



JUNE 2006

FITTER & TURNER: OCCUPATIONAL SKILL SHORTAGE ASSESSMENT

2004 Situation: Genuine skill shortage

Current Situation: Genuine skill shortage

Short-term Outlook: Genuine skill shortage

1 Executive Summary

1.1 Results from the 2005 Survey of Employers who have Recently Advertised indicate that employers have had considerable difficulty in filling fitter and turner positions in New Zealand. Only 27% of positions were filled within ten weeks of advertising and there was an average of one suitable applicant per vacancy. This report considers these survey results in the context of trends in the demand for and supply of fitter and turners.

Table 1: Employer Survey Indicators, 2005

	Fill Rate	Average Number of Suitable Applicants
Fitter and Turners	27%	1.0
All Trades Surveyed	37%	1.0

Source: Survey of Employers who have Recently Advertised, Department of Labour.

1.2 The employment of fitters and turners and other metal trades workers has fluctuated from year to year but has been on a slow downward trend since the early 1990s. Employment has declined by an average of -0.3% between 1991 and 2005 despite the fact that the sectors in which they are predominately employed have shown strong growth in output. This disconnect between the growth in output and growth in employment can be partially explained by the adoption of labour saving technology. The demand for fitters and turners and other metal trades workers has rebounded since 2003, within the overall downward trend.

1.3 Demographic data from the census provides evidence that training levels were low during the 1990s while the Department's estimates show that training was low in the early 2000s. During this period retirements were occurring at a high rate. The net effect of these forces was that the supply of fitters and turners probably declined during the 1990s and early 2000s. Training levels have risen considerably between 2001 and 2005.

- 1.4 A shortage of fitters and turners probably emerged during the 1990s and early 2000s as the decline in supply (through retirements exceeding training) was greater than the slight decline in demand. This shortage has probably become more acute over the past few years due to the recent rebound in demand. While there has been a considerable increase in training since 2002 this has not matched the growth in demand. The Department regards the shortage of fitters and turners to be a **genuine skill shortage** as the decline in supply since the early 1990s has exceeded the decline in demand.
- 1.5 Shortages should ease slightly in the short term due to higher levels of training coupled with an easing in demand growth as the metal industries slow. Despite the easing, shortages will continue to exist.

2 Introduction

- 2.1 This report will investigate skill shortages for fitter and turners in New Zealand.
- 2.2 The following section presents key findings from the Department of Labour's (the Department's) *Survey of Employers who have Recently Advertised* (SERA). This survey provides an indication of employer's success in filling advertised vacancies for fitter and turners as well as other information on their recruiting experiences. The next two sections investigate trends in the demand for, and supply of, fitter and turners. The penultimate section presents some of the issues that arise from the matching of demand and supply in the labour market, such as wage rates. Finally, the 'Assessment' section considers all the information presented in the report and provides a view on whether the occupation is in shortage, and if so, the type of shortage being experienced. A short-term outlook for the shortage situation is also offered.



- 2.3 Further background to this occupational report, including a discussion of the methodology; a glossary of terms; and an overview of the Department's *Survey of Employers who have Recently Advertised*, including the survey questionnaire, can be found in the 'Background and technical note' at <http://www.dol.govt.nz/publications/jvm/trades/2005/background.asp>.

2.4 *Fitter and Turners in New Zealand*

- 2.4.1 Fitter and turners (code 72231 in the New Zealand Standard Classification of Occupations) are skilled trades people who fit and assemble fabricated parts in the manufacture of machinery, engines, and other metal apparatus; fit, assemble and repair machine parts; set and operate machine tools to cut and shape metal parts and make jigs, tools and fixtures as required for production, and maintain production plant and equipment.

- 2.4.2 The Department estimates that there were approximately 5,800 fitter and turners employed in New Zealand in 2005. The 2001 Census found that nearly all of the workers were male (99%) and employed full-time (97%). Approximately 5% were self-employed with no employees. Over one in five (23%) fitter and turners worked in excess of 50 hours per week. Furthermore, the Census revealed that the majority of fitters and turners (59%) were employed in the basic metal, and machinery and equipment manufacturing industries.

3 Survey of Employers who have Recently Advertised

- 3.1 This section presents the key findings from the SERA and highlights the experiences of employers recruiting fitter and turners.
- 3.2 The SERA results provide insights into skill shortages by investigating how difficult it is for employers to fill vacancies. A fill rate is the proportion of vacancies included in the SERA sample which were filled with an adequately qualified and experienced person within ten weeks of advertising. Occupations with fill rates lower than 80% are typically regarded as being in shortage, while fill rates lower than 40% usually indicate that the occupation is in acute shortage.

Table 2: SERA Results for Fitter and Turners and All Trades Surveyed, August 2005

	Number of Employers	Number of Vacancies	Fill Rate ¹	Average Number of Suitable Applicants per Vacancy ¹
Fitter and Turners	25	37	27%	1.0
All Trades Surveyed	885	1480	37%	1.0

Source: Survey of Employers who have Recently Advertised, Department of Labour.

1 The 'All Trades Surveyed' fill rate and average number of suitable applicants per vacancy figures were both weighted to compensate for any under or over sampling of individual trade worker occupations in the 2005 survey.

- 3.3 The 2005 SERA results highlight the challenges employers have confronted in recruiting skilled fitter and turners. Findings show that only 27% of fitter and turner vacancies included in the survey were filled within ten weeks of being advertised; this is down considerably from the 54% measured in 2004. The fill rate is also below the rate for all surveyed trade occupations (37%). There was an average of one suitable applicant for each fitter and turner vacancy, which is comparable to the average for all trades surveyed by the Department.

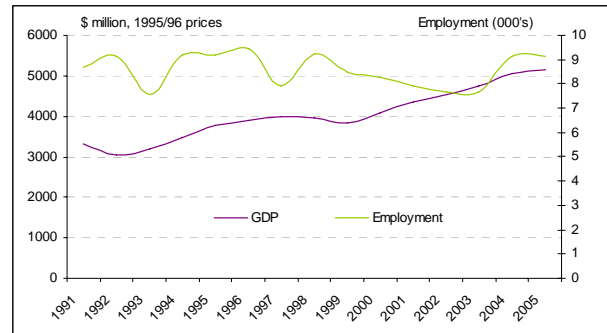
4 Demand for Fitter and Turners

4.1 This section investigates trends in the demand for fitter and turners and the factors underlying these trends. Demand is measured by the number of fitter and turners required by employers at current wage rates.

4.2 *Historical Demand*

4.2.1 According to the Household Labour Force Survey¹ the employment of *blacksmiths, toolmakers and related workers* has fluctuated from year to year but has been on a slow downward trend since the early 1990s, although it has rebounded somewhat since 2003 (see Figure 1). Employment has declined by an average of -0.3% between 1991 and 2005 despite the fact that the sectors in which they are predominately employed (basic metal and machinery and equipment manufacturing) have shown strong growth. Output in these sectors grew on average by 3.7% per annum between 1991 and 2005.

Figure 1: *Metal Industries GDP & Employment of Blacksmiths, Toolmakers and Related Workers, 1991-2005*



Source: Economic Survey of Manufacturing & Household Labour Force Survey, Statistics New Zealand.

4.2.2 This disconnect between the growth in output and growth in employment can be partially explained by the adoption of labour saving technology and product innovations among New Zealand's metal manufacturers. Technological innovations, such as laser cutting tools, are now commonplace in many New Zealand metal manufacturing firms. Product developments involving the use of composites (metal products combined with plastic or fibre glass materials) and metal casting have also eroded the traditional domain of the fitter and turner.

4.3 *Future Demand*

4.3.1 Findings from the ANZ-Business New Zealand Performance of Manufacturing Index (PIM)² suggest that the metal products industry will contract in 2006. This contraction is partially the result of the strong New Zealand dollar which has dampened the export market for many manufacturers. However, the long-term prospects for the metal products, and machinery and equipment industries are promising according to projections from the New Zealand Institute of Economic Research. Growth for these industries is expected to surpass the economy-wide average between 2005 and 2010.

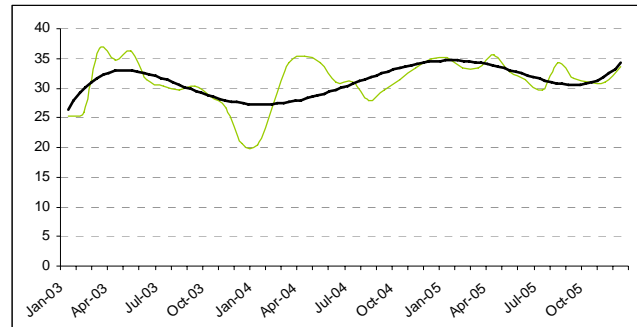
¹ Household Labour Force Survey data captures employment trends for *Blacksmiths, Toolmakers and Related Workers*. This is the broad occupational category in which fitter and turners comprise the majority of workers (73% in 1991 to 60% in 2001).

² The ANZ-Business NZ Performance of Manufacturing (PMI) is a composite index based on the diffusion indices for production, new orders, deliveries, inventories and employment with varying weights.

4.4 **Changes in Market Conditions³**

- 4.4.1 The Department's Job Vacancy Monitor shows that in the year to December 2005, the change in the three-month moving average in job advertisements for fitter and turners was negligible (see Figure 2). This suggests that the market for skilled fitters and turners has remained tight.

Figure 2: Number of Advertised Vacancies for Fitter and Turners



Source: Job Vacancy Monitor, Department of Labour.

5 **Supply of Fitter and Turners**

- 5.1 This section investigates the various sources contributing to the supply of fitter and turners. Supply is measured by the number of people willing and able to work as fitter and turners at current wage rates.

5.2 **Training - National Certificate (Level 4) Qualifications**

- 5.2.1 This section looks at the growth in supply of *fully qualified* fitter and turners through training. There are two nationally recognised qualifications for fitter and turners issued by Competenz. These qualifications are the National Certificate in Maintenance and Diagnostics in Mechanical Engineering (Level 4) and the National Certificate in Machining and Tool Making (Level 4). The industry training organisation designs its programmes to meet the needs of employers in the engineering and manufacturing sectors. On average, it takes a trainee three years to complete a national certificate programme.
- 5.2.2 All of the national certificates (Level 4) issued between 2000 and 2005 were awarded by Competenz (see Table 4). The number of trainees achieving national certificates rose significantly during this period, more than doubling between 2000 and 2005. There were no non-national certificate qualifications at the equivalent level awarded over this period.

³ Analysis of the Job Vacancy Monitor suggests that it is an indicator of change in labour market tightness, or change in the degree of difficulty of recruiting staff. An increase in vacancies typically indicates increasing difficulty in recruiting staff and vice versa. While changes in demand usually dictate changes in labour market tightness, it can also be affected by changes in supply conditions, such as a rise in net migration.

Table 3: Number of Trainees Enrolled for the National Certificate in Maintenance and Diagnostics in Mechanical Engineering, and the National Certificate in Machining and Tool Making (Level 4)

	National Certificate in Maintenance & Diagnostics in Mechanical Engineering (Level 4) (Competenz)		National Certificate in Engineering Machining & Toolmaking (Level 4) (Competenz)		Total	
	Total Enrolments	New Enrolments	Total Enrolments	New Enrolments	Total Enrolments	New Enrolments
2001	761	301	260	85	1021	386
2002	1004	321	329	99	1333	420
2003	923	291	281	73	1204	364
2004	993	339	299	95	1292	434
2005	968	316	300	88	970	404

Source: Competenz.

Table 4: Number of Trainees Achieving the National Certificate in Maintenance and Diagnostics in Mechanical Engineering, and the National Certificate in Machining and Tool Making (Level 4)

	National Certificate in Maintenance & Diagnostics in Mechanical Engineering (Level 4) (Competenz)		National Certificate in Engineering Machining & Toolmaking (Level 4) (Competenz)		Total
	Total Enrolments	New Enrolments	Total Enrolments	New Enrolments	
2000	100		39		139
2001	99		37		136
2002	91		39		130
2003	170		49		219
2004	144		52		196
2005	205		87		292

Source: Competenz.

- 5.2.3 The training rates for fitter and turners, and all trades analysed by the Department are provided in Table 5. This indicator provides an approximate measure of the rate at which the supply of fully qualified fitter and turners can potentially grow through training. The training rate is calculated by expressing the number of trainees achieving the relevant qualification as a percentage of total employment in that occupation. The training rate for fitter and turners was 3.0% in 2005, which is double that in 2001. The training rate for this occupation is slightly lower than the average training rate for all trades analysed by the Department (3.3%).

Table 5: Training Rate for Fitter and Turners, 2001-2005

	Fitter and Turners ⁴	All Trades ⁵
2001	1.5%	2.0%
2002	1.6%	2.2%
2003	2.4%	2.2%
2004	2.2%	2.7%
2005	3.0%	3.3%

Source: Department of Labour.

5.3 Migration

5.3.1 Migration data for fitter and turners is presented at the broader occupational group level of *blacksmiths, toolmakers and related workers*. Between 2001 and 2005, New Zealand experienced a net inflow of 115 *blacksmiths, toolmakers and related workers* (see Table 6). This contrasts to a larger net outflow of 193 over the three previous years. The number of fitter and turners immigrating to New Zealand has declined since 2001, as has the number of these skilled workers going overseas.

Table 6: Permanent and Long-term Arrivals, Departures and Net Migration of Blacksmiths, Toolmakers and Related Workers, 1998-2005 December Year End

	1998	1999	2000	2001	2002	2003	2004	2005
Arrivals	106	110	93	138	117	125	90	79
Departures	182	169	151	133	89	87	62	63
Net Migration	-76	-59	-58	5	28	38	28	16

Source: External Migration, Statistics New Zealand. This data is only available at the broad (3-digit) occupational level of 'blacksmiths, toolmakers and related workers'. Fitters and turners comprise a significant proportion (60% in the 2001 Census) of this broader occupational group.

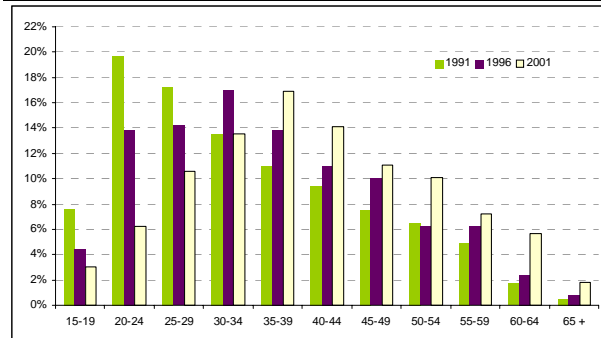
⁴ The calculation of the training rate for fitter and turners takes into account that the nationally recognised qualifications for this trade are also nationally recognised qualifications for other trades. The National Certificate in Maintenance and Diagnostics in Mechanical Engineering is also a recognised qualification for fitter and welders turners and the National Certificate in Engineering Fabrication (Heavy) is also a recognised qualification for boilermakers. In calculating the training rate for fitter and turners it is assumed that the number of trainees achieving each of these qualifications available to its two associated occupations is in proportion to the number of people employed in those occupations. For instance, there are seven times as many fitter and turnerswelders in employment compared with boilermakers and we therefore assume that seven times as many trainees who achieve the National Certificate in Engineering Fabrication (Heavy) are available for employment as fitters and turners compared with boilermakers.

⁵ The training rates for 'all trades' were calculated for the 14 trade occupations that were examined in-depth using data from the SERA Intensive 2005. As the composition of occupations being examined changes from year-to-year, so will the training rates.

5.4 Retirements

5.4.1 Based on 2001 Census data, it is estimated that approximately 1.5% of the fitter and turner workforce retires annually (assuming a retirement age of 65) which is above the average for all trade occupations (1.3%). Each year, approximately 90 fitter and turners retire, and this number will be exacerbated as the workforce ages. In 1991, 20% of fitter and turners were aged 20-24; while in 2001 only 6% were in this age bracket. The sharp decline in young fitters and turners probably reflects low levels of training during the 1990s and early 2000s.

Figure 3: Age Profile of Fitter and Turners, 1991-2001



Source: Census of Population and Dwellings, Statistics New Zealand.

6 Matching of Supply and Demand

6.1 This section considers some of the issues that arise from the labour market matching of the supply of fitter and turners with the demand for fitter and turners.

6.2 Salaries

6.2.1 According to the Labour Cost Index (LCI), fitter and turners (\$22.30) earn an average wage that is above the average for all trades workers (\$19.81). A comparison between June 2005 and June 2004 LCI data shows that the average wage for fitter and turners increased by 4.1% - a slightly greater increase than that for all trades (4.8%). This suggests that employers are increasing compensation to remain competitive in the current labour market.

Table 7: Hourly Wage Rates for Fitter and Turners⁶

	2004	2005
Fitter and Turners	\$21.42	\$22.30
All Trades	\$18.90	\$19.81

Source: Labour Cost Index, Statistics New Zealand.

6.2.2 Each year the Employers and Manufacturers Association publishes annual pay rates for its members. The three-year moving annual average salary for maintenance fitters among its members was approximately \$46,000.

⁶ The data shown from the LCI are unadjusted mean hourly rates. Caution should be taken with interpreting this information due to the relatively small sample sizes, particularly at the occupational level. Furthermore, the LCI is designed to measure changes in, rather than the actual level of, wage and salary rates.

7 Assessment

- 7.1 This section considers all the information presented in this report on employers' recruiting experiences, supply and demand trends, and matching issues and offers a view on whether there is a shortage of fitters and turners and the type of shortage. A short-term outlook for the shortage situation is also offered.
- 7.2 There has been a slight downward trend in the demand for fitters and turners since the early 1990s with data showing that employment of fitters and turners and other metal trades workers declined by 0.3% per annum between 1991 and 2005. Within this overall trend, demand has rebounded slightly since 2003.
- 7.3 There is evidence that training levels for fitters and turners in the 1990s were extremely low. The census shows that there was a sharp fall in the number of young people entering the trade in the 1990s. The Department's data shows that training was also very low in the early 2000s. While training made only small contributions to supply, the pool of fitters and turners was being depleted by relatively high levels of retirements.
- 7.4 A shortage of fitters and turners probably emerged during the 1990s and early 2000s as the decline in supply (through retirements exceeding training) was greater than the slight decline in demand. This shortage has probably become more acute over the past few years due to the recent rebound in demand. While there has been a considerable increase in training since 2002 this has not matched the growth in demand. The Department regards the shortage of fitters and turners to be a **genuine skill shortage** as the decline in supply since the early 1990s has exceeded the decline in demand.
- 7.5 Shortages should ease slightly in the short term due to higher levels of training coupled with an easing in demand growth as the metal industries slow. Despite the easing, shortages will continue to exist.

Box 1: Skill Shortage Definitions

Genuine Skill Shortage

Occurs when employers have difficulties filling their job vacancies because there are not enough individuals with the required skills in the potential labour market to fill the positions on offer.

Recruitment and Retention Difficulty

Occurs when there is a considerable supply of individuals with the required skills in the potential labour market but they are unwilling to take up employment at current levels of remuneration and conditions of employment. Retention problems are often a major contributor to this condition.

For queries regarding this report please contact info@dol.govt.nz.

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