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**Analysing the infrastructure in
Antarctic Gateway Cities**

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Fit for the Ice:

Analysing the infrastructure of Antarctic gateway cities

Contents

Abstract	3
Introduction.....	3
Fig 1: positions of the Antarctic gateway cities.....	5
Case study 1: Cape Town.....	6
Fig 2: Cape Town.....	6
Case study 2: Christchurch	8
Fig 3: Christchurch	8
Case study 3: Hobart	12
Fig 4: Hobart	12
Case study 4: Punta Arenas	15
Fig 5: Punta Arenas	15
Case study 5: Ushuaia	19
Fig 6: Ushuaia	19
Discussion	22
Acknowledgments	26
References	27
Appendix 1: List of acronyms	32
Appendix 2: Statement of Intent, Christchurch, 2009.....	33

Abstract

Most people travelling to Antarctica will pass through one of five Antarctic gateway cities: Cape Town, Christchurch, Hobart, Punta Arenas and Ushuaia. The use of these cities as a portal to Antarctica for national programmes and tourism will depend on geography, reputation, experience, political decisions, infrastructure and mutual interest between the parties involved.

Cape Town is an important aerial gateway to Antarctica, for both national programme and adventure tourism; Christchurch's main connection is as a logistics centre for national programmes, but it has not yet attracted Antarctic tourism operations; Hobart, which has the most complete infrastructure of any gateway city serves a relatively small portion of Antarctic activities; Punta Arenas shows the best balance between national programmes and tourism support; Ushuaia is the most popular gateway for Antarctic tourism but has not yet attracted national programme operations.

While the quality of infrastructure is important, the extent of a gateway's Antarctic involvement is more dependent on a mixture of geography and political determination.

Introduction

Travelling to Antarctica has been in people's mind ever since the idea of the existence of a southern continent. Depending on the nature of their travels, travellers to Antarctica depart from a city in the Southern Hemisphere most convenient to achieve their Antarctic goals. These cities are known as 'Antarctic gateway cities'.

There are five cities in the world commonly identified as an Antarctic Gateway. These are: Cape Town (South Africa), Christchurch (New Zealand), Hobart (Australia), Punta Arenas (Chile) and Ushuaia (Argentina). A sixth one, Stanley (Falkland Is.) is also considered an Antarctic gateway city in literature referring to Antarctic tourism. For the purpose of this report, Stanley will not be included in the analysis as no national programme and only a very small number of commercial trips to Antarctica are organized from this town.

These five Antarctic gateway cities concentrate the largest volume of people travelling to Antarctica by air and sea. It should be noted that there are a few other cities that handle Antarctic logistic operations. For example, in New Zealand, the port of Bluff or Dunedin handles a small number of Antarctic tourism departures.

The expression 'Antarctic Gateway Port' defines *'a coastal or island port, able to its proximity to the Antarctic to benefit from, and control access to, Antarctic and Southern Ocean resources, including fishing, tourism and scientific support'* (Bertram et al, 2007), while Grace's (2005) description *'focuses on the role the city plays as a nodal point that performs complex intercontinental transport flows through multifunctional operations'* (cited in Muir et al, 2007).

Attention has been paid by many researchers to the role of Antarctic gateway cities and the development of Antarctic tourism. Hall (2000) examined the role of Christchurch and Hobart

as Antarctic gateways and the significance of these in Antarctic travel, and as a means of economic and regional development. Bertram et al.(2007) assessed the origins, development and present level of participation of six Antarctic gateway cities (the above mentioned, plus Stanley) in within Antarctic tourism activities. Muir et al.(2007) identified main issues and examined the challenges in developing more Antarctic tourism for East Antarctica and, in particular, from Hobart.

The Antarctic gateway cities analysed here are located in countries that Dodds (1997) defined as 'Southern Ocean Rim States (SORS)', or countries that are geographically close to the Antarctic region (Bertram et al, 2007). In addition, four of these five gateway cities belong to countries that have territorial claims in the Antarctic continent (with the exception of South Africa). These nations' interest in maintaining sovereignty claims in Antarctica are clearly expressed in the support given to the development of the gateway cities. For the South American gateway cities, there are feelings of pride and patriotism associated with the concept of being the portal to Antarctica. Antarctica and the territorial claims of Argentina and Chile (Sector Antártico Argentino and Antártica Chilena) are part of their national identity, the 'Antarctic consciousness' concept that the military government influenced in their citizens in the 1970s to 1990s (Child, 2010).

The Antarctic connection is important to the identity of the gateway cities. Some of the factors that influence these 'self-identities' include geographical proximity to Antarctica, governmental and economic development policies, and International collaborations for co-operative research and logistical support. Hall (2000) examined the concept of place promotion, as a valuable tool to create government policies attempting economic development. *'Antarctica is a powerful brand...connotes a number of images, including purity, wilderness and untamed nature'*. Under this concept, gateway cities with similar characteristics, such as those in Australasia (Christchurch and Hobart) compete with each other to attract more Antarctic related business.

In September 2009, Christchurch held a meeting with government representatives from Cape Town, Christchurch, Hobart, Punta Arenas and Ushuaia. This official attempt to integrate the five Antarctic gateway cities concluded in the signing of an international agreement, having recognized potential mutual interests among these cities. The Statement of Intent between the Southern Rim Gateway Cities of the Antarctic 'is a commitment to a joint exploration into the benefits of academic and best practice exchange among the five cities...' (Statement of Intent, 2009, see Appendix 2).

This report aims to review the infrastructure available in the five Antarctic gateway cities, analysing the use of such infrastructure to support Antarctic related activities. The Antarctic related activities taken into consideration are the operation of Antarctic national programmes and Antarctic tourism. The analysis resulting from this report will provide a greater insight into the availability of resources for Antarctic logistics, future opportunities and constraints for developing Antarctic related business, and the level of community and governmental efforts required to maintain the status of gateway city. The understanding of these factors could promote greater collaboration between gateway cities in developing more efficient infrastructure and programmes to support their services. Furthermore, the understanding of similar problems and the contribution of information may bring the

Antarctic gateway cities to work collectively, complementing each others efforts and resources instead of standing alone.



Fig 1. Positions of the Antarctic gateway cities (Source: McGonigal, D., L. Woodworth, 2001)
References: 1: Cape Town (South Africa); 2: Christchurch (New Zealand); 3: Hobart (Australia);
4: Punta Arenas (Chile); 5: Ushuaia (Argentina)

Case study 1

CAPE TOWN



Fig 2. Cape Town, South Africa (Photo by G. Roldan)

Situated at the south-western point of South Africa and surrounded by the iconic flat-topped Table Mountains, this city prides itself from being ‘a free-spirited, cosmopolitan... (and) a melting pot of cultures’ (p.1, Cape Town Tourism, 2009).

Before Antarctic exploration begun, Cape Town was well known as a re-provisioning and commercial port since the mid 1600’s, when the Dutch East India Company established a fort to support its trade of slaves, gold and, later, diamonds through the Cape of Good Hope route (Ross, 2008).

South Africa is an original Signatory Party of the Antarctic Treaty and consequently, a Consultative Party since 1961. It is the only African nation that has adopted the Antarctic Treaty System to this date. The South African National Antarctic Program (SANAP) was established in 1959 and has since been actively working to support research expeditions to Dronning Maud Land (Antarctica), and sub-Antarctic Marion and Gough Is. SANAP main offices are located in Cape Town’s upmarket Victoria & Albert Waterfront (V&A Waterfront), a wharfing facility for cruise ships with attractive shopping, entertainment and dining areas, hotels and tour operators.

The construction of the V&A waterfront complex in 1988 has raised SANAP’s public profile, given that the research programme operates in a highly visited area, and has access to an exclusive wharfing zone for the South African polar research vessel S.A. Agulhas to re-supply and launch its polar expeditions from the heart of Cape Town (Valentine, personal communication, 2009).

South Africa is not the only national Antarctic programme that benefits from Cape Town’s

proximity to Antarctica. In its facilities, SANAP also offers office space and communication services to other Antarctic national research programmes, and those from Russia, Sweden and Belgium are currently using these facilities. The availability of these services could draw other parties operating in Dronning Maud Land, such as Finland, India, Norway, and the UK (Valentine, personal communication 2009).

Lately, not only Cape Town's port but its International Airport has attracted other Antarctic expeditions. In 2002, a consortium of eleven national programmes that operate in Dronning Maud Land formed the air network known as The Dronning Maud Land Air Network (DROMLAN) (SCAR, 2005). DROMLAN country founders are Belgium, Finland, Germany, India, Japan, The Netherlands, Norway, Russia, South Africa, Sweden and the United Kingdom. This network aims to facilitate the intercontinental air link between Cape Town and East Antarctica, for those Nation members of the Scientific Committee on Antarctic Research (SCAR) and the Council of Managers of National Antarctic Programs (COMNAP). DROMLAN is operated by the Antarctic Logistic Centre International (ALCI) who services the air link between late October and the beginning of March (ALCI, 2009). ALCI operates an Ilyushin 76TD cargo/passenger aircraft that takes approximately six hours to reach Novo runway, close to the Russian base Novolazarevskaya (70°46.43'S - 011°51.90'E). Novo runway acts as a hub from which passengers and cargo can be flown in small ski-equipped aircraft to other destinations within Dronning Maud Land, such as the Finnish Aboa Station, Swedish Wasa Station, Norwegian Troll Station, India's Maitri Station, British Halley Station, German Kohnen Station. Novo also provides logistics to flights to the South Pole and Russian Vostok Station (SCAR, 2005).

Regarding Antarctic tourism, Cape Town is not a popular port of call for Antarctic cruise ships. It seems unlikely that Cape Town will develop as a popular Antarctic tourism gateway. A disadvantage for Cape Town against its competitors is the 3811 km distance to the closest point in Antarctica (Bertram et al, 2007), approximately three times more than from Ushuaia (Argentina). In addition to longer distances and extended sailing in mostly rough seas, tourism in this sector is further disadvantaged by the fact that the Antarctic coastline immediately south of South Africa is ice covered almost year round and very difficult to operate with small vessels. However, these issues do not hinder air-based tourism and the intercontinental air bridge provided by ALCI supplies the need of a more specialized land-based form of tourism: adventure tourism and private expeditions. Companies such as The Antarctic Company (TAC) and Ice Trek Expeditions offer from tours as emperor penguin viewing (flying from Cape Town to Antarctica and return in 4 days) and skiing expeditions to the South Pole, with flights to the Polar Plateau, camping gear, polar clothing, meals and guide included (Ice Trek Expeditions, 2010). Dr Vasily Kaliakin from ALCI reports that thirteen round flights are scheduled for 2010-2011 operational season (from Cape Town to Novo) estimating that a total of 926 passengers will be transported to Antarctica and return to Cape Town. From those 8926 passengers, 183 people will be flying to participate in private expeditions and/or tours. (Kaliakin, personal communication, 2011).

Cape Town's development as a significant Antarctic gateway city may come from the potential of increasing its logistical support and supply industry. Since the signing of the Statement of Intent between the Southern Rim Gateway Cities to the Antarctic in Christchurch, September 2009, the government of Cape Town has invested many resources in promoting their city as a Gateway to Antarctica (Felicity Purchase, personal

communication, 2009). The local government intends to create greater awareness among the Capetonians of the benefits of their status as a gateway city, as well as attracting private investors (Pollack, 2010). An up-to-date and comprehensive website is dedicated solely to promoting Cape Town's Antarctic Gateway connections and services, organizing festivals and open day visits to the SA Agulhas and the research centre, and connecting education centres with other educational resources around the world to inspire the study of Antarctic science in school curriculums and within University students (City of Cape Town, 2010). Another vital step is to develop the potential of Cape Town's port for Antarctic cargo handling, ship repairs and supplier market for goods to the Antarctic. The provincial government instructed its development agency The Western Cape Investment and Trade Promotion Agency (WESGRO), to conduct research looking at economic opportunities based on Cape Town's port facilities. WESGRO's 2010 report envisaged economic opportunities for the port's ship repair facilities with its large dry docks and sea berths, and the use of its multi purpose terminal to handle cargo and cold storage. But, most importantly, an opportunity lies with the ability to supply industrial goods, fresh produce, electrical appliances, motor vehicles, chemicals and light petroleum distillates, among others, to the growing demand and needs for the various activities taking place in the Antarctic. All these products are produced in the Western Cape Province and could potentially supply Antarctic research expeditions or refill the supplies of cruises ships en route (WESGRO, 2010).

Case study 2:

CHRISTCHURCH



Fig. 3: Christchurch, New Zealand (Photo by G. Roldan)

Christchurch, the 'Garden City' of New Zealand, lies on the eastern coast of the South Island, sprawling across the fertile Canterbury Plains. The gentle meander of the Avon River, the

backdrop on the Southern Alps to the west and the slopes of the Port Hills to the south, are natural features of this modern city.

The British Empire claimed the territory of New Zealand after Captain Cook's expeditions in the 1770s. In 1840s the first settlers arrived to the Canterbury region. In 1856, Christchurch was founded by the English Canterbury Association as a 'Better Britain' settlement, in which *'English class distinctions were preserved but where laborious farmers and artisans could work cooperatively towards prosperity and respectability'* (King, 2003:172). Today, Christchurch is the largest city of the South Island, with a multicultural population of European descendants, Maori and Pacific Islanders, and immigrants from different parts of the world. Migration of people from overseas has become an important factor for the City's population and economy growth (Christchurch City Council, 2010).

Christchurch's distance from its closest point in Antarctica is 2852 km (Bertram et al, 2007). Christchurch's historic Antarctic connections are linked to its natural harbour, Lyttelton. Due to New Zealand's political relationship with Great Britain as part of the Commonwealth Nations and its geographical proximity with Antarctica, Lyttelton was the port of departure for famous Antarctic British expeditions, such as Captain Scott's *Discovery* Expedition (1901-1904) and *Terra Nova* Expedition (1910-1913), and Shackleton's *Nimrod* Expedition (1907-1909). Not only coal, timber and fresh produce were supplied at this final stop before the Antarctic, but public support and, in most cases, financial aid. *'Shackleton had been taken to the heart of New Zealanders, who took great pride in bestowing official recognition and public support. He now turned this to his advantage and asked for help from the New Zealand Government, which offered to pay half the cost of a tow to the edge of the ice'* (Riffenburgh, 2004: 143-144). Today, this busy port handles 99% of Canterbury's trade by sea (Lyttelton Port, 2008) but only a few Antarctic related operations. As regards national programmes logistical operations, Lyttelton is the port of call for American re-supply vessel and fuel tanker.

What makes Christchurch a dynamic Antarctic gateway is its long term partnership with the United States Antarctic Program (USAP). In 1928, American Admiral Richard Byrd saw the convenience of Christchurch as the staging post for his Antarctic expeditions. In the summer of 1955-56, Admiral Byrd brought to Christchurch the American Antarctic programme 'Operation Deep Freeze', bringing with it hundreds personnel, new aircrafts and powerful ships and icebreakers (Peat, 2007). Christchurch welcomed this influx of people and equipment, and soon New Zealand benefited from this connection. In 1957, the Ross Sea party of the Commonwealth Trans-Antarctic Expedition, led by Sir Edmund Hillary, established Scott Base at Pram Point, Ross Island, receiving logistical support from US McMurdo Station (Peat, 2007). Ever since then, friendships, businesses, scientific cooperation, logistics and communications, search and rescue missions, among others, have linked the US and New Zealand in Antarctica. *'The American Antarctic connection has been valuable to New Zealand from both a political and scientific standpoint. In Antarctic terms, the partnership is unique'* (Prior, 1997).

New Zealand is also working to attract other national programmes to its Gateway City. Since 2009, the Ministry of Foreign Affairs and Trade (MFAT) and AntNZ's have been hosting delegations from the Republic of Korea, which intends to establish a base in the Ross Sea

region (Lou Sanson, 2010). The Korean Polar Research Institute (KOPRI) conducts research in both polar regions since 1987 (KOPRI, 2010). The construction of the Korean icebreaker *Araon* was a multimillion dollars investment that today allows KOPRI to support their Arctic and Antarctic research, as well as supplying logistical support to other nations. If the Republic of Korea chooses Christchurch as its Antarctic gateway, this will bring economic benefits to New Zealand and the possibility to include another party in the joint logistic pool. One of the challenges facing these negotiations is the provisioning of Antarctic diesel for the new icebreaker *Araon*, which is not supplied at the moment in the port of Lyttelton, but it is supplied in Hobart (Sanson, 2010)

In 1961, New Zealand signed the Antarctic Treaty, becoming a Signatory and Consultative Party for ATCM. Since 1923, New Zealand has maintained rights of sovereignty over the Ross Dependency, an area containing the Ross Sea, islands and continental land as far south as the South Pole. This territory was then given to the jurisdiction of the New Zealand Government by an Order of the British Council (Te Ara, 2011). From a small Antarctic Division which looked after New Zealand's activities in Antarctica (1959), the New Zealand Antarctic Programme has grown to have its own government funded agency, named Antarctica New Zealand (AntNZ). AntNZ is responsible for executing New Zealand's Antarctic Policy, managing Scott Base and maintaining permanent presence in the Ross Dependency. Its headquarters are in Christchurch. The New Zealand Government commitment with the ATS is to value, protect and understand Antarctica and the Southern Ocean, developing research programmes and raising public awareness (through media, arts programmes, education and outreach) of the international significance of Antarctica (AntNZ, 2011). To support the Antarctic programme, New Zealand has a year-round operational base in Antarctica (Scott Base) and receives logistical support from the New Zealand Defence Force (NZDF) and the USAP. NZDF provides an intercontinental air link with LC-130 Hercules aircrafts and the P-3 Orion aircraft, which makes regular marine observation flights to assist with the Convention for the Conservation of Antarctic Marine Living resources (CCAMLR) in regulating illegal tooth-fishing in the Southern Ocean. During the operational season (October to February), 160 tonnes of cargo are transported between the NZDF and the US Air Force. For 2010-11 season, there are 104 flights scheduled from Christchurch to McMurdo Station (Rogers, personal communication, 2011). The USAP brings to this joint logistics pool an icebreaker, a resupply vessel and a fuel tanker transporting up to 400 tonnes of fuel and cargo (AntNZ, 2011).

Another Antarctic national programme that benefits from this logistic pool is the Italian National Antarctic Programme (Programma Nazionale di Ricerche in Antartide – PNRA). All three National programmes are housed at the International Antarctic Centre, a working campus located in Christchurch Airport Company's land. This complex was built in 1991 with the purpose of servicing Antarctic aerial operations. It provides administration and communication facilities for the three national programmes mentioned before, cargo and cold weather clothing storage, a departure passenger terminal and easy access to the airport runway. Within the airport facilities, there are services such as: aircraft servicing and maintenance, cargo storage, loading equipment and machinery, etc. (Christchurch International Airport, 2010). To contribute to the pool of logistics, the New Zealand government covers the expenses generated by the air link with Antarctica, such as airport landing fees, Customs and bio-security controls; subsidises the fuel; hires a New Zealand

helicopter provider for travel within Antarctica (Brown, 2010). Recently, the New Zealand government and an electricity provider company (Meridian Energy), in a joint effort have built a wind farm in Ross Island, providing renewable energy to both Scott Base and McMurdo Station. Although this wind farm won't provide enough energy for the needs of both research facilities, it reduces considerably the carbon footprint of both national programmes as well as reducing the environmental risks associated with fuel handling (AntNZ 2009).

Regarding Antarctic Tourism, the only New Zealand based Antarctic tour operator (Heritage Expeditions) sails from Bluff or Dunedin in southern New Zealand (personal observation). Despite of sailing from other New Zealand ports besides Lyttelton, Antarctic cruise ship passengers arrive and depart from Christchurch airport, before and after sailing south. It should be noted that there are no commercial flights to Antarctica from New Zealand.

As an Antarctic gateway city, Christchurch offers to its visitors many amenities that link it with Antarctica. Although Antarctic cruise ships depart from other New Zealand ports than from Lyttelton, Christchurch receives an important number of Antarctic interested travellers from around the world. The Antarctic Attraction Ltd is located at The International Antarctic Centre Campus. The Antarctic Attraction is an interactive centre showcasing modern era Antarctica, with a simulated Antarctic blizzard in a cold room, videos, informative panels, entertaining Haggglünd rides and a new 4D show 'Ice Voyage' (opened in November 2010), a combination of 3D film and extra components, such as splashing water, bubbles, aroma and movement. This is a popular tourism attraction, bringing close to 250.000 visitors per year (Cowan, personal comment, 2011). Also, in the same campus, the offices of the Antarctic Heritage Trust are located. This is a New Zealand-based charity dedicated to the conservation of the historic huts and artefacts of the British Antarctic Expeditions from the early 1900s in the Ross Sea. The Canterbury Museum has an extensive Antarctic collection on permanent display, a documentary research centre and special exhibitions. The New Zealand Antarctic Society organizes public lectures, social events and publishes a quarterly magazine. For those interested in keeping up-to-date with Antarctic topics, the Antarctic Hub has a website with the latest developments in Antarctic science and news. The Antarctic Hub is a forum of organizations with interests in Antarctica (Antarctic Hub, 2011). The Christchurch City Council maintains a walking trail showing interesting historic buildings, sites and sculptures that helps the city's Antarctic identity (CCC, 2010). Christchurch City Council is working toward developing an attractive bi-annual Antarctic Festival. The idea for this festival developed from a long time tradition of Christchurch's Mayor of welcoming the USAP authorities at the beginning of each operational season. From a social gathering of Antarctic veterans, the New Zealand Antarctic Festival will grow to a week of celebrations in August 2012. It is expecting to attract domestic and overseas tourism to Christchurch (CCC, 2011). Christchurch's private and public sectors get together regularly, looking at expanding the Antarctic businesses in the region. Antarctic Canterbury Link (ALC) and Christchurch & Canterbury Development Corporation (CDC) are clear examples of this kind of cooperative effort (CDC, 2010).

On the subject of Antarctic research and education, there are several organizations involved in Christchurch. University of Canterbury (UC) houses Gateway Antarctica, a centre for Antarctic studies and research. Through Gateway Antarctica, UC offers to undergraduate

students year-round Antarctic studies courses. Also, there is a Postgraduate Certificate in Antarctic Studies (PCAS), an intensive 14-week multidisciplinary course, including a field trip to Antarctica. For further academic involvement, Gateway Antarctica offers a Postgraduate Diploma in Antarctic Studies; a Master of Antarctic Studies degree and Antarctic Studies PhD. Reaching out to a wider audience, this Centre organizes community-based courses and lectures. As regards research, Gateway Antarctica participates actively in Antarctic research, with an extensive list of publications (Gateway Antarctica, 2011). University of Canterbury also houses the Secretariat for the Council of Managers of Antarctic National Programmes (COMNAP). This prestigious Antarctic organization enhances Christchurch's Antarctic connections.

Case study 3:

HOBART



Fig. 4: Hobart, Australia (Source: Antarctic Tasmania, 2010)

'Hobart is a big town with capital-city infrastructure: the best of both worlds, manageable yet *civilised*' (Timms, 2009:1)

The beginnings of Hobart are similar to most port towns in southern latitudes: the small colony of farmers trading wheat and port services turned into a penal colony for second offenders and criminal convicts from the British Empire in 1830 (Timms, 2009). Today, Hobart is a vibrant and modern city lying between the margins of the Derwent river and Mt Wellington. Known to be the smallest city in Australia, it is the financial and administrative heart of Tasmania. Its economy relies on the skills of many immigrants from the Baltic, Italy, Greece, Holland, Poland and Britain, that made the Australia's southernmost city their home. Hobart's main industries are seaport and ship building, breweries, chocolate

manufacturing, tourism and lately, wineries and vineyards (Hobart City Council, 2010). Hobart's natural harbour is a hub for trading, cultural events and for Antarctic related activities (Antarctic Tasmania, 2011).

Hobart's Antarctic connections begun in the 1800's as a re-supplying port for sealers and whalers. By the beginning of the 20th century, Antarctic explorers such as Borchgrevink, Amundsen and Mawson, used Hobart as their port of departure and or return from their Antarctic expeditions (Antarctic Tasmania, 2011).

Australia's initial interest in Antarctica was driven by the exploration and discoveries made by Douglas Mawson. In 1911-1914, Mawson led the 1911-1914 first Australasian Antarctic Expedition (AAE), and later led the British, Australian, New Zealand Antarctic Research (BANZARE) expedition of 1929-31 (AAD, 2010). Partly as a result of these explorations, Australia claims the largest territory in Antarctica, known as the Australian Antarctic Territory (AAT). The AAT was claimed in 1933 by the British Government, placing the authority of this claimed land under the authority of the Commonwealth of Australia. The AAT became permanently occupied by Australia in 1954 (AAD, 2010). During the 1958 International Geophysical Year (IGY), Australia participated actively with research and data collection programmes. This participation led Australia to be one of the twelve Signatory States of the Antarctic Treaty in 1961, becoming a Consultative Party for Antarctic Treaty Consultative Meetings (ATCM) and a leading country in Antarctic science and policy (AAD, 2010).

Today, the Australian Antarctic Division (AAD) leads the Australian National Antarctic Programme. This division is part of the Australian Government Department of Environment, Water, Heritage and The Arts. The AAD operates from Kingston, Tasmania, administering Australia's Antarctic territories. From here it also coordinates the logistics needed to conduct scientific research in Antarctica, the Southern Ocean and Sub Antarctic Islands, and maintains permanent stations on the continent to promote Australia's Antarctic interests within the Antarctic Treaty System; among other tasks (AAD 2010). To conduct this programme, AAD operates Australia's Antarctic research vessel *Aurora Australis*, maintains three permanent bases in Antarctic and a fourth one in Sub-Antarctic Macquarie Island. Since 2007, they have also operated a regular inter continental air service between Hobart and Casey Station, in East Antarctica (AAD, 2010). This air bridge facilitates the transport and exchange of cargo and personnel during the summer months in a time-efficient way, as well as offering opportunities to other National Programmes working in East Antarctica to operate from Hobart (Antarctic Tasmania, 2010). Besides Casey Station's blue ice runway, the air bridge within Antarctica is complemented with small ski-equipped aircrafts and helicopters, providing aerial access to remote field camps in East Antarctica, the Antarctic Plateau and South Pole, and Ross Island. This air link enhances Australia's ability to become a leading country in Antarctic logistics, attracting more business from other National Programmes (Powell & Jackson, 2007).

The Government of Tasmania through its Department of Economic Development, Tourism and Arts, have an agency dedicated to promote Hobart as the gateway to East Antarctica, and to support businesses and organizations that have Antarctic-related interests (Antarctic Tasmania, 2010). This agency is called Antarctic Tasmania. This agency has branded Hobart

as ‘the capital of Antarctic capability’ (Antarctic Tasmania, 2010). The infrastructure in Hobart to support Antarctic related activities include: a deep-water port, shipping access, cold storage (including export and quarantine accredited cold storage), and competitive domestic port fees and fuel bunkerage, among other services (Antarctic Tasmania, 2010). Antarctic Tasmania is the secretariat for The Tasmanian Polar Network (TPN) a group of businesses with access to the wide range of Antarctic expertise present among Tasmanians. TPN has more than 60 members offering goods and services from polar clothing and equipment to logistic support, as well as research and education (TPN, no date provided). This pool of services and Antarctic expertise has attracted other Antarctic national programmes besides Australia’s. One example is the case of the French National Programme (Institute Polaire Français) that operates from Hobart. Also, it should be noted that TPN members have provided support to the Chinese, Italian, Russian, American and other Southern Ocean expeditions (Antarctic Tasmania, 2010). Furthermore, the local government promotes Hobart as ‘the ideal location for meetings and forums’ (Antarctic Tasmania, 2010) and is in preparations for hosting the 35th ATCM, in 2012.

In addition to the infrastructure that supports Antarctic expeditions, Hobart is a hub for Antarctic research. Following the move of the AAD headquarters to Hobart in 1981, other Antarctic organizations and programmes have established there, such as: the Marine and Atmospheric Division of the Commonwealth Scientific and Research Organization (CSIRO); The Antarctic Climate and Ecosystems Cooperative Research Centre (ACE CRC); The Institute for Marine and Antarctic Studies (IMAS); the Australian Integrated Marine Observing System (IMOS); The Australian Bureau of Meteorology; The Australian Maritime College (AMC); The Secretariat for the Commission for the Conservation of Antarctic Marine Living Resources (CCAMLR).

Regarding Antarctic Tourism, Hobart hosts three to four Antarctic tour operators per season (Muir et al, 2007). Cruise ships operating from Hobart organize their trips to visit sub-antarctic islands, Commonwealth Bay and the Adèlie Land coast, in East Antarctica. The number of tour operators organizing cruises from Hobart is low compared with the more than thirty companies operating off the South American Antarctic gateway cities (Muir et al, 2007). This scenario is unlikely to change in the near future. Tour operators point out the challenges associated to travelling to East Antarctica, such as the long distances in rough seas, limited landing sites and extreme weather (Muir et al, 2007). The distance from Hobart to Antarctica’s closest point is 2609 km (Bertram et al, 2007). There are no tourist flights to Antarctica departing from Hobart; the only exception in Australia are sightseeing flights to the Antarctic operated by a Melbourne based tour operator (Croydon Travel, 2011).

For visitors who are Antarctic enthusiasts, Hobart offers an array of Antarctic exhibits: ‘Island on Ice’ is a permanent exhibition at The Tasman Museum and Art Gallery; Polar Pathways is an online virtual tour of Tasmania’s Antarctic Heritage; the AAD houses a visitor centre; and walking trails along Salamanca Place, Sullivan’s Cove and Macquarie Street contain historic buildings and sculptures of Antarctic relevance (Antarctic Tasmania, 2010). The “Antarctic Midwinter Festival” is an annual community event run by Antarctic Tasmania. It began in 2001, celebrating Hobart’s Antarctic connections and the contribution of AAD to the understanding of Antarctica. The festival aims to celebrate the city’s Antarctic identity and attracts tourism and trade (Hardley, 2007). This festival has had more success over the years

than the 'Antarctic Adventure', an entertainment and educational interactive centre that opened in 1997 and closed in 2004 for financial reasons (Muir et al, 2007).

As regards Antarctic education resources, The International Antarctic Institute (IAI) operates in Hobart since 2007. This is a consortium of universities and agencies that collaborate with each other developing university-level education, facilitating exchange programmes and conducting research in Antarctica. There are 25 institutions involved, and the secretariat is held by the local university, the University of Tasmania (UTAS) (IAI, 2010). UTAS offers a 3 years science degree (with an optional honours year) of Bachelor of Antarctic Studies. They also offer a Master of Antarctic Sciences, a specialized degree in polar marine biology (UTAS, 2010). For younger students, the AAD offers comprehensive information and interactive activities on their website, under the 'Classroom Antarctica' section (Classroom Antarctica, 2011).

Case study 4:

PUNTA ARENAS



Fig. 5 Punta Arenas (Photo by G. Roldan)

This South American city was founded in 1849 on the western coast of the Magellan Strait. From humble beginnings as a military outpost for the newly formed Republic of Chile, the town of Punta Arenas developed in the late 1800's as a coaling and ship repair port for sealers and whalers. It flourished as a supply port until the 1920's, as it was conveniently situated for ships heading to the Californian gold rush (Martinic 2002). The opening of the Panama Canal in 1914 diverted much of Punta Arenas' international trade of wool, timber and fish, contributing to the decline of its economy and development (Martinic 2002).

As regards polar exploration, Punta Arenas was known to the Antarctic explorers that ventured to the Antarctic Peninsula. Fredrick Cook, the doctor on Gerlache's *Belgica* expedition of 1898-99, described the port thusly: '*... Five large ocean liners were at anchor,*

and many small coaster steamers...were scattered about on the unruly waters...Punta Arenas has a character and a life which mark it as once as one of the most peculiar towns on the globe' (Cook 1907, p80-81). Punta Arenas played an important role in the rescue of men from Shackleton's *Endurance* expedition, who were marooned on Elephant I. in 1914 (Shackleton, 1919)

Today, Punta Arenas is the largest city in Chile's Patagonia; with a growing population of Spanish, Lithuanian, Yugoslavian, Croatian and German descendants. Its economy is largely dependant on farming, oil exploration and tourism (Municipalidad de Punta Arenas 2010).

Chile has been an active participant in Antarctic politics and science. In 1940, Chile's President Aguirre Cerda declared the limits of the Chilean Antarctic Territory, a controversial territorial claim which overlaps with the sovereignty pretensions of the UK and Argentina. Proud of its Antarctic identity, Chileans strongly support Chile's National policy in the Antarctic. Selected objectives of this policy are 'the protection and strengthening of Chile's rights to the Antarctic, supported by clear geographical, historic and juridical grounds,... and the promotion of Chile as a gateway country' (Ministerio de Relaciones Exteriores 2000:5). A signatory and Consultative party of the Antarctic Treaty since 1961, Chile's participation in Antarctic research started in 1963 with the creation of the Instituto Antártico Chileno (Antarctic Chilean Institute -INACH).

For many decades, the Antarctic research expeditions were run by the Chilean Armed Forces from Chile's capital city, Santiago. However, in 2000, important political decisions were made from the head of the newly elected democratic government to support the National Antarctic Policy. The Chilean Government acknowledges the importance in developing better infrastructures and services to promote Punta Arenas as the gateway to Antarctica, to 'transform this city into a centre for international Antarctic activities, useful and efficient, providing facilities and services for scientists, tourists and visitors in general' (Ministerio de Relaciones Exteriores 2000:5). This document also gives the XIIth Region de Magallanes y Antártica Chilena, the southernmost region of Chile, the power of administration and governance of the Chilean Antarctic Territory (Ministerio de Relaciones Exteriores 2000:6).

To support the new Antarctic National Policy, in 2004 the offices of INACH moved from the city of Santiago to Punta Arenas. It was not a welcome move for all employees involved, as the Patagonian town seemed dull and cold compared with the cosmopolitan comfort of Santiago (Pedro Courard, personal communication, 2010). Despite of being an unpopular move, shows the commitment of the National government to its Antarctic policy and Antarctic identity, managing and concentrating all Antarctic related activities in Punta Arenas. Also, having the headquarters of INACH in the hub of Antarctic logistics strengthens the relationship with other Antarctic national programmes operating from this port. It should be noted that many former INACH managers that resign due to the move were appointed during the military government of Pinochet (1974-1990), with strong military background and not necessarily with the same Antarctic Politic agenda of the new democratic Chilean government.

With the need of understanding the demand and the offer of services to the Antarctic community, the Chilean Government created the Chilean Antarctic Information Network

(CHAIN). CHAIN is a government agency that offers professional support to private investors interested in participating in business derived from Antarctic related activities. In 2008, CHAIN published an initial evaluation report of the situation of business opportunities in Punta Arenas. CHAIN's report indicates that there is a potential demand for logistical support, including the provision of local produce to provide to Antarctic national research programmes, to Antarctic tourism and to the Antarctic fishing industry (CHAIN 2008). It also suggests that National Programmes that operate from Punta Arenas only spend 3-4% of their Antarctic budget in town. Punta Arenas could potentially supply logistics, storage space in port facilities, polar equipment and polar clothing, fuel and local fresh produce. However, the most important disadvantages found in the above mentioned report are: the lack of interest and/or knowledge of local producers of what is in demand, the language barrier between supplier and client, and the insufficiently specialized technical staff to repair and operate machinery and equipment.

Despite of the above findings, Punta Arenas is a well-established Antarctic gateway city for research programmes. Fifteen countries launch their National Antarctic programmes from Punta Arenas to supply their research stations in the Antarctic Peninsula. These are: Germany (Neumayer Station), Brazil (Ferraz Station), Bulgaria (Ohridski Station), China (Great Wall Station), Korea (King Sejong Station), Ecuador (Maldonado Station), US (Palmer Station), Spain (Juan Carlos I and Castilla Stations), Peru (Macchu Picchu Station), Poland (Arctowski Station), Czech Republic (Gregor Mendel Station), Ukraine (Verdnasky Station), Uruguay (Artigas Station) and Chile (Frei, Escudero, O'Higgins and Prat Stations) (Figueroa 2008). Some of these National Programmes operate their own vessels, and others benefit from the air link that the Chilean Air Force operates from Punta Arenas to Frei Station, on King George Island (South Shetland Is., Antarctica).

In spite of offering a dock accessible to cruise ship and with in walking distance to the town's main amenities, the port of Punta Arenas is not the most popular gateway for Antarctic cruise operations. Even though the distance from Punta Arenas to the closest point in Antarctica is 1371 km (Bertram et al 2007), ships sailing to and from the Antarctic Peninsula have an extra day at sea than when sailing from its competitor gateway city, Ushuaia. In addition, ships sailing south from Punta Arenas through the Magellan Strait and the Beagle Channel are required to hire the services of local pilots, increasing considerably the cost of the operations (Captain Derrick Kemp, personal communication, 2009). With the recent global economic recession affecting the tourism industry, additional operational costs are not always manageable by all tour operators. Although there are some Antarctic cruise ships that will include Punta Arenas as part of their cruise itinerary, the local authorities anticipate a decrease of 33% of cruise ship passengers for the 2010/11 season (Mercopress, 2010)

Antarctic tourism is not limited to cruise-ship operations. Two operators of air-supported expeditions successfully operate from Punta Arenas to Antarctica. Adventure Network International (ANI), now operating under the name of Antarctic Logistic and Expeditions (ALE), has offered flights from Punta Arenas to Antarctica since 1985. ANI/ALE offers private flights to the South Pole, photographic safaris to emperor penguin colonies, climbing tours or logistic support for private expeditions, and even accommodation on a summer base camp, near the foot of the Ellsworth Mountains (ANI/ALE 2010). Another tour operator is Aerovias DAP, who have offered regular commercial flights to Antarctica since 1987

(Bertram et al. 2007). DAP's fleet consists in two Bae 146 (with capacity for 60 seats) and a Beechcraft King Air (eight seats) aircraft (DAP 2010). The air link is from Punta Arenas to Frei Station (King George I.). The tours offered include one full day in Antarctica, or two days with an overnight in Frei Station's Villa Las Estrellas. It should be noted that the use of a permanent or semi- permanent Antarctic facility for the purpose of tourism has been a highly controversial issue at ATCM's and, specifically , at the Antarctic Treaty Meeting of Experts on Antarctic Tourism (Bastmeijer et al 2008).

Punta Arenas City Council attempts to raise awareness among its citizens of the city's 'Antarctic Gateway' status. During the International Polar Year of 2007-08, the City Council developed an 'Antarctic historic walking trail' (INACH 2007), tracing the footsteps of Antarctic explorers in Punta Arenas. Visitors can follow this walking circuit along the central streets of the town, equipped with a colourful brochure that provides sufficient information to find the buildings that housed members of Antarctic expedition, such as De Gerlache's *Belgica* Expedition (1898-99). For those with an interest in Antarctic history, the Museo Naval y Marítimo (Maritime Museum) has is a detailed presentation of the rescue mission that the Chilean Navy initiated for the men marooned at Elephant Island from Shackleton's *Endurance* expedition in 1914 (Municipalidad de Punta Arenas, 2010)

As regards Antarctic education resources, the INACH website has an education portal for primary school children with facts and frequently asked questions section. With the aim of providing skilled personnel and researchers to the Chilean Antarctic Institute, the Universidad Nacional de Magallanes, the local university, offers a multidisciplinary 19- week postgraduate diploma in Antarctic Studies (Universidad Nacional de Magallanes, 2010).

Case study 5:

USHUAIA



Fig. 5: Ushuaia, Argentina (Photo by G. Roldan)

Known as ‘the southernmost city in the world’, Ushuaia is a growing town nestled on the slopes of the southern end of the Andes mountain range and the coast of the Beagle Channel. This city is the administrative capital of Tierra del Fuego Province, the southern land of Argentina.

‘Ushuaia means in the tongue of the native inhabitants of that locality “inner harbour to the westward”. Well sheltered from the prevailing westerly winds...the harbour is situated on the north shore of the Beagle Channel’ (Bridges, 1951:58). Home to the once numerous nomadic canoeing people of the Beagle Channel, the Yahgan, in 1869 it became a settlement for the Anglican South American Missionary Society until the Government of Argentina installed a penal colony and a navy outpost (Bridges, 1951). Ushuaia was almost forgotten by the Argentine Government for decades until sovereignty issues with Chile urged immediate action. The Argentine Government introduced a package of tax incentives, services and bank loans for businesses and citizens to settle in Tierra del Fuego. This incentive package was effective, and the population skyrocketed from a few thousands inhabitants in 1970’s to over sixty thousands in 2010 (Secretaria de Turismo de Ushuaia, 2011). Although manufacturing is no longer the main activity, the economy of Ushuaia relies on its natural resources for the growth of fishing, sheep farming and tourism industries. Today, Ushuaia is one of the most prosperous cities in Argentina (Secretaria de Turismo de Ushuaia, 2011).

Ushuaia did not have a strong connection with Antarctic expeditions at the beginning of the 1900s, unlike most of the Antarctic Gateway Cities analysed in this report. Despite of being the closest land to the Antarctic Peninsula, distant only by 1131 km (Bertram et al, 2007), the small naval post had very little to offer. In 1897, the Belgium explorer Adrien De Gerlache wrote: *‘Ushuaia, which with Punta Arenas disputes the honour of being the most*

southerly city, is, despite its official title as capital of Argentinian Tierra del Fuego, nothing more than a straggling village of some twenty houses and a wooden chapel' (De Gerlache, 1902:35). Only coal and timber was in offer in Ushuaia at the time, and therefore, Punta Arenas was the choice for departure of those Antarctic adventurers sailing south from South America.

It was not until the late 1980s when Ushuaia became an interesting port for Antarctic related activities, particularly for Antarctic tour operators (Bertram et al, 2007). This coincided with the creation of the Province of Tierra del Fuego, in 1991. The National Government gives the name of Tierra del Fuego, Antártida e Islas del Atlántico Sur (Tierra del Fuego, Antarctica and the Islands of the South Atlantic) to the youngest province of the country, showing its pretensions of sovereignty over the South Atlantic Islands (particularly the Malvinas/ Falkland Islands) and the claim over Antarctic territory (Ley de Provincialización N°23.775, 1990). The new provincial government had its agenda regarding positioning Ushuaia as a Gateway to Antarctica. Government funding was used to improve the port facilities and Ushuaia's airport. In 1995, the international airport runway and passenger terminal was finished, allowing larger aircraft to operate and increasing the frequency of flights to Argentina mainland from one to seven flights per day in the summer months (Secretaria de Turismo de Ushuaia, 2010). By 1999, the mooring quay of the port was extended to allow several container and cargo ships to operate simultaneously, as well as facilitating the operation for cruise ships (Secretaria de Turismo de Ushuaia, 2010). In addition to this, the Antarctic Unit of the Tourism Board of Tierra del Fuego (IN.FUE.TUR) opened its quayside offices to provide information and assistance to Antarctic travellers, tour operators and public in general. This government-funded agency promotes Ushuaia as 'the most active gateway to Antarctica' (In.Fue.Tur, 2010), producing an annual report on Antarctic cruise ship statistics that clearly shows Ushuaia's leading role as an Antarctic Gateway city for tourism. Over 90% of Antarctic cruises will call at the port of Ushuaia during the tourism season (In.Fue.Tur, 2006). Besides the infrastructure created to promote Antarctic tourism (an improved port and a brand new airport), Ushuaia offers port services, cargo handling, cold storage space, fuel and bunkering services, experienced pilots and land agents, bilingual tour guides, search and rescue service provided by the Argentine Navy and Coast Guard. One local tour operator, Antarpply, using their ship *Ushuaia*, runs trips to Antarctica. They have operated successfully since 2002. There are no Antarctic tourist flights offered from Ushuaia.

In a study done by Vereda in 2008 regarding the expectations of Antarctic visitors towards their trip, the author concluded that Antarctic tourists do not see Ushuaia as a potential complimentary destination to their travels, but just as a stepping stone towards their Antarctic voyage. This result highlights the image of Ushuaia as a Gateway to Antarctica, but diminishes its potential benefits from further business associated to Antarctic tourism (Vereda, 2008).

Ushuaia appears to be the most convenient port to operate Antarctic cruises. However, for Antarctic national programmes, it has not yet developed as the Antarctic gateway.

Argentina is an active member of the Antarctic Treaty System, being an original Signatory State since 1961. The Argentine Antarctic Institute (IAA) was created in 1951 to support Argentina's sovereign interest in Antarctica by developing programmes for scientific

research, maintaining international cooperation with other Antarctic parties, and promoting the awareness of the Antarctic Argentine sector among its citizens (IAA, 2010). On the 22nd February, Argentina celebrates the 'Argentine Antarctic Day'. It commemorates the country's permanent presence in Antarctica. On the 22nd February of 1904, Argentina took over the Scottish meteorological base in South Orkney Islands, handed in by Dr William Bruce, the leader of the expedition. The Argentine Antarctic Programme (DNA) maintains six permanent bases in the Antarctic Peninsula region, and many other seasonal (non permanent) stations and refugios. Logistics are provided by the Argentine Army (DNA, 2010). Since the Argentine flag ship *Almirante Irizar* was destroyed by a fire in 2007, DNA charters the cargo vessel *Canal Beagle* and the Russian vessel *Vasili Golovnin*, or the Russian icebreaker '*Capitan Dranytsin*' for transport of personnel and scientists, and re-supplying the research facilities (DNA 2010). The *Puerto Deseado* is an oceanographic vessel used for research and cargo, and smaller patrol vessels from the Argentine Navy sails south every summer season for support and for search and rescue in within the Argentine Antarctic claimed sector (DNA, 2010). Air links between Argentina and Antarctica are operated by the Argentine Air Force, landing C-130 Hercules at the runway of Marambio Station. From this Antarctic facility, there is connection to other Antarctic research facilities by operating small ski-equipped aircrafts and helicopters. All these logistical operations take place from other ports and cities in Argentina, mostly from Navy and Air Force posts, rather than from Ushuaia. As regards other National Programmes operating from Ushuaia, no other national programme has a permanent connection with Ushuaia, although the Brazilian vessel *Ary Rongel* or the Spanish vessel *Las Palmas*, will occasionally call at Ushuaia in support of those national programmes. They alternate their resupply operations between Ushuaia and Punta Arenas (Ocampo, personal communication, 2011). Some Antarctic scientists may see Ushuaia at the end of their expeditions, having benefited from the generosity of a cruise ship that brings them back from Antarctic on their way to their home countries (personal observation, 2008).

Ushuaia's marketing campaign brands this city as 'the most active gateway to Antarctica' and with the slogan 'At the end of the world, where everything begins' (InFueTur, 2008). However, it seems this promotion campaign is only targeted to the Antarctic tourism industry and not to other Antarctic related operations. Daniel Leguizamón, head of Ushuaia's Tourism Board, understands the economic benefits to be gained from Antarctic business. He would like to see the Argentine Antarctic Programme run from Ushuaia (personal comment, 2009). This will attract other Antarctic Treaty Parties that will benefit from Ushuaia's proximity to Antarctica and from the infrastructure already in place to support Antarctic expeditions. The main problem lies on Argentina's unstable economy and political instability, two mayor issues that the country has been battling with since the 1980s (personal observation). The budget to run Argentina's Antarctic Programme is limited, and DNA has not shown intentions of drafting a strategic plan to move their headquarters to Ushuaia yet. Therefore, the logistical operations to supply cargo, fuel and transporting personnel to Antarctica are run from Argentina's capital city, Buenos Aires and nearby military bases. (Marensi, personal comment, 2009).

With the support of the Municipality of Ushuaia, Leguizamón works towards creating awareness on the citizens (or 'Fueguinos') of the unique situation of Ushuaia as a convenient Antarctic Gateway City, and promoting participation of all Antarctic institutions, government

and the private sector to work together to achieve this goal. Ushuaia celebrates its Antarctic connection with an annual winter festival, known as 'The Antarctic Week'. During this festival, there are public lectures, Antarctic films and video releases, art exhibitions and art performances, competitions and a public forum to discuss Antarctic-related issues. This festival is promoted in Ushuaia's winter tourism marketing campaigns, aiming to attract domestic and overseas tourists during the ski holiday season (May to October). Furthermore, in Christchurch in 2009, Ushuaia signed the Statement of Intent between the Southern Rim Gateway Cities to the Antarctic. This agreement provides for cooperation and the sharing of information among the signatory cities. Planning is under way to have an International Antarctic Area to attract national Programmes to Ushuaia. This facility will provide an exclusive tax free zone for storage of overseas cargo heading to, or coming back from Antarctica; a multipurpose logistic pier for national programme vessels to operate from; a science lab and research facilities; and an Antarctic theme park among other services (Leguizamon, personal communication, 2010).

As far as research centres and education resources, Ushuaia is home to the Southern Scientific Research Centre (CADIC), created in 1969 to provide opportunities for scientists interested in undertaking research in Patagonia and Antarctica. The University of La Patagonia San Juan Bosco (UNPAT) houses the Centre for Antarctic Information and Publications (UNPAT, 2005). Also, UNPAT runs seminars to update and up-skill graduate students interested in working in Antarctic related fields. UNPAT has signed an agreement with Antarpplly to supply skilled and knowledgeable staff for its Antarctic cruises (Leguizamon, personal communication, 2010).

For those interested in Antarctica, the Maritime Museum has an extensive collection of miniature model Antarctic vessels; historic artefacts from Nordenskjold's expedition (1901-04) are in exhibition at the Antarctic Unit of In.Fue.Tur; a walking trail with statues of Antarctic explorers; and plenty of Antarctic souvenir shops (Secretaria de Turismo de Ushuaia, 2010).

Discussion

In all cases, the title or 'brand' of Antarctic gateway is predominantly displayed next to the city's name, showing the marketing efforts of government agencies to mark their Antarctic connection, sometimes disregarding the existence of other gateway cities in the region. Lately, some Antarctic gateway cities are attempting to re-brand their connection with Antarctica. For example, Ushuaia promotes itself as the 'most popular Antarctic gateway', a true statement only as regards Antarctic tourism operations. Recently, Hobart branded itself as the 'gateway to East Antarctica', finding a niche that may bring better Antarctic-related business opportunities for those operating in East Antarctica.

While the majority of people travelling to and from Antarctica pass through the five main gateway cities, there are a small number of Antarctic logistical operations working through other centres, as Melbourne (Australia) and Buenos Aires (Argentina).

Although Antarctic national programmes managers and tour operators choose the shortest way to gain access to Antarctica, some key factors determine from where these operations

are launched. According to Stuart Prior (1997) *'geography, experience and reputation are valid and compelling parts of the equation'* for the development of an Antarctic gateway city. In addition to these, other factors that influence the decision of choosing a suitable Antarctic gateway city are: political agreements, infrastructure and mutual interests.

If geographic proximity is a key factor, Ushuaia should be the main Antarctic gateway city for both national programmes and tourism. Ushuaia is the closest point to the Antarctic Peninsula, where many ATS countries have interests and conduct research. Ushuaia is the port of call for circa 90% of Antarctic tourism operations. However, this city is not a nodal point for Antarctic national programmes. Despite of the government's initial efforts of improving Ushuaia's infrastructure in the 1990s to become an Antarctic gateway city, today's enlarged port and international airport don't seem enough to attract national programme operations. An indication of the latter is shown with Argentina's Antarctic programme launching its logistical operations from other Argentine cities, but excludes Ushuaia. Also, in spite of its geographic convenience, Ushuaia has not yet developed a permanent air link with Antarctica. Regarding the availability of other resources that may complement the demand of Antarctic national programmes, Ushuaia offers one research facility and modest educational opportunities through the local university. However, there are opportunities to attract more Antarctic-related business based on the present infrastructure, the understanding of the needs of the market (i.e. providing storage facilities and tax exemptions to imported Antarctic equipment), the availability of experienced personnel and the supply of fresh local produce. The local government and local community are working collectively towards this goal. However, these efforts will need the support of political decisions from the national government, if Argentina wishes to maintain Ushuaia's status as an important Antarctic gateway city.

Chile's Punta Arenas' is the second closest city to the Antarctic Peninsula. This gateway city is not as popular as its competitor, Ushuaia, for Antarctic cruise ship operators, which have extra operational costs sailing from Punta Arenas. However, Punta Arenas is a hub for Antarctic national programmes that work in the Antarctic Peninsula. During the summer months the city hosts more than a dozen national programmes. Punta Arenas provides the essential infrastructure for sea and air to Antarctica. The port of Punta Arenas is as busy as its airport with logistical operations that support National programmes during the summer season. The air link between Punta Arenas and King George Island allows regular flights transporting National programme personnel as well as tourists and private expeditions. Furthermore, the development of Punta Arenas as an Antarctic gateway city is supported by Chile's Antarctic National Policy, which recently established the Antarctic Chilean Institute headquarters in Punta Arenas. This political decision is based on Chile's sovereignty interests in the Antarctic Peninsula sector that they have claimed, but has also strengthened Punta Arenas position as a gateway for Antarctic logistical operations. There is a clear agenda from the Chilean government to enhance Punta Arenas' offer for further Antarctic business. CHAIN, a government funded agency seeks to facilitate Antarctic business opportunities for Punta Arenas. Initial evaluation reports indicate that the most important disadvantages for Punta Arenas businesses are: lack of interest and/or lack of knowledge of the demands of Antarctic operators, the language barrier between supplier and client, and the inadequately specialized technical staff to repair and operate machinery and equipment. These findings provide a significant initial assessment that should allow improvement in the situation of

services and business interested in benefiting from the city's Antarctic connection (CHAIN, 2008).

If 'experience and reputation' are the key components to develop an Antarctic gateway city, Christchurch and Hobart have the strongest ties with Antarctica. Christchurch has had a historic Antarctic connection through the port of Lyttelton, assisting British Antarctic expeditions from the 'heroic era of Antarctic exploration'. Lyttelton's Antarctic connection is of a bygone era, today receiving only a few visits per season from an American supply vessel and a fuel tanker.

However, Christchurch's forte is the air link and associated facilities at The International Antarctic Centre Campus and airport, which support the logistical operations of the established National programmes of United States, Italy and New Zealand. New Zealand's government has supported the development of Christchurch as the Antarctic gateway city by establishing the headquarters of its agency Antarctica New Zealand here. In addition, the New Zealand government facilitates the relationships between USAP and PNRZ by contributing to the joint pool of logistics and by subsidising fuel and covering expenses stemming from Antarctic-related operations. They also work to attract other business opportunities and Antarctic partners to operate from Christchurch, such as the latest negotiations with the Republic of Korea. As regards educational resources and research facilities, the local university is heavily involved in developing educational programmes for both academic involvement and for the wider community, participating in Antarctic research with its dedicated centre for Antarctic studies and research (Gateway Antarctica).

The long term partnership between New Zealand and the United States is the single most important connection between Christchurch and Antarctica. There is no indication that this partnership will cease in the near future, allowing Christchurch to further develop better infrastructures and business opportunities with its Antarctic partners. As the number of nations interested in doing research in Antarctica grows, Christchurch should consider opening its Antarctic infrastructure and logistical experience to other national programmes, allowing other partners to contribute to the pool of logistics and therefore, benefiting from the consequent Antarctic business.

As gateway cities, Christchurch share some similarities with Hobart, The Tasmanian capital has developed infrastructure to allow operations by air and sea for both national programmes and Antarctic tourism. In addition, a government funded agency and a business association have collated and promoted Hobart's available equipment, goods and services and human resources for the support of Antarctic operations. In terms of experience and reputation, Hobart hosts the headquarters of the Australian Antarctic Division and concentrates the largest number of Antarctic research centres and Antarctic educational facilities in the world. In 2007, when the continental air link was established between Australia and Antarctica, Hobart was the natural choice for the Australian government, strengthening its significance as a portal to Antarctica. In the case of Hobart, it is clear that the national and regional government work together to strengthen Hobart's position as the gateway to East Antarctica, using geography as the key factor in finding a distinction or a niche of opportunities that separates it from the other Antarctic gateway cities.

Cape Town lies further away from Antarctica than any other gateway city. This has proved to be a major disadvantage for cruise ship tourism, but air-based national programme operations have developed here steadily. Cape Town is an active aerial gateway to Antarctica, maintaining continental air link with Dronning Maud Land. This connection enables the logistical operation of a consortium of European and Indian national programmes that work in Dronning Maud Land, which benefit from Cape Town's airport facilities and the services of a private company that operates Russian aircraft. The port of Cape Town is fully operational to support Antarctic expeditions, with a wharfing zone exclusively for polar research vessels, and building facilities that host the South African National Antarctic Programme, including lending office space for other ATS parties. With the capability of its commercial port, there are potential benefits for Cape Town's economy from becoming a specialized goods and services supplier for Antarctic operators. It is clear that the government of Cape Town is interested in attracting more Antarctic related business to its city, supporting the air link for both National programmes and adventure tourism activities. While Cape Town's distance from Antarctica is likely to prevent much growth in ship-based tourism, there is a great potential for the expansion of air-based tourism from this city. Adventure tourism and private expeditions could increase if Cape Town increased its air link capabilities.

These five Antarctic gateway cities have developed as a result of national government decisions of supporting the growth of their Antarctic connections. These government decisions are driven for political and economic reasons, the former being the case of Chile and Argentina, which have placed the administrative control of their 'Antarctic territories' in Punta Arenas and Ushuaia, respectively. Four of the five cities analyzed in this report belong to countries that pursue Antarctic sovereignty claims. The only exception is Cape Town, as South Africa makes no Antarctic claim.

All five cities are working to attract more Antarctic tourism to their town. However, despite efforts to improve infrastructure, and the presence of much knowledge and resources, it is unlikely that Cape Town, Hobart and Christchurch will ever match the levels of tourism currently seeing in the South American ports of Ushuaia and, to a lesser extent, Punta Arenas. Long distances to Antarctica, inclement weather and difficult landing sites are among the most common problems cited by cruise tour operators and passengers when discussing the use of Cape Town and the Australasian cities as Antarctic tourism gateways. These reasons affect the ship-borne Antarctic tourism, but not the air-borne tourism. Fly-in tourism is currently very limited, but could become a popular way for Antarctic tourism to develop in the near future.

Conceivably, Antarctic tourism does not have to be situated in or close to Antarctica. The idea that people do not have to travel to Antarctica to get an Antarctic experience could be the solution to attract some form on Antarctic business to any of these gateway cities or other cities interested in developing this idea. Virtual tours to Antarctica and land-based entertainment and interactive centres that showcase the continent can attract large number of 'Antarctic tourists' that would not otherwise experience Antarctica. Actual trips to Antarctica involve a greater level of difficulty, and are vastly more expensive. Antarctic themed tourism can be complemented by art exhibitions, museums, historic trails and festivals.

It is important to note that all cities have identified the need of creating and maintaining awareness among citizens of their Antarctic connection. All five study cases promote their local organizations showcasing Antarctica in any form: art displays, museums exhibits, historic walking trails, festivals and interactive entertainment.

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APPENDIX 1

List of Acronyms used in this report:

AAD: Australian Antarctic Division
 AAT: Australian Antarctic Territory
 ACE CRC: The Antarctic Climate and Ecosystems Cooperative Research Centre
 ALC: Antarctic Canterbury Link
 ALCI: Antarctic Logistics Centre International
 AMC: Australian Maritime College
 ANTNZ: Antarctica New Zealand
 ATCM: Antarctic Treaty Consultative Meeting
 ATS: Antarctic Treaty System
 BANZARE: British Australian New Zealand Antarctic Research Expedition
 CADIC: Centro Austral de Investigaciones Cientificas
 CCAMLR: Convention for the Conservation of Antarctic Marine Living Resources
 CCC: Christchurch City Council
 CDC: Christchurch and Canterbury Development Co.
 CHAIN: Chilean Antarctic Information Network
 COMNAP: Council of Managers of National Antarctic Programs
 CSIRO: Division of the Commonwealth Scientific and Research Organization
 DNA: Direccion Nacional del Antartico (Argentina's Antarctic Programme)
 DROMLAN: Dronning Maud Land Air Network
 IAA: Instituto Antartico Argentino (Argentine Antarctic institute)
 IAI: International Antarctic Institute
 INACH: Instituto Antartico de Chile
 IGY: International Geophysical Year
 IN.FUE.TUR: Instituto Fueguino de Turismo (Tourism Board of Tierra del Fuego)
 IMAS: Institute for Marine and Antarctic Studies
 IMOS: Australian Integrated Marine Observing System
 KOPRI: Korean Polar Research Institute
 MFAT: Ministry of Foreign Affairs and Trade
 NZDF: New Zealand Defence Force
 PCAS: Postgraduate Certificate in Antarctic Studies
 PNRA: Programma Nazionale di Ricerche in Antartide (Italian National Antarctic Programme)
 SANAP: South African National Antarctic Program
 SCAR: Scientific Committee on Antarctic Research
 TAC: The Antarctic Company
 TPN: Tasmanian Polar Network
 UC: University of Canterbury
 USAP: United States Antarctic Program
 V&A Waterfront: Victoria & Albert Waterfront, Cape Town
 WESGRO: The Western Cape Investment and Trade Promotion Agency

APPENDIX 2

Copy of the Statement of Intent, signed in Christchurch in September 2009

Statement of Intent between the Southern Rim Gateway Cities to the Antarctic: Ushuaia, Hobart, Punta Arenas, Christchurch & Cape Town

Ushuaia, city of Argentine Republic; Hobart, city of Australia; Punta Arenas, city of the Republic of Chile; Christchurch, city of New Zealand and Cape Town, city of the Republic of South Africa - as the Southern Rim Gateway Cities to the Antarctic act in accordance with the guiding principles of the Antarctic Treaty that promote the enhancement of peaceful and cooperative relations between signatory Nations.

Ushuaia, city of Argentine Republic; Hobart, city of Australia; Punta Arenas, city of the Republic of Chile; Christchurch, city of New Zealand and Cape Town, city of the Republic of South Africa; have recognised a potential mutual interest to share and embrace best practices in areas such as Antarctic related education, work force development, tourism and economic development. The participants believe that the potential for expanded collaboration will be of mutual benefit to all five cities.

To develop their prospective mutual interests and intentions as Gateway Cities to the Antarctic, the Mayors of the five cities, have decided to sign a Statement of Intent that confirms the five participants' commitment to a joint exploration into the benefits of a cooperative programme of academic and best practice exchange.

- i. The five participants will carry out, in accordance with the principles of equality and mutual benefit, a full exploration of potential exchanges in the areas of education, work force development, tourism, and economic development to promote common prosperity and city advancement.
- ii. Regular contacts will be maintained between the identified project leader(s) and relevant Departments to facilitate consultations on the exchanges and cooperation as well as matters of concern.
- iii. This Statement of Intent will come into effect from the date of signature. It will be valid for a period of 18 months. It is intended that, should all participants make favourable findings, an Arrangement will be signed prior to the expiry date.

**This Statement of Intent was signed on
25 September 2009 in Christchurch, New Zealand.**



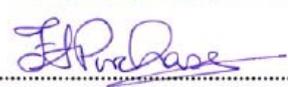
Ushuaia, Argentine Republic
*Mr Daniel Leguzamón,
Secretary of Tourism, Ushuaia City Council*



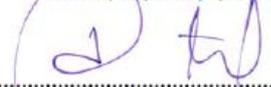
Christchurch, New Zealand
*Mr Norm Withers MNZM,
Deputy Mayor of the City of Christchurch*



Hobart, Australia
*Alderman Robert Valentine,
Lord Mayor of the City of Hobart*



Cape Town, Republic of South Africa
*Alderman Felicity Purchase,
City of Cape Town*



Punta Arenas, Republic of Chile
*Mr José Retamales,
Director of the Chilean Antarctic Institute*