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Executive Summary

In March 2005, the Waterloo Wellington Training and Adjustment Board issued a report entitled "Skilled Trades Projection 2015" that estimated the demand and supply for skilled trades in the local service area for the years 2010 and 2015 and found no evidence of a systemic skilled trades shortage in either of those time periods. A key source of labour force supply arose from in-migration to the local area.

Since migration is so important to the health of the local economies, Waterloo Wellington Training and Adjustment Board has asked Essential Economics to investigate the supply of selected skilled trades in the adjacent areas of urban southern Ontario. The present work looks at a subset of skilled trades, those of particular importance in manufacturing and construction. These trades are machinists, tool and die makers, electricians, industrial electricians, plumbers, sheet metal workers, boilermakers, fitters, ironworkers, welders, carpenters, cabinetmakers, brick layers, concrete finishers, millwrights and machine fitters.

These skills are examined in each of the 10 service areas of Ontario's training and adjustment boards. In addition to Waterloo Wellington, the following areas were studied: Durham, Elgin Middlesex Oxford, Grand Erie, Hamilton, Niagara, Peel Halton Dufferin, Simcoe, Toronto and York South Simcoe.

The rates of retirement in the areas of urban southern Ontario adjacent to Waterloo Wellington reveal an increasing retirement burden and one which is, in many instances, heavier than that borne in Waterloo Wellington. Everything else being equal, this means that the ability of Waterloo Wellington to draw on in-migrants to fuel its growth becomes progressively more difficult. This is a serious matter that warrants community attention. However, it is a problem growing slowly over time and especially increasing in degree after 2017.

The data indicates that it will become increasingly problematic to recruit machinists, tool and die makers, industrial electricians, plumbers, sheet metal workers, fitters, welders and concrete finishers. As a result, Waterloo Wellington needs to continue its efforts to increase local training and lower its dependence on in-migration. However, we must argue that educational programs and the promotion of the skilled trades must avoid overly general responses. Education programs must be tailored to the specifics of the requirement of individual trades and/or to those of employers who have carefully identified their present and future needs.

The challenge is not just to replace workers, but to fuel future growth.

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Introduction to the Work

In March 2005, the Waterloo Wellington Training and Adjustment Board issued a report entitled "Skilled Trades Projection 2015" that estimated the demand and supply for skilled trades in the local service area for the years 2010 and 2015. Using occupational and demographic data from Statistics Canada, migration data from Canada's Technology Triangle Inc. and the responses of a large selection of employers, the report found no evidence of a systemic skilled trades shortage in either of those time periods. However, a small number of specific skills did indeed appear to be in short supply and were identified.

Three factors appear to account for the absence of a systemic shortage. First, the area has a somewhat younger age profile than the rest of Ontario. Second, employers exhibited caution with respect to their future needs; and third, the area has traditionally been the recipient of strong in-migration levels, especially from the rest of Ontario. It is quite clear that without this continuing in-migration, there would have been a serious skilled trades shortage and the local economies would have grown more slowly. Of course, there would have been a shortage of other skills as well. (The Executive Summary in the March 2005 Report is provided in Appendix A)

Since migration is so important to the health of the local economies, Waterloo Wellington Training and Adjustment Board has asked Essential Economics to investigate the supply of selected skilled trades in the adjacent areas of urban southern Ontario. In particular, researchers were asked to examine the demographic characteristics of adjacent areas to detect whether the retirement burdens in the areas would make it increasingly difficult to attract labour from them to Waterloo Wellington. As in the earlier work, there is concern that the retirement of the post-war baby boomers may occasion severe and continuing skilled shortages. To fully appreciate the "boomer" effect, this report also looks at the period 2017 to 2021, the period in which the full weight of boomer retirements may be argued to occur.

This report continues to draw on the occupational and demographic data provided by Statistics Canada as a customized tabulation for the Ontario Ministry of Training, Colleges and Universities. It also draws on the migration research conducted by Paul Knafelc of Community Benchmarks for Canada's Technology Triangle Inc. (CTT).

Because of resource constraints, it was not possible to study the whole array of skilled trades that were covered in the March 2005 Report. That report covered any occupation for which an apprenticeship was offered in the province of Ontario. The present work looks at a subset of skilled trades, those of particular importance in manufacturing and construction. These trades are machinists, tool and die makers, electricians, industrial electricians, plumbers, sheet metal workers, boilermakers, fitters, ironworkers, welders, carpenters, cabinetmakers, brick layers, concrete finishers, millwrights and machine fitters. These skills together constitute the Study Skills. For comparison purposes, this report will also look at several other occupational categories; they are auditor/accountants, civil, mechanical, electrical and chemical engineers, physicians, dentists and veterinarians, judges and lawyers, university professors and elementary and secondary school teachers.

The research examines the above Study Skills in 10 of the service areas of Ontario's training and adjustment boards. In addition to Waterloo Wellington, the following areas were examined: Durham, Elgin Middlesex Oxford, Grand Erie, Hamilton, Niagara, Peel Halton Dufferin, Simcoe, Toronto and York South Simcoe. These areas together constitute the Study Area.

Overview of Study Trades and Study Area

The Study Trades in Waterloo Wellington represent 36.1 percent of all the skilled trades, broadly defined, in the Waterloo Wellington service area. This constitutes 5.5 percent of total employment. For the jurisdictions of the Study Area, employment in the Study Trades ranges between 2.4 percent and 5.6 percent of total employment in each respective area. The equivalent figure for Ontario is 3.8 percent. Details are presented in Table A.

Table A
Study Trades and Total Employment
2001
Study Area and Ontario

	Number Employed in Study Trades	Total Employed	Study Skills as Percent of Total Employed
Durham	10,335	264,065	3.9
Elgin Middlesex Oxford	12,360	291,485	3.9
Grand Erie	6,145	110,425	5.6
Hamilton	12,775	232,240	5.4
Niagara	10,335	198,185	5.2
Peel Halton Dufferin	25,500	767,070	3.3
Simcoe	7,365	155,875	4.7
Toronto	30,045	1,228,015	2.4
Waterloo Wellington	18,410	333,250	5.5
York South Simcoe	11,575	400,165	2.9
Total Study Area	144,845	3,980,775	3.6
Ontario	214,280	5,713,900	3.8

Source: Statistics Canada

Several points can already be noted. Any discussion concerning skilled trades should always proceed with the realization that skilled trades in total are a very small proportion of the total number of persons employed. As the March 2005 Report noted, even when we take all skilled trades broadly defined (not just those examined in this document) the persons in these occupations still constitute, in total, only 15 percent of the total number of persons employed. Those occupations that constitute high priorities for manufacturing and construction are a subset of that 15 percent. Thus, it is clear that only a relatively small shift in occupational choice could dissipate whatever shortages might be occurring, everything else being equal. However, if all skilled occupations are going into shortages simultaneously, there would then be great competition for any skilled resources. Nevertheless, it is important to note that the skilled trade occupational category has to win over only a small number of persons whatever the circumstances.

It is also to important to observe, with respect to the other nine jurisdictions in the Study Area, that Waterloo Wellington has the second highest proportion of Study Trades to total employment. In other words, the Study Trades are relatively more important to Waterloo Wellington then to every other jurisdiction in the Study Area excluding Grand Erie. This almost certainly reflects the abnormal manufacturing orientation in Waterloo Wellington. In Toronto, for example, the Study Trades represent only 2.4 percent of total employment in that jurisdiction.

Nevertheless, the total supply of the Study Trades in Waterloo Wellington represents only 12.7 percent of the total pool of those skills in the Study Area. In other words, Waterloo Wellington should not need to attract a disproportionate share of those skills from elsewhere in urban southern Ontario to re-dress such imbalances that Waterloo Wellington may have. However, Waterloo Wellington does have a higher share of such trades as machinists, tool and die makers, boilermakers, fitters and machine fitters. The question is, of course, whether those other jurisdictions will have workers to "spare" or not.

A detailed breakdown of employment in the Study Trades Waterloo Wellington and in the jurisdictions of the Study Area is provided in Tables B and C.

Table B
Study Trades 2001
Total Study Area and Waterloo Wellington

Code	Skill	Total	Waterloo Wellington	Waterloo Wellington as a Percent of Each Skill
7231	Machinists	17,415	2,740	15.7
7232	Tool & Die Makers	9,950	1,725	17.3
7241	Electricians	14,560	1,305	9.0
7242	Industrial Electricians	7,590	815	10.7
7251	Plumbers	8,475	750	8.8
7261	Sheet Metal Workers	4,590	550	12.0
7262	Boilermakers	625	165	26.4
7263	Fitters	2,595	395	15.2
7264	Ironworkers	1,570	155	10.0
7265	Welders	23,690	4,320	18.2
7271	Carpenters	22,055	1,890	8.6
7272	Cabinetmakers	4,310	405	9.4
7281	Bricklayers	5,725	500	8.7
7282	Concrete Finishers	2,315	270	11.7
7311	Millwrights	18,030	2,215	12.3
7316	Machine Fitters	1,350	210	15.6
	Total	144,845	18,410	12.7

Source: Statistics Canada

Table C
Employment in Selected Trades
2001 Selected Areas

Code	Skilled Trade	Durham	Elgin Middlesex Oxford	Grand Erie	Hamilton	Niagara	Peel Halton Dufferin	Simcoe	Toronto	Waterloo Wellington	York South Simcoe
7231	Machinists	845	1,225	875	1,615	1,710	3,555	870	3,020	2,740	960
7232	Tool & Die Makers	900	985	295	445	650	2,010	500	1,370	1,725	1,010
7241	Electricians	1,225	1,060	420	990	800	2,610	750	3,585	1,305	1,815
7242	Industrial Electricians	685	725	325	1,065	705	1,350	375	1,050	815	495
7251	Plumbers	720	775	155	555	490	1,380	500	1,930	750	1,220
7261	Sheet Metal Workers	480	460	130	265	335	835	295	825	550	415
7262	Boilermakers	25	50	60	70	35	45	25	105	165	45
7263	Fitters	155	130	105	295	265	570	55	495	395	130
7264	Ironworkers	215	105	55	245	125	255	50	290	155	75
7265	Welders	1,045	2,590	1,310	2,280	1,890	3,705	1,045	4,460	4,320	1,045
7271	Carpenters	1,560	1,575	685	1,715	1,085	3,350	1,470	6,525	1,890	2,200
7272	Cabinetmakers	340	335	165	330	275	770	180	1,130	405	380
7281	Bricklayers	400	340	200	455	260	725	355	1,970	500	520
7282	Concrete Finishers	150	260	60	235	125	305	90	670	270	150
7311	Millwrights	1,535	1,585	1,225	2,090	1,460	3,700	760	2,395	2,215	1,065
7316	Machine Fitters	55	160	80	125	125	275	45	225	210	50
	Total	10,335	12,360	6,145	12,775	10,335	25,500	7,365	30,045	18,410	11,575

Source: Statistics Canada

Migration Patterns in Waterloo Wellington

The March 2005 Report presented the migration research conducted by Paul Knafelc of Community Benchmarks for Canada's Technology Triangle Inc. Based on this data, it was estimated that the in-migration of skilled tradespersons with post-secondary qualifications equaled between 2,500 and 3,000 between 1996 and 2001. For the purposes of the March 2005 Report, it was assumed that this rate of in-migration would continue to 2011.

Community Benchmarks also provided an occupational breakdown of the in-migrants to Waterloo Region (not including Wellington). While the data do not allow for a complete or detailed description, they do reveal a significant in-migration of specific skilled trades. As a result, it remains fair to say that, over five-year periods, Waterloo Wellington receives between 2,500 and 3,000 skilled trades in-migrants and that they are essential for continued growth. The question is whether this flow can be reasonably expected to continue. Details are presented in Table D

Table D
Net Migration[1]
1996 to 2001
Canada's Technology Triangle (Waterloo Region)

Construction Trades	460
Mechanics	325
Contractors and Supervisors in trades and transport	225
Stationary engineers, power station operators, electrical trades and telecommunication occupations	115
Other trades	70
Total	1,195

1: In-migration less out-migration

Source: Statistics Canada, Community Benchmarks and Canada's Technology Triangle Inc.

Introduction to Retirement Issues

While this report will comment briefly on demand conditions, the research concentrates on supply issues. Of course, the supply of skilled labour is strongly affected by the rate at which persons retire.

There has been much comment about the effect of the retirement of the post-war baby boomers on the labour markets, both generally and in specific jurisdictions. The post-war baby boomers (boomers) refer to those persons born approximately between 1945 and 1960; they constitute a disproportionate share of the demographic age profile of Canada. And it is certainly true that as they have aged, they have disrupted a number of marketplaces and social patterns.

The *leading* edge of the boomers is just turning 60 in 2005, and they do not reach 65 until 2010, with the trailing edge only 50 years old in 2010. The retirement effect rises slowly after 2010 and is not fully

completed until 2025.

The matter is complicated by the fact that the "normal" retirement age is in transition. The average age of retirement has indeed fallen. However, part of that effect is directly driven by the use of early retirement to downsize both private and public organizations. Using the retirement experience of sectors with too many workers' as indicative of retirement practices elsewhere is questionable.

Furthermore, independent of the average age of retirement, a significant number of persons continue to work after they "first" retire and after age 65. Moreover, if Ontario prohibits mandatory retirement, as it proposes to do, retirement practices will inevitably become more varied.

It should also be noted that the choice of when to retire is not just a matter of pure personal preference. It must also be affected to some significant degree (but not exclusively) by the financial reward being offered to the employee. Of course, in any area of employment where a shortage may occur, there will be a natural tendency for wages to rise. And that will to some degree induce workers to continue working. Of course, the business person may see the increase in wages as disadvantageous. However, it will to some degree moderate the shortage which was setting off the wage increase. In other words, if serious shortages do in fact occur, it is certain that the number of persons retiring at age 65 will decrease in relative terms.

This likelihood grows stronger in light of two other observations. While many persons say they wish to retire before age 65, there is a widely held view amongst retirement planners that large numbers of persons are not adequately preparing for their retirement at age 65 and that they may encounter even at that age some economic disadvantage. It is also a fact that large numbers of Canadians are not, in the aggregate, approaching the limits of their income tax RSP deductions. The concern of the retirement planners does not appear to be misplaced. As a result, it is quite reasonable to believe that persons approaching retirement would be strongly affected by the possibility of working a few years longer and earning a relatively good reward for doing so.

There are also two factors that will significantly *weaken* the demand for all labour, including skilled labour. First, it must be recognized that when one worker retires he or she does not necessarily have to be replaced by an equivalent full-time worker. This is because productivity (output per worker) rises most years. In other words, any particular piece of work would require slightly less of a worker's time than in the previous year. And therefore merely to maintain a steady state of output, the number of workers needed will decline over time. These productivity gains affect all workers including the Study Trades. Indeed, manufacturing productivity tends to grow faster than the average for the economy overall. In a thousand different ways year in and year out, technology and improved organization reduce the need for worker time. Something as simple as more reliable valves reduces the demand for plumbers and gas fitters - to name only two skills affected. It has always been true that productivity gains are partly replacing every worker who retires. It should be noted that productivity gains in Canada often increase several percent per year. Of course, rising wages increase the tendency to use technology to replace labour.

Second, the slowdown in the birth rate itself moderates the demand for labour. The slowing rate of population growth will, everything else being equal, reduce the demand for goods and services. This factor cannot be overlooked. A falling birth rate means, ultimately, fewer workers, but it also means fewer consumers. For example, a falling birth rate means a smaller pool from which to call forth carpenters. Yet, at the same time, it reduces the demand for carpenters to build new houses. Of course, these effects do not occur simultaneously and there certainly can be situations at which these elements are out of phase with each other, causing shortages. However, these may be transient shortages upon which one would not wish to create labour force strategy. And it is also the case that while the above observation is true in the aggregate, there may be local marketplaces which continue to experience rapidly rising demand because of in-migration. But when that is happening there should be available labour elsewhere where demand of necessity is weaker.

It must be emphasized that the availability of skilled labour is not and never has been solely a function of demographic considerations. This is, of course, not to deny the importance of demographic factors as part of the analysis.

Demographic Analysis

Age Profile

The ability of Waterloo Wellington to draw on labour from the Study Area is directly affected by whether or not the Study Area is facing its own serious labour shortages occasioned by the burden by its retirements. To begin to answer this question, we can examine the age profile of the Study Trades in the Study Area. The March 2005 Report noted that Waterloo Wellington has a somewhat younger population than the average for Ontario. That would suggest that other parts of Ontario will encounter their retirement burden earlier and more seriously than Waterloo Wellington. However, a more detailed analysis is warranted.

By looking at the age profile of the employed labour force in the jurisdictions of the Study Area by five-year cohorts beginning at age15, we can see that Waterloo Wellington's population profile is slightly skewed to younger rather than older. These other jurisdictions face a retirement burden that will be somewhat higher. The degree of the difference, however, should not be exaggerated. A detailed breakdown is presented in Table E.

Table E
Age Profile of Employed Labour Force
2001 – Study Area

Source: Statistics Canada

	Durham		**Elgin Middlesex Oxford**		**Grand Erie**		**Hamilton**		**Niagara**	
15 – 19	17,765	6.7	20,085	6.9	8,365	7.6	14,605	6.3	14,175	7.2
20 – 24	21,510	8.1	28,365	9.7	9,425	8.5	22,190	9.6	17,615	8.9
25 – 29	23,355	8.8	29,185	10.0	9,355	8.5	23,830	10.3	18,225	9.2
30 – 34	29,815	11.3	32,005	11.0	11,105	10.1	26,520	11.4	21,040	10.6
35 – 39	42,105	15.9	39,655	13.6	14,800	13.4	32,255	13.9	26,600	13.4
40 – 44	40,720	15.4	39,615	13.6	15,560	14.1	32,790	14.1	27,300	13.8
45 – 49	34,085	12.9	35,745	12.3	14,965	13.6	28,910	12.4	25,175	12.7
50 – 54	27,885	10.6	30,415	10.4	12,150	11.0	24,120	10.4	21,955	11.1
55 –59	15,625	5.9	19,215	6.6	7,620	6.9	15,225	6.6	14,275	7.2
60 – 64	7,180	2.7	10,225	3.5	4,065	3.7	7,575	3.3	7,220	3.6
65+	4,030	1.5	6,980	2.4	3,020	2.7	4,225	1.8	4,605	2.3
Total	264,065		291,485		110,425		232,240		198,185	

Continued

	Peel Halton Dufferin		**Simcoe**		**Toronto**		**Waterloo Wellington**		**York South Simcoe**	
15 – 19	47,560	6.2	10,880	7.0	49,240	9.0	23,605	7.1	25,190	6.3
20 – 24	67,575	8.8	13,045	8.4	107,000	8.7	33,355	10.0	33,185	8.3
25 – 29	77,350	10.1	14,650	9.4	151,730	12.4	35,725	10.7	37,725	9.4
30 – 34	92,910	12.1	18,300	11.7	168,150	13.7	39,025	11.7	44,700	11.1
35 – 39	112,040	14.6	24,290	15.6	177,445	14.4	46,410	13.9	56,405	14.1
40 – 44	107,850	14.1	23,240	14.9	160,535	13.1	44,870	13.5	59,145	14.8
45 – 49	91,765	12.0	18,570	11.9	142,155	11.6	39,290	11.8	52,120	13.0
50 – 54	79,655	10.4	15,365	9.9	120,105	9.8	33,100	9.9	44,675	11.1
55 –59	50,715	6.6	9,635	6.2	77,315	6.3	20,175	6.2	25,550	6.4
60 – 64	25,955	3.4	4,885	3.1	44,925	3.7	10,865	3.3	13,870	3.5
65+	13,685	1.8	3,015	1.9	29,425	2.4	6,290	1.9	7,595	1.9
Total	767,070		155,875		1,228,015		333,250		400,165	

To capture part of the detail of Table E, it is helpful to generate a measurement of the proportion of each of the respective populations that is between 15 and 39 years old. The higher the number is, the younger the population is. Using this number, the degree of Waterloo Wellington's advantage becomes clear. Of all the jurisdictions, Waterloo Wellington has the highest proportion of its employed labour force between 15 and 39 years old at 53.4 percent. The other jurisdictions range from a low of 48.0 percent to a high of 53.2 percent. The differences are significant but should not be overstated.

Details are presented in Table F.

Table F
Employed Labour 15 to 39 Years
As Percent of Total Employed
2001
Study Area

Durham	51.0
Elgin Middlesex Oxford	51.2
Grand Erie	48.0
Hamilton	51.4
Niagara	49.3
Peel Halton Dufferin	51.8
Simcoe	52.1
Toronto	53.2
Waterloo Wellington	53.4
York South Simcoe	49.2

Source: Statistics Canada

Of course, above observations refer to the age profile of the total employed labour force, not specifically to the Study Trades. In spite of its absolute size, Toronto is not a particularly good source for in-migration. For example, in Table B it can be observed that while Toronto has more than three times the total number of employed labour as does Waterloo Wellington, it does not employ even twice the number of persons with the Study Trades. This is partly a reflection of the manufacturing orientation of Toronto compared to Waterloo Wellington.

It is particularly helpful to look at the Study Trades according to the proportion of workers between the ages of 15 and 39 years old. The greater this proportion is relative to other jurisdictions, the younger is the population; the smaller this proportion is, the relatively older is the population.

For example, 47.3 percent of the Study Trades in the total Study Area are between 15 and 39 years old; the equivalent figure for Toronto is 46.0, a 1.9 percentage point difference. If a comparison is between the Study Area less Toronto, the difference increases to 2.5 percentage points. In other words, the Study Trades employed in Toronto are relatively older than the rest of the Study Area.

By contrast, in Waterloo Wellington, Study Trades are younger than the average in the Study Area, with 54.7 percent of the Study Trades between the ages of 15 and 39.

Of the 16 trades that make up the Study Trades, 12 of those in Waterloo Wellington have a higher proportion of 15 to 39 year old workers than those for the Study Area. And Waterloo Wellington has relatively young workers in fifteen of the sixteen Study Trades when compared to Toronto. Therefore Toronto is not a

prime recruitment area for the Study Skills for Waterloo Wellington, based on data for 2001. There is no reason to believe that the situation is different today.

Details are presented in Table G

Table G
Employed Study Trades (15 to 39 years)
As Percent of Total Study Trades
2001
Study Area, Toronto and Waterloo Wellington

Code	Skilled Trade	Total	Toronto	Waterloo Wellington
7231	Machinists	47.5	42.4	58.9
7232	Tool & Die Makers	48.2	47.4	54.5
7241	Electricians	50.6	47.7	49.0
7242	Industrial Electricians	42.7	45.2	47.9
7251	Plumbers	49.2	50.8	48.0
7261	Sheet Metal Workers	47.5	42.4	58.2
7262	Boilermakers	30.2	23.8	30.3
7263	Fitters	43.4	36.4	50.6
7264	Ironworkers	47.8	41.4	67.7
7265	Welders	49.8	41.9	60.8
7271	Carpenters	49.9	51.0	51.6
7272	Cabinetmakers	47.6	46.0	55.6
7281	Bricklayers	53.5	49.5	65.0
7282	Concrete Finishers	52.8	37.3	66.7
7311	Millwrights	38.5	35.5	47.4
7316	Machine Fitters	34.6	33.3	31.0
Total Study Skills		47.3	46.0	54.7

Source: Derived from Statistics Canada

Retirement Replacement Ratios

Another way to consider the extent of the demographic challenge to Waterloo Wellington and the rest of the Study Area is to look at what may be termed the retirement replacement ratio. This is the number of anticipated retirees divided by the number of people working at the beginning of the period under consideration. For our purposes, the benchmark year against which the calculations are done is 2001, the Census year. Comparable data for intervening years is not available. We will, for the moment, assume that everyone retires at age 65. Below we will consider another alternative.

Following Statistics Canada's protocol, we will be analysing five-year age cohorts. This will allow us to look at the number of retirements in 2007 to 2011, 2012 to 2016 and 2017 to 2021. The number of persons who retire in 2007 to 2011 is, of course, the number between the ages 55 and 59 in 2001. And the number who retire between 2012 and 2016 is the number of persons between 50 and 54 years old in 2001. The number who retire in 2017 to 2021 are those who are 45 to 49 in 2001.

The March 2005 Report noted that the number of persons who reach retirement age in Waterloo Wellington in 2007 to 2011 represent about 6.2 percent of those employed in 2001. That means that the retirement replacement burden on the labour marketplace is about 1.2 percent per year. In light of the historic

net growth of the Waterloo Region labour market of 18.5 percent in the seven-year period 1996 to 2003, such a replacement burden did not appear to seem disproportionate. Moreover, since the retirement replacement ratio is calculated against 2001 and since the number of employed persons will have risen by 2007, the actual rate in 2007 is less than that calculated. The present report is particularly concerned about the retirement ratios in the other jurisdictions in the Study Area since that is the primary source of the in-migration to Waterloo Wellington comes from.

For each Study Trade in each jurisdiction of the Study Area, we can determine whether it has a higher or lower retirement ratio than that in Waterloo Wellington. Not surprisingly, there are instances in which Waterloo Wellington has a lower retirement ratio than that in some, but not all jurisdictions. And, of course, the reverse is also true.

Considering the period 2007 to 2011, the data indicate that in Waterloo Wellington there are eight out of the sixteen Study Trades in which the retirement replacement ratio is lower than in at least six of the ten other jurisdictions; it is equally true that in eight of those skills the situation is reversed. Therefore, from the point of view of Waterloo Wellington, there are some skills where it would be more difficult to recruit because the retirement rates are higher in some of the jurisdictions. But there are also ones in which it will be relatively easier to recruit since the retirement replacement ratios are lower. A simple generalization based on the entire Study Area is not valid.

Specifically, it appears that it will be more difficult to recruit machinists, tool and die makers, industrial electricians, plumbers, sheet metal workers, fitters, welders and concrete finishers because their retirement replacement ratios are higher than those in Waterloo Wellington in many jurisdictions of the Study Area. By contrast, in the future it may be relatively easier to recruit electricians, ironworkers, carpenters, cabinetmakers, bricklayers, millwrights and machine fitters. Boilermakers are discussed below.

Details are presented in Table H.

Table H
Comparison of Retirement Replacement Ratios
Waterloo Wellington and the Study Area
2007 – 2011

Code	Skill	Number of Jurisdictions (out of 10) in which Retirement Ratio is higher than in Waterloo Wellington
7231	Machinists	6
7232	Tool & Die Makers	6
7241	Electricians	1
7242	Industrial Electricians	6
7251	Plumbers	7
7261	Sheet Metal Workers	9
7262	Boilermakers	3
7263	Fitters	7
7264	Ironworkers	5
7265	Welders	6
7271	Carpenters	5
7272	Cabinetmakers	2
7281	Bricklayers	5
7282	Concrete Finishers	7
7311	Millwrights	5
7316	Machine Fitters	4

Source: Statistics Canada

An examination of the specific Study Trades in each jurisdiction also makes clear that several trades have relatively high or very high retirement ratios. Through much of the Study Area, tool and die makers, ironworkers, cabinetmakers and machine fitters (machine builders/integrators) have particularly high retirement burdens. Boilermakers have abnormally high rates in a number of the areas, including Waterloo Wellington.

Details are presented in Table I.

Table I
Retirement Replacement Ratios
2007 - 2011 Selected Areas

Code	Skilled Trade	Durham	Elgin Middlesex Oxford	Grand Erie	Hamilton	Niagara	Peel Halton Dufferin	Simcoe	Toronto	Waterloo Wellington	York South Simcoe
7231	Machinists	5.3	5.7	4.0	8.4	8.2	10.7	3.4	9.3	5.3	10.9
7232	Tool & Die Makers	6.7	8.1	8.5	9.0	10.0	8.0	4.0	10.6	7.2	6.4
7241	Electricians	4.9	11.8	7.1	10.6	3.8	7.7	6.0	8.2	10.7	6.3
7242	Industrial Electricians	5.8	4.1	9.2	8.5	14.2	8.5	8.0	11.0	6.1	6.1
7251	Plumbers	8.3	6.5	6.5	7.2	5.1	7.6	3.0	9.3	6.0	7.8
7261	Sheet Metal Workers	5.2	8.7	7.7	7.5	11.9	14.4	10.2	9.7	2.7	4.8
7262	Boilermakers	40.0	20.0	50.0	0	0	22.2	0	0	21.2	3.3
7263	Fitters	6.5	11.5	0	0	13.2	11.4	18.2	10.1	6.3	7.7
7264	Ironworkers	7.0	0	0	18.4	12.0	9.8	0	10.3	6.5	0
7265	Welders	6.7	6.0	3.4	9.2	8.2	9.9	4.3	9.0	6.3	13.4
7271	Carpenters	4.8	7.9	2.9	4.7	8.8	6.3	5.4	6.5	5.8	8.9
7272	Cabinetmakers	10.3	6.0	12.1	12.1	5.5	8.4	5.5	5.3	11.1	9.2
7281	Bricklayers	5.0	4.4	0	16.5	0	6.2	7.0	7.9	5.0	12.5
7282	Concrete Finishers	0	5.7	0	10.6	8.0	4.9	11.1	9.7	3.7	16.7
7311	Millwrights	9.8	7.6	8.2	11.2	11.3	6.8	9.2	10.2	9.0	8.9
7316	Machine Fitters	18.2	18.8	0	20.0	0	7.3	0	15.6	16.7	20.0

Source: Statistics Canada

An examination of the retirement replacement ratios for 2012 to 2016 reveals a similar pattern. In nine of the sixteen Study Trades, Waterloo Wellington faces a higher retirement replacement ratio. In this time frame it suggests that machinists, tool and die makers, industrial electricians, sheet metal workers, fitters, welders, concrete finishers, millwrights and machine fitters will be relatively harder to recruit since the retirement burden in the other jurisdictions is higher than in Waterloo Wellington. A direct comparison of Waterloo Wellington to Toronto shows that ten out of sixteen Study Trades have higher retirement replacement ratios in Toronto than in Waterloo Wellington.

Details are presented in Tables J and K.

Table J
Comparison of Retirement Replacement Ratios
Waterloo Wellington and the Study Area
2012 – 2016

Code	Skill	Number of Jurisdictions (out of 10) in which Retirement Ratio is higher than in Waterloo Wellington
7231	Machinists	8
7232	Tool & Die Makers	8
7241	Electricians	5
7242	Industrial Electricians	6
7251	Plumbers	5
7261	Sheet Metal Workers	9
7262	Boilermakers	0
7263	Fitters	7
7264	Ironworkers	5
7265	Welders	8
7271	Carpenters	4
7272	Cabinetmakers	2
7281	Bricklayers	4
7282	Concrete Finishers	8
7311	Millwrights	6
7316	Machine Fitters	7

Source: Statistics Canada

Table K
Retirement Replacement Ratios
2012 - 2016 Selected Areas

Code	Skilled Trade	Durham	Elgin Middlesex Oxford	Grand Erie	Hamilton	Niagara	Peel Halton Dufferin	Simcoe	Toronto	Waterloo Wellington	York South Simcoe
7231	Machinists	15.4	10.6	5.1	10.8	9.4	10.8	9.8	12.6	6.6	15.6
7232	Tool & Die Makers	10.0	13.2	20.3	16.9	16.9	11.1	10.0	8.8	9.0	11.4
7241	Electricians	13.5	9.0	21.4	12.6	12.5	9.0	15.3	8.8	11.9	8.8
7242	Industrial Electricians	12.4	12.4	7.7	17.4	21.3	14.1	0	14.3	11.0	10.1
7251	Plumbers	6.3	7.7	19.4	10.8	17.3	7.6	15.0	11.1	10.7	6.6
7261	Sheet Metal Workers	13.5	10.9	23.1	17.0	19.4	14.4	18.6	16.4	6.4	12.0
7262	Boilermakers	0	0	0	0	0	0	0	9.5	18.2	0
7263	Fitters	9.7	15.4	14.3	18.6	13.2	14.9	0	13.1	12.7	15.4
7264	Ironworkers	11.6	0	18.2	4.1	12.0	5.9	0	12.1	6.5	20.0
7265	Welders	9.6	9.5	10.3	10.7	9.3	11.2	6.7	11.1	6.9	10.0
7271	Carpenters	9.0	10.5	16.8	10.8	7.4	9.7	8.2	9.4	9.8	11.8
7272	Cabinetmakers	8.8	4.5	6.1	7.6	5.5	13.6	13.9	8.4	12.3	9.2
7281	Bricklayers	7.5	11.8	0	7.7	17.3	13.1	4.2	9.4	8.0	6.7
7282	Concrete Finishers	13.3	7.7	16.7	10.6	16.0	6.6	0	6.0	5.6	6.7
7311	Millwrights	10.7	17.0	13.5	12.9	16.4	14.3	9.9	14.8	11.7	11.7
7316	Machine Fitters	18.2	12.5	0	12.0	16.0	9.1	22.2	6.7	7.1	20.0

Source: Statistics Canada

The phenomenon of the post-war baby boom of course means that retirement replacement ratios are in almost all cases rising from the 2007 to 2011 period to the 2012 to 2016 period. The retirement burdens for the Study Trades in all of the jurisdictions of the Study Area are almost all increasing. Care should, however, be taken to avoid exaggerating the increase in the burden. There is no doubt that it is considerable. However, the retirement replacement ratio somewhat overstates the retirement burden since it continues to be related to the benchmark year 2001, the year for which the most reliable data is available. Of course, the number of persons working in almost all of these jurisdictions is rising, and therefore the retirement replacement ratio will be somewhat lower than that actually calculated. Still there can be hardly any doubt that the retirement burden is rising.

Details are presented in Tables L(a) and L(b).

Table L(a)
Comparison of Retirement Ratios
2007 - 2011 and 2012 - 2016 Selected Areas

Code	Skilled Trade	Durham		Elgin Middlesex Oxford		Grand Erie		Hamilton		Niagara	
		2007 - 2011	2012 - 2016	2007 - 2011	2012 - 2016	2007 - 2011	2012 - 2016	2007 - 2011	2012 - 2016	2007 - 2011	2012 - 2016
7231	Machinists	5.3	15.4	5.7	10.6	4.0	5.1	8.4	10.8	8.2	9.4
7232	Tool & Die Makers	6.7	10.0	8.1	13.2	8.5	20.3	9.0	16.9	10.0	16.9
7241	Electricians	4.9	13.5	11.8	9.0	7.1	21.4	10.6	12.6	3.8	12.5
7242	Industrial Electricians	5.8	12.4	4.1	12.4	9.2	7.7	8.5	17.4	14.2	21.3
7251	Plumbers	8.3	6.3	6.5	7.7	6.5	19.4	7.2	10.8	5.1	17.3
7261	Sheet Metal Workers	5.2	13.5	8.7	10.9	7.7	23.1	7.5	17.0	11.9	19.4
7262	Boilermakers	40.0	0	20.0	0	50.0	0	0	0	0	0
7263	Fitters	6.5	9.7	11.5	15.4	0	14.3	0	18.6	13.2	13.2
7264	Ironworkers	7.0	11.6	0	0	0	18.2	18.4	4.1	12.0	12.0
7265	Welders	6.7	9.6	6.0	9.5	3.4	10.3	9.2	10.7	8.2	9.3
7271	Carpenters	4.8	9.0	7.9	10.5	2.9	16.8	4.7	10.8	8.8	7.4
7272	Cabinetmakers	10.3	8.8	6.0	4.5	12.1	6.1	12.1	7.6	5.5	5.5
7281	Bricklayers	5.0	7.5	4.4	11.8	0	0	16.5	7.7	0	17.3
7282	Concrete Finishers	0	13.3	5.7	7.7	0	16.7	10.6	10.6	8.0	16.0
7311	Millwrights	9.8	10.7	7.6	17.0	8.2	13.5	11.2	12.9	11.3	16.4
7316	Machine Fitters	18.2	18.2	18.8	12.5	0	0	20.0	12.0	0	16.0

Source: Statistics Canada

Table L(b)
Comparison of Retirement Ratios
2007 - 2011 and 2012 - 2016 Selected Areas

Code	Skilled Trade	Peel Halton Dufferin		Simcoe		Toronto		Waterloo Wellington		York South Simcoe	
		2007 - 2011	2012 - 2016	2007 - 2011	2012 - 2016	2007 - 2011	2012 - 2016	2007 - 2011	2012 - 2016	2007 - 2011	2012 - 2016
7231	Machinists	10.7	10.8	3.4	9.8	9.3	12.6	5.3	6.6	10.9	15.6
7232	Tool & Die Makers	8.0	11.1	4.0	10.0	10.6	8.8	7.2	9.0	6.4	11.4
7241	Electricians	7.7	9.0	6.0	15.3	8.2	8.8	10.7	11.9	6.3	8.8
7242	Industrial Electricians	8.5	14.1	8.0	0	11.0	14.3	6.1	11.0	6.1	10.1
7251	Plumbers	7.6	7.6	3.0	15.0	9.3	11.1	6.0	10.7	7.8	6.6
7261	Sheet Metal Workers	14.4	14.4	10.2	18.6	9.7	16.4	2.7	6.4	4.8	12.0
7262	Boilermakers	22.2	0	0	0	0	9.5	21.2	18.2	3.3	0
7263	Fitters	11.4	14.9	18.2	0	10.1	13.1	6.3	12.7	7.7	15.4
7264	Ironworkers	9.8	5.9	0	0	10.3	12.1	6.5	6.5	0	20.0
7265	Welders	9.9	11.2	4.3	6.7	9.0	11.1	6.3	6.9	13.4	10.0
7271	Carpenters	6.3	9.7	5.4	8.2	6.5	9.4	5.8	9.8	8.9	11.8
7272	Cabinetmakers	8.4	13.6	5.5	13.9	5.3	8.4	11.1	12.3	9.2	9.2
7281	Bricklayers	6.2	13.1	7.0	4.2	7.9	9.4	5.0	8.0	12.5	6.7
7282	Concrete Finishers	4.9	6.6	11.1	0	9.7	6.0	3.7	5.6	16.7	6.7
7311	Millwrights	6.8	14.3	9.2	9.9	10.2	14.8	9.0	11.7	8.9	11.7
7316	Machine Fitters	7.3	9.1	0	22.2	15.6	6.7	16.7	7.1	20.0	20.0

Source: Statistics Canada

Since the full weight of the post-war baby boomer retirements occurs somewhat after 2016, it is also useful to look at the retirement replacement ratios between 2017 and 2021. Consistent with what one would expect, the retirement replacement burden rises in the latter time frame. However, it must be noted very carefully that while this is not always true for all of the Study Trades. As we have noticed repeatedly in our analysis in this report and in the March 2005 Report, the labour market conditions for specific skills vary dramatically from one to the other. It is inappropriate to treat all the skilled trades and even the subset that constitute the Study Trades as if they were in similar circumstances offering similar employment opportunities. When looking at 2017 to 2021, some of the Study Trades face a dramatically increased

retirement burden with the ratio increasing several fold. In other trades, the ratio declines slightly or sharply. This is not particularly surprising as it merely reflects occupational choices made in the past.

It must be noted again that the Study Trades in Ontario, in each of the jurisdictions and in Waterloo Wellington still represent relatively small shares of total employment and in many cases an absolutely small number of persons. This means, for instance, that the launch or termination of an educational program can cause a sharp change in any one of these demographic cohorts. In addition, the past arrival or departure of a major employer in Waterloo Wellington has an ongoing demographic reflection.

The overall implication of this last time frame is that the retirement burden rises for some skills and not for others. Moreover, it continues to be true that the retirement replacement ratios in Waterloo Wellington are often but not always lower than those of the other jurisdictions in the Study Area.

Details are presented in Tables M(a) and M(b).

Table M(a)
Comparison of Retirement Ratios
2012 - 2016 and 2017 – 2021 Selected Areas

Code	Skilled Trade	Durham		Elgin Middlesex Oxford		Grand Erie		Hamilton		Niagara	
		2012 - 2016	2017 - 2021	2012 - 2016	2017 - 2021	2012 - 2016	2017 - 2021	2012 - 2016	2017 - 2021	2012 - 2016	2017 - 2021
7231	Machinists	15.4	13.0	10.6	10.6	5.1	16.6	10.8	14.9	9.4	19.9
7232	Tool & Die Makers	10.0	13.9	13.2	8.6	20.3	6.8	16.9	10.1	16.9	12.3
7241	Electricians	13.5	12.2	9.0	7.5	21.4	9.5	12.6	14.1	12.5	10.0
7242	Industrial Electricians	12.4	19.7	12.4	14.5	7.7	16.9	17.4	14.6	21.3	20.6
7251	Plumbers	6.3	11.8	7.7	14.8	19.4	6.5	10.8	19.8	17.3	13.3
7261	Sheetmetal Workers	13.5	6.3	10.9	8.7	23.1	7.7	17.0	22.6	19.4	10.4
7262	Boilermakers	0	0	0	0	0	16.7	0	14.3	0	0
7263	Fitters	9.7	9.7	15.4	11.5	14.3	28.6	18.6	16.9	13.2	18.9
7264	Ironworkers	11.6	23.3	0	0	18.2	18.1	4.1	26.5	12.0	8.0
7265	Welders	9.6	8.1	9.5	11.8	10.3	9.9	10.7	14.0	9.3	10.0
7271	Carpenters	9.0	11.5	10.5	14.0	16.8	13.1	10.8	11.4	7.4	14.3
7272	Cabinetmakers	8.8	16.2	4.5	12.7	6.1	15.2	7.6	0	5.5	3.7
7281	Bricklayers	7.5	15.0	11.8	8.8	0	7.5	7.7	7.7	17.3	9.6
7282	Concrete Finishers	13.3	0	7.7	5.8	16.7	16.7	10.6	14.9	16.0	8.0
7311	Millwrights	10.7	11.7	17.0	16.4	13.5	15.9	12.9	18.4	16.4	19.9
7316	Machine Fitters	18.2	18.2	12.5	6.3	0	18.6	12.0	20.0	16.0	20.0

Source: Statistics Canada

Table M(b)
Comparison of Retirement Ratios
2012 - 2016 and 2017 - 2021 Selected Areas

Code	Skilled Trade	Peel Halton Dufferin		Simcoe		Toronto		Waterloo Wellington		York South Simcoe	
		2012 - 2016	2017 - 2021	2012 - 2016	2017 - 2021	2012 - 2016	2017 - 2021	2012 - 2016	2017 - 2021	2012 - 2016	2017 - 2021
7231	Machinists	10.8	13.1	9.8	14.4	12.6	11.9	6.6	11.3	15.6	10.4
7232	Tool & Die Makers	11.1	14.0	10.0	9.0	8.8	10.6	9.0	9.3	11.4	7.4
7241	Electricians	9.0	11.3	15.3	13.3	8.8	10.5	11.9	10.7	8.8	13.2
7242	Industrial Electricians	14.1	18.8	0	13.3	14.3	11.0	11.0	17.1	10.1	20.2
7251	Plumbers	7.6	15.9	15.0	13.0	11.1	9.6	10.7	10.0	6.6	11.1
7261	Sheet Metal Workers	14.4	7.8	18.6	8.5	16.4	10.9	6.4	15.5	12.0	9.6
7262	Boilermakers	0	0	0	0	9.5	38.1	18.2	18.2	0	22.2
7263	Fitters	14.9	9.6	0	0	13.1	14.1	12.7	12.7	15.4	19.2
7264	Ironworkers	5.9	17.6	0	20.0	12.1	16.7	6.5	0	20.0	0
7265	Welders	11.2	14.4	6.7	15.3	11.1	13.3	6.9	9.0	10.0	14.8
7271	Carpenters	9.7	10.6	8.2	14.6	9.4	12.4	9.8	9.3	11.8	11.8
7272	Cabinetmakers	13.6	11.0	13.9	0	8.4	10.2	12.3	11.0	9.2	11.8
7281	Bricklayers	13.1	11.0	4.2	12.6	9.4	10.9	8.0	4.0	6.7	4.8
7282	Concrete Finishers	6.6	11.5	0	11.1	6.0	14.9	5.6	11.1	6.7	6.7
7311	Millwrights	14.3	13.5	9.9	18.4	14.8	14.0	11.7	12.2	11.7	19.7
7316	Machine Fitters	9.1	18.2	22.2	22.2	6.7	20.0	7.1	19.0	20.0	0

Source: Statistics Canada

It may also be useful to note that the retirement burden facing the Study Trades is not unique. Retirement burdens faced by the Study Trades are similar to those facing many occupations. It is, of course, important when planning educational and labour force policies to note the similarity. With many occupations facing at least some level of retirement burden, the Study Trades should not, in general, be presented as an abnormal circumstance. In other words, from the point of view of the overall community, it is not clear that there is a net benefit from attracting someone to the Study Trades away from another occupation which is

itself in short supply. Of course, it is especially useful to attract young unskilled persons into any of the skilled occupations. However, motivation and focus are necessary to develop high skilled in any context, including that of the Study Trades. As we have argued in the March 2005 Report, we must continue to promote the Study Trades as a career choice offering the rewards of satisfaction and adequate income; it should be directed to those who would find the work inherently interesting and consistent with their personal goals and aptitudes.

For comparison purposes, we present the retirement replacement ratios for the three time horizons under consideration for six professional occupations. The situation is broadly similar for the skilled trades in Waterloo Wellington. Indeed, several of the professions have relatively higher retirement burdens than that of some of the Study Trades.

Details are presented in Table N

Table N
Retirement Replacement Ratios
Other Skills
Waterloo Wellington
2007 – 2011, 2012 – 2116 and 2017 – 2021

Occupation	2007 – 2011	2012 – 2016	2017 – 2021
Auditors, Accountants, Investment Professions	5.3	9.8	13.1
Civil, Mechanical, Electrical and Chemical Engineers	7.0	8.3	11.0
Physicians, Dentists, Veterinarians	5.7	12.8	16.2
Judges, Lawyers	11.2	18.0	18.0
University Professors	16.8	17.2	14.8
Elementary and Secondary Teachers	7.3	19.1	14.7

Source: Statistics Canada

Projected Withdrawals from the Labour Force of Waterloo Wellington

If we assume that everyone retires at age 65, we can estimate that 4,895 workers in the Study Trades will leave the labour force of Waterloo Wellington between 2007 and 2021. Some of these retiring workers will be replaced by young entrants who already live here and by productivity gains.

However, we also know that already in 2001, 1.3 percent of the employed labour force is *over* 65 years old. That represents 3.6 percent of those 60 to 64 years old. There is no reason to expect that proportion to decline; indeed, it is likely to rise in the face of any degree of skills shortage. Hence, the actual number of retirements will be less than 4,895. That remains true even when we account for the eventual retirement of those who are still working past 65 years old.

Conclusion

An examination of the rates of retirement in the areas of urban southern Ontario adjacent to Waterloo Wellington (the Study Area) reveals an increasing retirement burden. This burden in many instances is heavier than that borne in Waterloo Wellington. Everything else being equal, this means that the ability of Waterloo Wellington to draw on in-migrants to fuel its growth becomes progressively more difficult. This is a serious matter that warrants community attention. However, it is a problem growing over time and especially increasing in degree after 2017.

The best estimate of the number of persons who will actually withdraw from the labour force between 2007 and 2021 is less than 4,895 persons. A relatively modest shift in occupational preferences by young persons could accommodate the retirement challenge here, and elsewhere. It must be strongly emphasized that generalizations about the skilled trades in general and the Study Trades in particular should only be done with great caution. While it is true that most of the Study Trades face a slowly rising retirement burden, that is not the case for all of them.

The data indicates that it will become increasingly problematic to recruit machinists, tool and die makers, industrial electricians, plumbers, sheet metal workers, fitters, welders and concrete finishers because their retirement rates are often higher in much of the Study Are than in Waterloo Wellington. However, educational programs and the promotion of the skilled trades must avoid overly general responses. Educational programs must be tailored to the specifics of the requirements of individual trades and/or to those of employers who have carefully identified their present and future needs. Any other approach risks the waste of resources and the misleading of the young.

It is particularly important to note that the March 2005 Report and this document demonstrate that growth, not retirement, is the primary challenge. The greatest difficulty is not replacing those workers who are retiring from the labour force, difficult though in some cases it is. Rather, the fundamental challenge is to provide the *additional* resources to grow at the rates Waterloo Wellington has enjoyed in the past. In an economy with a declining proportion of the young, the resources we need to grow aggressively are increasingly being called into question.

The implications for the prosperity of the local community are clear. It must maintain its attractiveness to workers who wish to move here, critically important as they are. Secondly, it must emphasize its ability to grow its talent internally, talent which replaces those who are retiring and also fuels the community's continued growth.

Appendix A

Skilled Trades Projection 2015

Waterloo Region and Wellington County

March 2005

Executive Summary

Executive Summary

Using a custom tabulation of demographic labour force from Statistics Canada and the responses of a large sample of local employers, this report investigated the supply and demand for skilled trades for Waterloo Wellington, in the reference years 2010 and 2015. The research was conducted for the Waterloo Wellington Training and Adjustment Board and addressed the conditions for individual skilled trades and for the trades in the aggregate.

The work assumed that the existing patterns of migration and the pace new skills certification continued at their existing rates. It also assumed that the responding employers provided mature estimates of their future requirements, that the economic environment remained relatively stable and that no large of employers left or entered the area.

No evidence was found to indicate a systemic shortage of skilled tradespersons in either of the reference periods, whether caused by the need to replace retiring workers or by the need to accommodate future growth. This conclusion is principally dependent on the continuation of relatively heavy in-migration to Waterloo Wellington and the youthful age profile that results. Should this migration abate sharply, a systemic skilled trades shortage will occur.

Excluding the above qualification, many of the skills essential for manufacturing and construction appear to be in adequate supply in 2010 and 2015. There are exceptions.

Considering only the locally-generated supply of fully certified tradespersons and assuming that all of the demand is for such fully certified tradespersons, shortages in both 2010 and 2015 were identified among electronic service technicians, boilermakers, cooks, assistant cooks, carpenters, cabinetmakers, brick and stone masons, auto body repairers/painters, small engine/marine engine technicians, fitters, electric motor rewind mechanics, and welders. A shortage of horticulturalists, machinists, and farm and heavy equipment technicians was detected for 2015, but not for 2010.

It should be noted that part of this deficiency may be overstated since some of it will be covered as employers hire those less qualified and some of them will certainly be covered by the area's traditional in-migration. In addition, except for carpenters and welders, the deficiency in each trade involves less than 100 workers.

This relatively adequate supply of the skilled trades represents an advantage for the continued prosperity and growth of the local economies. It can also offer the opportunity to address deficiencies in the *quality* of some of the skilled trades, a problem previously documented.

The report recommends that the local communities and its employers continue to strengthen the appeal of the area to the critically important in-migrants. The carefully targeted expansion of local apprenticeship training programs and facilities should be pursued to reduce Waterloo Wellington's dependence on outside sources of skilled labour supply. Should other communities in Ontario suffer serious retirement issues, the burden may well be imported into Waterloo Wellington.

The report urges that all initiatives for the skilled trades be conducted on a case-by-case basis in order to avoid generalizations that are inapplicable to individual skills or industrial circumstances.

It is also critically important for educational institutions, programs and policies to be as flexible as possible. With technological change so pervasive, workers must be prepared to adapt quickly, as must their educational and training facilities. Both students at the start of their careers and older workers re-orienting their careers must be able to mix and match their training opportunities and to move among programs and institutions with a minimum of obstacles.

This report invites career counsellors to present the skilled trades as they would any other demanding occupations. The skilled trades are a rewarding career for those with the interest and aptitude for the work. Only those with commitment and focus should apply.

Finally, the community should develop initiatives to alleviate the shortages identified above.