



BUILDING & CONSTRUCTION INDUSTRY TRAINING FUND



STATE OF THE WESTERN AUSTRALIAN BUILDING AND CONSTRUCTION INDUSTRY

REPORT 2007

The 2007 State of the Industry Report is a new initiative of the Building and Construction Industry Training Fund Board, which saw the need to identify and publish insights into the current workforce development issues, trends, opportunities and challenges confronting the industry.

Building and construction in Western Australia is operating at unprecedented levels, driven in great part by huge growth in the development of major resource projects in the north of the state. This has created significant additional employment opportunities in both construction of projects and subsequent commissioning and operations.

The current resources boom has created a multiplier effect on demand for goods and services which has seen the states economy also booming and the demand for housing and commercial construction increase exponentially.

The demand for skilled construction workers has increased at a level commensurate with the growth in building activity and the workforce has grown by 41% in a relatively short period of four years. The role of the Building and Construction Industry Training Fund has therefore been very important in supporting an increase in the number of skilled workers in the industry and in supporting improvement in the quality of training.

In the face of unprecedented demand for a limited resource, the BCITF has been able to achieve record results in support of apprentice employment, worker training and occupational safety and health training.

Through a comprehensive suite of funding programs and career promotion and school to industry support initiatives the BCIT Board sees great opportunities to maintain support for training in the building and construction industry in the future.

The industry's workforce is ageing and demand for skilled workers to replace those leaving the industry is a current and enduring challenge that will need new ideas and innovative solutions.

The state of the industry report is not aimed at solving these issues but it is aimed at providing information that will better inform decision makers and others who have a stake in skills development in the building and construction industry in Western Australia.



Ian C Hill
Chairman
BCIT Board

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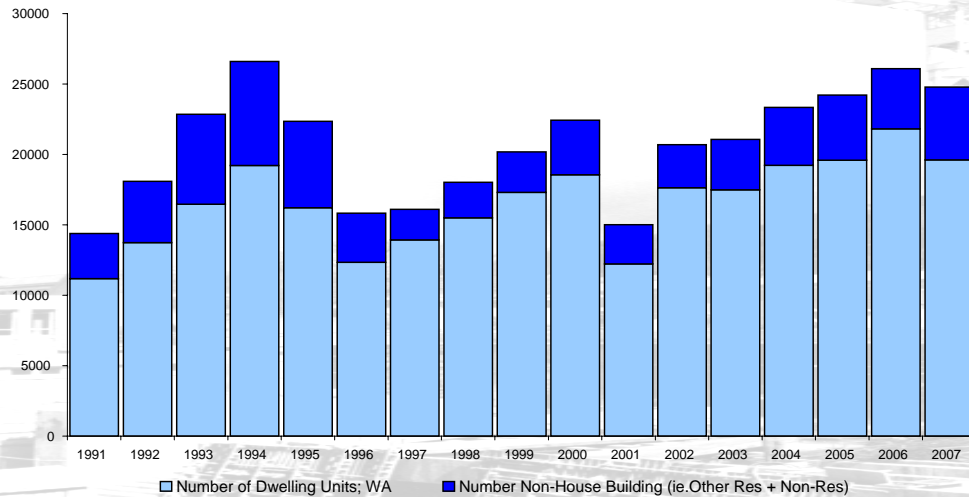
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1. BUILDING AND CONSTRUCTION ACTIVITY

1.1 Dwelling Activity Levels

This graph contains detailed estimates from the quarterly (ABS) Building Activity Survey. For the purpose of the graph, the results are annualised. The statistics were compiled on the basis of returns collected from builders and other individuals and organisations engaged in building activity.

**Approvals Number of Housing and Non House Building in WA
June 1991 to 2007**

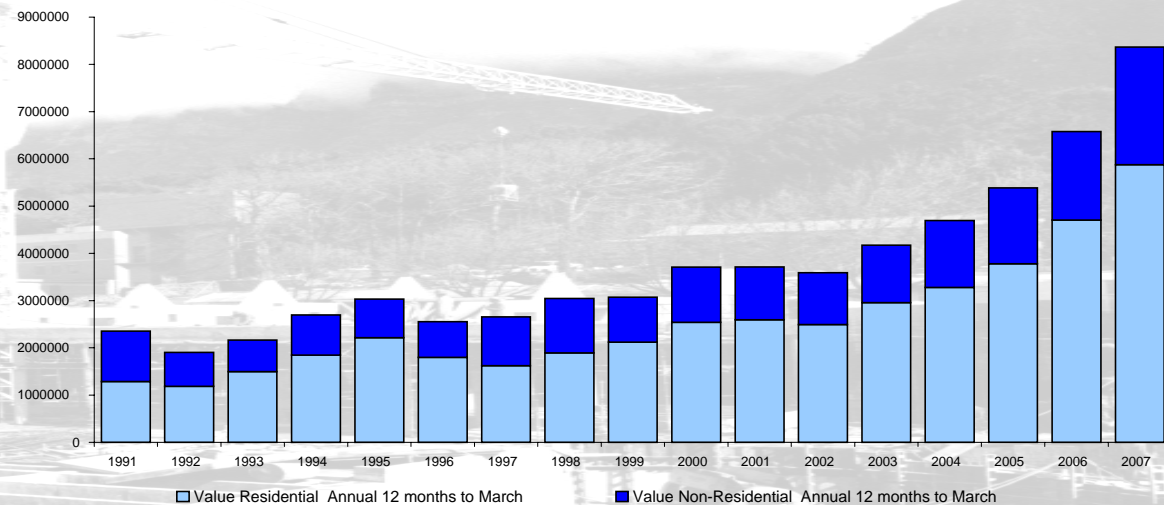


8731.0 Building Approvals, Australia
Number of Dwelling Units Approved, by Sector, all series - Western Australia. ABS.

1.2 Value of Dwelling Work Done

This graph illustrates the detailed estimates from the quarterly Building Activity Survey and refers to the value of work done over the year, March to March and represents an estimate of the total value of residential and commercial building in WA.

**Value of Residential and Commercial Construction
March 1991 to March 2007 shown in 000's**



8752.0 Building Activity, Value of Building Work Done by Sector, WA: ABS

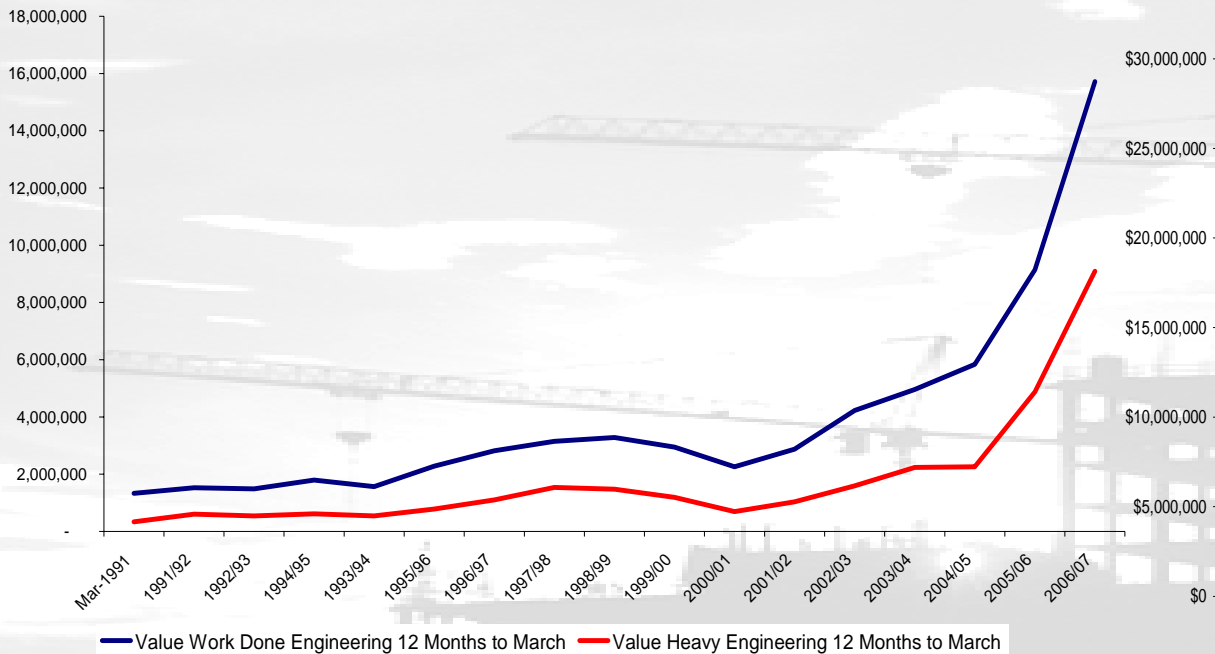
1.3 Engineering Construction Activity

This graph represents estimates of engineering construction activity in Western Australia by both public and private sector organisations. The estimates were compiled from the Engineering Construction Survey and with results from the (ABS) Building Activity Survey provide a complete quarterly picture of building and construction activity in WA (ABS).

1.4 Total Building Value of Work Done

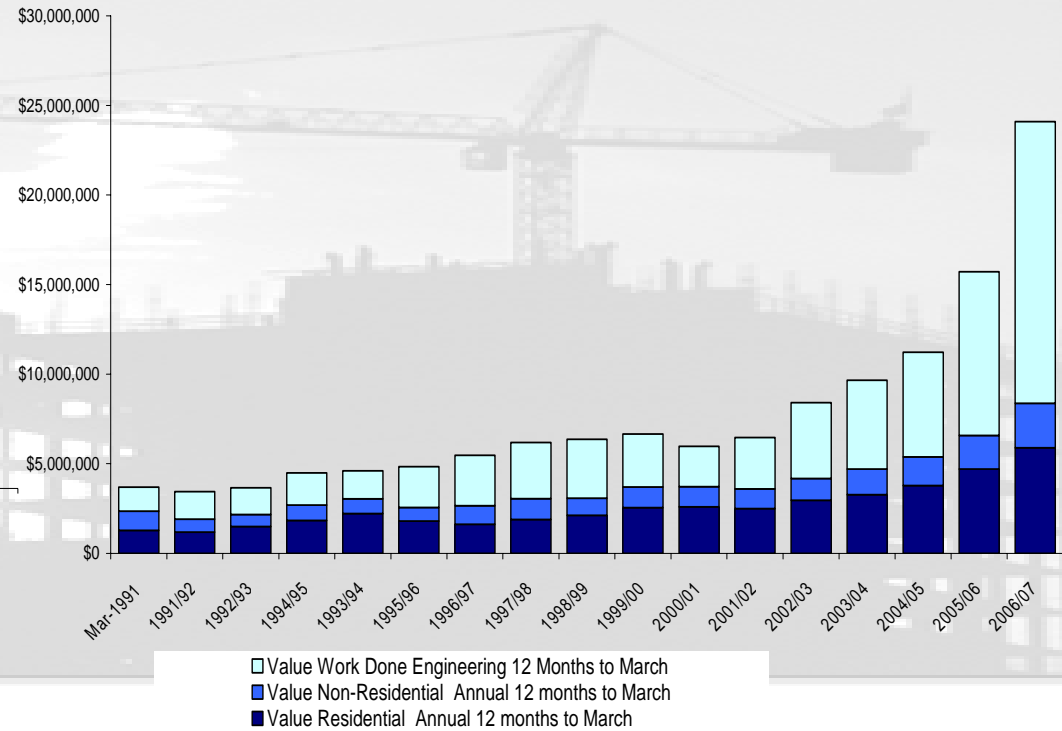
This graph indicates the totals of the value of building activity (both residential and non-residential) and Engineering Construction activity (including heavy engineering).

**Value of Engineering Construction
March 1991 - 2007. Shown in '000s**



**8762.0 Engineering Construction Activity,
Value of Work Done, Western Australia, Original. ABS**

**Comparative Value of All Construction WA
Shown in '000s**



1.5 Forecasted Industry Activity

Forecasts of industry activity are undertaken by a small number of organisations. The Australian Construction Industry Forum (ACIF) as the peak consultative organisation of the building and construction sector has established the Construction Forecasting Council. The Council has developed short and long-term forecasts of construction activity. The forecasts take into account data and other information available up to May 2007. Historical data published by the ABS is used to inform the forecasts.

Forecasted Value of Construction in WA in \$millions

Sector	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14
Residential	8,952.432	9,106.311	9,475.553	10,248.8	10993.18	11436.79	11812.64
Non Residential	2,533.461	2,467.28	2,537.22	2,623.75	2745.959	2890.592	3035.948
Engineering (excluding Heavy Industry & Mining)	6,102.367	5,772.06	5,926.786	6,199.236	6612.814	7172.58	7771.215
Totals above	17,588.26	17,345.65	17,939.56	19,071.79	20351.95	21499.96	22619.8
Heavy Industry & Mining	10,008.17	8,976.393	7,824.819	7,349.202	7580.72	8232.835	9111.94

Note: Data is sourced from the Australian Construction Industry Forum (ACIF), <http://www.cfc.acif.com.au/forecasts>
ABS cat 8760 Engineering Construction Activity and ABS 8752.0 Building Activity

Forecasting is also undertaken by the Housing Industry Association, and an extract from the latest report in the HIA Western Australian State Outlook June quarter 2007 is as follows:

Sector	2006-07	2007-08	2008-09	2009-10
Residential	7,096	6,847	6,319	6,377
Non Residential	2,041	2,041	1,980	1,900
Engineering & Construction (incl mining)	12,934	10,347	9313	9,313

Note that the HIA report does not provide a value for engineering construction *without mining*.

Housing : Value of work done on new housing, constant 2005/06 prices.

Non-residential : Value of work done, chain volume measures, base 2005/06.

Engineering Construction: Value of work done, chain volume measures, base 2005/06

Differences in the projections is due to the different models used by each organisation, and illustrates the challenge that forecasting presents.

2. WORKFORCE DEMOGRAPHICS

The Construction Forecasting Council provides limited forecasts of the growth of the construction workforce and the following table predicts the number of tradespersons in the WA construction industry, sourced from their most recent 2007 release.

2.1 Construction Workforce Growth

Construction		
As at Date	Employed, '000s	% WA Workforce
Aug-1996	72.3	9%
Aug-1997	77.3	9%
Aug-1998	68.5	8%
Aug-1999	76.7	9%
Aug-2000	78.9	9%
Aug-2001	80.8	9%
Aug-2002	78.2	8%
Aug-2003	77.7	9%
Aug-2004	83.0	9%
Aug-2005	95.8	10%
Aug-2006	105.0	10%
Aug-2007	109.5	10%
% increase since 1996	47%	

2.2 Total Construction Workforce Employment

(Units in 000's)

Region	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14
Australia All BCI Occupations	959.369	958.566	958.628	967.338	985.656	1003.323	1018.163
WA All BCI Occupations	118.701	118.434	116.800	116.997	118.984	121.665	124.584
% Aus	0.124	0.124	0.122	0.121	0.121	0.121	0.122
Australia BCI Tradespersons	477.046	477.039	476.551	480.397	489.014	497.298	504.162
If we assume that 12% BCI tradespersons are in WA *							
<i>Extrapolation of BCI Tradespersons</i>	57.246	57.245	57.186	57.648	58.682	59.676	60.499

*BCITF assumption, based on ratios sourced from earlier data.

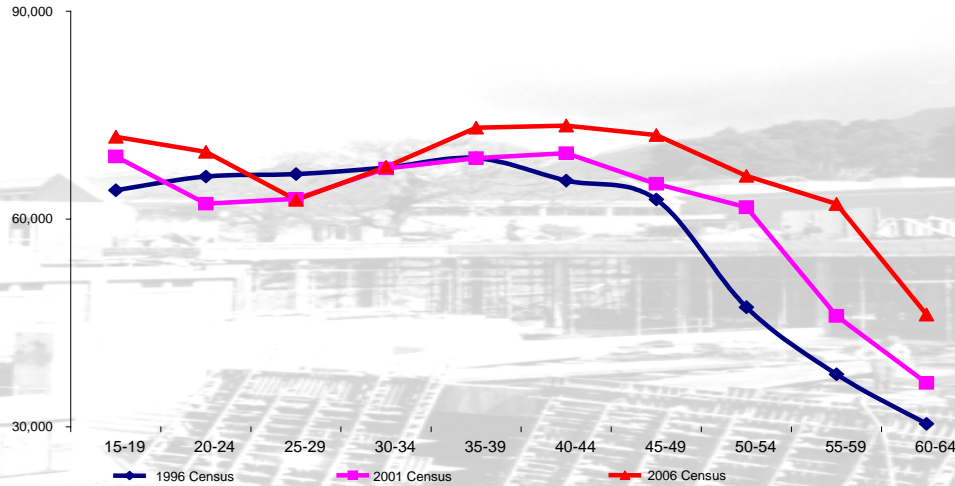
Source : Construction Forecasting Council, (Short-term Labour All Occupations)

http://www.cfc.acif.com.au/forecastlabour_results.

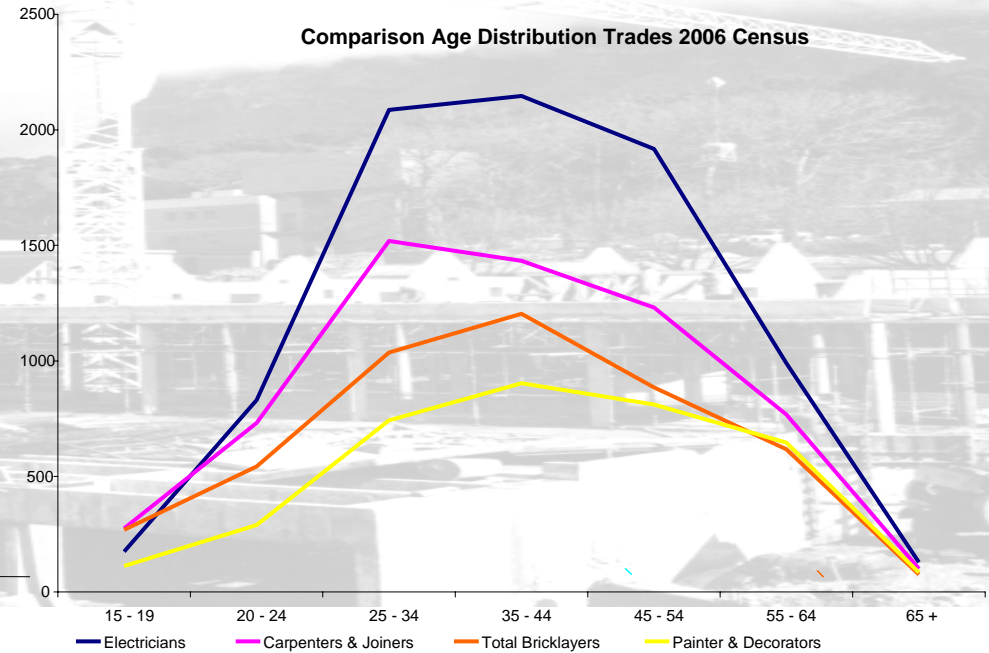
August 1996 to August 2007 annualised percentage growth					
Occupation	% growth Construction	% 2007 share	% growth Mining	%2007 share	
Labourers & Related	76%	12%	-7%	6%	
Tradespersons & Related	45%	48%	35%	21%	
Elementary Clerical,	-21%)	14%)	
Intermediate Clerical	54%) 24%	94%) 29%	
Advanced Clerical	-17%)	-11%)	
Associate Professionals	31%	7%	48%	11%	
Managers & Administrators	64%	4%	138%	9%	
Professionals	116%	5%	151%	25%	
Total % growth 1996 - 2007	47%	100%	58%	100%	

2.3 Age Demographics in the Workforce

Change in WA Working-Age Male Population 1996, 2001 and 2006 Census



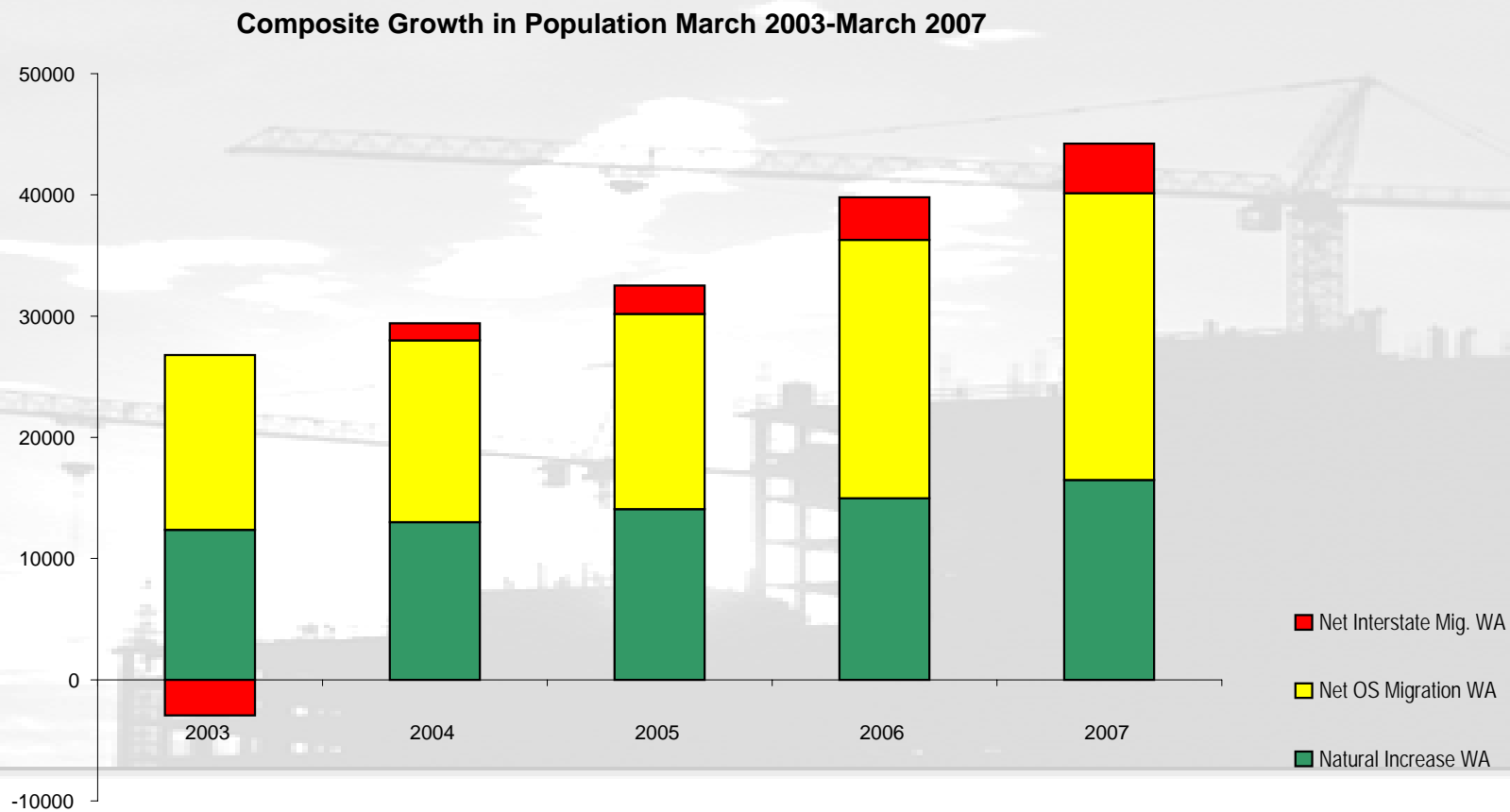
Comparison Age Distribution Trades 2006 Census



Comparison of the construction workforce chart and that of the trends in the male population in WA, provide an insight into the working life of the tradesperson (which is predominantly male). There is a comparatively narrow period of workforce participation for construction tradespeople with a peak between the ages of 25 to 50 years (and even narrower for carpenters) when compared to the whole of the working male population in WA. One explanation is that they do not have a long “working life”, alternatively, they move onto higher level professions such as project administrators, site supervisors and so on. Nonetheless, it is an important consideration for workforce planning.

2.4 Contribution of Migration to Population Growth

The pattern of growth of the WA population provides insight to the contribution and comparative significance of migration from both overseas and interstate. The graph shows that migration makes a significant contribution to the state population.

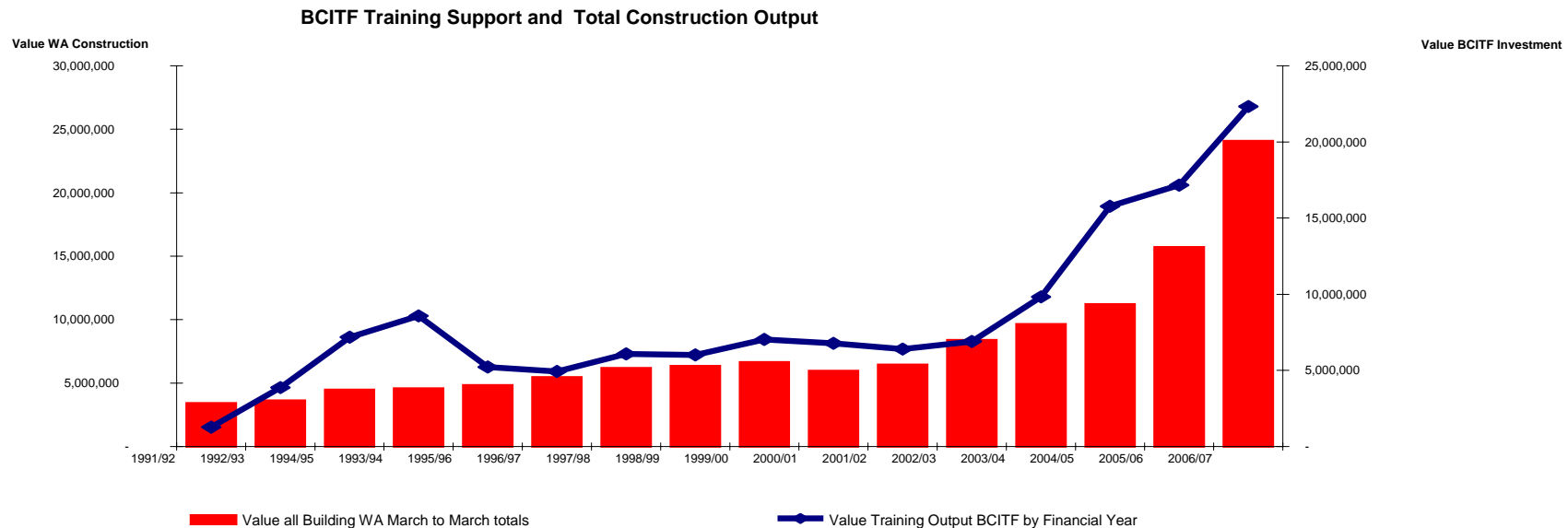


Source 3101.0 Australian Demographic Statistics
ABS

3. TRAINING ACTIVITY

3.1 Training Activity and Construction Output

Training is important to the future of the industry. There is some indication that training activity is related to construction output. Historically, it does not appear that training activity drives productivity; rather that output drives the training response. However, since 2003/04 there has been a marked increase in investment in training (as measured by BCITF expenditure on training) in relation to construction output indicating that industry is increasingly looking to training to address its labour shortfall. The following graph compares industry activity (measured by value of output) with BCITF expenditure. No data is available on Government expenditure, however a rough estimate indicates that State Government expenditure in 2006-7 is approximately \$27 million.



3.2 Employer views about training.

NCVER conducted a national survey “Employers’ use and views of the VET system” in 2005. This publication presents a summary of results from a national survey of employers conducted in 2005. The survey collects information about employers’ use and views of the vocational education and training system and the various ways employers use the VET system to meet their skill needs. This may include hiring staff with vocational qualifications, employing apprentices and trainees, or providing staff with nationally recognised and informal training.

Employers across all industry, at a national level, were asked if it was important to employ staff with vocational qualifications and 96% of employers said it was important.

The following table shows the extent to which employers use apprenticeships and traineeships as a means of replenishing their stock of skills. The rate for all employers is 3.9%; that is, one in 25 of those employed at the end of 2004 was an apprentice or trainee. Again the results are national, but rates for apprentices and trainees are low in terms of being a viable source to supply adequate numbers of tradespeople. The table also shows the percentage of employers who reported undertaking training activity, both structured and unstructured. Unstructured training occurs at a much higher rate than structured training, across all industries.

Employer Provided Training by Industry

Industry	Unstructured training 2001-02	Structured training 2001-02%	Structured training expenditure 2001-02 in \$ / employee	Trainee & Apprentice training rates end 2004 %
Mining	74.3	45.2	1643.00	2.0
Manufacturing	83.2	33.6	434.30	5.5
Electricity, gas & water supply	90.7	86.7	1279.10	3.8
Construction	73.4	42.0	207.70	5.9
Retail trade	84.5	34.1	127.00	4.8
Accomm, cafes & restaurants	86.3	41.3	146.80	5.7
Transport & storage	50.4	17.0*	426.30	5.0
Communication services	52.3	37.1*	1279.30	3.3
Finance and insurance	77.5	64.0	1323.40	1.8
Property & business services	79.0	42.2	536.70	4.5
Health & community services	85.2	57.9	382.90	2.3
Cultural & rec services	79.7	39.7	225.00	2.0
Personal & other services	94.5	47.5	859.40	5.3
All industries	79.2	41.0	458.40	3.9

"Employer-Provided Training Findings from Case Studies", Mark Scully, NCVET. 2005

The construction industry was a moderate performer for both unstructured and structured training. Of note is expenditure by the mining industry with an outlay of around \$1643 in 2001-2 per employee, despite a relatively low incidence of apprentice and trainees and of structured training at 45.2%. An explanation for this is that the mining industry employs a comparatively high number of professionals, with more expensive delivery costs and this factor raises the average per employee. The training rate is the ratio of apprentices in-training to employed tradespersons, and measures the extent to which an occupation is reproducing itself through the domestic training system.¹ The lowest apprentice and trainee training rate were in the finance/ insurance, mining and cultural/recreational service industries at approximately 2% while the highest rate was the construction industry at 5.9%.

¹ Declining Apprenticeship Training Rates: Causes, Consequences and Solutions, Dr Phillip Toner 2003

3.3 Apprentices in Training 1990 – 2007.

Comparison of changes in Building and Construction Apprentices with other industries in WA since the commencement of the Fund. (table @ September 07)

Apprentices by industry In-Training	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007 @Aug	% total	% inc 1991-2007
Metals, Manufacture & Services	2,871	2,755	2,726	2,848	3,091	3,413	3,782	3,681	3,312	2,947	2,704	2,676	3,039	3,512	4,365	5,026	5,401	25%	88%
Automotive	2,188	1,961	1,801	1,958	2,147	2,300	2,217	2,112	1,980	1,914	1,892	1,950	2,115	2,394	2,858	3,187	3,569	17%	63%
Wholesale, Retail & Pers Services	1,344	1,286	1,206	1,185	1,154	1,075	993	974	985	1,019	1,008	1,034	1,108	1,229	1,356	1,548	1,603	7%	19%
Light Manuf	569	580	630	751	797	780	784	770	747	721	669	686	732	786	917	999	1,107	5%	95%
Food + Hospitality	1202	1205	1280	1405	1518	1606	1507	1492	1465	1385	1293	1343	1395	1404	1491	1614	1648	8%	37%
Primary Industry	202	190	236	257	270	280	254	230	225	240	225	231	222	211	221	187	204	1%	1%
Utilities, Electrotech & Printing	188	151	139	172	179	189	169	124	112	107	92	69	62	56	61	75	84	0%	-55%
C Services, Health & Ed	73	65	56	65	71	76	70	68	66	54	54	55	59	58	55	64	63	0%	-14%
Total apps (excl BCI & Electrical)	8,637	8,193	8,074	8,641	9,227	9,719	9,776	9,451	8,892	8,387	7,937	8,044	8,732	9,650	11,324	12,700	13,679	65%	58%
% growth all other apps		-5%	-1%	7%	7%	5%	1%	-3%	-6%	-6%	-5%	1%	9%	11%	17%	12%	8%		58%
Apps BCI & Electrical	1,782	1,731	1,945	2,420	2,614	2,727	2,958	2,998	3,138	3,260	3,121	3,202	3,455	4,184	5,325	6,740	7,695	36%	332%
increase BCI Apps prev yr		-3%	12%	24%	8%	4%	8%	1%	5%	4%	-4%	3%	8%	21%	27%	27%	14%		
Total (all apprentices)	10,419	9,924	10,019	11,061	11,841	12,446	12,735	12,449	12,030	11,647	11,058	11,246	12,187	13,834	16,649	19,440	21,375	100%	105%
BCI Trades	31,250	32,750	33,500	35,500	35,900	35,000	35,900	34,925	33,850	38,750	37,700	39,475	36,025	40,500	43,475	50,150	52,450	46%	68%
% Growth BCI Trades		5%	2%	6%	1%	-3%	3%	-3%	-3%	14%	-3%	5%	-9%	12%	7%	15%	5%		68%
Total BCI	52,604	58,899	63,565	72,250	73,683	71,895	74,140	63,063	74,038	80,645	80,124	69,491	85,492	90,823	99,528	114,809	109,500	100%	118%
BCI Training rate*	6%	5%	6%	7%	7%	8%	8%	9%	9%	8%	8%	8%	10%	10%	12%	13%	15%		9%

The graph on the previous page confirms a 332% increase in the employment of apprentices in the building and construction industry between 1990 and 2006. By comparison, the average increase in other industries was 54%.

3.3.1. Apprentices and Trainees in training, by trade in Building and Construction

Late 1990 was the year that the Building and Construction Industry Training Levy Bill was passed. These 17 years have overseen a substantial growth in building and construction apprentices, however, the rate of growth has shown considerable variation across the trades, as is evidenced in the table following. Bricklayers have increased by 556% since 1991, while electrical mechanics have increased by 507%, yet painting and decorating has increased by just 147%. Overall the industry has increased for all trades by 352%. Since 1999 traineeships have grown by 148%.

Apprentices in Training														Trainees	
Year	ALL BRICKLAYING	ALL CARPENTRY AND JOINERY	ALL PAINTING	ALL PLASTERING	PLUMBING AND GASFITTING	ROOF PLUMBING	ROOF TILING	SPRINKLER FITTING	STEEL FRAMING (HOUSING)	ALL STONEMASONRY	ALL TILING	ALL WALL & CEILING FIX	ELECTRICAL MECHANICS	CONSTRUCTION + ELECTRICAL MECHANICS	BUILDING & CONSTRUCTION TRAINEES
1990	138	652	202	50	372	0	0	0	0	23	54	67	449	2007	0
1991	106	558	158	42	304	0	0	0	0	20	48	60	467	1763	0
1992	110	547	176	51	290	0	0	6	0	14	36	61	434	1725	0
1993	140	625	202	69	310	0	0	7	0	20	45	66	462	1946	0
1994	176	775	234	89	355	0	0	8	0	23	63	81	616	2420	0
1995	158	803	253	101	372	3	0	9	0	32	65	85	734	2615	0
1996	154	781	250	86	392	10	0	6	0	32	72	90	856	2729	134
1997	152	779	221	81	413	18	0	8	0	24	75	106	998	2875	196
1998	151	753	213	70	413	24	1	14	0	38	77	123	1118	2995	214
1999	174	733	228	86	446	21	1	16	0	34	78	122	1199	3138	250
2000	189	746	253	85	464	22	1	14	0	36	87	144	1250	3291	220
2001	187	717	255	96	417	25	0	18	0	45	94	119	1190	3163	140
2002	204	715	250	95	439	23	0	12	0	37	98	111	1196	3180	180
2003	244	766	246	91	479	41	0	9	0	50	113	126	1310	3475	145
2004	356	1008	241	107	577	38	0	13	0	43	127	154	1543	4207	206
2005	478	1295	262	148	738	68	22	15	0	42	148	188	1941	5345	283
2006	606	1680	329	190	942	95	36	20	1	42	193	241	2377	6752	226
Nov-07	695	1961	391	216	1161	102	43	40	6	41	222	259	2833	7970	332

(Data is sourced from the Department of Education and Training TRS datacube)

Note sign writing, lead burning and glazing are not included, but are included elsewhere for parity with Departmental definition of the Building industry.

3.3.2 Progress of 2007 Commencements by Trade

This table illustrates the status of Apprentices who commenced their apprenticeship at anytime in 2007, as at November of the same year. It also indicates the apprenticeships with higher rates of attrition during the 3 month probationary period, which ends when they are "registered". The table is arranged from the most "at risk"- trades to the least at risk of leaving during the probationary period.

STATUS OF APPRENTICES WHO COMMENCED IN 2007	Commenced	Registered	Left during probation	Attrition during probation	Active
ROOF TILING	30	18	12	40%	16
CARPENTRY (HOUSING)	28	20	8	29%	17
PLASTERING	92	68	24	26%	66
WALL AND FLOOR TILING (HOUSING)	4	3	1	25%	3
ROOF PLUMBING	41	31	10	24%	30
PAINTER AND DECORATER	60	48	12	20%	42
STONEMASONRY	10	8	2	20%	7
BRICKLAYING	294	240	54	18%	226
TILELAYING	97	80	17	18%	75
WALL AND CEILING FIXING	94	78	16	17%	76
BRICKLAYING (HOUSING)	34	30	4	12%	28
PAINTING / DECORATING	121	107	14	12%	102
CARPENTRY AND JOINERY	782	692	90	12%	664
WALL AND CEILING FIXING (HOUSING)	12	11	1	8%	11
SPRINKLER FITTING	29	27	2	7%	26
PLUMBING / GASFITTING	433	406	27	6%	397
ELECTRICAL MECHANICS	1,009	953	56	6%	931
CARPENTRY FORMWORK (HOUSING).	2	2	0	0%	2
JOINERY (HOUSING)	1	1	0	0%	0
PLASTERING (HOUSING)	9	9	0	0%	6
CARPENTRY FRAMING (HOUSING)	0	0	0		0
TOTAL	3182	2832	350	11%	2725

(Data sourced from the Apprenticeship and Traineeship Support Network. July 2007 <http://www.apprenticeships.training.wa.gov.au/>)

This table shows that some trades are at risk of losing apprentices more than others. Roof Tiling, Roof Plastering, and Carpentry (housing) have lost more than 1 in 4 apprentices during the probationary period this year, so far.

3.4 Apprentice Commencements 1993 – 2007

Building and Construction including Electrical Mechanics							(Source datacube, WA Department of Education & Training).
Year	Commenced	Withdrawn	Registered	Cancelled	Completed	Completion rate from Registration	Overall Completion Rate
1990	607	92	515	111	400	77.67%	65.90%
1991	378	50	328	60	262	79.88%	69.31%
1992	681	75	606	121	471	77.72%	69.16%
1993	1,021	120	901	192	685	76.03%	67.09%
1994	1,194	158	1,036	253	752	72.59%	62.98%
1995	869	106	763	154	593	77.72%	68.24%
1996	964	119	845	195	623	73.73%	64.63%
1997	1,091	134	957	209	723	75.55%	66.27%
1998	1,168	136	1,032	234	770	74.61%	65.92%
1999	1,203	157	1,046	251	765	73.14%	63.59%
2000	1,219	144	1,075	260	788	73.30%	64.64%
2001	1,028	116	912	188	710	77.85%	69.07%
2002	1,251	160	1,091	247	817	74.89%	65.31%
2003	1,539	193	1,346	328	922	68.50%	59.91%
2004	2,080	295	1,785	376	540	30.25%	25.96%
2005	2,577	307	2,270	436	125	5.51%	4.85%
2006	3,292	436	2,856	335	46	1.61%	1.40%
2007	3,213	357	2,856	53	8	0.28%	0.25%

Note :
apprentices
still active
2003 - 07

Across the building and construction industry, it is apparent that for all years, 2 out of every 3 apprentices who commence will complete their apprenticeship, and around 3 out of every 4 from registration.

In the past four years the building and construction industry has significantly lifted the number of apprentice commencements, as a proportion of all apprentice commencements, as demonstrated by the following comparison:

Industry	Percentage Share of Apprentices			
	2003	2004	2005	2006
Building and Construction	19%	22%	23%	31%
Electrical	10%	11%	11%	11%
BCI & Electrical combined	29%	33%	34%	42%
Total State (all apprentices)	100%	100%	100%	100%

The building and construction industry employs approximately 10% of the state's workforce and it is therefore achieving apprentice commencement results well above the average for industries in the state. (see Department of Education and Training statistics http://www.apprenticeships.det.wa.edu.au/fine_print_statistics.asp)

3.5 Apprentices employed in Group Training Schemes (GTS) and Direct Indenture

Group training schemes employ a substantial number of apprentices in the building and construction industry (BCI) in WA, with 39% of apprentices in WA employed in group training. It is interesting to note that group training schemes are a very significant employer of apprentices in bricklaying and carpentry and joinery.

Employers of Apprentices					
Trade (as at November 2007)	Group Training Scheme	Private Employers	Other Employers	All Employers	GTS % Share
BRICKLAYING	421	237	1	659	64%
BRICKLAYING (HOUSING)	27	9	0	36	75%
CARPENTRY (HOUSING)	20	12	0	32	63%
CARPENTRY AND JOINERY	938	981	7	1,926	49%
CARPENTRY FORMWORK (HOUSING)	0	2	0	2	0%
JOINERY (HOUSING)	1	0	0	1	100%
PAINTER AND DECORATOR	50	79	1	130	38%
PAINTING (HOUSING)	0	1	0	1	0%
PAINTING AND DECORATING	112	147	1	260	43%
PLASTERING (HOUSING)	8	1	0	9	89%
PLUMBING AND GASFITTING	379	768	14	1,161	33%
ROOF PLUMBING	22	80	0	102	22%
ROOF TILING	0	43	0	43	0%
SPRINKLER FITTING	0	40	0	40	0%
STEEL FRAMING (HOUSING)	1	5	0	6	17%
ALL STONEMASONRY	4	37	0	41	10%
TILELAYING	48	170	0	218	22%
WALL AND FLOOR TILING (HOUSING)	2	2	0	4	50%
WALL AND CEILING FIXING	55	178	0	233	24%
WALL AND CEILING FIXING (HOUSING)	19	7	0	26	73%
Total	2107	2799	24	4930	43%
ELECTRICAL MECHANICS	939	1888	6	2833	33%
Total Including Electrical Mechanics	3046	4687	30	7763	39%
Building & Construction Trainees	70	204	58	332	21%

3.6 Demographics of Apprentices

It is useful to look at the characteristics of apprentices and trainees to determine whether particular characteristics have a role in contributing to success in completion of training

Note that the data in the following tables does not include electrical mechanics, unless specified.

3.6.1 Who is employing by size of organisation. (apprentices only).

Sector	Employer Size	Group Training Scheme	Private Employers	Other employers	All Employers	GTS %	Private %
BCI	Small (<20 employees)	88	2,385	5	2,478	4%	96%
	Medium (20 to 99 employees)	1	457	13	471	0.2%	97%
	Large (100 employees or more)	2,109	108	6	2,223	95%	5%
Electrical Mechanics	Small (<20 employees)	45	1089	0	1,134	4%	96%
	Medium (20 to 99 employees)	1	559	2	562	0%	99.5%
	Large (100 employees or more)	893	240	4	1,137	79%	21%

Note the following highlights from the table :

- Most small employers in the building industry employ directly, and only a small percentage employ through a group scheme.
- Medium sized organisations play less of a role in the employment of apprentices than either large or small employers.
- Large employers predominantly employ through group schemes, and large employers are the main customers of group schemes.

How this impacts on completion rates is interesting; the following table illustrates that apprentices with large size employers have a higher chance of completing, and those with a small employer, have a slightly less chance (the years 2003 to the present still have active apprentices and therefore the rates are not final).

Year (both sectors)	Highest Completion rates (year)	Lowest Completion rate (Year)	Most recent Rate(2003*)
Large Employer	87% (1991)	64% (1994)	67%
Medium Employer	78% (2001)	67% (1994)	68%
Small Employer	66% (1992)	58% (2003)	59%

*if current active apprentices complete

Similarly, an Electrical Mechanic apprentice with a large employer has the least likelihood of leaving their apprenticeship. (Note, again there are active apprentices from 2003 onwards, so the rates are not final.) It is interesting that for all apprentices all trades, there is as much as a 16 percentage point difference in the attrition rates of large employers and small employers, though in recent years the margin has narrowed.

The picture for **trainees** is a little different. The table is for the Building and Construction Industry; there are no Traineeship in Electrical.

Employer Size	Group Training Scheme	Private Employers	Other	All Employers	GTS %	Private %
Small (<20 employees)	2	52	1	55	4%	95%
Medium (20 to 99 employees)	0	47	6	53	0%	89%
Large (>100 employees)	68	105	51	224	30%	47%
All Employers	70	204	58	332	21%	61%

Thus, trainees are more likely to be employed with a large employer, than either a small or medium employer. Attrition rates for trainees are affected by employer size, as well, with large employers retaining more of their trainees to completion.

Employer Size	Lowest Completion rate	Highest Completion rate
Small (<20 employees)	14%	42%
Medium (20 to 99 employees)	15%	83%
Large (100 employees or more)	26%	72%
All Employers	27%	62%

3.6.2 Location

Comparing the location of all current apprentices and trainees by postcode, indicates that 35% of are rural and 65% are metropolitan based. The “in training” rates for rural Electrical Mechanics are slightly lower. (Attrition rates are similar, and are not reported in the table below.)

Employer	Rural	Metro Zone	2,007
BCI Group Training Scheme	36%	64%	100%
BCI Private Employers	39%	61%	100%
Total BCI	38%	62%	100%
Electrical Mechanics Group Training Scheme	26%	74%	100%
Electrical Mechanics Private Employers	31%	69%	100%
Total Electrical Mechanics	29%	71%	100%
All Building Industry and Electrical Mechanics	35%	65%	100%

3.6.3 Non traditional participants in training.

With stretched labour markets, the building industry has recognised that it needs to look at recruiting from non-traditional sources which includes females, those with a disability, and the indigenous (ATSI) population. However, looking at the historical data, it is apparent that the industry does not have a good record in attracting either females or those with a disability.

Apprentice Status	Female	Disability	ATSI
Commencements over all years since 1990	1.59%	0.98%	2.84%
Completions over all years since 1990	1.15%	0.63%	1.09%
Active as at November 2007	1.54%	1.09%	2.07%

This is a very low participation rate for females and those with a disability (who number around 10% of the mainstream population). Of those women who do begin an apprenticeship, 35% are mature age, (21 and over) compared to only 19% of males who are mature age.

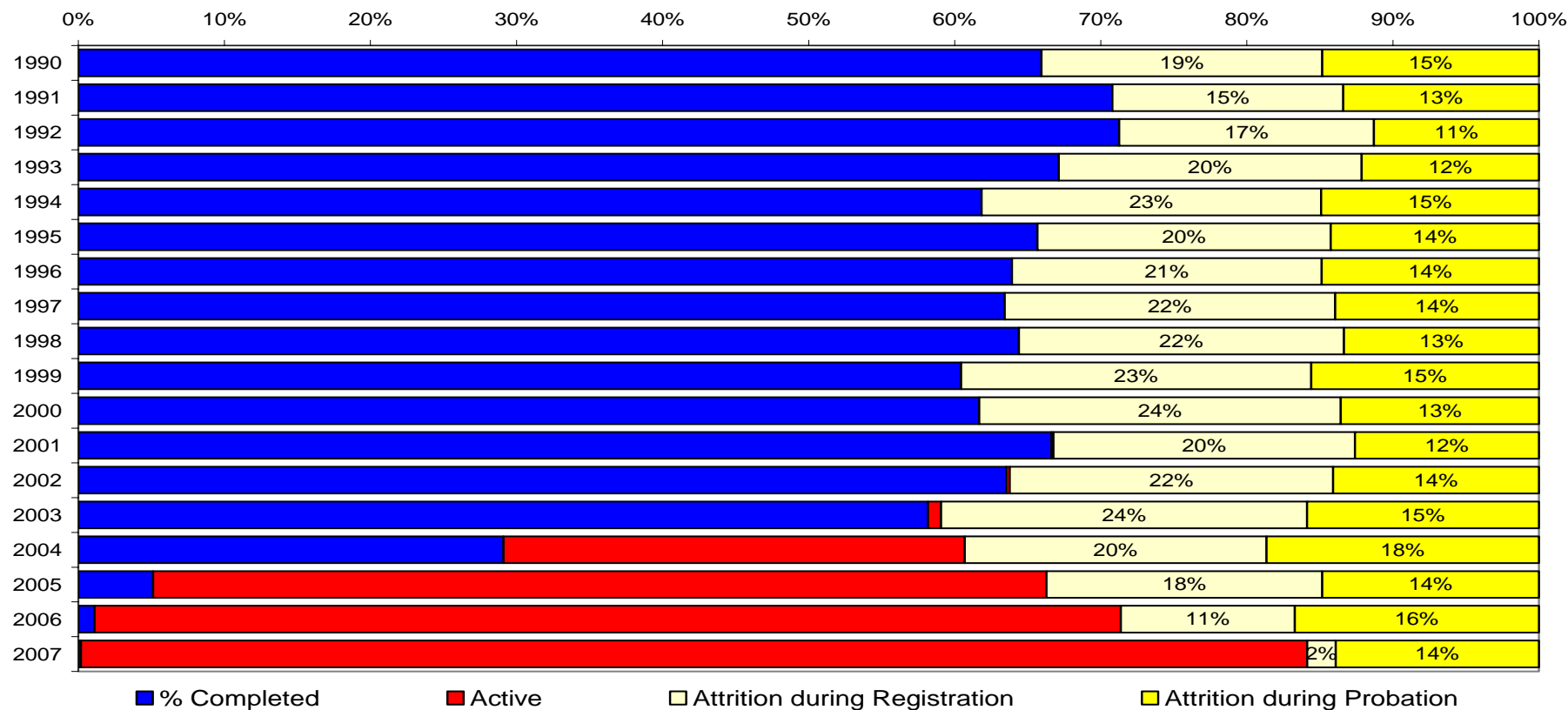
Statistics from the 2001 census indicated that only 0.05% of women were represented in the “tradespersons and related” occupations while 84.7% of the industries administrative positions such as office managers, secretarial / clerical positions and human resource personnel are held by women.

Of the indigenous apprentices and trainees, 70% of all commencements are located outside the metro area and interestingly, 50% of all indigenous commencements are in traineeships. Group training organisations have employed 35% of all ATSI entrants since 1990. Looking at the population of the state as a whole, the indigenous population is 3.8% of the total population of WA indicating that participation in the BCI training is proportionately lower than the population. It is noteworthy that the 2006 census indicates that the indigenous population has increased by 18.2% in the last 4 years, while the non indigenous population increased 7% over the same period. The implication of this is that the indigenous population is a comparatively youthful population with a potential for solving some of the shortfall in new entrants to the industry.

3.7 Other Risk Factors and Attrition.

The following graph gives a snapshot of the cumulative results for all trades in the building and construction industry, other than Electrical Mechanics. Electrical Mechanics have a much lower rate of attrition for a number of reasons, and given the high proportion of apprentices, will distort the overall results. The graph below shows the attrition rate in probation (*in dark yellow*) and following registration (*in pale yellow*). The graph illustrates a number of points: 2003 had a high total rate of attrition, attrition in probation is fairly stable at around 15%, with a high of 18% in 2004. Note that the rates of attrition after registration for the years 2004 onwards, are not yet complete as there are still active apprentices, who may still leave their apprenticeship before completion.

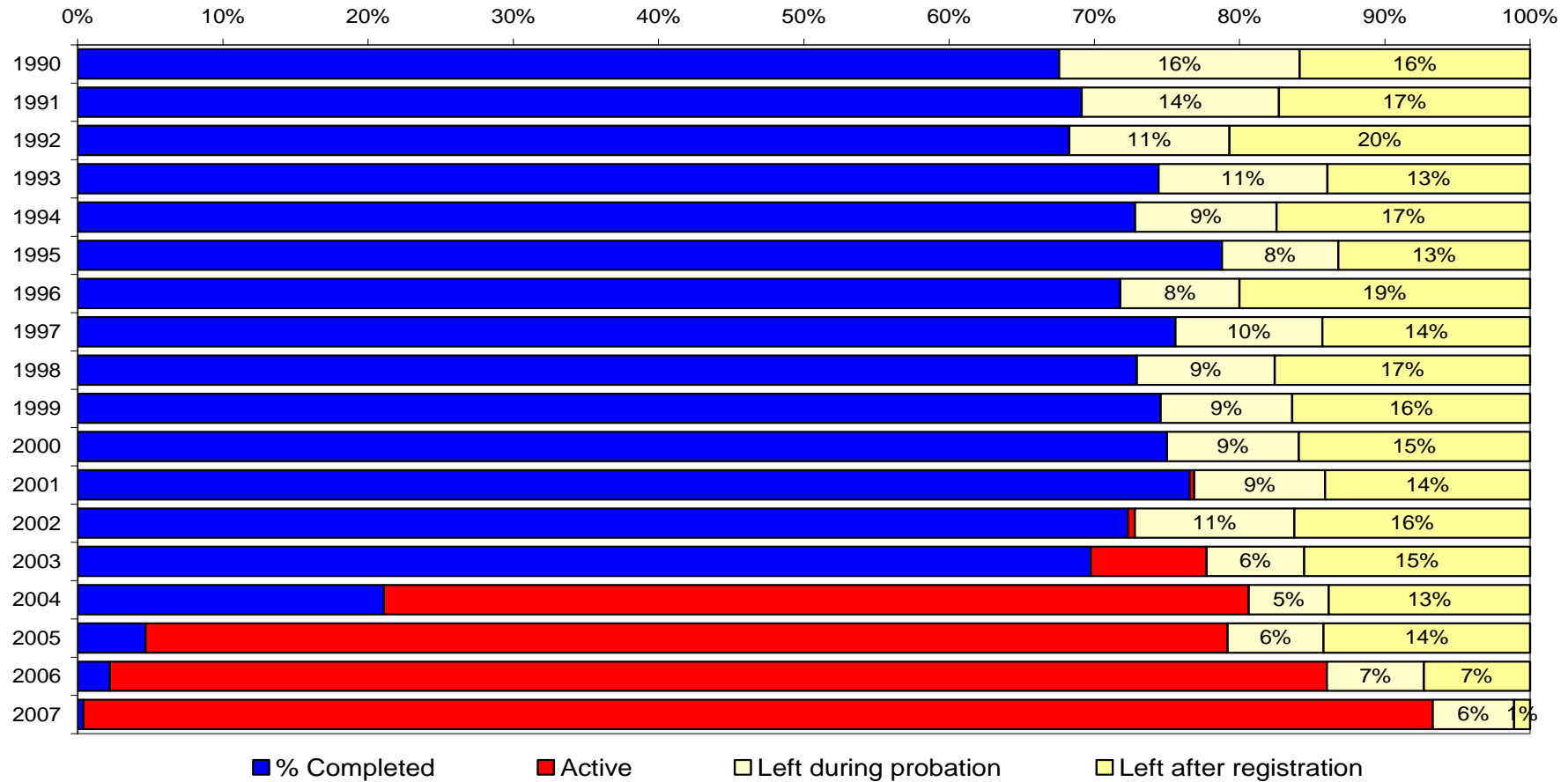
Building Industry Attrition Comparison Over Time



Data is sourced from the WA Department of Education and Training datacube.

Attrition for the trade of Electrical Mechanic, since 1990 is illustrated in the graph below and shows the attrition rate in probation (*in pale yellow*) and following registration (*in dark yellow*). The graph illustrates a number of points: 2002 had a comparatively higher total rate of attrition to other years, attrition in probation has fallen in recent years and is now fairly stable at around 6%, with a high of 11% in 2002. Note that the rates of attrition after registration for the years 2004 onwards, are not yet complete as there are still active apprentices, who may still leave their apprenticeship before completion. Nonetheless, it is clear that electrical mechanic apprentice have a lower rate of attrition than apprentices in the wider building and construction industry.

Electrical Mechanics and Attrition

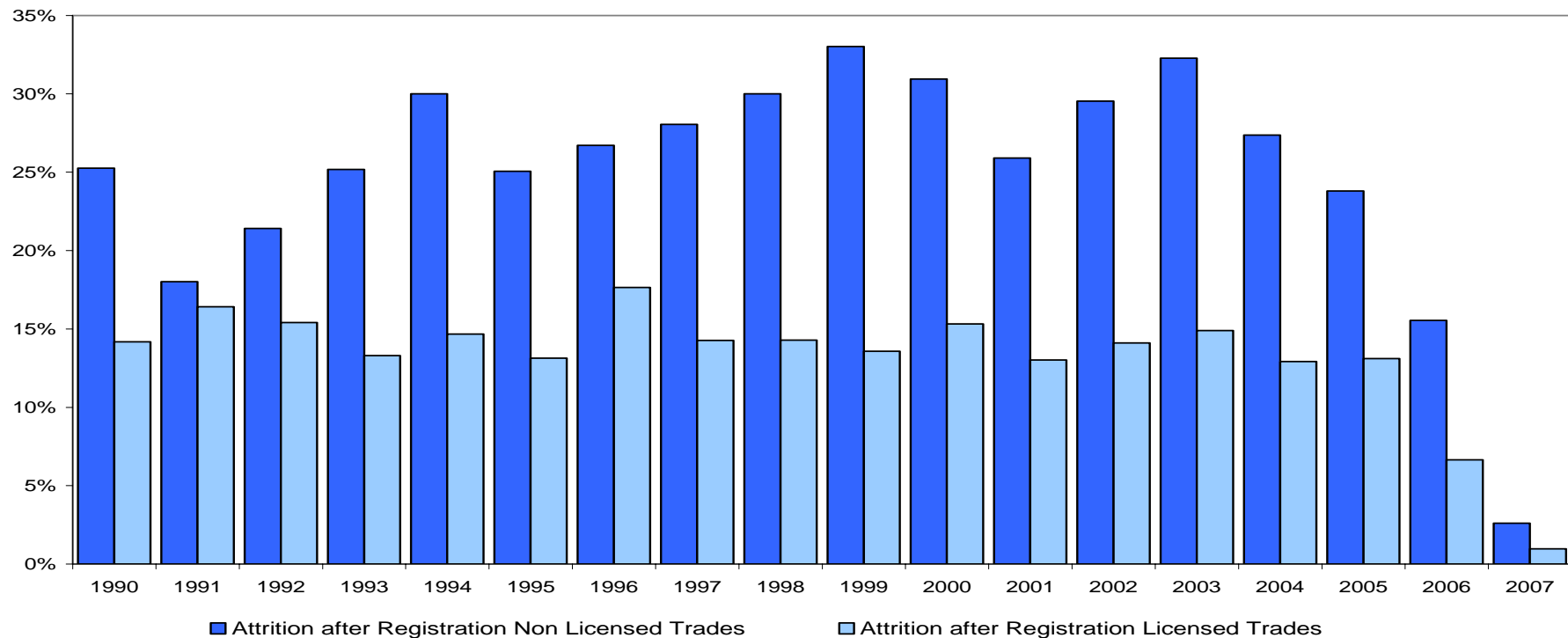


3.7.1 Difference between Licensed and Non Licensed trades.

It is noticeable that in the last 10 years, there is a substantial difference in the attrition rates in the licensed and non-licensed trades. The necessity to be licensed to operate in the trades of Plumbing and Gasfitting and Electrical Mechanic in the construction industry has a positive effect on apprentice attrition rates.

Focusing on attrition rates over the 13 years from 1990 to 2003, (noting that many apprentices who commenced after 2003 are still active), there was a low of 18% and a high 33% once registered for the non-licensed trades. This compares with attrition in the licensed trades of 13% and 18% respectively.

Effect of Licensing on Attrition Rates Following Registration



To update this to the most current numbers, this rate of attrition equates to around 1344 apprentices who have left their apprenticeship before completion in the non-licensed trades in the years 2000 – 2007.

3.7.2 The non licensed trades.

There is a hierarchy among the non-licensed trades of likelihood of completing an apprenticeship. Of the non licensed trades of Roof Plumbing, Roof Tiling, Bricklaying, Carpentry & Joinery, Wall & Ceiling Fix, and Tile laying, the trade least affected by attrition is Carpentry, with an average of 12% in the probationary period and 17% after registration in the years. This does not include the new 2 year housing trades. Roof Tiling has the highest among the above trades with an average of 36% during probation and 36% after registration. Note that as the current active apprentices progress through their indenture, they too may not complete and this will *further exacerbate* the attrition rate.

Comparative Attrition			
Trade	Probationary period	Registration period	Overall*
Roof Plumbing (1995 – 2007)	22%	31%	46%
Roof Tiling (1998 – 2007)	36%	36%	59%
Bricklaying (1990-2007)	21%	31%	45%
Carpentry & Joinery (1990-2007)	12%	17%	27%
Wall & Ceiling Fix (1990-2007)	19%	27%	41%
Tiling (1990-2007)	19%	29%	42%

(*calculated as a sum of Withdrawals and Cancellations as a factor of Commencements)

3.7.3 Effect of age on likelihood of completion

Age of Apprentice	Under 15	15-19	20-24	25-29	30-44	Over 45	all industry
% commencements	0.9%	76%	14%	5%	4%	0.2%	100%
% share active	0.6%	77%	14%	4%	4%	0.2%	100%
% share completions	0.9%	80%	12%	4%	3%	0.2%	100%

The 15-19 group represent the majority of apprentice commencements and completions, and this age group is associated with a slightly higher chance of completing their apprenticeship. 23% of all apprentices are over 20, yet they account of only 19% of completions. The over 20s have an average of 36% attrition rate (from 1990 to 2006) compared to those under 20 with an average of 32%. The flexibility of the new training system may go some way in addressing this problem.

3.7.4 Schooling.

The level of schooling that a commencing apprentice or trainee has completed was examined to determine if there is an effect on likelihood of completion. The level of schooling achieved can have implications for readiness to learn, literacy and numeracy, maturity, and so on.

Effect of Schooling on Average Attrition Rates 1990 to 2006			
	Attrition in Probation	Attrition after Registration	Total Attrition
Went beyond Year 10	12%	16%	27%
Did not completed year 10	19%	29%	43%
Completed Year 12	12%	15%	26%
All BCI	15%	23%	36%

It is apparent that higher levels of school completion are associated with greater success in completing an apprenticeship. Conversely, not completing school beyond year 10 is associated with greater risk of non completion.

In terms of combined (during probation and after registration) rates of attrition, those who complete beyond year 10 have an average of 16% *increased* chance of completion. Those who complete year 12, have an average of 17% better chance of completion than those with year 10 or less.

Effect of schooling in traineeship completions is less significant. Trainees who have not gone beyond year 10, have an attrition rate (pre and post probation) of 51%, while trainees who went beyond year 10 had a 43% chance of not completing the traineeship. Note also that a high proportion of all trainees have not completed year 10, at around 62%.

Consider this, for commencing apprentices and trainees, approximately 1 in 4 (27%) year 12 completers will not complete their apprenticeship or traineeship, while 4 out of every 10 (39%) of those who do not go to school beyond year 10, will not complete.

3.7.5 Type of Contract.

A young person commencing in the building industry under a contract of training will be a trainee or an apprentice. Apprenticeships are in the traditional trades. Traineeships have only been of significance in the WA building industry since 1998.

Average Rate Since 1996			
Type Training Contract	Attrition during Probation	After Registration	All Attrition Since Commencement
Apprenticeship	15%	23%	36%
Traineeship	11%	42%	48%

Calculated as a sum of Withdrawals and Cancellations as a factor of Commencements)

Despite having a shorter duration term, traineeships account for only 11% of all contracts of training and are associated with a significantly higher risk of non completion.

3.7.6 Multiple Factors

When multiple risk factors that are identified as contributing to a higher rate of attrition, it is interesting to observe the effect. For example, cross tabulating known risk factors with success factors, presents some interesting results.

Average attrition 1993-2003 (includes during probation and after registration)			
Trade	Attrition: did not complete year 10	Attrition :went beyond year 10	% current apprentices who have not completed year 10
Bricklaying	55%	51%	61%
Carpentry	36%	27%	42%
Plastering	51%	47%	68%
Tilelaying	55%	45%	39%
Electrical mechanic	34%	21%	20%

There is a high proportion of current active apprentices who did not complete beyond year 10, and while the findings show that this is associated with higher rates of attrition, there is some variance of this effect in the different trades. Such results are of particular concern in the trades of plastering and bricklaying, where the high number of current apprentices who have not completed year 10, exposes those trades to a higher risk of attrition, with all other factors equal.

3.7.7 Attrition rate risk factor association

The significant risk factors that are associated with a higher or lower risk of non completion include :

Higher Risk	Lower Risk
Did not complete Year 10	Licensed trade
Traineeship	Schooling beyond Year 10
Non licensed trade	Male
Female	Apprenticeship
Indigenous	Non indigenous

Of all the variables identified as risk factors, the most significant finding is the level of schooling and in particular, the impact of not completing year 10. This information should be interpreted with caution. Anecdotal evidence suggests that those who do not succeed at school or are disengaged with learning are encouraged to leave at or before year 10. However, simply making this group stay in school and go beyond year 10 – if they are already disengaged from learning- will not necessarily increase their chances of success. This “troubled group” may have difficulty succeeding in whatever pathway they take. What it may mean is that they will need additional support to succeed – such as mentoring, literacy and numeracy support and so on.

Similarly, trainees may need to have better support mechanisms in place. It appears that there is a higher proportion on non year 10 completers in traineeships. It may be that traineeships are considered an easier option for those with identified risk factors. If the factors that see them drop out of school early are not addressed, they do have a great chance of success in completing a traineeship.

4. FORECASTED GROWTH IN OCCUPATIONS

4.1 Forecasted Growth by Sector

Forecasts are developed by Monash University. The following table gives the output growth by ANZSIC industry, WA, \$ million (constant prices), 2006-7 to 2015-16. (includes civil construction and the electrical trades.)

Employment growth by ANZSIC occupation, WA, '000 persons, 2006-7 - 2015-16										
Industry sector	06-07	07-08	08-09	09-10	10-11	11-12	12-13	13-14	14-15	15-16
Building construction	25.5	24.1	22.7	23.1	25.0	26.9	28.1	28.9	29.5	30.3
Non-building construction	12.5	11.8	11.2	11.4	12.3	13.2	13.8	14.2	14.5	14.9
Site preparation	7.5	7.1	6.7	6.8	7.4	7.9	8.3	8.5	8.7	8.9
Building structures	11	10	10	10	11	12	12	12	13	13
Installation trades	22	21	20	20	22	23	24	25	26	26
Building completion	20	19	18	18	20	21	22	23	23	24
Other construction	10	10	9	9	10	11	11	11	12	12
Totals	109	103	97	99	107	115	120	123	126	129

Indicators are that the average growth in tradespeople through to 2016 is 18%, which is an additional 21,000 workers.

4.2 Forecasted Growth in Trades

Forecasting growth in occupations is a difficult science. Models for predicting growth are subject to many variables and assumptions, at the state level, as well as nationally and internationally. Data is from Monash University Employment projections which are prepared for the WA Department of Education and Training, July 2007.

Employment growth by ASCO occupation, WA, '000 persons, 2006-7 to 2015-16

Occupation	June 2007	June 2008	June 2009	June 2010	June 2011	June 2012	June 2013	June 2014	June 2015	June 2016
Electricians	12.82	13.51	14.08	14.43	14.05	14.45	15.01	15.32	14.90	14.90
Ref & Air Con Mechanics	1.93	2.03	2.13	2.18	2.11	2.17	2.26	2.32	2.26	2.26
Carpenters & Joiners	8.81	9.32	9.83	10.06	9.56	9.86	10.40	10.74	10.31	10.31
Fibrous Plasterers	4.50	4.78	5.05	5.17	4.85	5.02	5.33	5.52	5.26	5.26
Roof Tilers	0.94	0.99	1.05	1.07	1.01	1.04	1.11	1.15	1.09	1.09
Bricklayers	5.90	6.27	6.63	6.77	6.34	6.57	6.99	7.25	6.89	6.89
Solid Plasterers	0.17	0.18	0.19	0.20	0.19	0.19	0.20	0.21	0.20	0.20
Wall & Floor Tilers and Stonemasons	2.94	3.11	3.28	3.36	3.19	3.29	3.48	3.59	3.44	3.44
Painters and Decorators	5.28	5.60	5.91	6.04	5.70	5.89	6.25	6.46	6.18	6.18
Plumbers	7.28	7.72	8.13	8.31	7.85	8.12	8.58	8.86	8.48	8.48
Cabinetmakers	3.46	3.57	3.75	3.89	4.01	3.98	4.01	4.06	4.09	4.09

The average growth in trades to 2016 is 17%.

5. KEY ISSUES

Some of the key issues affecting skilled workforce demands in the building and construction industry in WA are detailed as follows.

5.1 Skill Shortages will remain

This report identifies the fact that the resources boom is no longer a boom, but a sustained increase in actual and planned resource sector output, which will involve substantial infrastructure development over at least the next 10 years.

The flow on effect for the commercial, housing and civil engineering sectors of the industry is an estimated 18% increase in required employment over the next 10 years. The growth in trade's people over the same period is approximately 17%. The most obvious barriers to achievement of this growth are the age demographics with 35% of the workforce aged over 45 and attrition of apprentices which is running at over 30%.

The clear implications for training strategies include:

- Maximise retention of aged workers by retraining and skills upgrading to accommodate them in para professional roles such as scheduling, estimating and site management.
- Reduce the attrition in the apprenticeship system
- Attract a larger proportion of young people to trade careers in the industry.

5.3 Regional Growth Pressures

Much of the construction activity in the state has been concentrated in the two outer regions of Perth, namely Wanneroo and Peel. Each area is struggling to respond to the demand for a local skilled workforce with limited training facilities available to meet the needs of the industry.

These issues have been raised with Government which has responded with plans to establish a new building and construction training centre in Clarkson, in the Wanneroo region. Additional facilities are also being established within the TAFE system in the Peel region.

A number of country regions, including Bunbury and Busselton in the South West, Albany in the Great Southern and Geraldton in the Mid West are also experiencing unprecedented growth in construction and as a result there is pressure to recruit, train and retain skilled workers.

It has also become apparent that there is a significant shortage of housing stock in the North West to meet the demands from a growing resources sector workforce. Building companies who would otherwise respond to this demand do not have the capacity due to skilled labour shortages in their normal work and concern that sending their construction workers to the North West will exacerbate the already serious flow of workers away from the construction industry to the resources sector.

5.4 Skills needed for Infrastructure Programs

Apart from major infrastructure projects initiated in the resources sector the state is seeing a significant increase in other Government and private infrastructure projects.

The total value of civil engineering construction has increased 200% from approximately \$5 billion per annum to over \$15 billion per annum in the past four years.

Private sector project owners and Government are deferring projects due to commence because the cost is prohibitive at present, however there is a question about whether simply delaying commencement will address the problem.

The Civil Construction sector has traditionally not relied on formal training and skills development processes to meet its workforce needs.

The Queensland Government recently identified similar problems in that state and has established a Civil and Infrastructure skills formation strategy to respond to the high levels of activity planned in future years.

5.5 Improving the Training Culture of the Industry

The building and construction industry, has a mixed training culture with some employers committed but many not involved in training. Training and skills development are viewed as a business expense and not a business investment or development strategy.

Strategies and funding support provided by the BCITF have been effective in increasing and maintaining the number of apprentices in training and in upgrading the skills of existing workers. However, there is still a serious lack of support for training in the industry which has been caused by many factors including:

- Structural changes in the industry with subcontract arrangements and most skilled work undertaken by micro-businesses.
- Complexity and duplication within the administration systems for training which have created confusion and frustration in industry.
- Lack of value placed on a training qualification.

Many apprentices in the system have left part way through their formal training and immediately gained employment with higher wages as semi skilled workers. These people are in time running their own micro businesses as sub contractors and as a result do not maintain the stronger training culture that existed years ago.

There is dissatisfaction with the current training system, which is seen as inflexible and unresponsive to industries needs. A number of these issues have been identified in a recent review of the training system and reforms are being considered and implemented.

The State of the Industry report confirms that the training rate of apprentices (includes Electrical Mechanics) is approximately 11%. This has increased from 8% since the Fund was established in 1991. National research indicates that industries should be training apprentices at a rate of 15% of their trade's workforce to simply meet normal retirement and attrition. Therefore, there is a great deal of work still required to improve the training culture of the industry and increase the training rate.

5.6 Addressing High Attrition Rates

The attrition rate for apprentice training in the building and construction industry is unacceptably high at between 30% and 40%.

Previous research undertaken by the BCITF has identified many of the causes of the attrition and the substantial costs involved to all the stakeholders. Advice has been provided to Government on these issues and the BCIT Board has initiated action to address attrition rates by implementing policy changes to its programs.

A more recent analysis of attrition has been undertaken as part of the preparation of this report, which identifies that attrition, in the last few years, remains a serious problem. Since 1993 attrition during the probationary period has averaged 13.6% and 30.3% once registered. By comparison attrition in the licensed trades is much lower at 9.4% and 15.8% respectively.

Another significant finding is that retention in school has a significant effect on the attrition rate. The attrition rate for apprentices who completed year 12 was 27% but was much higher, at 39%, for apprentices who did not go beyond year 10. These results confirm previous research findings that focussed on the need to better prepare school students for trade careers. The results also reinforce the need for support of school to work transition and support of apprentices during the first stages of an indenture.

Attrition is of concern in the current environment, and poses a perennial dilemma for the BCITF and all stakeholders in the industry in developing strategies, interventions and incentives to address the problem of apprentices leaving their apprenticeship before completion of their indenture.

5.7 The Impact of Growth in the Resources Sector

The movement of skilled labour from the traditional areas of the building and construction industry to construction projects and operations in the resources sector has dramatically escalated in the past three years. The resources sector has been prepared to pay very high wages to attract workers and the ripple effect of these recruitment strategies and the resulting skill shortages in the south of the state has contributed to a dramatic increase in construction costs.

Various industry and economic organisations are now identifying the fact that there is around \$100 billion of resources sector infrastructure projects still in the pipeline and the very real likelihood that skilled worker shortages will remain a problem affecting all sectors of the WA economy, but the building and construction industry in particular.

5.8 Implications of Technological Change

There are wide ranging innovations and technological advances in construction methods, business process and in the use of alternative materials, impacting on the construction industry. Construction will increasingly rely on pre-fabrication and the manufacture of construction components offsite, and assembly in situ, and this will have implications for training, not only in construction methodology, and demand for different skills but in safe systems of work and safe work practices.