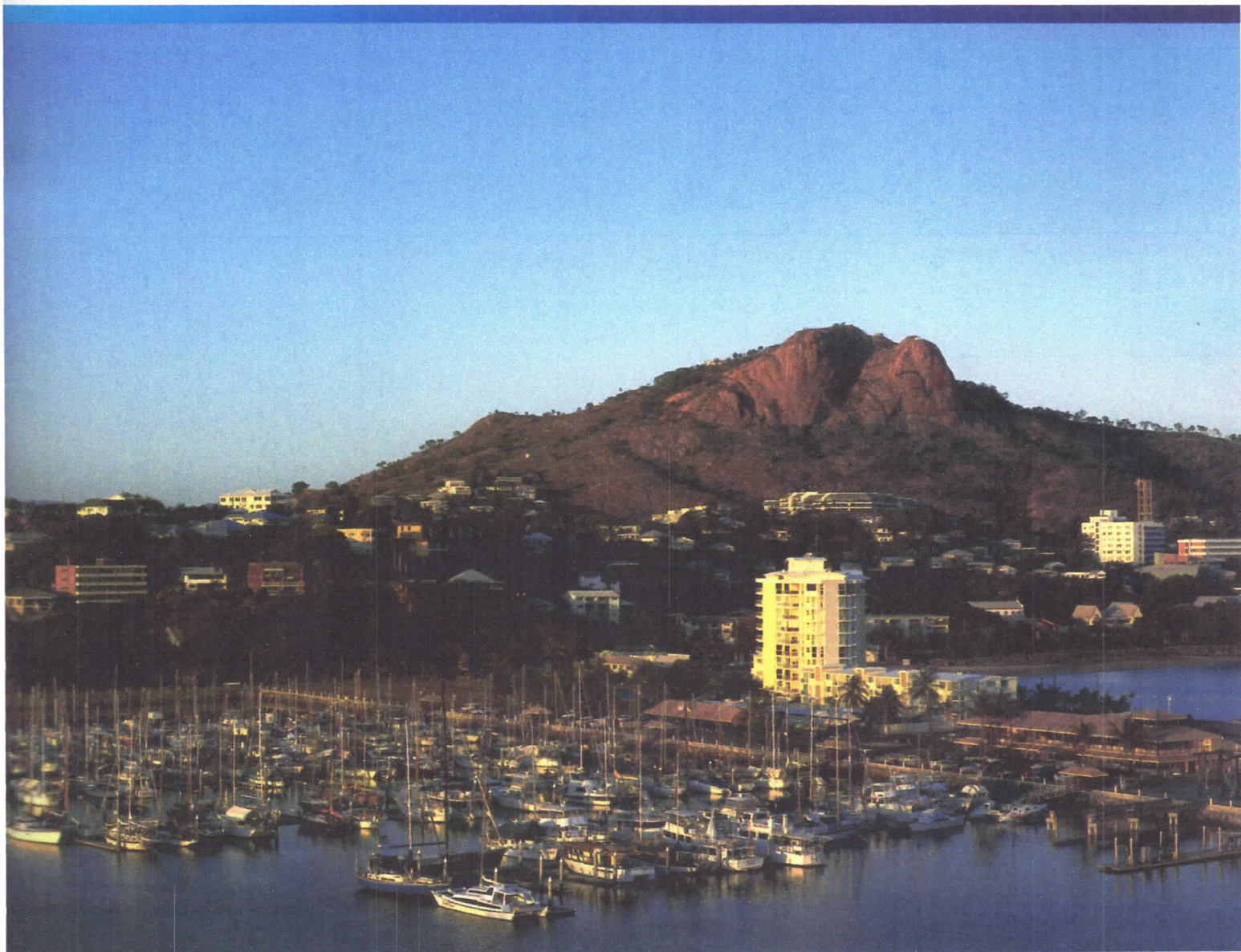


A holistic analysis of the socio-economic impact of the Australian Defence Organisation and its interaction with the city of Townsville

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Executive Summary

This report assesses the socio-economic impact of Australian Defence Organisation (ADO) Townsville on the Townsville-Thuringowa (TT) region in the period between 2006 and 2016. ADO Townsville will complete significant expansion within this period. We study the socio-economic impact of ADO Townsville pre-expansion (2006/2007), the economic impact of the required activities to accommodate the expansion (2009-2011) and the socio-economic impact of ADO Townsville post-expansion (2012 onwards).

A. Methodology

The results presented in this Report are based on a minimum number of assumptions which increases the accuracy of its outcomes.

The Report:

- is one of the first of its kind to use the 2004/2005 input-output tables released by the Australian Bureau of Statistics (ABS) in November 2008. This means that we are not reliant on the 1996/1997 data (the previous update) which would have required us to assume that the structure of the Townsville economy had remained unchanged over the last decade. We consider this would have been a difficult assumption to make given the strong economic growth and diversification of industry within the study region;
- uses cutting edge techniques to update the model to the financial year 2006/2007;
- uses complementary survey data from ABS Census 2006 and Defence Census 2007. The latter data set has the lowest response rate, which is still 65%, implying the representativeness of survey outcomes included in the Report is very satisfying;
- applies innovative techniques to use economic behaviour to demarcate the relevant region to study the impact of ADO Townsville, rather than using statistical regions that are often arbitrarily demarcated. Again this should improve the outcomes markedly;
- is time consistent? All additional data used in the Report are from 2006/2007. We therefore need not make awkward assumptions about temporal consistency;
- is space consistent? All additional data used in the Report are congruent to the demarcations of the relevant region under investigation, implying no further constraining assumptions need to be made about spatial consistency.

B. Defining and depicting the region

ADO Townsville is situated in the city of Townsville, which is a so called 'functional economic region'. Functional economic regions are regions which have a high degree of economic independence. It is this economic independence which makes a functional economic region and in our case, the city of Townsville, an ideal demarcation for measuring the impact of ADO Townsville on the region.

The city of Townsville consists of two hubs: Townsville and Thuringowa, in which in total 157,000 people reside. The demographics of the region show the population is substantially younger than the Australian average, which feeds differences in terms of marital status and in the housing market.

Furthermore, we find that:

- the 'Mining', 'Construction', and the 'Defence' sectors stand out in the region compared to the Australian average;
- these industry sector differences feed into occupational differences between the region and the Australian average, in favour of 'Technicians and Trades Workers', 'Community and Personal Service Workers', and 'Machinery Operators and Drivers';
- the dominance of these lower occupational levels also shows up in lower educational attainments in the region compared to the Australian average;
- average earnings in the region are nonetheless comparable to the Australian average, because workers employed in the three high demand occupations receive about 9% wage premiums;
- ADO Townsville is one such employer that pays higher than average wages and as opposed to the other two dominant employers (mining and construction) is a stable employer.

C. Direct socio-economic impact of ADO Townsville on the TT region

The direct economic impact of ADO Townsville on the local economy consists of:

- demand for locally produced goods and services worth 150 million dollars annually;
- supply of goods and services to the local economy worth 65 million dollars annually;
- wage provision to its personnel who reside in the region, worth 330 million dollars.

The first and third contribution will lead to further indirect economic effects, discussed under D.

ADO Townsville employed 6,180 employees in 2006/2007 who reside in the region and further support nearly 8,000 partners and dependent children. That implies the ADO Townsville community constitutes about 9% of the region's total population. This community relies on social structures provided by the region. We used the nationwide performance on housing affordability/availability, health care, and child care and education as a benchmark to analyse the performance of the region with respect to these three social domains.

We find that:

- the housing market in the TT region does not expose residents to more affordability and availability problems than it does in the major Australian capitals;
- health care provision (*i.e.* GP services) in the TT region is 2.5% under funded compared to the Australian average;
- child care support availability is slightly less of a concern to ADO Townsville members than to the average ADO member in Australia. However, about a third of ADO uniformed members in the TT region, experience child care support constraints. Affordability is the main reason for such concerns both locally and nationally;
- primary / secondary education (*i.e.* FTE teachers) is 21% under funded in the TT region compared to the nationwide average.

D. Indirect impact of ADO Townsville on the TT region

The economic influence of ADO Townsville stretches further than the direct impact it has on the economy through expenditures on goods and services, and wages. Expenditures on locally produced goods and services, and wages provided to locally residing personnel will (partly) be reinjected into the local economy and lead to further economic activity.

We find that:

- the 490 million dollars in direct spending leads to a further 656 million dollars worth of output in the region, which is indirectly attributable to ADO Townsville;
- once the indirect impact of ADO Townsville is factored in, ADO Townsville accounts for 10.3% of regional GDP;
- sectors 'Agriculture, Forestry and Fishing', 'Wholesale Trade', 'Retail Trade', 'Accommodation and Food Services', 'Financial and Insurance Services', and 'Rental, Hiring and Real Estate Services' are the main benefactors of ADO Townsville activity once indirect impact is factored in.

E. ADO Townsville expansion

ADO Townsville will welcome 3 RAR in late 2011. The preparatory work required to accommodate 3 RAR in 2012 will provide an economic stimulus, which is worth:

- 490 million dollars in direct spending in the local economy;
- 643 million dollars in further indirect spending in the local economy.

Consequently, the preparatory work to expand ADO Townsville will generate 1.1 billion dollars of direct and indirect spending in the local economy. The construction industry will be the main benefactor of this stimulus. This spending coincides with a recessionary climate in the TT region, which implies that ADO Townsville will make a substantial contribution to pulling the local economy through the current rough economic conditions.

Once the integration of 3 RAR in ADO Townsville is completed in 2012, the local economy will receive a 1.5% boost in GDP growth because of the upsizing of ADO Townsville. ADO Townsville's impact on the local economy will simultaneously increase from 10.3% to 11.6% once the expansion is completed, all else equal.

The expansion of ADO Townsville together with demographic developments in the TT region will have repercussions in the social domain as discussed under C.

The expansion of ADO Townsville will:

- lead to sustained demand for housing in the years ahead. Population is projected to grow at a fast rate as well, which implies that demand for housing will remain high through to 2016. However, the region does not face supply constraints that would necessarily lead to a tightening of the housing market in the 2009-2016 period;
- together with demographic developments (*i.e.* growing and ageing population) in the TT region lead to sustained demand for health care through to 2016. The 2.5% health care deficit of the region compared to the nationwide average will widen in the 2009-2016 period if no policy change is implemented which is urgently needed to accommodate health care demand;
- together with the projected growth of the population in the TT region increase demand for child care and education. However, the changing demographic (*i.e.* ageing population) will reduce demand for child care and primary / secondary education, leaving the overall direction of demand ambiguous in the 2009-2016 period. However, given the existing 21% deficit of teaching capacity in the region (compared to the national average), urgent policy change is needed in this social domain as well.

1. Introduction

The Australian Defence Organisation (ADO) – which includes uniformed (service personnel) and non-uniformed members (defence civilians) – operates bases and other facilities throughout Australia, leading to a scattered picture of significant pockets of economic activity and employment throughout Australia. The ADO requires a better understanding of the socio-economic impact of its bases on the local economy in which it is located. To obtain such an understanding, the ADO has commissioned James Cook University (JCU) to conduct an analysis of one such locality: ADO Townsville.

The outcomes of this study should serve at least three purposes.

First, the study should inform the ADO about the interaction between them and the local economy of Townsville. That is, the ADO requires a holistic overview of the wider implications of their day-to-day business decisions, which include the economic spill over effects in the local economy resulting from ADO activity.

Second, the study should inform the ADO about the social impact of the ADO on the regional community. Such an analysis will underpin the findings under 1) and subsequently contribute to an understanding of the social interaction of the ADO and the wider community and provide pathways to both the ADO and the community to optimise the added economic and social value of the ADO to the community.

Third, the study should inform the ADO of implications (informed by the analysis under 1) and 2)) of expanding the ADO in the region in the foreseeable future. The study should reveal such implications which will allow both the ADO and the wider community to take measures to accommodate anticipated change in a timely manner.

The ADO operates army, air force and marine base activities in the Townsville region. Additionally, the ADO operates a number of facilities through Defence Civilians in the region. However, the dollar value and personnel component of marine activities is negligible compared to the army and air force activities in the region. This report therefore concentrates on the activities at Lavarack Barracks, Jezzine Barracks, Ross Island, RAAF Base Townsville Air Force and Civilian support services (including Defence Community Organisation (DCO), Defence Support Group (DSG), Defence Housing Australia (DHA)).¹ Consequently, throughout this report we use the term ADO Townsville to cover the broad range of defence activities in the region.

The report will use the financial year 2006/2007 as the starting point, which is the most recent year for which a complete broad scale of data is available, which is necessary to complete the task set out above – most notably the Australian Bureau of Statistics (ABS) Census 2006 and the Defence Census 2007. Our choice of using data from 2006/2007 and not to include older or more recent data in the analysis will ensure our analysis is time-consistent. Finally, the financial year 2006/2007 was a 'business-as-usual' year for ADO Townsville, which means that the financial data we retrieved from ADO Townsville for that financial year represent a normal spending pattern. The latter two arguments are necessary conditions to project forward as we intend to do.

The report is structured as follows.

- Section 2 will focus on the local economy in which ADO Townsville operates. We will set the demarcations of the relevant region to study the impact of ADO Townsville, before depicting the industrial and occupational structure of that local economy and explore key demographic patterns of the region;
- Section 3 will analyse the direct economic contribution of ADO Townsville to the region and the requirements ADO Townsville places on the region in the social sphere to function optimally;
- Section 4 examines the dynamics and the interaction between ADO Townsville and the local economy, which will reveal the importance of ADO Townsville to the local economy;
- Section 5 will forecast the socio-economic consequences of the expansion of ADO Townsville which will be completed in 2012;
- Section 6 will provide concluding remarks.

¹ Activities on Jezzine Barracks were relocated to Lavarack Barracks in 2008.

2. Defining and depicting the region

To understand the interaction between ADO Townsville and the region in which it is located, we need a thorough appreciation of what the economy of that region looks like. This report and hence this section therefore starts with a discussion of the key features of that region. However, before presenting that overview of the region, we first and foremost require a clear definition of what we consider the region to be. This will be the first task of this section.

2.1 Defining the impact region

Choosing the size of the area that is likely to be affected by ADO Townsville activities is an important but also difficult exercise. The impact follows the pattern of a raindrop falling into a puddle of water, *i.e.* the raindrop causes a ripple at the centre of impact, which moves through the water and subsequently has an impact on water which is more distant from the centre of impact. However, the amplitude of that ripple will fade the further the ripple has moved away from the centre of impact, but that additional impact is typically not zero even for significant distances from the centre of impact.

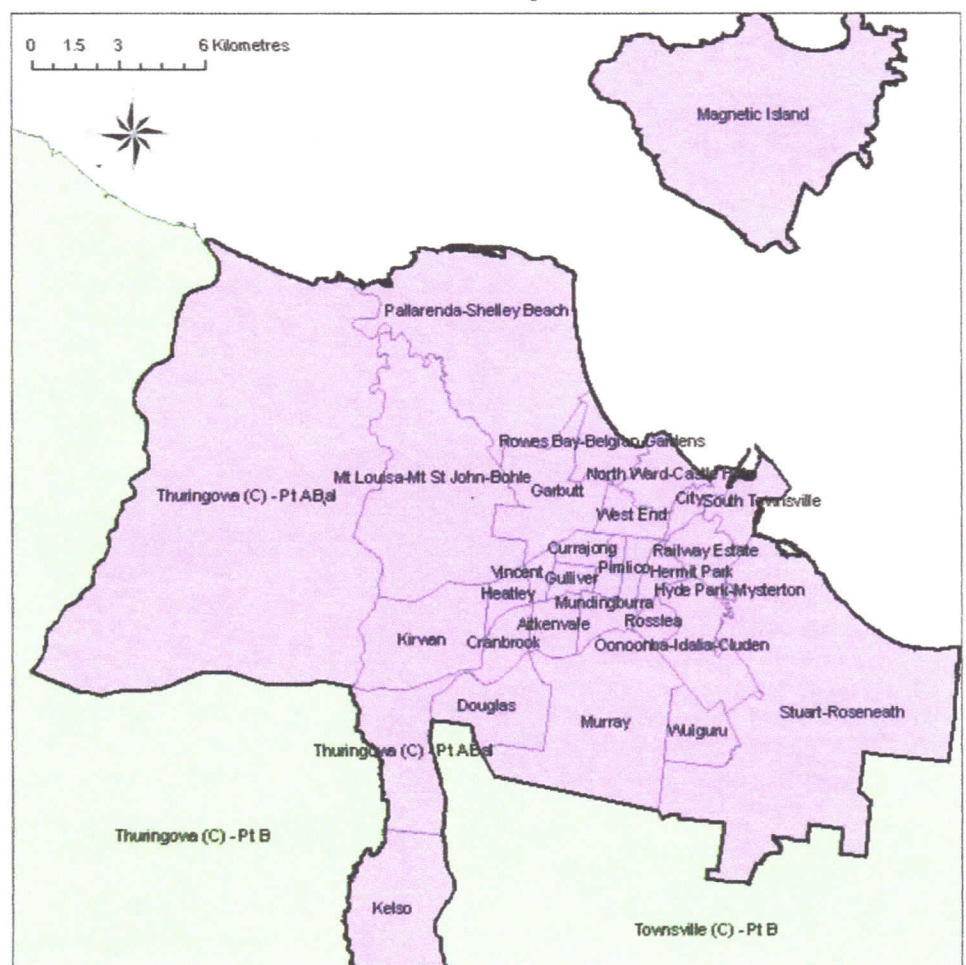
We face a similar trade-off in establishing the relevant size of the regional economy under investigation. Enlarging the regional economy will enhance capturing the total impact of ADO Townsville, but it will blur the intensity of the interaction of ADO Townsville on that larger region.

To inform our definition of the region we rely on so-called 'functional economic regions', which have been developed by the Centre of Full Employment and Equity based at the University of Newcastle to demarcate the relevant size of a region. Functional Economic Regions (FERs) are established by studying economic behaviour in the form of commuting flows – see Mitchell and Flanagan (2009). Using a FER to demarcate the relevant region for our study is superior to using the often arbitrary statistical demarcations employed by the ABS, which are not necessarily based on economic activity. However, the FER in which ADO Townsville

is located coincides with the Townsville Statistical District, which implies we can nonetheless rely on the ABS regional classification. Figure 2.1 shows the Townsville Statistical District in purple.

Broadening the focus area beyond the FER will only have limited added value, but potentially large discrepancies as it will include areas which are largely unrelated to ADO Townsville activities whose inclusion would subsequently blur the overall impact of ADO Townsville in this study. Consequently we will focus on the Townsville Statistical District in this report. As we will see in Section 3 of this report, wage accumulation is the driving force behind the impact of ADO Townsville in the region. We deduce from the Defence Census 2007 that 99% of ADO Townsville personnel reside in the Townsville Statistical District. Consequently, our choice for the Townsville Statistical District will be an accurate one. From here on we will use the abbreviation TT region (Townsville / Thuringowa region) to refer to the Townsville Statistical District.

Figure 2.1 Townsville Statistical District – Source: ABS



2.2 Depicting the impact region

The TT region consists of two statistical local areas: the major hubs Townsville and Thuringowa. According to regional population growth statistics sourced from the ABS, Townsville had a resident population of 98,500 in 2006, while Thuringowa's resident population totalled 58,500, which brings the total resident population of the TT region to 157,000.

Table 2.1 provides some key demographics for the TT region compared to the Australian average, using the 2006 ABS Census. We note some substantial differences. Inhabitants of the TT region are more likely to have been born in Australia and also more likely to have an indigenous background. The TT region's population is substantially younger than the Australian average, as the statistics in Table 2.1 demonstrate. This age difference between the TT region and Australia drives many other differences. It feeds differences in marital status (more never married inhabitants in the TT region) and in the housing market (more tenants in the TT region). As we will see in Sections 3 and 5, the age difference has implications for social service provision in the TT region in 2006 and beyond – notably health care provision.

Table 2.1 Demographic comparison of TT region and Australia (% shares), 2006

Demographics	TT region	Australia
Country of birth:		
Australia	81.6	70.9
Of whom: indigenous persons	7.0	3.2
Cumulative age groups:		
0 – 4 years	7.1	6.3
0 – 14 years	21.7	19.8
0 – 24 years	38.5	33.4
0 – 54 years	81.6	75.6
0 – 64 years	90.8	86.6
Marital status:		
Married	44.7	49.6
Never married	38.8	33.2
Separated or divorced	12.0	11.3
Widowed	4.5	5.9
Type of dwelling:		
Fully Owned	23.7	32.6
Being purchased	33.5	32.2
Rented	34.9	27.2
Other	7.8	8.0

Source: ABS Census 2006

Table 2.2 gives an overview of some key labour market statistics of the TT region compared to the Australian average for 2006.² We note that the unemployment rate in the TT region was 0.7% point below the Australian average. Moreover, those employed were more likely to have full time jobs than the average Australian worker. Both statistics indicate that the TT region's labour market is tighter than the overall Australian labour market, which will have repercussions for our analysis in Section 3. Gross weekly earnings are slightly below the Australian average, which may come as a surprise given the tightness of the local labour market. We will explain this finding further down in this section.

Table 2.2 Labour market conditions in the TT region versus Australia (% shares), 2006

Labour market conditions	TT Region	Australia
Unemployment rate	4.5	5.2
Share of full-time employees in total employment	64.1	60.7
Average gross weekly earnings (in dollars)	800	810

Source: ABS Census 2006

Table 2.3 provides an industry sector comparison between the TT region and Australia. We see some notable differences in employment patterns. Sectors that stand out in the TT region are 'Mining', 'Construction', 'Accommodation and Food Services' (which includes the tourism industry in the region) and 'Health Care and Social Assistance'.

However the main difference is the 6.1% employment share of ADO Townsville in the TT region, which is nine times the Australian average and goes a long way toward explaining the substantially larger than average public sector in the TT region.

2. We note that the analysis of the labour market is somewhat outdated given the unusual developments in the Australian economy and subsequently the labour market in 2009. However, for sake of consistency we continue describing the 2006/2007 situation in the TT region.

Table 2.3 Employment breakdown to sectors in TT region and Australia (% shares), 2006

Industry sectors	TT Region	Australia
Agriculture, Forestry and Fishing	0.5	3.1
Mining	2.6	1.2
Manufacturing	8.0	10.5
Electricity, Gas, Water and Waste Services	1.4	1.0
Construction	9.6	7.8
Wholesale Trade	3.1	4.4
Retail Trade	11.1	11.3
Accommodation and Food Services	7.0	6.3
Transport, Postal and Warehousing	5.0	4.7
Information Media and Telecommunications	1.7	1.9
Financial and Insurance Services	1.8	3.8
Rental, Hiring and Real Estate Services	1.8	1.7
Professional, Scientific and Technical services	4.3	6.6
Administrative and Support Services	2.8	3.1
Public Administration and Safety	13.0	6.7
Of which: Public Administration	5.0	4.4
Defence	6.1	0.7
Public Order, Safety and Regulatory Services	1.9	1.5
Public Administration and Safety, nfd	0.0	0.0
Education and Training	8.1	7.7
Health Care and Social Assistance	11.1	10.5
Arts and Recreation Services	1.3	1.4
Other Services	3.5	3.7
Not stated	2.4	2.6
Total	100.0	100.0

Source: ABS Census 2006

Sectoral differences typically translate into occupational differences. Table 2.4 shows the occupational breakdown of the three industry sectors in the TT region that have a larger than 1% point (positive) deviation from the Australian average: 'Mining',

'Construction' and 'Public Administration and Safety'. We observe that both 'Mining' and 'Construction' rely heavily on 'Technicians and Trades Workers', while 'Mining' also significantly draws on 'Machinery Operators and Drivers'. The 'Public Administration and Safety' sector draws on other occupational categories: 'Community and Personal Service Workers' and 'Clerical and Administrative Workers'.

Table 2.4 Linking industries to occupations in the TT region (% shares), 2006

Occupational categories	Mining	Construction	Public Admin and Safety
Managers	7.3	8.8	9.9
Professionals	12.9	2.8	13.2
Technicians and Trades Workers	27.2	48.8	12.1
Community and Personal Service Workers	0.4	0.1	29.5
Clerical and Administrative Workers	7.7	10.9	23.9
Sales Workers	0.2	1.4	0.6
Machinery Operators and Drivers	37.8	8.1	5.8
Labourers	5.6	17.9	3.4
Other	1.1	1.2	1.5
Total	100	100	100

Source: ABS Census 2006

The shaded areas in Table 2.4 give a first indication of which occupational categories will be more prevalent in the TT region compared to nationwide averages. We make this comparison in Table 2.5. It should not come as a surprise that the occupational categories 'Technicians and Trades Workers', 'Machinery Operators and Drivers' and 'Community and Personal Service Workers' are significantly larger in the TT region than overall in Australia. The former two categories are driven by the larger than average mining and construction industries; the latter by the presence of the ADO in Townsville.

The lower share of high occupational level workers in the TT region is also reflected in lower educational attainments in the TT region as can be deduced from Table 2.6. The incidence of workers with advanced diplomas or higher educational attainments is below the Australian average.

Table 2.5 Occupational breakdown in the TT region and Australia (% shares), 2006

Occupational categories	TT Region	Australia
Managers	9.8	13.2
Professionals	16.5	19.8
Technicians and Trades Workers	16.8	14.4
Community and Personal Service Workers	12.0	8.8
Clerical and Administrative Workers	14.8	15.0
Sales Workers	10.0	9.8
Machinery Operators and Drivers	7.8	6.6
Labourers	10.7	10.5
Other	1.7	1.8
Total	100.0	100.0

Source: ABS Census 2006

Nonetheless, these lower educational levels do not result in worse labour market outcomes for the TT region, as we saw in Table 2.2.

The average gross weekly earnings in 2006 are similar in the TT region compared to the Australian average – see Table 2.7. Two remarks need to be made here. The comparable earnings are surprising given the occupational (educational) distribution differences between the TT region and Australia. That is, the occupational (educational) distribution is more skewed towards lower occupational (educational) levels in the TT region as Table 2.5 (2.6) shows, which would suggest earnings in the TT region should be lower than the Australian average.

Table 2.6 Educational attainment in the TT region versus Australia (% shares), 2006

Educational attainment	TT Region	Australia
Bachelor degree or higher	10.3	12.4
(Advanced) diploma	4.7	5.7
(Trade) certificate	15.5	13.3
Year 12 or less	69.6	68.6
Total	100.0	100.0

Source: ABS Census 2006

However, this is not the case, because the three sectors which stand out in the TT region ('Mining', 'Construction', and 'Defence') put upward pressure on wages for the three occupational categories from which they predominantly recruit: 'Technicians and Trades Workers', 'Community and Personal Service Workers', and 'Machinery Operators and Drivers'. The wage premiums in these sectors are about 9%, which cancel out any overall wage differences between the TT region and Australia. Sectors in the TT region that rely on workers from these three occupational categories experience fierce competition.

Table 2.7 Wage breakdown in the TT region and Australia (gross weekly earnings), 2006

Occupational categories	TT region	Australia	Wage premium
Managers	1,090	1,080	0.9%
Professionals	1,060	1,100	-3.8%
Technicians and Trades Workers	880	800	9.0%
Community and Personal Service Workers	630	570	9.2%
Clerical and Administrative Workers	730	730	0.3%
Sales Workers	490	520	-6.6%
Machinery Operators and Drivers	880	790	9.7%
Labourers	560	530	4.5%
Total	800	810	-0.8%

Source: ABS Census 2006

The future sustainability of this elevated wage structure critically depends on the viability of the 'Mining', 'Construction' and 'Defence' sector. Since the mining and the construction sector typically are volatile industries, the role of ADO Townsville in stabilising the current wage structure should not be underestimated. Alternatively, large scale skills upgrading (towards the nationwide average – see Table 2.6) will protect the current wage structure against future industry sector volatility.

2.3 Taking stock

We have seen that:

- the major ADO base in Townsville is situated in a so called 'functional economic region' (which coincides with the Townsville Statistical District), which makes the task to demarcate the effective region in which ADO Townsville operates more straightforward;
- the demographics of the TT region show the population is substantially younger than the Australian average;
- the 'Mining', 'Construction', and the 'Defence' sectors stand out in the TT region compared to the Australian average;
- these industry sector differences feed into occupational differences between the TT region and the Australian average, in favour of 'Technicians and Trades Workers', 'Community and Personal Service Workers', and 'Machinery Operators and Drivers';
- the dominance of lower occupational levels also shows up in lower educational attainments in the TT region compared to the Australian average;
- earnings in the TT region are nonetheless comparable to the Australian average, because workers employed in high demand occupations receive significant wage premiums. ADO Townsville is one such employer and as opposed to the other two dominant employers (mining and construction) a stable employer.

3. Direct socio-economic impact of ADO Townsville on the TT region

Having discussed the relevant economic aspects of the TT region in Section 2, this section will discuss the – at times idiosyncratic – nature of ADO Townsville, which shows up in the direct economic contribution it makes to the region and the requirements ADO Townsville places on the region in the social sphere to function optimally. Section 3 will therefore be subdivided into two parts.

1. Economic impact: that is, like any industry ADO Townsville uses goods and services from and provides goods and services to the TT region. Moreover, as part of its production process, ADO Townsville generates wages to its employees who reside in the TT region and spend their income in the local economy. Both factors impact directly on the local economy;
2. Social impact: ADO Townsville employed 5,730 uniformed members and another 450 non-uniformed members in 2007 according to the Defence Census 2007. These employees and their families need, among others, accommodation, child care, educational facilities and health care provision. These are essential ingredients to function adequately, 'but how does the TT region perform on providing these facilities?

We will discuss both direct impacts separately.

3.1 Direct economic impact

To assess the direct economic impact of ADO Townsville on the TT region, we rely on data retrieved from the ADO administrative systems in Townsville. Table 3.1 gives the results of this exercise. The table contains ADO Townsville expenditures on goods and services in the TT region in the financial year 2006-2007. Spending on goods and services is grouped according to the standard ABS classification and totals 146.8 million dollars.

The left column of this table shows that ADO Townsville spending on goods and services is concentrated in four main domains. Construction is the first big spending category. ADO Townsville used more than 30 million dollars in goods and services from the construction industry. Next there is the retail / wholesale sector, which provided goods and services to ADO Townsville worth more than 40 million dollars in the 06/07 financial year. The commercial service sector is a third main spending category of ADO Townsville. ADO Townsville required 30 million dollars worth of goods and services from this sector. Finally, ADO Townsville spent about 20 million dollars on education and health care, which also made these sectors substantial suppliers to ADO Townsville.

The spending of ADO Townsville on goods and services in the TT region constitutes nearly 1% of all local production of goods and services – see the right column of Table 3.1. ADO Townsville's

direct impact is largest in 'Construction', 'Wholesale Trade', 'Financial and Insurance Services', and 'Health Care and Social Assistance'. The impacts seem moderate, but do not include the consumptive effects of wage generation or any multiplier effects. Such a comprehensive analysis will be provided in Section 4 – Tables 4.1 and 4.2.

Table 3.1 ADO Townsville spending in the TT region, 2006-2007

Industry sectors	ADO Spending (million dollars)	ADO Spending in sector output
Agriculture, Forestry and Fishing	0.0	0.0
Mining	0.0	0.0
Manufacturing	4.4	0.2
Electricity, Gas, Water and Waste Services	2.1	0.3
Construction	31.5	1.6
Wholesale Trade	32.2	4.4
Retail Trade	9.4	0.9
Accommodation and Food Services	0.2	0.0
Transport, Postal and Warehousing	4.5	0.4
Information Media and Telecommunications	0.3	0.1
Financial and Insurance Services	10.8	2.0
Rental, Hiring and Real Estate Services	11.8	0.8
Professional, Scientific and Technical Serv.	12.3	1.3
Administrative and Support Services	0.0	0.0
Public Administration	0.0	0.0
Defence	non applicable	non applicable
Education and Training	5.5	1.0
Health Care and Social Assistance	11.5	1.8
Arts and Recreation Services	0.1	0.0
Other Services	4.8	1.7
Remainder	5.5	
Total spending (non-defence)	146.8	1.0

Source: ADO Townsville and JCU modelling

Total industry in the TT region spent over 5 billion dollars on local goods and services – as Table 3.2 details – which is about two thirds of total spending of the TT region's industry. The remaining third is 'imported' from outside the TT region. In this respect ADO Townsville is an idiosyncratic sector in the TT region. It 'imports' more than two thirds of the goods and services it uses in its production process from outside the TT region. No other sector in the TT region comes remotely close to such a high import share. The atypical share of local spending is caused by the nature of the ADO production process. Its main suppliers do not reside in the TT region, which will impact on the indirect impact of ADO Townsville on the TT region as we will outline in detail in Sections 4 and 5.

Table 3.2 Spending on goods and services in the TT region, 2006

Industry sectors ¹	Local spending (million dollars)	Local spending (share in total)
Agriculture, Forestry and Fishing	5.2	58.8
Mining	151.2	62.6
Manufacturing	1,011.6	58.8
Electricity, Gas, Water and Waste Services	179.7	56.0
Construction	990.4	72.5
Wholesale trade	310.1	76.0
Retail Trade	307.1	63.5
Accommodation and Food Services	157.3	62.6
Transport, Postal and Warehousing	442.3	69.8
Information Media and Telecommunications	131.3	69.6
Financial and Insurance Services	162.4	87.3
Rental, Hiring and Real Estate Services	445.0	76.8
Professional, Scientific and Technical services	408.9	83.4
Public Administration	173.8	64.6
Defence	146.8	31.1
Education and Training	75.5	62.0
Health Care and Social Assistance	69.6	56.9
Arts and Recreation Services	150.2	67.7
Other Services	61.0	63.7
Total	5,379.3	65.0

Source: ADO Townsville and JCU modelling

¹ The 'Administrative and Support Services' sector is not included in our modelling. This sector was newly created in the 2006 update of the ABS ANZSIC industry sector classification and hence did not exist in the 2004-2005 IO model that we used to develop the 2006-2007 IO model. Since it is a small sector on which ADO Townsville has only limited impact, excluding this sector will have little ramifications for the analysis.

We now turn to the supply side of the production process, i.e. how much does ADO Townsville supply in goods and services to the region and how does that compare to other industries in the TT region?

Table 3.3 presents the details. The total industry in the TT region supplied over 10 billion dollars of goods and services to the local economy. The local supply pattern is very similar to the local usage pattern. Again about two-thirds of total production of goods and services in the TT region is locally supplied. Again, ADO Townsville is an outlier in the overall picture as it only supplies 6.8% of its production of goods and services to the TT region. Obviously, that does not come as a surprise as the nature of ADO Townsville suggests it will supply the majority of its services outside the TT region. This atypically low share of local supply in total output will play a role in determining the total impact of ADO Townsville on the TT region's economy, as we will discuss in Section 4.

However, the bulk of spending of ADO Townsville in the TT region does not come from providing to or using goods and services from the TT region, but from the income generation in its production process. ADO Townsville generates 328 million dollars in wages to employees and another 120 million dollars in gross operating surplus and mixed income.³ These income streams flow into the TT region.

³. Gross operating surplus and mixed income is not a relevant variable for ADO Townsville, since ADO Townsville does not have a profit generating objective. The gross operating surplus listed here refers to price increases of capital goods which elevate the value of the existing capital stock of ADO Townsville, which the model attributes to gross operating surplus.

Table 3.3 Supply of goods and services to the TT region, 2006

Industry sectors	Local supply (million dollars)	Local supply (share in total)
Agriculture, Forestry and Fishing	15.4	77.7
Mining	287.9	58.9
Manufacturing	1,339.2	56.2
Electricity, Gas, Water and Waste Services	399.5	62.9
Construction	1,620.6	82.2
Wholesale trade	663.2	91.1
Retail Trade	735.0	73.8
Accommodation and Food Services	307.7	69.2
Transport, Postal and Warehousing	656.0	58.6
Information Media and Telecommunications	315.4	82.6
Financial and Insurance Services	508.3	95.3
Rental, Hiring and Real Estate Services	1,334.4	81.1
Professional, Scientific and Technical services	919.7	95.5
Public Administration	294.0	48.1
Defence	64.4	6.8
Education and Training	276.8	51.3
Health Care and Social Assistance	328.7	52.1
Arts and Recreation Services	293.2	74.3
Other Services	167.8	59.2
Total	10,527.3	67.5

Source: ADO Townsville and JCU modelling

Table 3.4 shows the income shares of the various industry sectors as a share of total income generation in the TT region. We distinguish between compensation paid to employees and operational surplus and mixed incomes. Employee compensation will predominantly (barring the share of private saving and tax) be reinjected into the local economy through consumption. ADO Townsville was the sixth largest contributor of employee compensation which implies it has a significant impact on consumption generation within the TT region. The figures in Table 3.4 may be compared to the employment shares presented in Table 2.3 to obtain some appreciation of the relative wage contributions of the various sectors. In Section 4 we will analyse the (indirect) impact of that ADO Townsville consumption potential on the local economy.

Table 3.4 Industry shares of income in TT region, 2006

Industry sectors	Employee compensation	Operational surplus and mixed income	Total income generation
Agriculture, Forestry and Fishing	0.1	0.2	0.1
Mining	1.6	6.0	3.5
Manufacturing	9.4	8.5	9.0
Electricity, Gas, Water and Waste Services	2.1	7.2	4.3
Construction	6.4	11.1	8.4
Wholesale Trade	4.6	3.7	4.2
Retail Trade	8.3	4.8	6.8
Accommodation and Food Services	2.8	2.0	2.5
Transport, Postal and Warehousing	6.1	6.7	6.3
Information Media and Telecom.	1.5	4.1	2.6
Financial and Insurance Services	4.0	5.7	4.6
Rental, Hiring and Real Estate Services	3.0	25.2	12.4
Professional, Scientific and Technical Serv.	8.4	3.7	6.4
Public Administration	7.3	1.2	4.7
Defence	8.0	4.3	6.3
Education and Training	9.2	1.0	5.8
Health Care and Social Assistance	10.3	2.5	7.0
Arts and Recreation Services	2.8	1.7	2.3
Other Services	3.9	0.7	2.6
Total	100.0	100.0	100.0

Source: JCU modelling

3.2 Direct social impact

The direct impact of the ADO stretches further than just the economic impact. ADO Townsville employed 6,180 workers in the TT region in 2007 who further support families. These ADO families live in the TT region and rely on various social facilities offered by the region. Before outlining the importance of these facilities to the performance of ADO Townsville and the state of these facilities in the TT region, we first depict ADO Townsville's work force, comparing it to ADO Australia's work force and the TT region's work force – see Table 3.5.

First, we compare the second and third column of Table 3.5, which implies we compare ADO Australia to some key demographics of the labour force in the TT region. We see clear differences in age, gender and educational attainments. Overall, ADO Australia employees are younger, more likely to be male and more highly educated.

The first two differences are even more pronounced when comparing ADO Townsville's work force to the TT region. However, ADO Townsville employees are significantly less educated than the nationwide ADO average. This holds for both uniformed and non-uniformed members (not shown).

Table 3.5 Demographics ADO Townsville / Australia and TT region (% shares), 2006/7

Demographics	ADO employment		TT Region employment
	TT region	Australia	
Country of birth:			
Australia	88.5	85.0	84.5
Of whom: indigenous persons	3.0	2.7	NA
Cumulative age groups:			
16 – 20 years	2.0	4.6	8.7
16 – 24 years	27.8	23.9	21.8
16 – 34 years	66.9	55.4	44.8
16 – 44 years	90.8	80.7	67.7
16 and older	100.0	100.0	100.0
Gender:			
Male	84.2	79.4	54.3
Female	15.8	20.6	45.7
Cumulative educational attainments:			
Post Graduate	3.3	11.2	2.5
Bachelor Degree	10.8	23.3	17.6
Certificate/Diploma	59.1	58.7	50.3
Secondary School or less	100.0	100.0	100.0

Source: Defence Census 2007, ABS Census 2006

For the purpose of this section we are more interested in the household size of ADO Townsville personnel. That is, how large is the ADO Townsville community, which relies on the social structure provided by the TT region? To determine that, we investigate household composition of both uniformed and non-uniformed members in Townsville. Table 3.6 shows the findings. The differences between uniformed and non-uniformed members can by and large be attributed to age differences and permanency of deployment in Townsville.

Based on the household size distribution, we can determine the average household size per ADO member. This average household size is 2.3 for each uniformed member and 2.7 for every non-uniformed member.⁴ In total, the ADO Community is therefore much bigger than the 6,180 members. The ADO community totals 14,140 persons in the TT region, which is 9% of the TT region's population.

Having established the size of the ADO Townsville community, we now turn to some of the key social areas of interaction between the TT region and its ADO Townsville community. We focus in this report on three such areas: housing, health care and child care / education. These are three socio-economic areas which impact on the external environment of ADO personnel. If this external environment is not adequately serviced, it might adversely impact on the performance level of ADO personnel. We will discuss the three areas separately. In conducting this analysis, we will compare the external environment present in the TT region to the nationwide average. Consequently, we will benchmark the external environment in the TT region to the Australian average, leaving a discussion of appropriate funding levels at the nationwide level aside. This analysis will be particularly relevant if comparable research would be undertaken for other ADO localities around the country. A comparison of external environments across Australia, may inform the ADO as to where to expand their activities in the future, if all else is equal.

4. These numbers are likely to be slight underestimates of the average household size of an ADO Townsville member. That is, we treat 'Spouse and two or more children' and 'Sole parent and two or more children' as respectively four and three person households, though they could be larger. Moreover, we leave 'Parents, brothers, sisters' and 'Others, but no relatives' out of the analysis, since these household members are unlikely to be financial dependants of the ADO Townsville member.

Table 3.6 Household size ADO Townsville personnel (% shares), 2007

Household composition	Uniformed Staff	Non-uniformed Staff
Single	23.1	15.0
Spouse without children	27.4	32.8
Spouse and one child	10.8	12.7
Spouse and two or more children	24.6	32.1
Sole parent and one child	1.3	3.9
Sole parent and two or more children	0.9	3.5
Parents / brothers / sisters	1.3	0.0
Others, but no relatives	10.7	0.0
ADO population:		
Staff members only	5,730	450
Dependent household members inclusive	12,950	1,190

Source: Defence Census 2007

3.2.1 Housing

A substantial share of ADO Townsville personnel does not originate from the TT region, but is instead recruited from outside the region. Housing affordability and availability therefore is an important element of the social environment in which ADO Townsville operates.

Table 3.7 presents the type of accommodation that uniformed members have in the TT region. It shows that a large share of uniformed members are protected from the economic forces of the housing market, that is, 46% live in accommodation provided by Defence either on or off base. Furthermore, the vast majority of uniformed members who decide to rent non-defence accommodation receive ADO allowances to assist in keeping housing costs down. Finally, just over a quarter of uniformed members privately own accommodation.

Though uniformed members may be shielded from potential housing affordability problems, DHA is not, since it is DHA that purchases accommodation off base. Moreover, the closely related issue of housing availability remains a potential point of concern to both uniformed members who seek private accommodation on the housing market and to DHA. Therefore we now analyse the state of the housing market in the TT region.

In Table 2.1 we showed that the demographics of the TT region impact on house tenure type. The on average younger population of the TT region compared to the nationwide average leads to lower home ownership in the TT region and within that category to lower outright ownership. Instead residents of the TT region rely more on renting their residential dwelling.

Table 3.7 Accommodation type ADO Townsville uniformed members (% shares), 2007

Household composition	Uniformed Staff ¹
ADO Housing on base	13.7
ADO Housing off base	33.1
Privately rented	26.9
Of whom with ADO allowance	82.9
Privately owned	25.9
Of whom owner outright	4.8
Rent free	0.5

Source: Defence Census 2007

¹ Defence Census 2007 does not include information about the type of housing that non-uniformed members have. Figures in this table are therefore uniformed members only.

To get an indication of potential constraints on the housing market in the TT region, Table 3.8 details some widely used key statistics of the local housing market compared to the nationwide housing market, or in the case of house prices, the housing market in the eight capital cities of the country.⁵ The median house price in the TT region is about 25% below the average in the major capitals.⁶ This difference is also reflected in the house price to gross household income ratio which is 25% below the average in the major Australian capitals. This is not to say that there is no housing affordability issue in the TT region. On the contrary, AEC (2008) provide an in depth analysis of the problems in the local housing market, demonstrating the surge in housing affordability constraints in the TT region. We do conclude that housing affordability is a more serious concern in the major capitals of Australia than in the TT region. The Urban Development Institute of Australia (UDIA, 2007) shows that housing affordability is also more critical in much of the coastal Queensland areas, including the neighbouring regions Cairns and Mackay, than in the TT region.

The lower pressure in the housing market in the TT region also emerges from lower median monthly housing loans and median rents. Furthermore the median housing loan to median rent ratio – which indicates the financial consequences for households who transit from renting to home ownership – is slightly lower in the TT region compared to the Australian average.

These statistics indicate that, if housing costs would be the decisive factor, the TT region provides more favourable conditions to the ADO than the major capital cities in Australia.

5. The eight capitals (i.e. major statistical regions) are: the ACT (Canberra and surroundings), Adelaide, Brisbane, Darwin, Hobart, Melbourne, Perth and Sydney. Data on house prices are sourced from the Real Estate Institute Australia (REIA), which collects house price information in the eight main capital cities / areas. These data are not available for the whole of Australia.
6. Median house prices are typically used in this type of analysis to control for the influence of expensive houses. Though their share in the total is moderate, through their high prices they still have significant influence on the average house price.

Table 3.8 Type of dwellings in the TT region and Australia (% shares), 2006

Affordability	TT region	Australia
Median house price (dollars) ¹	296,300	396,400
Median house price – Median gross household income ratio ¹	5.2	6.9
Median housing loan (dollars / monthly)	1,213	1,300
Median rent (dollars / monthly)	800	820
Median housing loan – median rent ratio	1.5	1.6

Source: UDIA (2007), AEC Group (2008) and ABS Census 2006

¹ The figures for Australia represent the eight major capitals of Australia and are in that sense not representative for Australia – see footnote 5 for a list of the eight major capitals.

Closely interlinked with housing affordability is housing availability. Table 3.9 shows the vacancy rate in the housing market, which is lower in the TT region than in Australia; i.e. 7.7% of all dwellings in the TT region are vacant compared to 9.9% nationwide.

Table 3.9 Type of dwellings in the TT region and Australia (% shares), 2006

Dwelling type	TT region	Australia
Occupied dwellings of which:	92.3	90.1
Separate house	78.1	74.8
Semi-detached	4.7	9.2
Flat, unit or apartment	15.1	14.2
Other	2.0	1.8
Non-occupied dwellings	7.7	9.9

Source: ABS Census 2006

Therefore we explore whether households in the TT region are more constrained in their choice of residential dwellings than the average Australian household. We link the number of bedrooms to the number of household residents. Table 3.10 shows the cumulative shares. That is, for example 65% of the households in the TT region consisting of three members have three or less bedrooms. Lower cumulative shares suggest households have more spacious dwellings. The differences between the TT region and Australia are small, but in favour of the TT region.

We conclude that the housing market in the TT region did not expose residents to more affordability and availability problems than it did in the major Australian capitals in 2006. Section 5 will discuss expected future developments in the housing markets up to 2016.

Table 3.10 Bedrooms to household size, TT Region vs Aust (cumulative shares), 2006

Household members	One	Two	Three	Four or more
TT region				
none (including bedsitters)	2	0	0	0
one	13	2	1	0
two	54	26	10	3
three	92	76	65	43
four or more	100	100	100	100
Australia				
none (including bedsitters)	2	0	0	0
one	16	3	1	0
two	52	27	13	4
three	91	79	68	45
four or more	100	100	100	100

Source: ABS Census 2006

3.2.2 Health care

Human wellbeing is of key importance to any organisation, but even more so to ADO Townsville for at least two reasons. Firstly, the nature of the job of uniformed members requires both physical and mental fitness, where the latter is affected by the wellbeing of dependants. Secondly, the job requires frequent and long overseas deployments which involve prolonged separations from families, which increase the potential of frictions in the private sphere. Discussions with DCO Townsville reveal that the top three reasons for contact with DCO Townsville are:

1. Deployment issues;
2. Resilience support;
3. Mobility support.

That support is crucial to the functioning of ADO Townsville. It will be partly provided by DCO Townsville and its partner defence organisations, but spouses of ADO personnel will also rely on the General Practitioners (GPs) network in the TT region. We will discuss the availability of health care within ADO Townsville in Section 5 and concentrate here on health care availability in the TT region. We focus on GPs in the TT region as that is the most important source of health care that relatives rely on.

To shed light on the supply of GP services in the TT region we use Medicare data provided by Medicare Australia and The

Primary Health Care Research and Information Service (PHCRIS) for the Townsville Division of General Practice, which is a close proxy of the TT region.⁷

Table 3.11 shows the distribution of services provided by GPs in the TT region and in Australia for the years 2006 and 2007. We see that a GP visit during regular hours accounts for nine out of ten GP consultations in the TT region as in Australia. Though, that percentage is slightly lower in the TT region, which can partially be explained by the higher incidence of practice nurses conducting consultations in the TT region.

Another notable difference between the TT region and Australia is the higher share of non-urgent after hours GP consultations in the TT region. Labour market differences explain this difference. In Section 2, Table 2.2 we saw that the unemployment rate (4.5% in the TT region versus 5.2% in Australia) and the share of fulltime employed workers in total employment (64% versus 60%), explain why patients have to rely more on after hours consultation. These labour market driven idiosyncrasies of the TT region should be accounted for when shaping health care policies.

Finally, we note the steady increase in services delivered per year. We observe a 4% increase in Australia and a 6% increase in the TT region. That difference is presumably driven by population growth, which we will address in Section 5.

Table 3.11 GP services in the TT region versus Australia (shares in total), 2006 and 2007

GP service	2006		2007	
	TT region	Australia	TT region	Australia
Professional attendance	88.1	92.6	87.3	92.1
Of which: non-urgent after hours	4.8	3.7	5.1	3.9
Diagnostic procedures and invest.	1.0	0.9	1.1	0.9
Therapeutic procedures	4.8	2.8	4.6	2.7
Pathology services	0.6	0.6	0.7	0.6
Practice nurse (on behalf of a GP)	5.4	3.1	6.3	3.8
Total (in volumes X 1,000)	721.4	107,683.7	764.3	112,077.3
Total (in dollars X 1,000,000)	25.1	4,042.6	27.3	4,341.9

Source: Medicare Australia Statistics (2008)

7. PHCRIS reports 161,000 residents in 2006 in the TT region, while the ABS reports 157,000. To safeguard consistency we follow the PHCRIS population statistic in this section of the report.

The statistics in Table 3.11 illustrate an estimate of shortages in GP services in the TT region compared to the nationwide average. If we calculate the GP services per capita, we can compare the provision of GP services between the TT region and Australia. The first row of Table 3.12 contains the results of this exercise. It appears that GP service provision in the TT region is 11% below the nationwide average.

Table 3.12 also provides the number and full time equivalent (FTE) number of GPs in the TT region and Australia. First we note that the capacity utilisation of the available GPs in the TT region is significantly below the nationwide average (61 versus 77%), which goes a long way towards explaining the difference between the population to FTE GP ratio between the TT region and Australia, which is 16.9%.

The difference between GP Services per capita (-11.2%) and the Population to FTE GP ratio (-16.9%) has at least two reasons. First, GPs in the TT region provide more services than GPs nationwide (+3.7%). Second, so far we have only focused on the supply side. We have left demand side factors (other than the population size) out of the equation. Table 2.1 demonstrates that that is an oversimplification. There are considerable age structure differences between the TT region and Australia, i.e. the TT region's population is younger.

Table 3.12 GPs and GP services in the TT region versus Australia, 2006

GP Statistics	TT region	Australia	Deficit
GP Services per capita ¹	4.6	5.2	-11.2%
Number of GPs	186	22,868	
Number of FTE GPs	114	17,648	
Capacity utilisation	61.3%	77.2%	-15.9%
Population to FTE GP ratio ¹	1,365	1,167	-16.9%
GP Services per FTE GP	6,328	6,102	+3.7%

Source: PHCRIS (2007)

¹ Since uniformed members access Australian Defence Forces (ADF) health care, they are left out of the population figures.

Table 3.13 shows the annual number of GP services per age cohort. We observe that younger persons require less GP services than older persons, which implies that the younger population of the TT region creates less demand for GP services than the Australian average.

If we control for such age cohorts differences, we find that the 11% shortfall we found in Table 3.12 reduces to a 2.5% shortfall compared to the nationwide average. Consequently, demand side factors matter and we have only looked at one such factor (age). More research into the health care effects of for example the larger than average indigenous population and the higher incidence of single households in the TT region is required to get a more precise picture, but that is beyond the scope of this report.

Table 3.13 GP services to age cohorts, 2006-2007

Age cohorts	Number of annual GP services
0-4	3.47
5-14	1.77
15-24	3.02
25-34	4.14
35-44	4.43
45-54	5.48
55-64	7.59
65-74	11.17
75-84	13.20
≥ 85	10.93
Total	5.26

Source: Medicare Australia (2007)

Overall we conclude that ADO Townsville operates in an environment in which GP service provision to relatives of ADO personnel is below the Australian average. DCO Townsville observes that the health care deficit in the TT region surfaces in at least three areas, which are of relevance to ADO Townsville. Access to after hours GP services, access to GP mental health services and access to special needs services are concerns. As mentioned before, the former is most likely a result of the tight labour market in the TT region in 2006-2007, which exposes the health care deficit.

To bring GP health care provision in the TT region back to the Australian average substantial Commonwealth expenditures are needed. However, increases in expenditures alone will not solve the health care deficit. The physical constraints (GP capacity) need to be addressed as well. In that light, the lower than average GP capacity utilisation in the TT region warrants further research. Section 5 will discuss expected future developments in health care demand up to 2016.

3.2.3 Child Care and Education

The third main social area that we will explore is the educational system of the TT region. ADO Townsville personnel will make use of the educational system in the region but also their accompanying families and especially their children will rely on the local educational system. We break down the educational system in the TT region into three groups: child care, primary and secondary schools, and tertiary education.

3.2.3.1 Child care

Child care support is important to uniformed members for at least four reasons.

1. Uniformed members work full time, which means they have no option to work part time to combine work and family duties;
2. Uniformed members are less likely to originate from the TT region than the average family in the region, which implies they are less likely to be able to draw upon relatives for child care support;
3. Uniformed members may be deployed overseas, which rules out any involvement in raising children for extended periods;
4. The age demography of uniformed members (see Table 3.5) suggests they are more like to have young children.

Obviously, they may have a spouse to rely on, but – according to the Defence Census 2007 – about 55% of uniformed members with one or more children have a spouse who works as well or no spouse at all. Consequently, a large share of uniformed members have to rely on child care support in the TT region.

Depicting the state of child care support provision in the TT region is complicated, since it often involves ‘hidden’ providers like relatives. Therefore we deviate from the methodology we applied so far in this section, *i.e.* compare supply in the TT region to nationwide supply. Instead we compare the child care support satisfaction among uniformed members in the TT region to that of uniformed members nationwide.⁸

Table 3.14 shows the share of uniformed members who are satisfied with child care support to household composition. The table shows that satisfaction in the TT region is higher than nationwide across all household types. Having said that, about one third of uniformed members in the TT region are not satisfied with child care support.

⁸ We focus on uniformed members here, because none of the four arguments mentioned above why child care support is important to uniformed members necessarily hold for non-uniformed members. Consequently, if constraints will show up in the analysis, they will first show up among uniformed members.

Table 3.14 Satisfaction with child care support, TT region vs Australia (% shares), 2007

Household composition	Uniformed members Townsville	Uniformed members Australia
Spouse and one child	68.8	65.5
Spouse and more than one child	68.7	63.3
Sole parent and one child	76.3	61.5
Sole parent and more than one child	... ¹	47.5
Total	68.1	63.6

Source: Defence Census 2007

¹ We do not report the satisfaction score for sole parents with more than one child in the TT region, because the number of uniformed members fitting this category is too small to provide a reliable figure.

Table 3.15 lists reasons for dissatisfaction with child care support arrangements.⁹ It appears that affordability of child care support is the main reason for dissatisfaction. More than half of the dissatisfied uniformed members list that reason as an important bottleneck to child care support access, but the affordability concern is a nationwide concern.

Table 3.15 Reasons for dissatisfaction with child care support, TT region vs Australia (% shares), 2007

Household composition	Uniformed members Townsville	Uniformed members Australia
Not available, no places	19.6	25.4
Not available in the neighbourhood	12.4	17.0
Not available during early hours	24.1	29.9
Not available during late hours	25.8	22.9
Not available during shift work	17.1	15.0
Not available during weekends	25.1	18.3
Not available for blocks of time	27.1	20.3
Not available during holidays	11.0	15.7
Not available before/after school	8.9	11.1
Non affordable	59.1	51.6
No salary packaging option	33.0	34.7

Source: Defence Census 2007

⁹ Multiple answers were possible; hence the figures do not add up to 100%.

3.2.3.2 Primary and secondary education

Access to high quality education is important for every child, but even more so for children of uniformed members, who regularly transfer between ADO bases across Australia. These children will have limited opportunities to settle at school and develop a network of friends. This instability combined with the non-standard Australian curriculum will inhibit optimal achievement at school.

Table 3.16 compares the design of the educational system in the TT region to the nationwide average. In primary and secondary school we see that catholic education is slightly bigger in the TT region than in the whole of Australia.

Table 3.16 Educational system in the TT region and Australia, 2006

Educational system	TT region	Australia
Pre school	2,100	307,800
Primary school:	13,200	1,696,800
▪ Government school	67%	69%
▪ Catholic school	25%	20%
▪ Other non-government	9%	11%
Secondary school:	9,200	1,275,100
▪ Government school	57%	60%
▪ Catholic school	26%	22%
▪ Other non-government	17%	18%
Technical or Further Educational Institution:	2,500	428,000
▪ Full-time	23%	33%
▪ Older than 25	50%	41%
University or other Tertiary Institutions:	7,300	745,500
▪ Full-time	71%	68%
▪ Older than 25	40%	41%
Total:	34,300	4,452,200

Source: ABS Census 2006

Making inferences about quality of teaching is notoriously difficult, not to mention making comparisons of teaching quality between different regions. We therefore do not attempt to measure the quality of a teacher but instead assume that it is constant across the country (which it should be anyway). This then means that the exposure of a student to a teacher becomes a determinant of teaching quality. To that end, the ABS has developed the so-called 'full-time equivalent number of students' to 'full-time equivalent number of teachers' ratio. The lower that ratio is, the higher the exposure of a student to a teacher will be, which will arguably raise quality.

Table 3.17 shows a comparison of this ratio between Australia and the TT region. The ratio should not be seen as a proxy for the number of students in class (for example, teachers will not be in class full time, they also have admin duties), however, a higher ratio suggests less exposure of a student to a teacher, or relative under funding of teaching (assuming admin duties are similar across Australia). We already saw that the TT region is under funded in terms of health care provision. The statistics in Table 3.17 suggest the same holds for teaching capacity at primary and secondary schools. While there are 14.1 students per teacher on average in Australia in primary and secondary schools, there are 17.1 students per teacher in the TT region, which means there are 21% more FTE students per FTE teacher in the TT region compared to the nationwide average. This difference holds for both primary and secondary schools in the TT region. If admin load in schools is a fixed load which is done by teachers, then the shortage of FTE teachers in the TT region implies fewer teachers have to do more admin load each, reducing class time per teacher. This would mean that the student to effective teacher (*i.e.* class time) ratio is even more disadvantageous to the TT region than the FTE student to FTE teachers ratio shown suggests.

Table 3.17 FTE Students to FTE teacher ratio, 2007

Type of school	Primary school		Secondary school		Total	
	TT	AU	TT	AU	TT	AU
Government	19.1	15.8	15.3	12.4	17.6	14.3
Non-Government ¹	18.5	16.4	11.8	11.8	15.9	13.8
Total	18.9	16.0	14.3	12.2	17.1	14.1

Source: ABS, Queensland Education, Catholic Education Townsville

¹ For the TT region, non-government is catholic education only.

3.2.3.3 Tertiary education

ADO personnel and their spouses (if any) also engage in tertiary education. Table 3.18 gives a snapshot of that engagement. We see that 11% of uniformed members, or one in every nine, are enrolled in either university or TAFE, where the former is slightly more popular. Turning to spouses we see that 12% of the uniformed members, or one in eight, have a spouse who is enrolled in tertiary education, again university is more popular. That is not to say that 12% of all spouses are enrolled in tertiary education. As Table 3.6 shows, 37.2% of all uniformed members do not have a spouse. Consequently the share of spouses enrolled in tertiary education is much higher at 31%. Adding the two gives the impact of uniformed members on tertiary education. That is, for every four uniformed members there is one enrolment in tertiary education, be it the uniformed member or their spouse.¹⁰

Determining the impact of this enrolment in tertiary education on the TT region is awkward. The majority of ADO members will study off campus and since ADO members do not necessarily come from the TT region nor stay there for extensive periods, they are more likely to engage in distance education than the average student. In other words, the TT region need not be the provider of tertiary education demand elicited by ADO Townsville. Subsequently, a comparison of tertiary education supply in the TT region and Australia does not provide much insight, which is why we do not make that comparison.

Table 3.18 Enrolment in tertiary education in the TT region, 2007

Enrolment in tertiary education	Uniformed member		Non-uniformed member	
	% share	one in	% share	one in
ADO member enrolled in:				
University	6.3	15.9	7.7	12.9
TAFE	4.6	21.6	4.6	21.5
Total	10.9	9.2	12.3	8.1
Spouse enrolled in:				
University	7.3	13.6	N.A.	N.A.
TAFE	4.3	22.9	N.A.	N.A.
Total	11.6	8.5	N.A.	N.A.
Aggregate enrolled in:				
University	13.6	7.3	N.A.	N.A.
TAFE	9.0	11.1	N.A.	N.A.
Total	22.6	4.4	N.A.	N.A.

Source: Defence Census 2007

¹⁰ The Defence Census 2007 does not provide similar detailed information for non-uniformed members.

3.3 Taking stock

We have seen that:

- ADO Townsville spends nearly 150 million dollars on goods and services produced in the TT region, which is about 30% of total spending of ADO Townsville. That share of 30% is nearly half as much as other sectors in the TT region;
- ADO Townsville supplies goods and services worth nearly 65 million to the TT economy, which is nearly 7% of its total production of goods and services. Again, that share is far below the share of total goods and services produced in the TT region absorbed by the local economy;
- the main impact of ADO Townsville on the local economy is the consumption potential it generates. ADO Townsville provides a total wage sum of nearly 330 million dollars annually to its personnel residing in the TT region;
- the housing market in the TT region does not expose residents to more affordability and availability problems than it does in the major Australian capitals;
- health care provision (i.e. GP services) in the TT region is under funded compared to the Australian average;
- child care support availability is a concern to about a third of uniformed members in the TT region, which is a slightly smaller share than for uniformed members nationwide. Affordability is the main reason for such concerns both locally and nationally;
- primary / secondary education is significantly under funded in the TT region compared to the nationwide average in terms of teaching staff.

4. Indirect impact of ADO Townsville on the TT region

The analysis so far has treated the various sectors in the TT region, including ADO Townsville, as exogenous, while in reality we know that is not the case. We know that sectors interact, *i.e.* one sector's output may be another sector's input and *vice versa*. That essentially means that the impact of one sector on the TT economy stretches further than just the economic activity and subsequent employment within that sector, which is called the direct impact of a sector. This section aims to reveal that interactive, indirect impact. Such an analysis serves two purposes. Firstly, it will provide ADO Townsville with a much broader insight into what contractions or expansions mean to its organisation in a business sense. Secondly, it will demonstrate the wider, indirect economic and social impact of ADO Townsville on the local economy.

To estimate the indirect impact of ADO Townsville on the TT region, we employ the standard analytical technique of Input-Output (IO) analysis. IO analysis reveals the output interrelations between different industries based on interdependencies in the production process. For example, assume Sector A uses outputs from Sector B as an input. An IO analysis allows us to estimate and consequently reveal the otherwise hidden impact of output levels in sector A on sector B's output.

To set up the IO model that will cover the TT region as represented in Figure 2.1 and is relevant for the financial year 2006-2007, we used expert input from Prime Research Pty Ltd, which sourced data from the ABS, which released its most recent IO model at the Commonwealth level (ABS, 2008) in November 2008. The model is based on 2004-2005 data, consequently the first task was to update the model to 2006-2007 data, for which various ABS and Australian Bureau of Agricultural and Resource Economics (ABARE) sources were used. Then the model had to be disaggregated from the national level to the level of the TT region. A two step procedure was used: first the national model was disaggregated to the Queensland state level and subsequently that model was used to further disaggregate the model to the TT region.¹¹

This section will use the IO model to focus on the indirect impact of ADO Townsville on the wider economy in the TT region; Section 5 will use the IO model to estimate the challenges or opportunities of upsizing ADO Townsville's activities for the wider TT region in the near future.

4.1 Indirect impact of current ADO Townsville activities

We will first use the IO model to set the stage, *i.e.* demonstrate the indirect effect of ADO Townsville in the TT region and its interaction with other industries in that region.

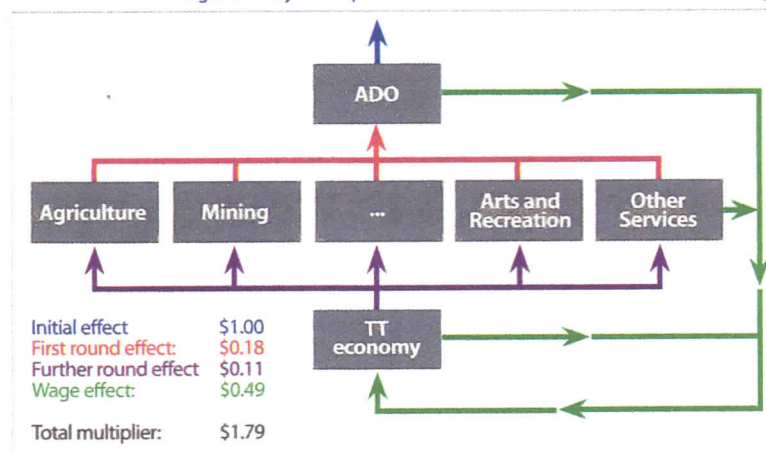
Let us assume ADO Townsville produces additional output worth 1 dollar. To produce that 1 dollar additional output, ADO Townsville requires 1) goods and services which are used as inputs in the production process, which it purchases from industries in the TT region (or outside the TT region, but we focus on spending in the TT region) and 2) labour input.

We first analyse the former requirement. The IO model predicts that a 1 dollar increase in ADO Townsville output requires an 18 cent increase in outputs from other industries in the TT region. This effect is known as the first round effect, depicted in red in Figure 4.1. To produce that extra output, these other industries need more inputs as well, consequently these 18 cents initial spending in the first round trickle down the local economy. These second and further round effects are depicted in purple in Figure 4.1 and amount to a further 11 cents of extra output in the TT region, triggered by the initial 1 dollar increase in ADO output.

To produce this extra output, both ADO Townsville and its suppliers require labour input. Workers receive wages for their input, which they partially consume locally. This extra demand for goods and services will be partly met by extra local output, which leads to another and final effect on aggregate local output. This wage effect amounts to a further 49 cents.

In total, each dollar that ADO Townsville produces in terms of output, leads to a 79 cent increase in output in the TT region. Or, as economists would say, the total multiplier equals 1.79.

Figure 4.1 Stylised representation of ADO Townsville in the TT economy



Source: JCU modelling

¹¹. A detailed analysis of the applied methodology is available on request from the authors.

4.2 Indirect effects of ADO Townsville on the TT region

We now disaggregate the indirect effect of ADO Townsville on the TT economy. Figure 4.1 suggests that for every dollar that ADO Townsville puts out, 79 cents in additional output are produced in the TT economy. About 60% of that additional output is a result of the wage effect (49 cents). That relatively high share is not surprising. First, because wages / compensation are the most important expenditure category of ADO Townsville and second the majority of expenditures on goods and services are not purchased locally, hence 'leak away' from the local economy – see Table 3.2. We now break down these 79 cents to reveal which sectors in the TT region benefit the most of the presence of ADO Townsville in the TT region.

Table 4.1 gives this detailed overview. Bear in mind that the findings in this table become relevant in the next section when we analyse ADO Townsville expansion plans. Any ADO Townsville expansion plans will expand the activities of the major benefactors of ADO Townsville activity.

The first column of Table 4.1 gives the cents that flow into the various sectors of the TT region for every dollar worth of output that ADO Townsville produces. The second column contains the more interesting information: the total dollar value (in millions) of the initial injection of ADO Townsville (expenditures on locally produced goods and services and wages) into the local economy. In total we observe that ADO Townsville activity leads to an additional 656 million dollars worth of output in the TT region.

Table 4.1 should be compared to Table 3.1, which contains initial ADO Townsville spending on locally produced goods and services. Table 3.1 does not include the secondary and further rounds output effects of that initial spending and it does not include the wage effects. The difference between Table 3.1 and 4.1 therefore captures these latter effects, where the wage effect dominates.¹² The indirect effects of the presence of ADO Townsville on the local economy – which go largely unnoticed – are substantial. We saw that ADO Townsville spent 4 million dollars on goods and services from the Manufacturing industry, but direct *and* indirect spending in that sector amount to 85 million dollars. ADO personnel may not spend directly in that sector, but goods they buy in the retail sector are likely to come from the manufacturing industry.

Other sectors that benefit hugely from the presence of ADO Townsville are 'Retail Trade', 'Accommodation and Food Services', 'Transport, Postal and Warehousing', 'Financial and Insurance Services' and the 'Rental, Hiring and Real Estate Services'. These sectors all rely on private consumption of local residents, of whom 9% are related to ADO Townsville – see Section 3.2.

Looking at the public sector, we see that both the 'Education' and the 'Health Care and Social Assistance' sector have about 10 million dollars each more output in Table 4.1 than in Table 3.1. In the case of the health care sector this must be attributed to non-uniformed members and the relatives of uniformed members (uniformed members have access to ADF provided health care).

Table 4.1 Benefactors of the presence of ADO Townsville in the TT region, 2006-2007

Industry sectors	TT region	
	Cents per ADO dollar output	Total additional output because of the ADO
Agriculture, Forestry and Fishing	0.2	1.5
Mining	0.3	2.8
Manufacturing	10.4	85.5
Electricity, Gas, Water and Waste Services	3.9	32.2
Construction	3.3	27.4
Wholesale Trade	6.2	50.9
Retail Trade	8.6	70.6
Accommodation and Food Services	3.7	30.7
Transport, Postal and Warehousing	7.3	60.4
Information Media and Telecommunications	2.7	22.1
Financial and Insurance Services	5.2	42.5
Rental, Hiring and Real Estate Services	12.5	102.4
Professional, Scientific and Technical services	5.7	47.1
Public Administration and Safety	0.8	6.7
Of which: Public Administration	0.8	6.6
Defence ¹	0.0	0.1
Education and Training	1.9	15.9
Health Care and Social Assistance	2.5	20.8
Arts and Recreation Services	2.7	22.6
Other Services	1.7	14.1
Total effect of spending on goods and services	79.8	656.2

Source: JCU modelling

¹ Note that the additional output because of the presence of the ADO is not zero for ADO Townsville itself. This is the case, because ADO Townsville also uses its own capacities as an input to expand, albeit that contribution is only marginal (but not zero).

In Table 4.2 we summarise the findings of the direct and indirect impact of ADO Townsville on the TT economy. The first column is the direct effect as described in Table 3.1 in Section 3: the

¹² Comparing Tables 3.1 and 4.1 reveals one problem: the construction sector. The figure in Table 4.1 is below the figure in Table 3.1. We suspect that the sector definition of the construction sector used to determine the figures presented in Table 3.1 does not link up perfectly with the definition the ABS uses (on which Table 4.1 is based). There potentially is a demarcation problem between the sectors 'Construction' and 'Electricity, Gas, Water and Waste Services', which is low in Table 3.1.

share of ADO Townsville spending in total output of that sector. It only includes the expenditures on goods and services that ADO Townsville purchased in the TT region. It does not include second and further round effects or wage effects. The column on the right does include these indirect effects.

The results demonstrate that ADO Townsville accounts for 4.5% of total non defence output in the TT region. That impact is however not evenly distributed over the range of sectors. A significant portion (6.8% or more) of the outputs of sectors 'Agriculture, Forestry and Fishing', 'Wholesale Trade', 'Retail Trade', 'Accommodation and Food Services', 'Financial and Insurance Services', and 'Rental, Hiring and Real Estate Services' are attributable to ADO Townsville activity in the TT region.

Table 4.2 Direct and indirect impact of ADO Townsville in the TT region (shares), 2006-2007

Industry sectors	TT region	
	Direct effect	Total effect
Agriculture, Forestry and Fishing	0.0	7.6
Mining	0.0	0.5
Manufacturing	0.2	3.6
Electricity, Gas, Water and Waste Services	0.3	5.1
Construction	1.6	1.4
Wholesale Trade	4.4	7.0
Retail Trade	0.9	7.1
Accommodation and Food Services	0.0	6.9
Transport, Postal and Warehousing	0.4	5.3
Information Media and Telecommunications	0.1	5.8
Financial and Insurance Services	2.0	8.0
Rental, Hiring and Real Estate Services	0.8	6.8
Professional, Scientific and Technical Services	1.3	4.9
Public Administration and Safety	0.0	1.1
Of which: Public Administration	0.0	1.1
Defence	NA	NA
Education and Training	1.0	2.9
Health Care and Social Assistance	1.8	3.3
Arts and Recreation Services	0.0	5.7
Other Services	1.7	5.0
Total (without defence)	1.0	4.5

Source: JCU modelling 2006-2007

4.3 The total economic impact of ADO Townsville on the TT region

Now that we have determined the indirect economic impact of ADO Townsville on the TT economy, we can quantify the total impact of ADO Townsville on the local economy. Or in other words, what would happen to the local economy if ADO Townsville left the region and was not replaced by alternative industries?

Table 2.3 shows that ADO Townsville is worth 6.1% of total employment in the local economy, which is a similar share once expressed in dollars according to our IO model. If ADO Townsville left the region the 6.1% share of local GDP would be gone. However, as can be seen in the last row of Table 4.2, ADO Townsville is also (indirectly) responsible for 4.5% of the non-ADO output generation in the local economy, which then constitutes 93.9% of the local economy. Taking ADO Townsville out of the local economy and not replacing it by other industries would mean the local economy would shrink by 10.3%.¹³

4.4 Taking stock

We have seen that:

- for every dollar of output that ADO Townsville produces, 18 cents worth of goods and services produced in the TT region will be used in the production process, which is the so-called first round effect;
- the second and further round effects amount to another 11 cents of goods and services produced in the TT region, bringing the total value of local production needed as input in the production process that allows ADO Townsville to increase output by a dollar to 29 cents;
- all above mentioned production also requires labour input, which will be rewarded through wage payments. These wage payments lead – through consumption – to more demand for local products and services. This wage effect is worth another 49 cents of extra output, which is attributable to the one dollar increase in ADO Townsville production;
- in total a one dollar increase in ADO Townsville production leads to 79 cents worth of additional output in the TT region;
- translating the one dollar example to total output of ADO Townsville, we conclude that ADO Townsville's activity leads to a further 656 million dollars worth of output in the TT region;
- ADO Townsville is – through its direct and indirect impact on the economy – responsible for about 10% of total output in the local economy.

13. This is calculated as follows: $100\% \cdot 0.061 + 4.5\% \cdot 0.939 = 10.3\%$. One could argue that if ADO Townsville claims 4.5% of the remaining economy, the remaining economy can also claim part of ADO Townsville's output, which would reduce the total impact of ADO Townsville. While correct in theory, Table 3.3 shows that ADO Townsville largely is a stand alone sector in terms of their inputs, which dampens this potential effect severely. Nonetheless, the 10.3% will be a slight overestimate of the total impact of ADO Townsville in the local economy.

5. ADO Townsville expansion

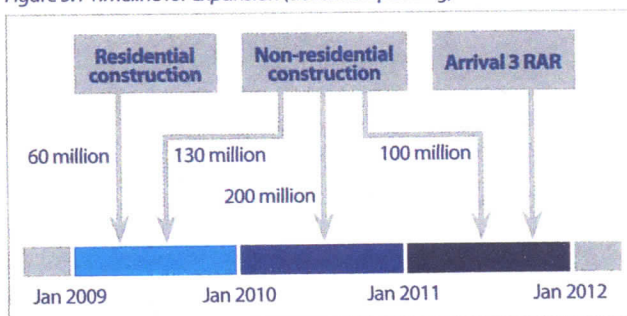
Sections 2 to 4 have analysed the current impact of ADO Townsville on the local economy. However, ADO Townsville will expand its operations from 2012 onwards with the arrival of the 3rd Battalion, Royal Australian Regiment (3 RAR) in late 2011. This section will therefore consider the 2006-2016 time window. It will discuss:

- how ADO Townsville will prepare for that expansion and predict what the impact of that preparatory work will be on the local economy in the 2009-2011 period;
- how the expanded ADO Townsville will impact on the local economy from 2012 onwards;
- how the requirements in the social sphere will change once ADO Townsville has completed its expansion in 2012 and whether the TT region will be able to accommodate these changed requirements through to 2016.

5.1 Construction in the 2009-2011 time window

3 RAR consists of an estimated 760 uniformed members. To accommodate this substantial expansion, ADO Townsville will start residential and non-residential construction in 2009, which will extend into 2010 and 2011. The expenditures involved are detailed in Figure 5.1.

Figure 5.1 Timeline for expansion (dollars of spending)



Source: ADO Townsville

ADO Townsville predominantly relies on two industry sectors to prepare Lavarack Barracks for the arrival of 3 RAR in late 2011: residential construction and non-residential construction. Expenditures will flow into these sectors as per Figure 5.1. To assess the impact of the ADO Townsville expansion plans, we first discuss multiplier effects of both sectors compared to the one we have presented in Section 4: Defence. Table 5.1 gives the multiplier effects. We observe that both Residential and Non-residential construction have higher total multiplier effects than Defence. The main reason is the origin of inputs in the production process. Table 3.2 shows that only 31% of inputs used by Defence are supplied by the TT economy, while that share is 73% for the construction industry. This higher share of locally produced inputs shows up in Table 5.1, which gives higher first and further rounds effects for the construction sectors.

Table 5.1 Breakdown of multiplier effects of affected sectors in TT region

Impacts on TT region	Residential construction	Non-residential construction	Defence
Initial effect	1.00	1.00	1.00
First round effect	0.51	0.52	0.18
Further round effects	0.39	0.38	0.11
Wage effect	0.46	0.39	0.49
Total multiplier	2.36	2.28	1.79

Source: JCU modelling

Table 5.2 shows the consequences of the 490 million dollars that ADO Townsville will spend on construction in the 2009-2011 period. The 490 million dollars direct spending will provoke a further 643 million dollars in indirect spending in the TT region, which then means that the total economic impact of the three year construction work on the TT region is worth 1.1 billion dollars.¹⁴

Table 5.2 Direct and indirect impact of construction 2009-2011 (million AUD)

Industry sectors	2009	2010	2011
Agriculture, Forestry and Fishing	0.3	0.2	0.1
Mining	2.4	2.5	1.2
Manufacturing	45.3	43.8	21.9
Electricity, Gas, Water and Waste Services	6.2	6.6	3.3
Construction	241.9	251.6	125.8
Wholesale Trade	12.7	13.1	6.5
Retail Trade	15.1	15.4	7.7
Accommodation and Food Services	6.2	6.3	3.2
Transport, Postal and Warehousing	16.4	17.9	9.0
Information Media and Telecommunications	6.0	6.4	3.2
Financial and Insurance Services	13.9	13.6	6.8
Rental, Hiring and Real Estate Services	32.9	35.2	17.6
Professional, Scientific and Technical Services	27.4	32.2	16.1
Public Administration and Safety	2.2	2.4	1.2
Education and Training	3.1	3.1	1.5
Health Care and Social Assistance	3.4	3.4	1.7
Arts and Recreation Services	4.1	4.2	2.1
Other Services	2.8	2.9	1.4
Total	442.2	460.8	230.4

Source: JCU modelling

¹⁴ This figure is likely to be a slight overestimate of the total impact. The model and hence its multiplier effects is based on data from the financial year 06/07. The Australian economy was in the midst of a boom in that period, which typically coincides with low saving rates. The Australian economy entered a downturn early 2009. The wage multiplier used in our analysis may therefore be too high given the current economic climate, which subsequently implies the indirect effects may be slightly overstated.

Next to 'Construction' we see that sectors 'Manufacturing', 'Rental, Hiring and Real Estate Services', and 'Professional, Scientific and Technical Services' will be the main benefactors of ADO Townsville spending, but also sectors 'Wholesale trade', 'Retail Trade', 'Transport, Postal and Warehousing' and 'Financial and Insurance Services' will be impacted significantly.

This significant injection of monies into the TT economy may lead to supply constraints. We therefore construct Table 5.3 which presents the figures in Table 5.2 as shares of total output of the involved industry sectors, which gives an indication of which sectors may face capacity constraints.

The construction sector will have to allocate 11% of its production capacity in 2009 and 2010 to accommodate the extra demand created by ADO Townsville. Others sectors will face more moderate impacts. The 'Financial and Insurance Services', 'Rental, Hiring and Real Estate Services' and 'Professional, Scientific and Technical Services' sectors stand out with impacts of up to 3%.

Table 5.3 Share of industry capacity needed for ADO Townsville expansions

Industry sectors	Year ¹	2009	2010	2011
Agriculture, Forestry and Fishing		1.4	0.9	0.4
Mining		0.4	0.5	0.2
Manufacturing		1.7	1.7	0.8
Electricity, Gas, Water and Waste Services		0.9	0.9	0.5
Construction		11.2	11.5	5.6
Wholesale Trade		1.6	1.6	0.8
Retail Trade		1.4	1.4	0.7
Accommodation and Food Services		1.3	1.3	0.6
Transport, Postal and Warehousing		1.3	1.4	0.7
Information Media and Telecommunications		1.4	1.5	0.7
Financial and Insurance Services		2.4	2.3	1.1
Rental, Hiring and Real Estate Services		2.0	2.1	1.0
Professional, Scientific and Technical Services		2.6	3.0	1.5
Public Administration and Safety		0.1	0.1	0.1
Education and Training		0.5	0.5	0.2
Health Care and Social Assistance		0.5	0.5	0.2
Arts and Recreation Services		1.0	1.0	0.5
Other Services		0.9	0.9	0.4
Total		2.6	2.6	1.3

Source: JCU modelling

¹ We have used the ABS Producer Price Index to control for producer price changes in the 2007-2009 period. Furthermore we expect producer prices to be stagnant in 2009, and increasing by 2% in 2010 and in 2011.

Given that an economic downturn hit Australia early 2009 (including the TT region) and is expected to last at least well into 2010, the stimulus provided by ADO Townsville to the local economy could not have come at a better time. Though arguably unintentional, the stimulus will assist the TT region in pulling through this downturn. The construction sector, that is typically hit hardest in downturns, is the sector that will receive the largest part of the ADO stimulus. We therefore do not expect any major bottlenecks to occur if ADO Townsville adheres to the current time line of spending. Such constraints may occur if ADO Townsville spending is delayed and coincides with a recovery of the Australian economy.

5.2 ADO Townsville in 2012

By late 2011 the upgrade of Lavarack barracks should be completed and 3 RAR should be accommodated at Lavarack barracks. That upgrade will intensify the socioeconomic impact of ADO Townsville on the TT region. We will discuss the change in ADO Townsville's economic and social impact separately.

5.2.1 Economic impact

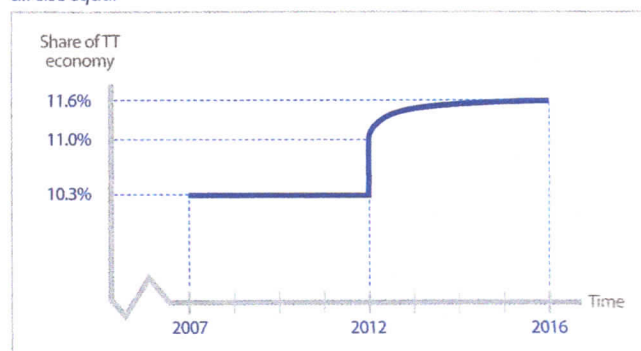
The arrival of 3 RAR in late 2011 will lead to a substantial increase in ADO Townsville operations and activity. The 760 uniformed member of 3 RAR will increase the total number of ADO Townsville uniformed members from 5,730 to 6,490 or a 13.3% increase in the workforce. Since ADO output is closely related to the size of the workforce and 3 RAR is fully operative, we assume that ADO Townsville output will increase by 13.3% as well.

We first analyse the general consequences of such an increase for the local economy. We know from Section 4 that ADO Townsville is responsible for just over 10% of total economic activity in the TT economy. When ADO Townsville completes its expansion in 2012, that share in total output of the TT economy will increase in two stages – see Figure 5.2. In stage 1 – which happens immediately after 3 RAR arrives in Townsville – ADO Townsville output will increase, which lifts the ADO Townsville share of the TT region's output from 10.3% to 11.0%.

However, we also know that the additional spending of ADO Townsville will lead to multiplier effects which trickle through the local economy. This extra output is also attributable to the presence of ADO Townsville in the region. Once the local economy has absorbed the increase of ADO Townsville, the ADO Townsville share in the TT region's output will settle at 11.6%. As Figure 5.2 indicates, that absorption process may take a while. If the local economy is not able to provide the inputs that ADO Townsville requires in 2012 (capacity constraints), ADO Townsville will have to import those inputs from outside the region, which means the multiplier effects will not take place in the TT region (but instead elsewhere). However, that will only be temporary, because ADO Townsville's demand for inputs will put upward pressure on the price of these inputs locally, which will

encourage local industries to increase production capacity. The length of this adaptation process depends on price elasticities, the business cycle and other factors. Once completed, ADO Townsville will be responsible for 11.6% of the local economy, all else equal. That is, we assume non-ADO industry structure in the TT region remains unchanged.

Figure 5.2 Evolution of impact of ADO Townsville on TT economy, all else equal



Source: JCU modelling

We can also estimate the impact the arrival of 3 RAR has on the local economy, which will grow as a result of the direct and indirect impact of the expansion of ADO Townsville. Table 5.4 provides the details. The first column provides the additional supply of goods and services required as a consequence of the ADO Townsville 2012 expansion expressed in 2007 prices. The second column expresses the required additional supply of goods and services as a share of total industry output, which is the economic growth rate by sector as a consequence of the ADO Townsville's 2012 expansion.

The local economy (*i.e.* gross domestic product) will grow by 1.5% once the adaptation process is fully completed and the new, expanded ADO Townsville is subsequently fully integrated in the local economy.

5.2.2 Social impact

To study the social impact of the 2012 ADO Townsville expansion, we focus on the households involved in the move of 3 RAR from Sydney to Townsville in late 2011 and early 2012. Since 3 RAR looks similar to the demography of current uniformed members at ADO Townsville, we can use Table 3.6 to predict that about 950 dependent household members will accompany the 760 army personnel that will join ADO Townsville, of whom approximately 470 are spouses and 480 dependent children.

These additional ADO Townsville households will have to rely on social services provided by the TT region from 2012 onwards as will the existing ADO Townsville and non-ADO Townsville

households. In this section we will consequently explore some demographic forecasts for the region to assess how the social environment will develop as compared to the situation described in Section 3, *i.e.* in 2006/2007. We will again focus on housing, health care and child care / education and look up to ten years ahead.

Table 5.4 Economic growth due to 2012 ADO Townsville expansion

Industry sectors	Total additional output because of 2012 ADO expansion ¹ (\$Millions)	Economic growth because of 2012 ADO expansion (% Growth)
Agriculture, Forestry and Fishing	0.2	1.1
Mining	0.4	0.1
Manufacturing	13.1	0.5
Electricity, Gas, Water and Waste Services	4.9	0.8
Construction	4.2	0.2
Wholesale Trade	7.8	1.1
Retail Trade	10.8	1.1
Accommodation and Food Services	4.7	1.1
Transport, Postal and Warehousing	9.2	0.8
Information Media and Telecom.	3.4	0.9
Financial and Insurance Services	6.5	1.2
Rental, Hiring and Real Estate Services	15.7	1.0
Professional, Scientific and Technical Serv.	7.2	0.7
Public Administration	1.0	0.2
Defence	125.9	13.3
Education and Training	2.4	0.4
Health Care and Social Assistance	2.9	0.5
Arts and Recreation Services	3.8	1.0
Other Services	2.2	0.8
Total spending	226.3	1.5

Source: JCU modelling

¹ Expressed in 2007 prices

5.2.2.1 Housing

We saw in Section 3.2.1 that the housing market in the TT region in 2006 was not as tight as it was in the major capital cities in Australia and in the neighbouring regions of the TT region. To understand what the housing market will look like in 2012 and beyond we use the projected population growth for the 2006-2016 period.¹⁵ ABS (2001) predicts that the Australian population will have grown by 7.8% and 15.8% in 2011 and 2016 respectively compared to 2006. Table 5.5 shows the projected population growth in the TT region which is twice as high as the Australian average. The projected population growth subsequently leads to a (less than proportionate) household growth in the region.

However, Table 5.5 not only shows that the number of households will increase significantly over time, also household composition will change in favour of 'couple families without children' and 'lone person households'.

Table 5.5 Population and Household growth projections in the TT region

Demographics	2006	2011	2016
Population growth from 2006:	base year	15.8	32.3
Household growth from 2006:	base year	13.1	25.0
Household composition:			
▪ Couple family with children	28.9	26.4	25.0
▪ Couple family without children	27.0	28.2	28.9
▪ One parent family	12.1	12.0	11.9
▪ Other family	1.3	1.3	1.2
▪ Group household	6.0	6.0	5.7
▪ Lone person household	24.7	26.1	27.2

Source: Queensland Government (2008)

Using these projections for the TT region and a link between household composition and dwelling structure listed in Table 5.6, we can estimate housing demand in the TT region to dwelling type for 2011 and 2016.

Table 5.6 Dwelling structure to household composition in the TT region (% shares), 2006

Household compositions	Separate house	Semi-detached house	Flat, unit, apartment	Other dwellings ¹
Family households:				
Couple family with children	96	1	3	0
Couple family without children	85	4	12	1
One parent family	83	4	13	0
Other family	76	6	19	1
Group household	68	6	26	1
Lone person household	56	12	32	2

Source: ABS Census 2006

¹ Other dwellings include caravans, cabins, houseboats, improvised homes, tents, sleepers out, houses or flats attached to a shop or offices.

Table 5.7 provides the projected extra residential dwellings needed between 2006 and 2011 and between 2006 and 2016, assuming the statistics in Table 5.6 remain constant until 2016. We observe that the need for new dwellings is different for different dwelling structures. The greatest need is for 'separate houses' and 'flats, units, and apartments'.

ADO Townsville – through DHA Townsville – is preparing for the arrival of 3 RAR in late 2011. Table 5.8 gives the off-base housing stock in 2008/2009 and the projected off-base housing stock in 2011/2012. We note two developments. Firstly, ADO Townsville intends to increase its housing stock by 450. Secondly, ADO Townsville intends to upgrade the quality of its housing stock and bring it more in line with the rank distribution of its uniformed members.

¹⁵ The ABS (and consequently all other institutes that use ABS data) run three population growth scenarios: low, medium and high. We present figures from the medium scenario of the population predictions throughout this report.

Table 5.7 Projected extra dwellings needed in the TT region in 2011 and 2016, 2006

Years	Separate house	Semi-detached house	Flat, unit, apartment	Other dwellings ¹
Projected extra dwellings needed by:				
2011	5,000	400	1,250	100
2016	9,500	800	2,300	150

Source: ABS Census 2006 and JCU modelling

¹ Other dwellings include caravans, cabins, houseboats, improvised homes, tents, sleepers out, houses or flats attached to a shop or offices.

That rank distribution is shown in brackets in the first column of Table 5.8 and links up with the minimum standard of housing quality to which a uniformed member is entitled given their rank. The quality upgrade will reduce the chance that ADO Townsville is not able to provide accommodation of the minimum required quality to one of its uniformed members and potentially force that employee into the private housing market.

Table 5.8 Projected off-base housing stock mid 2009 and 2012

Rank ¹	2008/2009	2011/2012
A / B1 (77.9%)	86.3%	82.9%
B2 (18.8%)	11.4%	12.5%
C (3.1%)	2.2%	4.5%
D / E (0.1%)	0.1%	0.1%
Total (numbers)	1,550	2,000

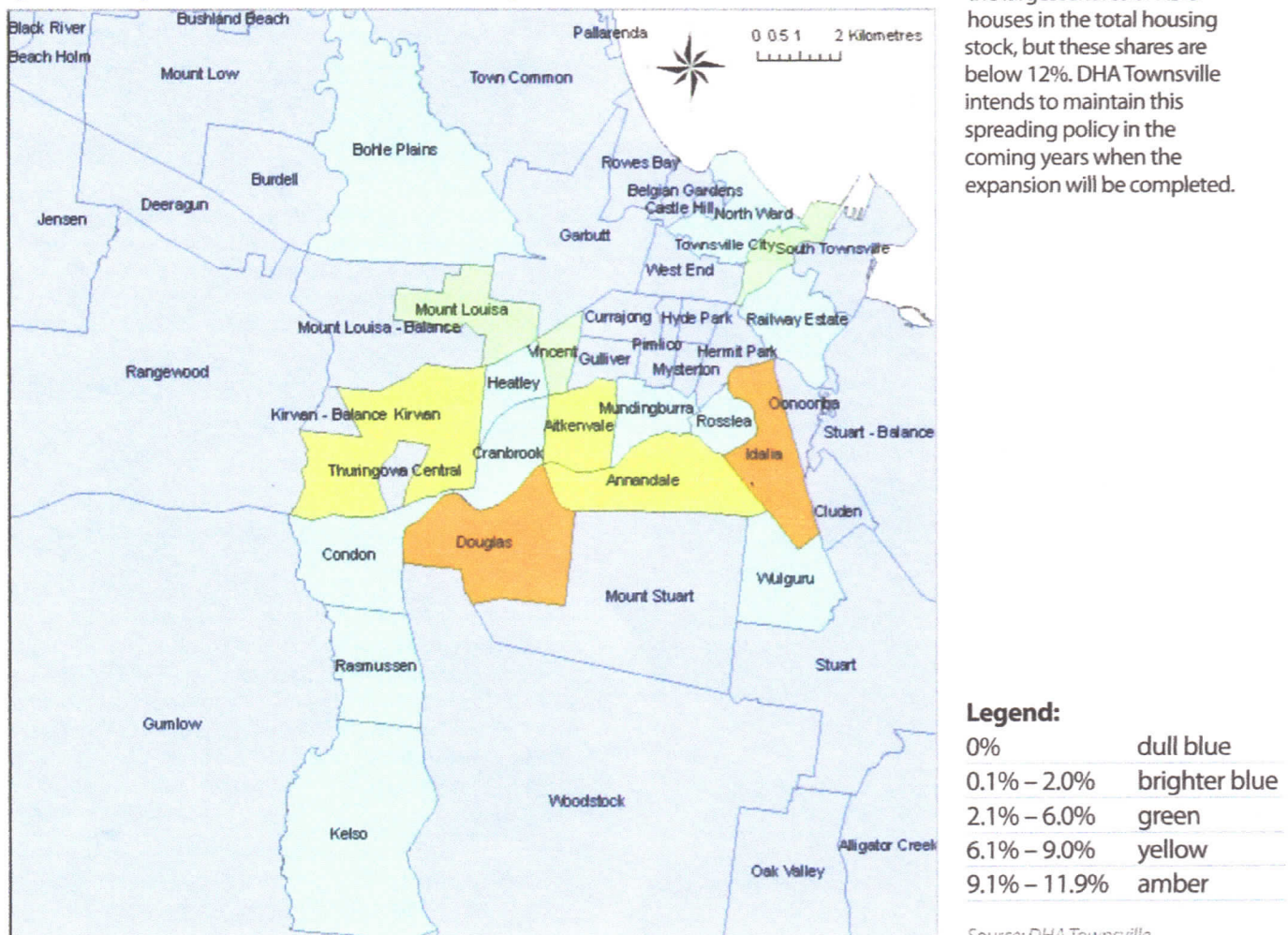
Source: DHA Townsville, Defence Census 2007

¹ A: Corporal and below; B1: (Staff) Sergeant; B2: Captain, (Second) Lieutenant, Warrant Officer Class 1 or 2; C: Lieutenant Colonel and Major; D: Brigadier and Colonel; E: Major General and above.

Finally, Figure 5.3 shows the spatial distribution of the housing stock of ADO Townsville as a share of total housing stock in a suburb in the TT region. DHA Townsville intends to spread its housing stock evenly over the TT region, to prevent pockets of ADO uniformed members in the region, which may lead to localised problems in health care and education provision. Lavarack Barracks is situated in the suburb of Mount Stuart.

The adjacent suburbs have the largest shares of ADO houses in the total housing stock, but these shares are below 12%. DHA Townsville intends to maintain this spreading policy in the coming years when the expansion will be completed.

Figure 5.3 Housing stock ADO Townsville as share of total housing stock to suburb, 2007



Source: DHA Townsville

Next to off-base housing acquisition, the construction plans detailed in Section 5.1 indicate that ADO Townsville will also build 540 single units of accommodation on the base in Townsville. Therefore in total ADO Townsville will raise its accommodation capacity by a thousand early 2012.

Whether or not demand for housing in the TT region due to ADO Townsville expansion and demographic changes will lead to a further tightening of the housing market depends on house supply, *i.e.* construction of new houses. To shed some light on housing supply in the TT region we use a study conducted by the Queensland Government's Planning Information and Forecasting Unit in 2005. Queensland Government (2005) conducted a so called broadhectare study for the TT region, where broadhectares refer to hectares of land which are suitable, available and serviceable for residential construction. Taking on board the time window between lot approval and dwelling approval (*i.e.* the lot needs to be produced, registered, sold and the dwelling constructed), Queensland Government (2005) forecasts the number of dwellings that can potentially be produced in the TT region ten years ahead.

Table 5.9 shows the results. The bulk of residential dwellings in the TT region can be produced in Thuringowa. For the TT region as a whole, nearly 17,000 residential dwellings could be produced before 2016. If we compare that to the projections of Table 5.7, we conclude that the supply potential is large enough to meet demand in the period up to 2016.

Table 5.9 Residential dwellings potential 2006-2015

Time window Geography	2006- 2008	2008- 2010	2010- 2015	2006- 2015
Thuringowa	3,290	4,950	3,800	12,040
Townsville	1,940	1,240	1,660	4,840
TT region	5,230	6,190	5,450	16,880

Source: Queensland Government (2005)

However, we also conclude that supply constraints may arise in the post 2015 period, if current planning schemes are not revised. Similarly, Queensland Government (2005) predict that current supply (based on broadhectares) will run out between 2020 and 2030. If changes to current planning schemes are allowed for, supply may last to 2045.

In conclusion, there is no reason to assume that the housing market in the TT region will further tighten in the period up to 2016, assuming that residential construction plans indeed translate into actual construction.

5.2.2.2 Health Care

The expansion of ADO Townsville in 2012 will increase demand for health care by 2.9 million dollars (2007 prices) as Table 5.4 shows. That increase is predominantly a consequence of the arrival of spouses and children of uniformed members who are part of the arriving 3 RAR. In Section 5.2.2 we estimated that 470 spouses and 480 dependent children would accompany 3 RAR to the TT region. These 950 persons have to rely on local non-ADF Townsville health care assistance.

Furthermore, the arrival of the 760 uniformed members of 3 RAR will lead to a substantial increase in health care demand, which is provided by ADF Townsville. 3 RAR is a fully operative battalion which means the 13.3% increase in the ADO Townsville personnel population is likely to feed through in health care spending proportionally. If the necessary medical manpower is drawn from the TT region, that will further strain health care supply in the TT region.

In Section 3.2.2 we concluded that health care supply in the TT region is under funded compared to the nationwide average. The expansion of ADO Townsville in 2012 will further exacerbate that situation, and demographic changes in the TT region will increase the health care provision deficit. We saw in Table 5.5 that the population of the TT region is projected to grow at a rate which is faster than the projected Australian population growth rate. That will imply that the health care deficit will grow if no measures are taken. Secondly as can be seen from Table 5.10, the age distribution of the TT region's population is projected to change as well, *i.e.* the population of the TT region is projected to grow older. Table 3.13 informed us that an ageing population will lead to an increase in health care demand, which also hints at an increasing health care deficit.

Table 5.10 Age cohort projections (shares), 2006-2016

Age cohort	2006	2011	2016
0-14 years	21.4	20.7	20.0
15-24 years	16.7	16.2	15.6
25-44 years	30.3	29.3	28.4
45-64 years	22.6	23.3	23.6
65 years and over	9.0	10.8	12.7

Source: Queensland Government (2008)

We conclude that the federal government urgently needs to increase health expenditure in the TT region to prevent a deepening of the health care deficit, which will otherwise compromise the functioning of ADO Townsville in particular and the TT region in general.

5.2.2.3 Child care and education

As mentioned in Section 5.2.2, the 480 dependent children that will arrive with 3 RAR will rely on child care and education systems in the TT region. Population growth in the TT region as described in Table 5.2 will spur demand for child care and education facilities even further. However, as opposed to health care demand, the ageing of the population will dampen demand for child care and primary and secondary education in the TT region – see Table 5.10.

Notwithstanding the dampening effect of an ageing population on child care and primary and secondary education, the deficit, especially in primary and secondary education, remains a concern and is unlikely to ease without additional substantial Commonwealth funding and subsequent recruitment of teachers.

5.3 Taking stock

We have seen that:

- the preparatory work required to accommodate the arrival of 3 RAR in 2012 will provide a welcome economic stimulus to the recession bound local economy in the 2009-2011 period. The construction industry will be the main beneficiary of this stimulus;
- ADO Townsville's impact on the local economy will increase from 10.3% to 11.6% once the expansion is completed in 2012;
- the expansion of ADO Townsville together with demographic developments in the TT region will lead to sustained demand for housing in the years ahead. However, the region does not face supply constraints that would lead to a tightening of the housing market in the 2009-2016 period;
- the expansion of ADO Townsville together with demographic developments in the TT region will lead to sustained demand for health care. Policy change is urgently needed to accommodate that demand;
- the expansion of ADO Townsville and the projected growth of the population in the TT region will increase demand for child care and education. However, changing demography (i.e. ageing population) will reduce demand for child care and primary / secondary education, leaving the overall direction of demand ambiguous. The effect of an ageing population is unlikely to be strong enough to make serious inroads to close the current deficit in primary / secondary education.

6. Conclusions

The study has highlighted the socio-economic impact of ADO Townsville on the region. ADO Townsville employs over 6,000 employees who further support 8,000 family members, bringing the total ADO Townsville community to 14,000, or 9% of the Townsville population.

In economic terms ADO Townsville is slightly bigger. The direct economic contribution of ADO Townsville is about 6% of total regional output. However, once the indirect impact of ADO Townsville is factored in, ADO Townsville's economic contribution increases to 10.3%. Consequently, ADO Townsville has a significant impact on the regional economy, but given its population also on the social structure.

The arrival of 3 RAR in 2012 will increase ADO Townsville's activity which – given its size – will change the structure of the local economy and the requirements it places on the existing social structure.

We have seen that the preparatory work to accommodate the arrival of 3 RAR will boost the local economy with 1.1 billion dollars worth of direct and indirect spending. These expenditures will assist the local economy in softening the current economic downturn.

Once the integration of 3 RAR in ADO Townsville is completed, the economic contribution of ADO Townsville will increase from 10 to 11.6% of the local economy. The expansion will lead to a 1.5% GDP growth of the local economy.

However, the expansion of ADO Townsville will also increase requirements on the social structures prevailing in the region. We explored the housing market, health care, and childcare and education in the 2006-2016 period. We saw that housing availability and affordability are less of a concern in the region than in the major capitals of Australia and we do not expect that pattern to change in the foreseeable future. Health care provision (*i.e.* GP services) is currently under funded and projected demographic change for the region suggests the health care deficit will deepen further. Additional funding is required.

Child care provision is slightly better organised in the region than in other ADO localities. However, child care remains a concern to a significant portion of ADO Townsville members. Primary and secondary education (*i.e.* teachers) is significantly under funded in the region. The effects of projected demographic change on demand for education are ambiguous, which means additional funding is needed also in this sector.

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