

Workforce Analysis of the Australian Rail Transport Industry (ARTI)

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by

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Abstract:

Despite a slowing in economic activity both internationally and nationally, the Australian rail transport industry (ARTI) is still reporting the existence of skill shortages amongst specified professions. This paper explores this interesting phenomenon more closely by analysing the ARTI workforce and providing a contemporary profile of its major employment trends and characteristics, using the most recently released ABS Census data. Like other industries the ARTI experienced substantial rationalisation of its workforce during the 1990's which resulted in considerable downsizing of employee numbers, reduced intake of young recruits and a significant decrease in training investment and skills development. The combined effect has left the ARTI facing several personnel problems including widespread labour shortfalls, an aging workforce and difficulties in relation to staff attraction and retention. The ARTI's heavy reliance on the skills of its personnel therefore means that such labour issues are likely to have important implications for the industry's prospective output capacity.

1. Introduction

Adequate transport infrastructure and an efficient transport industry are critical if any economy is going to achieve production at or near its capacity. The timeliness and cost efficiency with which raw materials and intermediate goods are brought to the production process and the delivery of final goods has a significant bearing on competitiveness in terms of both cost-structure and service quality. Equally, passenger transport is a major determinant of the liveability and functionality of cities and of the commercial connectedness between cities and regional areas. The transport sector takes on an even greater significance for a country such as Australia for various reasons. Australia's large resource base requires extensive bulk haulage over long distances. Second, Australia has a vast land mass, but is also one of the most highly urbanised countries in the world, with around 64% of the population living in the capital cities (ABS 2006: p.2).

The rail industry has played a pivotal role in Australia's economic and social development and will continue to do so for the foreseeable future. Rail is a major provider of passenger transport, both in the form of inner city rail networks and regional as well as interstate networks. In addition, rail also figures prominently in the transport of freight. Rail accounts for around one-fifth of the value of output from transport, and a higher share as an intermediate input into other industries. It is predicted that the importance of the rail sector for the Australian economy will continue to grow and that the magnitude of the rail transport task will increase even more into the future. In the ten years to 2001, the rail freight task increased by an average of 4.4% per annum (BTRE 2006: p. 45) and passenger kilometres by 1.5% per annum (Apelbaum Consulting Group 2005).

However, the rail industry is currently facing significant constraints in the form of the availability of appropriately skilled and trained labour to meet its growth potential and this situation is set to worsen dramatically in the next two decades. As policy-makers begin to grapple earnestly with the potential implications of the ageing of the Australian population for labour supply and productivity, concern about emerging shortages of skilled rail labour and the constraints this may be placing on further economic growth within the rail sector has become widespread, as evidenced in policy statements, current political debate and frequent media reporting on the 'skills crisis'.

The Australian rail industry is a prime example of an industry experiencing recruitment difficulties associated with a tight specialised or niche labour market. However, the synopsis of skills shortages in the rail industry is far more unique and complex than that of a generally tight labour market, where there is high a level of competition for skilled labour. On the one hand, the industry has undergone a lengthy period of restructuring that has seen total employment in rail transport fall by roughly half in the decade spanning from 1991 to 2001 (Mahendran, Dockery & Affleck 2006). From this perspective, the industry might be expected to be immune to some extent from the effects of rapidly growing aggregate labour demand. On the other hand, the long term reduction in the rail workforce has reduced the need to actively cultivate sources of new entrants and to minimise wastage among existing workers. This has exacerbated the ageing of the rail workforce. Further, where employment and growth opportunities are popularly seen to be strongest in emerging technology based occupations and industries, such as the information technology and telecommunications sector, and in tertiary services, such as health, business administration and other technical services, the rail industry suffers from being viewed as an 'old economy' sector, reducing its attraction to school leavers and graduates from post-secondary education and training.

The need for both industry and policy makers to effectively respond to the workforce challenges faced by the ARTI has thus arrived in order to secure the future of the rail industry and maximise its contribution to Australia's ongoing economic development. One initiative that was undertaken to assist in this endeavour involved the Centre for Labour Market Research (CLMR) with support and funding from the Planning and Transport Research Centre (PATREC), undertaking research to profile the current national rail workforce. This involved accessing and analysing the latest (2006) release of ABS Census data relevant to the rail sector, in order to develop an accurate profile of the industry's workforce.

2. Current Structure of the Australian Rail Industry

The Australian rail industry is very diverse in nature. The industry consists of suppliers, track access corporations, rail operators, (including those specialising in heritage, tourist, freight, passenger transport) and a diversity of other companies covering all sectors of the industry (TDT 2005). Although there are around 250 firms that are listed as being apart of the Australian rail industry, approximately ten large rail enterprises dominate the majority of the operating and infrastructure sectors.

The majority of the companies in the Australian rail transport industry are profitable private enterprises that operate in monopolistic domestic markets (RTBU 2004). Each sector of the rail industry has unique and different corporate and community objectives (TDT 2005). Urban and passenger rail service providers offer a range of community transport services that are largely financed by a combination of government funding and passenger fares. In contrast freight and track access providers are predominantly commercial organisations focussed on making profitable rates of return and being corporately accountable for their capital investments and capital stock. Most of the organisations that were principally focused on in this study include those that are associated with one or more of the following sectors within the Australian rail Industry;

2.1 Providers of Rail Infrastructure Access

These organisations either lease or own the track they control and thus administer track access to other parties. The category also includes companies that are involved in the provision of signaling and communications. In some Australian states rail access providers own and control major rail yards and sidings used for the assembling, maintenance and repair of trains. In addition, many of these organisations may also be responsible for controlling train movements to ensure that trains that may be sharing the same track are separated, thereby effectively securing “train control”. Such organisations may solely specialise in the provision of rail infrastructure access which would mean that they are ‘vertically separated’. Alternatively, these organisations may be ‘vertically integrated’ meaning that they have ownership of train operating services in conjunction with being rail infrastructure access providers (Affleck Consulting 2003).

2.2 Rail Train Operators

These organisations can be broadly classified as being involved in “Private Railways” or “Public Railways” within the Australian rail industry. The Private Railway group includes a small number of train operators whose rail services are not available for hire and reward (Affleck Consulting 2003). These rail operators often have operations integrated with the extraction, refining and transportation of natural resources and minerals. Public railway operators offer rail services for hire and reward. These rail operators may thus be owned by both private and public sector entities. Train operators may also be categorised according to whether they are involved in the transportation of freight or passengers or a combination of both. Rail operators are referred to as being “horizontally integrated” enterprises if they are involved in the operation of both passenger and freight rail services (Affleck Consulting 2003).

Passenger train operators specialise in the provision of commuter, regional and/or tourist train services for the transportation of passengers within metropolitan areas, between capital cities and regional areas and also across states and territories. Commonly inter-urban service and urban commuter operators also manage and control ticketing, passenger stations and reservation systems (Affleck Consulting 2003).

The majority of rail freight operators in Australia are engaged in the commercial transportation of cargo, most commonly primary agricultural products and mineral resources. Often rail freight operators own and manage major rail yards and sidings. These serve numerous functional purposes including allowing for the provisioning and fuelling of trains. The rail yards and sidings also provide a base for the storage, assembly and en route management of trains (Affleck Consulting 2003). In addition, many freight operators also own and control intermodal freight terminals. There is a prevailing trend for freight operators to be increasingly integrated into multimodal and logistics entities (Rail CRC 2006).

2.3 Maintenance and Other Related Service Providers

These organisations are involved in the assembly, repair and maintenance of rolling stock including the overhaul of passenger carriages, locomotives and wagons. Rail enterprises classified within this category may also be involved in the hire and lease of wagons and locomotives. It also includes organisations involved in the provision of services related to the development, maintenance and inspection of rail track and other rail infrastructure, as well as of signaling and communications systems. A small subsection of enterprises classified in this group are also responsible for providing services related to the training and recruitment of specialised rail personnel (Affleck Consulting 2003).

3. Economics of the Australian Rail Industry

3.1 Overview

It is clear that an efficient rail transport sector will deliver substantial and diverse benefits to the economy. However, unique aspects of the production and consumption of rail services mean that the market is far removed from that of the standard economic textbook. Some important characteristics of the rail industry are:

- High infrastructure (sunk) costs, meaning that variable costs are very low relative to average costs. That is, once the infrastructure is in place and maintained, the marginal cost of carrying additional freight or additional passengers is very small.
- As a result of its high fixed cost structure and relatively low variable costs, the economics of rail transportation are heavily dependent on economics of scale (Productivity Commission 2006).
- These 'natural monopoly' conditions tend to result in one viable operator providing services within a given area or network, rather than a competitive marketplace.
- There are positive externalities associated with consumption of rail services. In the case of rail passenger transport, for example, these are in the form of less pollution and reduced congestion for road transport users. Further, one passenger's use of rail services generally does not limit the use of the service by other passengers - in fact greater demand leads to enhanced services by allowing more frequent schedules.

The development of an efficient rail sector, therefore, can not be left to private markets. Rather, governments must play a leading role in their structure and regulation while at the same time trying to harness benefits available from competition. How infrastructure is to be funded, the separation of activities (such as 'above track' and 'below track'), regulation of access to infrastructure and the pricing of services are all highly contentious issues. This also has implications for the labour market. Once externalities are involved and prices are influenced by regulatory decisions, the textbook link between the marginal product of labour and wages also becomes tenuous. While this paper is mainly concerned with profiling the workforce of the industry and outlining some of the labour market issues facing the sector, it may be useful to first provide an overview of the evolving structure of the Australian rail industry. Indeed, such structural reforms over the past two decades have had lasting implications for the current rail workforce.

3.2 Rail Industry Reforms

Many rail sectors in Australia could be viewed as natural monopolies. This is because the level and nature of the demand that exists for these often means that, in most cases, a single operator can provide the required level of service at a lower cost than multiple operators would be able to achieve. As capital costs are so large, most rail operators often face the prospect of extremely low marginal costs and high fixed costs (Productivity Commission 2006, Bradshaw 1997). The implication of this is that average costs continue to fall as an incumbent provider expands in scale, making entry into the market of a second provider unviable. Consequently, the vast bulk of passenger and freight rail in each Australian state came to be operated through government owned monopolies.

In recent decades, however, Australia's railway sectors have undergone significant changes. Initiatives by the Commonwealth and State/Territory Governments to promote more competition and efficiency within the rail industry have resulted in an increase in private rail activity and a decline in government ownership and management of railways (TDT 2005, Hensher et al., 1994). These deregulation policies were part of a wider microeconomic policy framework and were designed to open the rail industry to more private sector competitive forces and remove the existence of state based government monopolies (Everett 2006).

The reforms involved significant deregulation of the industry following the publication of the 1991 Industry Commission inquiry into rail transport, the 1993 Hilmer Report as well as the National Competition Policy (Everett 2006, Productivity Commission 2000a). Many of the policies that were implemented were based on a fairly broad microeconomic reform framework and involved enforcing a more commercial focus on rail operators to improve cost recovery. The structure of railways in most Australian jurisdictions consequently changed with many of the previously integrated State rail authorities being vertically and horizontally separated.

Prior to the implementation of the reforms, most railways were controlled by State specific rail organisations which managed both below and above track operations within their jurisdiction (vertically integrated) and provided a combination of urban passenger, non urban passenger and freight services (horizontally integrated). Effectively, a single government agency controlled activities such as track provision, signalling, maintenance, train operations and timetabling. The implementation of rail reforms in the 1990's however resulted in several rail networks in Australia being structurally separated (Productivity Commission 2000a).

Deregulation paved the way for the establishment of "open access" regimes which allowed competition within the rail industry by enabling competitors to have access to below track infrastructure (Productivity Commission 2000c, Everett 2006). This provision was designed to allow competition and removed the ability of state government authorities to earn monopoly rents. Following deregulation and introduction of "open access" regimes, the number of rail operators within the Australian rail industry increased from 12 in 1991 to 27 in 1999. There are presently over 30 major private rail operators in Australia compared to the 8 that existed ten years ago (RTBU 2004). Deregulation also enabled rail enterprises to extend their

operations more freely interstate and rail operators have increasingly moved towards the provision of integrated intermodal services (i.e. integration of rail with road, air and water transport services). As a result many operators have evolved from being simple linehaul operators in bulk freight or container markets, to focusing their operations on the provision of third party services in a range of integrated functions (Everett 2006).

Many commentators have also purported that the reforms have facilitated structural separation in the Australian rail sector which has enabled increased product differentiation and market segmentation within the interstate rail markets. Evidence indicates that such segmentation enhances the ability of rail operators to more effectively compete with the sea and air modes of transport. Vertical separation of the interstate rail network has enabled greater integration of niche players into the transport logistics chain and has enhanced competition between rail operators for train schedules. Vertical separation has also enabled some expansion in the geographic markets of above rail operators and allowed for improved coordination of freight flows across infrastructure networks (Productivity Commission 2000a, 2006).

Outcomes identified from the rail reforms introduced in the 1990's have included reduced freight rates, improvements in service quality and increased productivity (Productivity Commission 2000a, 2000c). In turn, this has been credited with enabling productivity improvements estimated to be worth more than \$2 billion (RTBU 2004). The development and implementation of new technologies has also strongly contributed to productivity growth within the Australian rail industry and it is likely that this trend will continue and accelerate in the future (Rail CRC 2006). The improvements in the levels of productivity and competition experienced within the Australian rail industry have contributed to an 18% decrease in freight rates over the period spanning from 1990 to 1997 and a 30% reduction in real national freight rates from 1989 to 1998 (Everett 2006, Productivity Commission 2000b).

Another consequence of the reform process and resulting labour productivity growth has been a large scale reduction in employment in the rail industry. Employment fell by around fifty percent between 1991 and 2001. The Productivity Commission estimated that the number of full time employees in the rail industry decreased from 88500 in 1986 to 36500 in 1998 (2000c). Analysis of ABS Census data also shows a halving of employment in the rail transport industry between 1991 and 2001 as reported in Mahendran, Dockery & Affleck (2006). Other factors believed to be responsible for the decline in demand for rail labour include increased competition from alternative transport modes; increased contracting/outsourcing of rail operations and the redefining of labour arrangements with greater emphasis on multitasking or multiskilling. As an example of the latter, many train drivers are now responsible for a wider range of duties including inspecting locomotives, planning shunting work and completing minor repairs (TDT 2005, Productivity Commission 2000a).

The fall in rail employment in Australia may also have been partly due to the large increases in real average labour costs which were recorded by many rail operators following the introduction of Enterprise Bargaining Agreements in 1992-93 and 1996-97. One study reported that over the period spanning from 1990 to 1998 real average labour costs, as a proxy for remuneration, increased by 27% within the Australian rail industry (Productivity Commission 2000b). Research reveals that the losses in

employment among rail workers was less pronounced in Australian capital cities than in less densely populated regions such as rural and outer-city areas. A “Progress in Rail Reform” Report released in 2000 revealed that approximately two thirds of the 60% reduction in railway employment that occurred since 1986, was concentrated in regional areas, with devastating economic implications for some rural communities (Productivity Commission 2000a). The greatest reductions were recorded for occupational groups relating to clerical and service staff, labourers, tradespersons and managerial staff, all of which experienced a decrease of more than 50% in the number of their workers.

4. Profile of the ARTI workforce based on Analysis of ABS Census Data

This section provides a thorough, contemporary analysis of the current profile of the Australian rail transport industry workforce and of recent employment trends in the sector. Specifically it examines data from the four most recent ABS Population and Housing Censuses including the 1991, 1996, 2001 and 2006 Census. Data on rail employment is available from a number of existing published reports. Estimates of employment vary according to the methodology that is used and depending on how the ‘rail industry’ is defined. The only existing data source on employment in the Australian rail transport industry (ARTI) that is comprehensive enough to enable a detailed analysis is the full population Census.

4.1 Aggregate Employment

The 2006 ABS Census data reveals that there were 29,383 workers employed in the Australian Rail Transport Industry (ARTI). This is a decrease from the corresponding 1996 Census figure of 33,295 and represents a significant fall from the 54,677 rail transport employees recorded by the 1991 Census. Collectively the Australian rail workforce was downsized by over 85 percent in the time span between 1991 and 2006. Total employment in all industries grew by almost 9 percent over the 15 year period. In contrast, between 1991 and 2006, the ARTI’s share of employment more than halved, declining from 0.77 percent of total employment in 1991 to only 0.32 percent in 2006. Between 2001 and 2006, there was however a slight rise in employment within the rail transport industry across Australia of 1.7 percent.

4.2 Employment by Occupation

The 2006 Census Data indicates that there is still a predominant concentration of rail workers within the occupational category “intermediate production and transport workers”, as was also apparent in the national rail workforce data from 2001 and 1996 Censuses. The most prevalent occupation within the “intermediate production & transport workers” category is that of drivers, representing over 70 percent of jobs in the occupational group and about one fifth of all jobs in the rail sector. “Intermediate plant operators” are another prominent group of professionals within the “intermediate production & transport workers” category, accounting for approximately 23 percent of employees within the occupational group. The 2006 Census data also reveals that more than 80 percent of trade personnel in the ARTI were employed within the fabrication engineering trades and the electrical trades.

Table 1: AUS- Employment shares by occupation, Rail and All industries, 2006

	Rail Industry					All Industries
	1996 share (1)	2001 share (2)	2006 share (3)	Change in share (3) - (2) % pts	Change in share (3) - (1) % pts	2006 Share
1. Managerial	2.9%	4.9%	5.7%	0.8%	2.8%	9.2%
2. Professionals	4.9%	7.4%	9.7%	2.3%	4.8%	19.6%
3. Associate Professionals	6.4%	8.7%	8.8%	0.1%	2.4%	12.2%
4. Tradespersons	14.2%	11.0%	11.0%	0.0%	-3.2%	12.3%
5. Advanced Clerical & Service Workers	1.5%	1.8%	1.7%	-0.1%	0.2%	3.2%
6. Intermediate Clerical & Service Workers	10.6%	11.4%	9.9%	-1.5%	-0.7%	17.2%
7. Intermediate Production & Transport Workers	31.7%	31.5%	30.2%	-1.3%	-1.5%	8.2%
8. Elementary Clerical, Sales & Service Workers	12.9%	13.6%	15.0%	1.4%	2.1%	9.6%
9. Labourers & Related Workers	15.0%	9.8%	8.0%	-1.8%	-7.0%	8.5%
Total	100.0%	100.0%	100.0%			100.0%

In absolute terms, the greatest falls in employment in the ARTI between 1996 and 2006 were within the “labourers and related workers” occupational group (down by 2587 workers) with the vast majority of the decline within this group being recorded amongst “other labourers & related workers” (loss of 2065 workers). A large decrease in employee numbers was also recorded in the period between 1996 and 2006 amongst “intermediate production & transport workers” (down by 1623 workers), with falls being recorded for all professions classified within this occupational group. The largest quantitative fall in employee numbers within the occupational group was however reported amongst “intermediate plant operators” (recorded a decrease of 758 workers) and “road and rail transport drivers” (down by 502 workers).

Large falls were also reported among the number of workers employed within trade professions (down by 1452 workers). The greatest declines in jobs within this occupational group were among mechanical & fabrication engineering tradespersons (reported a decrease of 494 workers), electrical & electronics tradespersons (recorded a fall of 423 workers) and construction tradespersons (down by 369 workers). Another occupational group in which a considerable decrease in employment was reported was amongst “intermediate clerical, sales & service workers” (decreased by 599 workers). Most of the decline in employment within this occupational group was recorded for intermediate clerical workers (down by 544 workers). The largest increase in employment in absolute terms within the ARTI between 1996 and 2006 was recorded for the occupational group “professionals” (increased by 1226 workers). Increases in employment over the decade between 1996 and 2006 were also reported for “managerial” staff (increased by 692 workers) and “associate professionals” (increased by 476 workers).

4.3 Employment by Qualification

Table 2: AUS- Employment shares by level of qualification, Rail and All industries, 2006

	Rail Industry					All Industries		
	1996 share (1)	2001 share (2)	2006 share (3)	Change in share (3) - (2) % pts	Change in share (3) - (1) % pts	2001 Share (4)	2006 Share (5)	Change in share (5) - (4) % pts
Postgraduate Degree	0.80%	1.6%	2.9%	1.3%	2.1%	2.9%	4.0%	1.1%
Grad Diploma & Grad Certificate	0.40%	0.9%	1.2%	0.3%	0.8%	2.2%	2.2%	0.0%
Bachelor Degree	4.20%	7.2%	10.3%	3.1%	6.1%	14.9%	17.1%	2.2%
Advanced Diploma & Diploma	3.40%	4.7%	6.7%	2.0%	3.3%	8.2%	9.5%	1.3%
Certificate Level	*24.5%	26.2%	29.8%	3.6%	5.3%	21.6%	22.7%	1.1%
No Recognised Qualification	66.60%	59.5%	49.1%	-10.4%	-17.5%	50.3%	44.5%	-5.8%
Total	100.0%	100.0%	100.0%			100.0%	100.0%	

*NOTE: The 1996 figure for Certificate Level was derived by adding Certificate (skilled vocational) & Certificate (basic vocational)

The 2006 Census data indicates that the rail transport sector has largely maintained its status as a relatively lowly skilled industry, a standing which is reflective of the formally recognised skill level of the great majority of workers employed in the Transport & Storage Industry (TDT 2005). According to the figures the vast majority of rail employees have no recognised qualification with almost half of the workers

nationally, identified as falling into this category. This group of unskilled rail workers however was the only group to report a fall in employment share between 2001 and 2006 (recorded a decline of more than 10 percent). This decrease in employment share was almost double what was reported for the same category of workers for all industries over the same period. In the ten years from 1996, the employment share of rail transport workers without a recognised qualification fell by more than 17 percent. However, caution must be taken in investigating the trends between the Censuses as the classifications of qualifications changed from 1996 to 2001. Most notably, in 2001 certificates were no longer distinguished as basic or skilled as they were in 1996. Irrespective of this, a general trend towards higher levels of qualification within the rail workforce was still evident.

The 2006 Census data revealed that approximately 30 percent of rail workers possessed certificate level qualifications, thereby representing the qualification that most rail employees were likely to have. The Census figures also indicate that the rate of growth in the proportion of employees with certificate level qualifications was also higher between 2001 and 2006 for the ARTI compared to all industries (with the rate of growth for the rail industry being more than three times what was recorded for all industries). The employment share of rail workers with bachelor degrees and or advanced diplomas & diplomas also increased between the two most recent Census periods. However despite growth in these groups of workers between 2001 and 2006 being higher in the ARTI compared to what was reported for all industries, the proportion of rail employees with either of these qualifications was still noticeably lower than the average recorded for employees in all industries. Workers with postgraduate degrees and/or graduate diplomas & graduate certificates had the lowest employment share, accounting for less than 5 percent of the national rail workforce.

4.4 Age Profile

Figures 1 and 2 clearly indicate the aging phenomenon which has occurred within the Australian rail workforce. In the comparison of the age profiles for the ARTI between 1991 and 2006 presented in Figure 1, the significantly lower representation of workers aged 15-34 years in 2006 is clearly evident. The percentage of rail transport employees aged less than 35 years in 1991 was 40 percent. However 15 years later, the figure representing rail workers belonging to the same age group was only about 24 percent. This is indicative of a disturbing fall in the recruitment of entry level workers within the industry.

Figure 1: Age profile of the rail workforce; 1991 and 2006

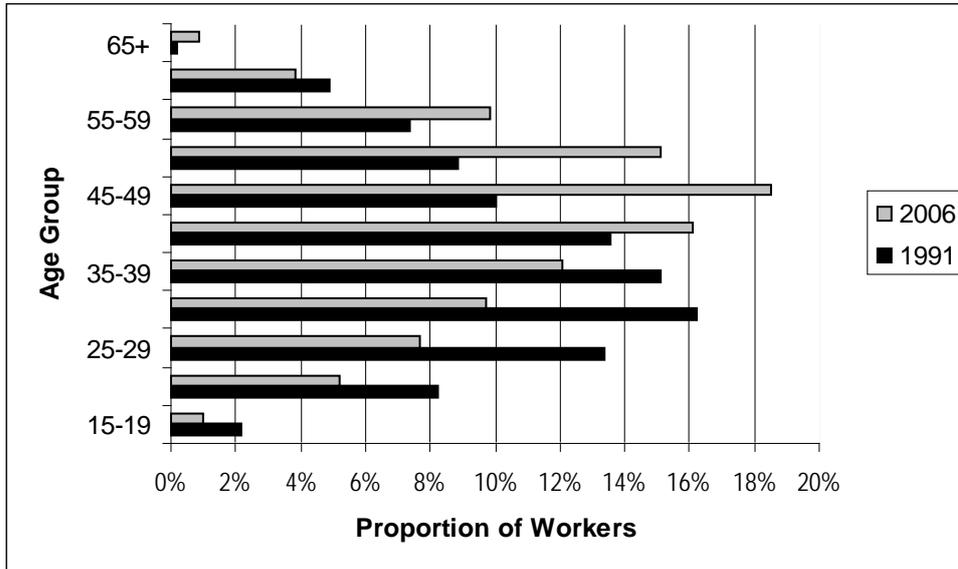
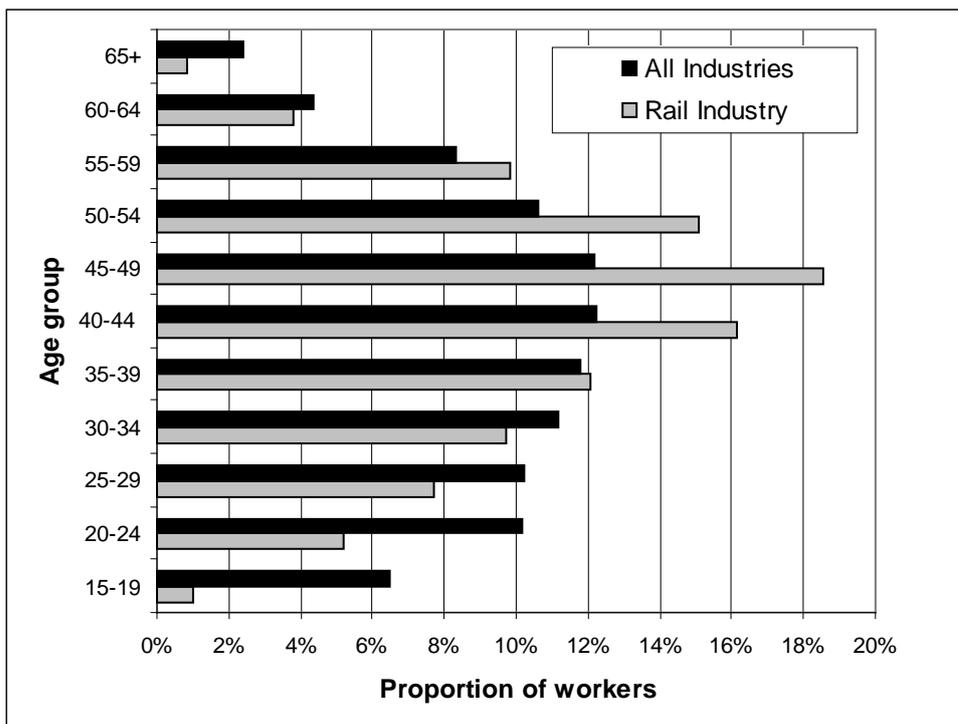


Figure 2: Age profile of the workforce; rail industry and all industries, 2006



The higher proportion of workers in the 35-59 age group and the under-representation of employees younger than 35 in the rail industry relative to all industries nationally in 2006, is clearly depicted in Figure 2. According to the 2006 Census data, workers aged less than 35 comprised approximately 38 percent of the overall Australian workforce compared to 24 percent in the rail transport sector. The rail industry also had a considerably higher percentage of employees aged between 35-59 years with this age group constituting almost 72 percent of its total workforce, while the corresponding figure for workers in this age group in all industries was only 55 percent.

The 1991 Census figures revealed that the average age of employees in the rail sector was 39, compared to 37 for workers in all Australian industries. By 2006 the average age of rail transport workers had rose to 42.9 years, which was almost 3.5 years older than the average age of employees in all industries. A comparison of the average age of workers in the rail industry and the wider Australian workforce by occupational group based on 2006 Census data, is presented in Table 3. The figures indicate that male rail employees in each occupational category are on average older than their counterparts in other industries. Consistent with findings from the 2001 Census, the average age of female rail employees was less than was the case in the general workforce in all occupational groups with the exception of intermediate and elementary clerical, sales and service workers and labourers and related workers. However due to the relatively small proportion of female rail employees in the ARTI, this finding has little bearing on the overall age profile of the rail workforce.

Table 3: Average age by occupation and gender, rail industry and all industries, 2006

	Males		Females	
	Rail	All Industries	Rail	All Industries
Managers	45.8	45.6	39.5	44.0
Professionals	42.2	41.8	34.6	40.3
Associate Professionals	44.8	41.2	38.0	39.9
Tradespersons & Related Workers	40.4	37.5	32.6	36.8
Advanced Clerical & Service Workers	45.0	41.5	37.1	41.9
Intermediate Clerical, Sales & Service Workers	45.2	38.5	38.1	38.1
Intermediate Production & Transport Workers	44.8	40.8	37.2	40.0
Elementary Clerical, Sales & Service Workers	42.2	34.0	39.1	33.0
Labourers & Related Workers	43.5	37.1	44.4	41.1
Total all Occupations	43.7	40.0	38.0	38.9

4.5 Employment by Gender

Data from the 2006 ABS Census revealed that female employees comprised approximately 15 percent of all rail workers nationally. This represented a slight increase of 3 percent from the figure for female representation derived from the 2001 ABS statistics. The Census figures also indicated that there was an increase in the percentage of female rail workers recorded for all occupational groups between 2001 and 2006. This was most pronounced amongst professional personnel, which as an occupational group experienced an almost 7 percent increase in the representation of females. Other occupational groups where growth in the proportion of women workers was evident was in relation to managers, associate professionals & intermediate clerical and sales workers for whom a 3-4 percent rise was reported. These findings seem to indicate a trend towards the increased employment of women in intermediate to highly skilled professions within the rail industry between 2001 and 2006.

It is evident from Table 4 that approximately 56 percent of all female rail workers were employed in clerical, sales and service positions. The total percentage of males employed in occupations within the advanced, intermediate or elementary clerical, sales and service occupational group was less than half that of females at around 22 percent. The occupational categories that did have a high proportion of male employees included the trade professions, intermediate production and transport workers and labourers and related workers. Looking at specific occupations more closely, women workers represent just over 1 percent of trade workers, 2.4 percent of transport drivers, 2.6 percent of intermediate plant operators and more than 98 percent of secretaries and personal assistants. The Census also indicated that the high degree of occupational segregation by gender has remained relatively unchanged between 1991 and 2006.

Table 4: Employment by occupation and gender, 2006, Australian rail industry

	Number Employed		%	Share of Employment	
	Male	Female	Female	Male	Female
Managers	1402	241	14.7%	5.7%	5.7%
Professionals	2112	699	24.9%	8.6%	16.5%
Associate Professionals	2064	492	19.2%	8.4%	11.6%
Trades & Related Workers	3138	36	1.1%	12.7%	0.8%
Adv. Clerical & Service Workers	169	321	65.5%	0.7%	7.6%
Interm. Clerical, Sales & Service Workers	1905	941	33.1%	7.7%	22.2%
Interm. Production & Transport Workers	8491	231	2.6%	34.5%	5.4%
Elem. Clerical, Sales & Service Workers	3247	1090	25.1%	13.2%	25.7%
Labourers & Related Workers	2115	195	8.4%	8.6%	4.6%
Total all Occupations	24643	4246	14.7%	100.0%	100.0%

5. Conclusion

The rail sector is thus having to contend with an aging workforce and further labour shortages that are likely to result from the imminent retirement of senior staff and older workers. The ageing of the industry's workforce is also likely to mean more workers in the sector will face a range of health issues. This includes such things as diminished hearing, sight, reactivity, impaired movement and the increased prevalence of age related diseases such as Type 2 Diabetes. All these may adversely impede the ability of employees to work efficiently, thereby contributing to reduced productivity and other labour problems. The relevance of this is particularly pertinent to the rail transport industry due to the physical nature of the work undertaken by the majority of employees, the stringent health and safety standards that have to be met and the often high risk work environment that much of the workforce is exposed to.

Due to the high proportion of older rail workers occupying positions of seniority, their eminent departure from the workforce due to retirement or other reasons is likely to result in a substantial loss of industry experience and expertise. This is of particular concern in a number of key rail occupations and is especially pertinent considering that there is likely to be an insufficient pool of adequately experienced and skilled workers available to replace them. The loss of experienced workers will also mean there will be a lack of mentors to effectively train and develop the younger workers. A lack of effective workforce planning and training of younger rail workers by Australian rail operators can thus be identified as having contributed to the skilled labour shortages currently being experienced by the industry nationally.

The skills crisis facing the rail sector is likely to be further exacerbated by the realisation that the industry has been largely unsuccessful in attracting new recruits. The problem is also complicated by the fact that over past decades the rail sector has enjoyed the benefits of having a very loyal, passionate and dedicated workforce who maintained a largely "cradle to grave" perspective in relation to their careers within the industry. This combined with the prevalence of traditional rail families helped to ensure sufficient numbers of recruits could be attracted and retained to continue working within the industry on a long term basis. However in recent times with the decline in traditional rail families and the changing employment attitudes of younger workers, much of the appeal that was once associated with a career in the rail industry has been diminished.

As has been identified elsewhere (see, for example, Department of Education, Science and Training 2006), the task of enticing more younger workers into embarking on and pursuing employment within the rail sector would be made easier if the image of careers within the rail industry could be markedly improved. Factors identified as negatively impacting the attraction and recruitment of workers into the rail transport sector included such things as the lack of clear career pathways, the industry image (i.e. as old, dirty and unsophisticated) and specific issues relating to the employment of younger workers (such as the attitudes of most "Generation Y" employees concerning the traditionally hierarchical nature of most rail workplaces).

It would also be prudent for the industry to address the entrenched gender segregation that exists with regard to the major semi-skilled occupations in the sector. Currently, half of the potential supply of young workers is effectively excluded from major rail occupations, such as driver and intermediate plant operator positions, due to the almost complete domination of males within these occupations. Policies to address this imbalance would likely require the inclusion of greater flexibility with regard to working hours, combined with other family-friendly working arrangements and a visible antidiscrimination regime.

One potential strategy rail operators could attempt to implement to mitigate some of their workforce problems would be to try to encourage older rail workers to delay retirement. This is likely to involve offering older employees more flexible working conditions and improved financial incentives in an effort to encourage them to continue working. Such measures have been perceived as necessary, to address the challenges of population ageing in the wider Australian economy. If this could be achieved in the ARTI, it would smooth the anticipated spike in wastage rates associated with the concentration of workers in the older age groups and at least delay emerging skills shortages, thus allowing greater time for human resource adjustments to be made.

Rail operators could also offer and sponsor more training opportunities for employees in order to further minimise the skills shortages they face. This would be particularly pertinent to rail employers who have previously not trained workers. For example in occupations that don't require a tertiary qualification, promoting more apprenticeship programs would be an effective method of training employees for specialised roles through a combination of classroom and on the job training. Rail employers could thus boost their efforts to deliver more internal training to new recruits and existing workers. Other training options available to rail operators would be to develop more collaborative training programs in cooperation with affiliated training organisations and educational institutions such as universities and TAFEs. In some cases, rail employers may not even have to bear the full cost of such training because it may be partially funded and supported by government bodies, workers and/or industry groups.

Many competing industries have already made significant progress towards ensuring their skill needs are met and so in this regard the rail industry could be viewed as being behind in developing effective strategies to tackle the issue. As other competing industries seek to improve their practices and strategies for attracting and retaining workers in the future, the challenge facing the rail sector to ensure it has an adequately qualified and trained workforce is likely to become even more difficult. Therefore unless effective action is taken to address current and emerging workforce issues within the sector, the ARTI may well have to contend with being in the arduous predicament of having to compete for a declining portion of the skilled labour available in the market, in addition to having to tackle the potentially adverse implications that the workforce issues it faces may have on the productive capacity of the industry.

References

Affleck Consulting 2003, *The Australian Rail Industry: Overview and Issues- Report prepared for the National Road Transport Commission.*

Apelbaum Consulting Group 2005, *Australian Rail- The 2004 Productivity Report*, Australasian Railways Association [ARA] Inc., Australia.

Australian Bureau of Statistics. 2006. *Australian Social Trends 2006*, Cat. no. 4102.0, ABS, Canberra.

Bradshaw, W. 1997. Competition in the rail industry. *Oxford Review of Economic Policy*, 13 (1): p 93-103

Bureau of Transport and Regional Economics [BTRE]. 2006. *Freight measurement and modeling in Australia*, BTRE, Report 112, Department of Transport and Regional Services, Commonwealth of Australia, Canberra.

Everett, S. 2006. Deregulation and reform in Australia: Some emerging constraints, *Transport Policy*, 13 (1): p 74-84, January.

Hensher, D.A, Daniels R., DeMellow I. 1994, *Revisions and Update: Productivity of Australian Railways 1971/71 to 1991/92*, Institute of Transport Studies, Graduate School of Business- The University of Sydney.

Mahendran, Anusha, Alfred Dockery, and Fred Affleck. "Skill shortages in the Australian rail industry." In *8th Path to Full Employment Conference and 13th National Conference on unemployment*, edited by Graham Wrightson, 157-168, Australia: Centre of Full Employment and Equity (CofFEE), 2006

Productivity Commission. 2000a. *Progress in Rail Reform*, Productivity Commission (Australian Government), Canberra.

Productivity Commission. 2000b. *An Assessment of the Performance of Australian Railways 1990-1998*, Productivity Commission (Australian Government). Canberra

Productivity Commission. 2000c. *Draft Report- Progress in Rail Reform (Media Release)*, Productivity Commission (Australian Government). Canberra

Productivity Commission. 2006. *Road and Rail Infrastructure Pricing*, Productivity Commission (Australian Government). Canberra

Rail Collaborative Research Centre [Rail CRC] 2006, *Research: Theme 6 Industry Skills Development (Education and Training)*, Rail CRC. Australia

Rail, Tram & Bus Union [RTBU] 2004, Skills Crisis in Australia's Railways. *Rail, Tram & Bus Worker*, 12 (3): p 1

Transport and Logistics Industry Skills Council [TDT] 2005, *Industry Skills Report*, Australian National Training Authority, February, p 9-28.