

The Australian Defence Organisation and Tropical Australia: Its Socio-Economic Impact in Cairns, Darwin and Townsville

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1. Introduction

Tropical Australia, defined as the area north of the Tropic of Capricorn – see Figure 1.1 for an illustration, has been one of the key population growth areas of Australia since the start of the 21st Century. While the Australian population grew at 1.6% per annum since 2001, tropical Australia's population grew at 2.1% per annum to reach just over a million in 2009, which is about 4% of the Australian population (Bureau of Infrastructure, Transport and Regional Economics, 2011).

The 2011 Census reveals that of those 1 million people, 71% live in the state of Queensland, which contains two major cities – Townsville (175,000 residents) and Cairns (142,000 residents). A further 21% live in the Northern Territory which contains one major city – Darwin (121,000 residents). The remaining 8% live in Western Australia which includes no major cities north of the Tropic of Capricorn.

The Australian Defence Organisation (from here on Defence) is an important industry in the three tropical cities. Together, they host about a fifth of Australia's permanent Defence force personnel, ranging from Army (29% of Australia's permanent army force) to navy (12%) and air force (9%). Further, the three tropical cities accommodate 4% of Australia's civilian Defence personnel.

Whilst Defence's footprint in tropical Australia is substantial, little research has been done on how Defence fits in the socio-economic structure of tropical Australia. This report therefore (1) describes the socio-economic structures of the three major cities; (2) contrasts their socio-economic structures to the Australian average; and (3) studies the impacts of Defence on the socio-economic structures of the three tropical cities.

The report is structured as follows. Section 2 gives an overview of the three tropical cities, comparing and contrasting the cities to each other and to the rest of Australia. Section 3 then describes the presence of Defence in the three tropical cities. Subsequently, Section 4 describes the interaction between Defence and the cities. Section 5 provides concluding remarks.

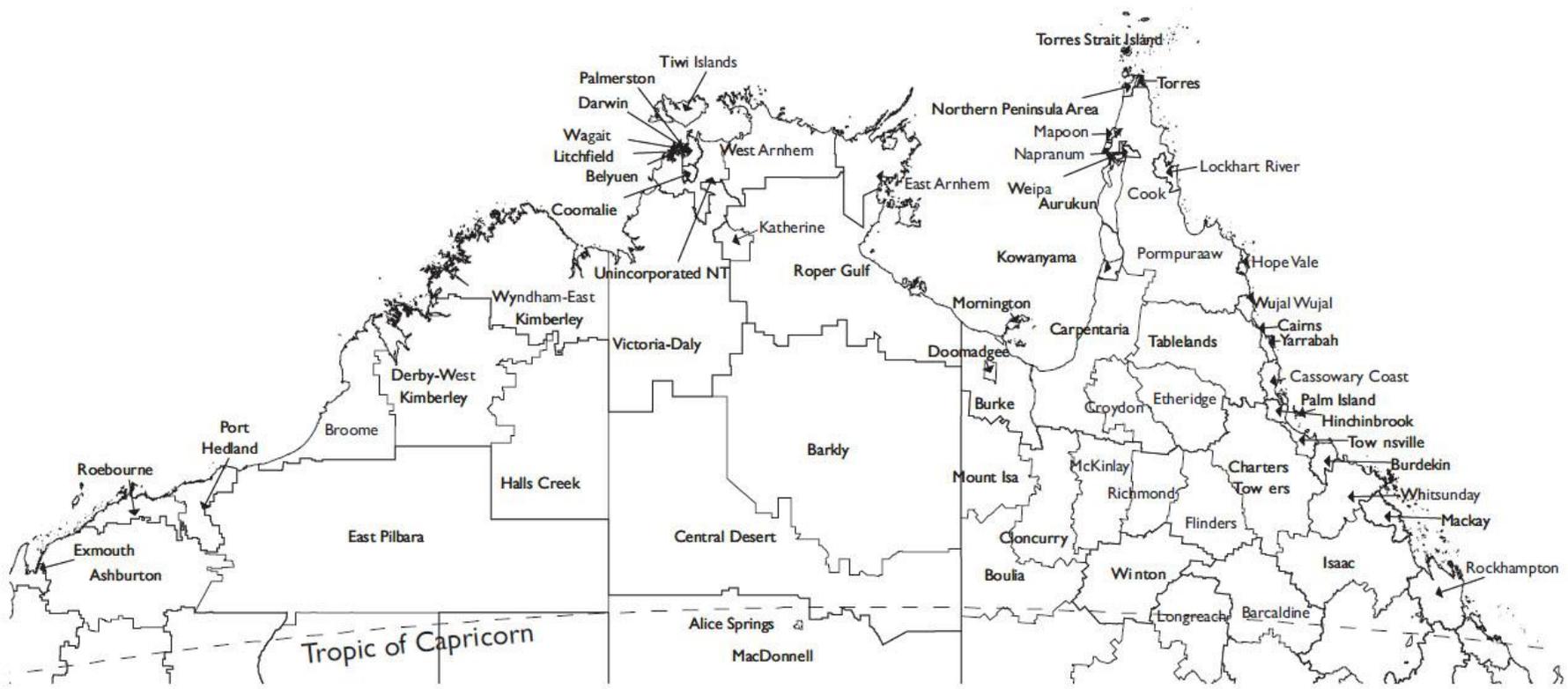


Figure 1.1 Demarcation of tropical Australia

Source: Bureau of Infrastructure, Transport and Regional Economics (BITRE) (2011)

2. Depicting the three cities in tropical Australia

While population growth in tropical Australia outstrips population growth in Australia, population growth in the three tropical cities outstrips population growth in tropical Australia. Consequently, whilst population distribution in tropical Australia is already skewed towards the three cities, that skewedness is likely to increase. This section therefore takes a closer look at the three cities, their demography and their economic structures.

2.1 Demography of the tropical cities

This subsection provides both an internal comparison of Australia's tropical cities by comparing key demographics of the three cities and an external comparison by contrasting the tropical cities' demography to the Australian average.¹

“... residents in the tropical cities are younger than the Australian average”

Figure 2.1 highlights the first main demographical difference between tropical cities and Australia: residents in the tropical cities are younger than the Australian average. The figure plots the percentage share of the total population to cumulative age cohorts. The purple line represents the Australian average. If a city's line is depicted below the purple line, it means the city has an older population than the Australian average; if a city's line is above the purple line, the city's population is younger than the Australian average.

Since the lines for all three cities are above the line representing the Australian average, populations in the three cities are younger. The population of Darwin is the youngest, followed by Townsville and Cairns. To make sure that the age effect is specific to the tropical cities and not for example to cities in general, we also include 'urbanised Australia' in the figure. Though the light blue line for urbanised Australia is slightly above the purple line for Australia – indicating cities indeed have younger populations – the cities of Cairns and especially Townsville and Darwin have younger populations than the urbanised Australian average.

The relatively young population also transpires into some other demographic characteristics of the three tropical cities. For example, Table 2.1 shows that whilst 70% of all Australian households purchased their dwelling, that is around 60% in the three tropical cities. If residents have purchased a dwelling, the share of households that own their property outright is about 40% Australia wide, but it ranges between 30% for Darwin (the tropical city with the youngest population) and 34% in Cairns (the tropical city with the oldest population).

¹ To demarcate the cities, we use the following set of definitions using the Australian Bureau of Statistics' Statistical Area (SA) geographical classification. Darwin consists of four SA3s (Darwin city, Darwin suburbs, Litchfield and Palmerston). Cairns consists of two SA3s (Cairns-North and Cairns-South); Townsville is one SA3 (Townsville).

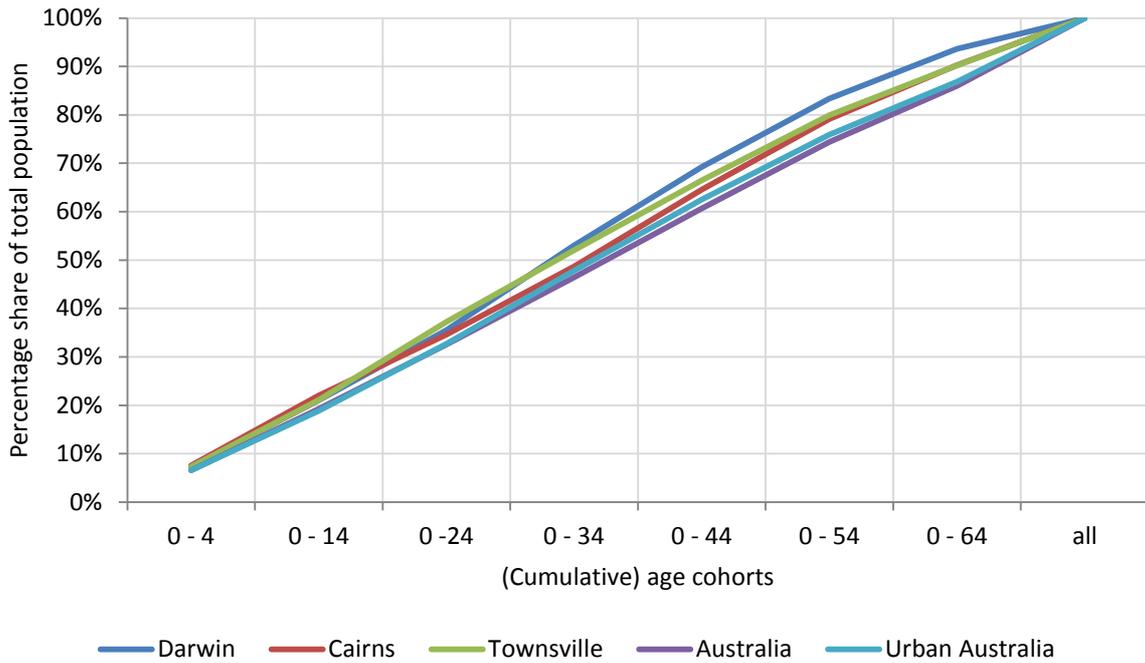


Figure 2.1 Age structure in Australia’s tropical cities

Source: ABS Census (2011)

However, age is unlikely to be the only factor driving differences in purchased dwellings between the tropical cities and Australia. The populations in the three tropical cities are also more transient than the Australian average. Whereas 58% of all Australians did not change address between 2006 and 2011, that percentage is much lower in all three tropical cities, particularly in Darwin and Townsville. To take into account that some residents may have changed address, but not city between 2006 and 2011, we also show the share of residents that did not change city. In Cairns and Townsville just under three quarters of all 2011 residents who were alive in 2006 lived there five years ago. That percentage is lower in Darwin. Overseas immigration is nationally at 5.6%. Townsville is below average, but Cairns and especially Darwin have attracted more overseas migrants to their cities in the last five years than the national average.

Table 2.1 Demographics tropical cities and Australia (% shares), 2011

Demographics	Locality	Cairns	Darwin	Townsville	Australia
Type of dwelling:					
- Purchased		59.3	58.0	61.9	69.9
Of which fully owned		34.2	30.5	32.8	40.2
- Rented		40.1	41.4	37.5	29.4
- Other		0.6	0.6	0.6	0.7
Residence in 2011:					
- Same address as in 2006		51.7	46.0	48.3	58.3
- Same city as in 2006		73.1	68.1	74.3	-
- Elsewhere in Australia in 2006		20.6	23.8	21.2	-
- Elsewhere outside Australia in 2006		6.3	8.1	4.5	5.6

Source: ABS Census (2011)

In terms of gender split, we observe that Cairns and Townsville look very similar to Australia, while Darwin has nearly 3% more men than the Australian average – see Table 2.2.

Further, Table 2.2 indicates two key demographical differences between the three tropical cities and the Australian average. First, the three tropical cities exhibit much higher shares of Indigenous Australians than the Australian average. Here we also observe notable differences between the three cities. The share of Indigenous people in Cairns and Darwin is significantly higher than in Townsville.

“...Darwin has nearly 3% more men than the Australian average”

Second, whilst residents in the three tropical cities are not more likely to be married than the Australian average, they are more likely to have formally registered that marriage.

Table 2.2 Distinctiveness of tropical cities (% shares), 2011

Demographics	Locality	Cairns	Darwin	Townsville	Australia
Gender:					
- Male		49.5	52.2	49.9	49.4
- Female		50.6	47.8	50.1	50.6
Citizenship:					
- Australia		90.2	90.2	91.4	90.3
Of whom Indigenous persons		11.8	12.0	6.9	2.9
Marital status:					
- Married (de-facto)		43.3	42.5	45.1	49.2
- Married (registered)		14.1	16.2	13.7	9.5
- Not married		42.6	41.3	41.2	41.3

Source: ABS Census (2011)

2.2 Economic structure of tropical cities

This subsection focuses on the economic structures of the three tropical cities, using Australia's economic structure as a benchmark.

The economic performance of the three tropical cities, measured in labour market outcomes in 2011, shows a mixed picture – see Table 2.3. While the unemployment rate in Cairns is above the nationwide average, the unemployment rate is below and far below the nationwide average in respectively Townsville and Darwin. Lower unemployment rates also translate into higher shares of fulltime positions possibly indicating that lower unemployment rates associate with lower underemployment rates.

Table 2.3 Labour market conditions tropical cities (% shares), 2011

Labour market conditions	Locality	Cairns	Darwin	Townsville	Australia
Unemployment rate		6.7	3.6	5.1	5.6
Share of fulltime employees in total employment		64.1	72.0	66.4	63.3
Average gross weekly earnings (in dollars)		950	1,160	1,020	1,020
Average gross hourly earnings (in dollars)		27.00	30.70	28.30	29.20

Source: ABS Census (2011)

Average gross weekly earnings are above average in Darwin and below average in Cairns. However, differences in the share of fulltime employment in total employment can obscure earnings differences. Therefore we also estimate average gross hourly earnings. We note that gross hourly wages in Darwin are \$1.50 above the Australian average. In Townsville average hourly wages are \$0.90 below the Australian average, while average hourly wages in Cairns are \$2.20 below the nationwide average.

Whilst regional differences in labour market tightness may play some part in explaining the above earnings structure, there are also other contributors. Table 2.4 presents educational attainments in the three tropical cities. We note that in both Cairns and Townsville educational attainments are lower than the Australian average, while Darwin looks more similar to the Australian average. Trade certificates are the leading qualification in all three tropical cities, whereas a university degree is the leading qualification throughout Australia.

Table 2.4 Educational breakdown in tropical cities (% shares), 2011

Educational categories	Locality	Cairns	Darwin	Townsville	Australia
Bachelor degree or higher		10.6	13.2	10.6	13.8
(Advanced) diploma		5.8	5.8	4.9	5.9
Trade certificate		16.5	15.7	16.5	13.2
Year 12 or less		67.1	65.4	68.2	67.1

Source: ABS Census (2011)

Lower educational attainments also surface in the occupational distribution – see Table 2.5. That is, lower shares of managers and professionals in the occupational distribution are in line with the lower than average share of workers with a university qualification in the three cities. Similarly, the higher incidence of technicians and trades workers in the three cities is in line with the higher than average share of workers with a trade certificate.

Further, we note the elevated share of community and personal service workers in the three tropical cities.²

Table 2.5 Occupational breakdown of tropical cities (% shares), 2011

Occupational categories	Locality	Cairns	Darwin	Townsville	Australia
Managers		10.0	12.8	9.8	13.1
Professionals		17.6	19.9	17.9	21.7
Technicians and Trades Workers		17.1	16.4	16.9	14.4
Community and Personal Service Workers		12.4	13.1	12.7	9.8
Clerical and Administrative Workers		14.6	16.6	14.7	15.0
Sales Workers		9.9	7.6	10.0	9.5
Machinery Operators and Drivers		8.4	6.3	8.1	6.7
Labourers		10.1	7.3	9.9	9.6

Source: ABS Census (2011)

In Table 2.6 we disaggregate average gross weekly earnings to occupational levels in order to reveal the occupations that support the wage structure in the three tropical cities. We focus on occupations that pay earnings premiums of 10% or more given the city's earnings structure. Not surprisingly, occupational groups that emerged from Table 2.5 as above average share in the total city occupational structure also command significant earnings premiums, possibly as a result of wage competition. The most prominent occupational category is 'community and personal services', which commands earnings premiums of around 15% in Cairns and Townsville and 27% in Darwin. Further, both 'Technicians and Trades Workers' and 'Machinery Operators and Drivers' command earnings premiums of respectively 10% and 13% in Townsville. Again these are two occupational categories that are larger in Townsville than in Australia.

² Community and Personal Service workers assist Health Professionals in the provision of patient care, provide information and support on a range of social welfare matters, and provide other services in the areas of aged care and childcare, education support, hospitality, defence, policing and emergency services, security, travel and tourism, fitness, sports and personal services.

Table 2.6 Earnings premiums in tropical cities, 2011

Occupational categories	Locality	Cairns	Darwin	Townsville	Australian average weekly wage (\$)
Managers		- 6.3%	11.1%	0.6%	\$1,300
Professionals		- 3.6%	6.1%	- 1.0%	\$1,310
Technicians and Trades Workers		- 0.0%	16.6%	9.8%	\$1,010
Clerical and Administrative Workers		- 2.7%	15.4%	1.7%	\$930
Community and Personal Service Workers		8.3%	41.5%	14.5%	\$700
Sales Workers		- 2.9%	11.4%	- 9.1%	\$630
Machinery Operators and Drivers		- 5.1%	10.5%	13.4%	\$1,010
Labourers		- 2.1%	17.2%	3.3%	\$670
Total		- 6.9%	13.8%	- 0.1%	\$1,020

Source: ABS Census (2011)

To better understand to what degree the public sector contributes to the demand for Community and Personal Service Workers, Table 2.7 displays the industry share of the public sector in employing Community and Personal Service Workers in the three tropical cities. We note that Australia-wide, two thirds of all Community and Personal Service Workers work in the public sector, but that share is significantly higher in Townsville and Darwin, driven by high demand from the Public Administration and Safety industry. In contrast, Cairns exhibits a much lower demand for Community and Personal Service Workers arising from the Public Administration and Safety industry and subsequently, its public sector share in employing Community and Personal Service Workers is below the Australian average at 61%.

Table 2.7 Industries employing Community and Personal Service Workers in tropical cities, 2011

Occupational categories	Locality	Cairns	Darwin	Townsville	Australia
Public Administration and Safety		15.8%	44.7%	31.4%	16.3%
Education and Training		11.6%	8.9%	10.9%	12.3%
Health Care and Social Assistance		33.8%	23.9%	32.4%	38.6%
Total public sector		61.1%	77.5%	74.7%	67.2%

Source: ABS Census (2011)

Having made the link between occupations and industries, we now turn to total industry composition (employment-wise) in the tropical cities. We note that the Manufacturing, Financial and Insurance services and the Professional, Scientific and Technical services industries are less prevalent in the three tropical cities' economies than they are in the nationwide economy – see Table 2.8. In all three tropical cities this is compensated by a larger than average Public Administration and Safety sector,

whose main occupational categories are Community and Personal Service Workers and Clerical and Administrative Workers.

Table 2.8 Industry breakdown of Tropical cities (% shares), 2011

Industry sectors	Locality	Cairns	Darwin	Townsville	Australia
Agriculture, Forestry and Fishing		0.9	0.9	0.6	2.5
Mining		1.5	2.2	3.0	1.8
Electricity, Gas, Water and Waste Services		1.2	1.6	1.6	1.2
Manufacturing		5.1	4.3	7.8	9.2
Construction		9.0	9.3	10.1	8.4
Wholesale Trade		3.3	2.7	3.1	4.1
Retail Trade		12.2	8.7	10.9	10.8
Accommodation and Food Services		10.0	6.1	7.1	6.6
Transport, Postal and Warehousing		6.9	5.5	5.2	4.9
Information Media and Telecommunications		1.0	1.3	1.4	1.8
Financial and Insurance Services		1.8	1.7	1.6	3.8
Rental, Hiring and Real Estate Services		2.1	1.8	1.6	1.6
Professional, Scientific and Technical services		5.2	5.7	4.8	7.4
Administrative and Support Services		3.8	3.2	3.1	3.3
Public Administration and Safety		8.6	21.9	12.1	7.0
Of which:	Public Administration	5.0	11.7	5.0	4.6
	Defence	1.3	7.9	5.4	0.7
	Public Order, Safety and Regulatory Services	2.2	3.4	2.1	1.7
Education and Training		8.2	8.0	8.2	8.2
Health Care and Social Assistance		13.2	9.4	12.8	11.9
Arts and Recreation Services		1.9	2.0	1.3	1.5
Other Services		4.2	3.8	3.8	3.8

Source: ABS Census (2011)

While that is an observation that applies to all three tropical cities, there are differences between the cities. Darwin – the only capital of the three tropical cities – has a predictably larger government sector. However, it is not only public administration that is far larger than the Australian average; also Defence is 11 times larger than the nationwide average in Darwin.

In Townsville we observe a similar but less extreme picture. Townsville is not a state capital and therefore its public administration is close to average. Instead, Defence is eight times the nationwide average, pushing the Public Administration and Safety sector in Townsville above the Australian

average. Also mining and construction are above average in Townsville. These are two industries that draw heavily from Technicians and Trades Workers and Machinery Operators and Drivers.

In Cairns, we find that Defence is twice as large as the Australian average, which leads to only a modestly larger Public Administration and Safety sector than the nationwide average. To compensate for lower than average shares for the Manufacturing, Financial and Insurance services and the Professional, Scientific and Technical services industries, Cairns has an above average tourism industry, evidenced by higher industry shares for Retail Trade and Accommodation and Food Services. These two sectors draw heavily from Sales Workers.

Consequently, the presence of a substantial Defence sector in Townsville combined with strong mining and construction sectors pushes earnings in Townsville beyond levels that may be expected based on educational attainment structures in the city. Similarly, the presence of a substantial Defence sector in Darwin combined with a strong Public Administration sector also pushes earnings in Darwin beyond levels that may be expected based on educational attainment structures in the city. In the absence of substantial support from any high earnings sectors, earnings in Cairns are at levels that may be expected based on educational attainment structures in the city.

2.3 Taking stock

In terms of their demography, tropical cities have:

- Younger populations than the Australian average. Whilst this is true for all three tropical cities, there are differences between the three cities. Darwin has the youngest population of the three; Cairns the oldest
- A more transient population. A quarter to two thirds of the 2011 population of the cities moved to the city in the last five years. Darwin and Cairns attract more overseas migrants than the Australian average; Townsville less
- Larger shares of Indigenous people than the nationwide average. In Cairns and Darwin that share is above 10%.

In terms of their economic structures, tropical cities have:

- Mixed results in the labour market. Townsville and especially Darwin have below Australian average unemployment rates; Cairns experiences above average unemployment rates
- Mixed earnings outcomes. Darwin has above (Australian) average hourly wages; Townsville and especially Cairns below average hourly wages
- Lower educational attainment outcomes than the Australian average. Trade certificates are the most prevalent qualification in all three tropical cities, whereas that is a university degree nationwide
- As a result of lower educational attainments, lower shares of managers and professionals in the occupational structure than Australia wide

- A strong occupational presence of Community and Personal Service Workers, compared to the nationwide occupational structure. Workers in this occupational cohort command significant wage premiums in the three cities, boosting the earning structure in the cities
- Above average public sector presence compared to the Australian average. However, that presence is larger in Darwin and Townsville than in Cairns, resulting in a larger demand from the public sector for Community and Personal Service Workers in Darwin and Townsville than in Cairns.

3. Defence in the tropical cities

The previous section highlighted the strong presence of Defence in the tropical cities. This section will describe the Defence population and their demography and the wider Defence community in the tropical cities.

3.1 Defence and the wider Defence community

The three tropical cities together host about a fifth of Australia's permanent Defence force personnel and 4% of Australia's civilian defence personnel. Townsville accommodates just over 6,500 Defence personnel – the largest number of Defence employees of all three cities (see Table 3.1). The vast majority of Townsville Defence personnel are permanent members, of whom 91% are in the army. The remainder are in the air force. Darwin also has a large Defence presence – just over 5,300 employees. Next to large army bases (71%), Darwin also hosts sizeable navy (16%) and air force (10%) contingents. Cairns has the smallest Defence presence of the three cities with – just over 950 employees. Most of them are in the navy.

Table 3.1 Defence presence in the tropical cities – volumes (% shares in brackets), 2012

Locality	Capability	Navy	Army	Air force	Total Permanent	Civilian	Total
Cairns		812 (93.7%)	54 (6.2%)	1 (0.1%)	867	85	952
Darwin		801 (16.1%)	3,532 (71.0%)	474 (9.5%)	4,977	327	5,304
Townsville		16 (0.3%)	5,327 (91.0%)	513 (8.8%)	6,213	364	6,577

Source: Personal communication with Department of Defence, 2013

In terms of the demographics of the Defence populations, there are no major differences between the three cities – see Table 3.2. All differences that exist relate to the differences in the navy – army – air force – civilian composition between the three cities. We observe that between eight and nine in 10 Defence members are male and the majority are between 20 and 40 years old. The mean age is just over 30 years.

The Defence workforce is a transient workforce, given that five years ago around 85% of all Defence personnel did not live in the city in which they currently live. We do see some differences in terms of educational attainment. Defence personnel in Cairns are more likely to have a qualification than in Darwin and Townsville. That qualification is more likely to be a diploma or a certificate, not a degree. The slightly higher educational attainments in Cairns also translate into higher gross weekly earnings.

Table 3.2 Defence demographics (% shares in brackets), 2011

Demographics	Locality	Cairns	Darwin	Townsville
Gender:				
- Male		81.4	83.7	87.8
- Female		18.6	16.3	12.2
Age cohorts:				
- Under 20		7.1	5.7	5.7
- 20 – 29		46.7	42.5	43.5
- 30 – 39		26.0	29.0	30.7
- 40 – 49		14.9	14.3	14.6
- Over 50		4.4	4.4	4.5
Mean age (years):				
		30.8	30.3	31.3
Residence in 2006:				
- Same as is 2011		15.7	11.6	14.9
- Elsewhere		84.2	88.4	85.2
Of whom overseas		2.7	3.2	3.3
Educational attainment:				
- Bachelor degree or higher		10.9	10.8	10.1
- (Advanced) diploma		18.3	11.3	12.2
- (Trade) certificate		34.2	31.8	29.8
- Year 12 or less		36.7	46.1	47.8
Gross weekly earnings (dollars):				
		1,432	1,304	1,234

Source: Australian Strategic Policy Institute (2011); ABS Census (2011)

Just under a quarter of all Defence personnel are single, implying that the vast majority have a spouse or children (or both) – see Table 3.3. Consequently, the Defence community is much larger than the number of Defence members. We estimate that the Cairns Defence community (members, spouses and children) is nearly 2,200 strong. For Townsville and Darwin that is approximately 14,200 and 11,900 respectively.

Table 3.3 Defence demographics and multipliers (% shares in brackets), 2011

	Locality	Cairns	Darwin	Townsville
Demographics				
Household composition:				
- Single		22.3	21.9	22.6
- Spouse; no children		27.9	26.9	27.8
- Spouse; one child		11.0	10.6	10.9
- Spouse; two or more children		25.3	24.3	25.0
- Sole parent; one child		1.5	1.4	1.5
- Sole parent; two or more children		1.1	1.0	1.1
- Other		10.9	10.9	11.3
Multipliers (persons):				
- Spouse		0.64	0.62	0.64
- Dependent children		0.65	0.63	0.65
- Dependent household members		1.29	1.24	1.28
Defence community (persons):				
- Members		952	5,304	6,577
- Spouses		610	3,273	3,960
- Children		622	3,320	4,015
- Total		2,184	11,897	14,195

Source: Australian Strategic Policy Institute (2011); Welters & Delisle (2008)

3.2 Taking stock

Defence:

- Activity in Darwin and Townsville is predominantly army based, while it is navy based in Cairns. Defence presence in Darwin and Townsville is far larger than in Cairns
- Personnel is predominantly male, young and only a minority have roots in the tropical city where they reside. Trade certificate is the most prevalent qualification
- Community (including spouses and dependent children) is 2,000; 12,000 and 14,000 strong in respectively Cairns, Darwin and Townsville.

4. Defence interaction with tropical cities

Defence interacts in various ways with the three tropical cities. It changes the demographics of the cities, it interacts with the social infrastructure of the city and as an industry it interacts with the city economy. We discuss these three links separately.

4.1 Defence and city demographics

The Defence cohorts are sufficiently large – especially in Darwin and Townsville – to have a meaningful impact on the demography of the respective tropical cities. We saw some key demographical differences between the three tropical cities and Australia in Section 2. Using information from Section 3, we can deduce whether Defence’s presence in the tropical cities contributes to these differences or instead neutralises them.

Table 4.1 presents this information in a qualitative sense. In the first row of the table we observe that there are relatively more men in the three cities than the nationwide average would expect. That is especially the case in Darwin. A ‘plus’ in brackets indicates that Defence is a contributor to this distribution. Consequently, Defence is a contributor to the elevated share of males in the three cities, even if one takes on board that Defence personnel bring their families with them to the city. We noted that the three cities have higher than average shares of Indigenous peoples in their respective city populations. Defence does not contribute to that trend in any of the three cities.³ We also saw that the three cities have higher shares of recent in-migrants (arrived in the city after 2006). Defence is a contributor to city transience.

Finally we saw in Section 2 that the share of university graduates in all three tropical cities is below the nationwide average. In Cairns, Defence neutralises that effect somewhat, but in Townsville and Darwin Defence contributes to a lower share of university graduates. On the other side of the educational spectrum, we noted that Cairns has a share of residents with no formal qualification which is equal to the Australian average while it is higher than average in Townsville and lower than average in Darwin. The impact of Defence is negative in all three cities. That is, the shares of Defence personnel with no formal qualification are lower in all three cities than the respective city averages. Consequently, Defence compresses the educational ladder in the tropical cities.

³ The Larrakeyah Barracks army base in Darwin accommodates the North-West Mobile Force (NORFORCE), which draws heavily from Indigenous Australians. Since NORFORCE mainly draws from Army Reserve and this report only focuses on permanent and civilian staff, NORFORCE is not fully represented in these figures.

Table 4.1 Impact of Defence on tropical city demographics, 2011

	Cairns (Defence impact)	Darwin (Defence impact)	Townsville (Defence impact)
Shares in city population compared to Australian average:			
- Males	+ (+)	+ (+)	+ (+)
- Indigenous people	+ (-)	+ (-)	+ (-)
- Recent in-migrants to city	+ (+)	+ (+)	+ (+)
- University degrees	- (+)	- (-)	- (-)
- No formal qualifications	0 (-)	- (-)	+ (-)

Source: ABS Census (2011)

4.2 Defence and the school system

We know from Table 3.3 that on average every Defence employee has 0.65 dependent children who reside with them in the city. Those children will draw upon childcare, pre-school and school facilities in the tropical cities. We focus on Defence's impact on the school system.

Using the link between Defence personnel and dependent children, we can approximate the number of school age children who are related to Defence. Table 4.2 gives the number of school age children in the three cities and the number of school age children related to Defence. Whilst that share is 1.6% in Cairns, it increases to 8.5% in Townsville and is above 10% in Darwin. Based on student-teacher ratios, we can approximate the number of full time equivalent (FTE) teachers whose jobs exist because of the presence of Defence in the city. While that is a modest number in Cairns, it is between 170 and 180 FTE teachers in Townsville and Darwin.

Table 4.2 Social impact Defence on school system, 2011/2012

	Cairns	Darwin	Townsville
School age population (6-17 years):			
- City	24,363	19,675	29,473
- Defence	388	2,049	2,494
Share Defence:			
	1.6%	10.4%	8.5%
Student (FTE) – Teacher (FTE) ratio: ¹			
	14.4	11.4	14.4
Teachers (FTE) for Defence:			
	27	180	173

¹ Ratios for state levels are used.

Source: Australian Bureau of Statistics (2013); ABS Census (2011); Personal communication with Department of Defence, 2013

4.3 Defence and the health care system

Whilst permanent members of Defence have access to Defence health care, their spouses and dependent children have not, and therefore rely on health care facilities in the tropical cities. Given the 'spouse and dependent children' multipliers from Table 3.3, we can estimate the share of the Defence related population (other than permanent members) in the total population in the three tropical cities – see Table 4.3.

Table 4.3 Social impact Defence on General Practitioner (GP) system, 2011/2012

	Cairns	Darwin	Townsville
GP dependent population:			
- City ¹	141,083	115,609	168,316
- Defence	1,232	6,593	7,975
Share Defence:	0.9%	5.7%	4.7%
Population – GP (FTE) ratio:	1,212	1,721	1,188
GPs (FTE) for Defence:	1.0	3.8	6.7

¹ Net of uniformed Defence members who have access to Defence health care.

Source: ABS Census (2011); Primary Health Care Research & Information Service (2012)

That share is about 1% for Cairns, 4.7% in Townsville and 5.7% in Darwin. Using population to General Practitioner (GP) ratios, we can then estimate the number of GPs active in the three tropical cities that can be attributed to the presence of Defence: one in Cairns, four in Darwin and seven in Townsville.

4.4 Defence and the local economy

The presence of Defence in the tropical cities also impacts on the cities' economies. Table 4.4 indicates the size of the city economies – their gross regional product. We note that Townsville has the largest economy at approximately \$13 billion, followed by Darwin at \$12 billion and Cairns at \$9 billion. As can be seen from the table, Defence makes a considerable contribution to the Townsville and Darwin economies, whereas the contribution to the Cairns economy is more modest at 3%.⁴

However, that is not where Defence's economic impact stops. Defence also interacts with local industries. It does so in two ways. First, Defence sources inputs for its own production processes from local producers. For example in Cairns, for every dollar of final demand Defence produces, \$0.24 of output will be sourced from local suppliers (first round effect).

We observe some differences in terms of industry linkages between Defence and local industries between the three cities, indicating that Defence in Cairns makes more use of local suppliers than

⁴ The latest information we have relates to 2010 data. We know that the Defence presence has increased in Townsville in 2011 and 2012, which suggests the economic impact of Defence on the Townsville economy will be slightly higher in 2013 than the figures presented here.

their counterparts in Townsville and Darwin. Some of that difference may be inherent to the type of inputs that Defence requires (which may not be available locally). If it is available locally, but not sourced locally, there is opportunity to strengthen the links between Defence and other local industries.

Following on from the first round effect, there are also future round effects. That is, for the local supplier of inputs to Defence to produce those inputs, they will also need to source inputs and some of that input is local. Also this contribution to the local economy is ignited by Defence, although Defence does not control it (in the case of Cairns that is another \$0.15).

Table 4.4 Economic impact Defence on tropical economies

	Cairns	Darwin	Townsville
GRP (2013, billion AUD):	9.2	11.8	12.8
Defence share (2010):	2.8%	11.4%	11.0%
Multipliers:			
- First round effect	0.24	0.15	0.18
- Further rounds effect	0.15	0.07	0.11
- Consumption effect	0.35	0.16	0.49
- Total effect	0.74	0.37	0.78

Source: JCU calculations; Deloitte Access Economics (2011)

Next to contributing to the local economy through sourcing inputs locally, Defence also impacts on the economy through wage generation for its employees, who may spend those wages in the local economy. This effect is captured by the consumption effect in Table 4.4. That is, for every dollar of final demand that Defence Cairns produces, \$0.35 worth of output is generated in the Cairns economy as a result of increased consumption. We note some substantial differences between the cities, with Townsville having the highest consumption effect and Darwin the lowest.

4.5 Taking stock

The presence of Defence in the three tropical cities:

- Increases the share of males in the city population, increases the transiency of the city population and it compresses the educational ladder in the three cities
- Leads to associated social impacts on the city school systems. In Darwin and Townsville about 10% of school age children are indirectly related to Defence; in Cairns that is about 2%
- Leads to associated social impacts on the health care system. In Darwin and Townsville about 5% of the population who rely on public health care are indirectly related to Defence; in Cairns that is about 1%
- Leads to associated economic impacts on the city economies. Defence is worth about 11% of Darwin's and Townsville's gross regional product and 3% of Cairns' gross regional product

- Leads to associated indirect economic impacts on the city economies through its purchases of inputs from local suppliers and through consumption effects of its personnel spending their wages locally.

5. Conclusions

The three tropical cities are in many ways different to the rest of the country. Their populations are younger and more transient than the rest of the country. Further, the share of Indigenous people is significantly higher in the tropical cities than the Australian average. The public sector is an important pillar under the economies of the tropical cities that supports the city wage structure and stabilises the economies.

One important contributor to the public sector presence in tropical Australia is Defence. Defence has a strong presence in Townsville and Darwin and a moderate presence in Cairns. The Department of Defence (2013) outlines the future of Australia's Defence and envisions prominent roles for Defence in Darwin and Townsville, indicating that the strong presence of Defence in the tropics is to continue into the future. The change of government in September 2013 is likely to see a continuation of existing policy if not an increase of Defence's role in the tropical north.

Defence employs 6,500 people in Townsville, 5,300 in Darwin and nearly 1,000 in Cairns. If one includes spouses and dependent children, the Defence community extends to in excess of 14,000 people in Townsville, 11,000 people in Darwin and 2,000 people in Cairns. This community has various interactions with and impacts on the cities in which it resides. We found that around 10% of school age children in Darwin and Townsville are related to Defence, while about 5% of city populations that rely on public health care in Darwin and Townsville are related to Defence.

“The three tropical cities are in many ways different to the rest of the country. Their populations are younger and more transient than the rest of the country”

The student-teacher (FTE) ratios for Queensland (Cairns and Townsville) are the highest in Australia (Australian average is 13.8) – see Table 4.2. As a result, the school system in Cairns and Townsville is under-resourced if the nationwide average is the benchmark. Further, we find that the Population – GP (FTE) ratios in the three cities are above the Australian average (1,011) as illustrated in Table 4.3. Consequently, the GP system is under resourced in tropical cities if the nationwide average is the benchmark. Policy makers should consider addressing these deficiencies in the social domain to improve social outcomes in general for the cities but in particular for the Defence community. With regular transfers between Defence bases across Australia and significant spells of overseas deployment of Defence permanent members, the wider Defence community is likely to be more dependent on local social infrastructure.

Defence is worth about 11% of gross regional product in Darwin and Townsville and about 3% in Cairns. However, Defence's economic impact through backward (using locally produced inputs) and forward linkages (wage provision which leads to consumption of local products) with city economies is larger than its share in gross regional product. Policy makers should consider opportunities (where available) to strengthen those linkages. Capitalising on those opportunities would increase the supporting and stabilising role that Defence plays in the city economies.

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7. About the Author

Riccardo Welters has worked in universities in The Netherlands and Australia for over 15 years. He obtained his PhD degree from Maastricht University – the Netherlands in 2005, did postdoctoral research at the University of Newcastle, Australia, before accepting an academic position at James Cook University, where he currently is head of the discipline of economics at the School of Business.

He lectures in a wide variety of economics subjects and has successfully supervised students at honours, masters and PhD level. His academic research interest focuses on social disadvantage in labour market outcomes. He has published widely in the academic literature and has attracted Australian Resource Council funding for his research. Besides academic research, he has also been the lead author on various policy-oriented research reports for organisations including the Australian Defence Organisation, Advance Cairns, Townsville Enterprise and the Port of Townsville.

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