ABCD

Department of Science and Technology

Final Report on a Pre-Feasibility Study into an Antarctic Gateway facility in Cape Town

January 2007
This report contains 103 pages
DST final report

Contents

Disclaimer
This document has been prepared specifically for the Department of Science and Technology of South Africa, and is in all respects subject to completion of required professional inquiries, the negotiation, agreement and signing of specific contracts.

Executive Summary

Background

Significant activity on the mainland of Antarctica only dates to the International Geophysical Year in 1957. Since then growth of activity has been exponential. Today the Antarctic has a visiting population of scientists and support personnel and varies in size between 1000 in winter and 4000 in the summer. Altogether 26 nations now have Antarctic programs and together they operate 37 year-round stations and 15 seasonal stations. The scientific research done in the Antarctic plays a vital role in our understanding of the dynamics of our planet and well justifies great cost and risk of maintaining scientific bases in that inhospitable environment.

Currently, the Antarctic is administered under the Antarctic Treaty which came into force in 1961. It was originally negotiated by a group of 12 countries including South Africa independently of the United Nations. It seeks to preserve the environment of the of Antarctica and to preserve the continent for scientific rather than commercial development

Gateway Cities

Antarctic activity is supported by five gateways. Besides Cape Town these are: Christchurch in New Zealand, Hobart in Tasmania, Ushuaia in Argentina and Punta Arenas in Chile. The vast distances between the respective gateway cities, and the vastness of the Antarctic continent, limits the interests of each gateway to a particular region of Antarctica. Each gateway has to a greater or lesser degree positioned itself to serve the peculiarities of its particular sphere of interest. Cape Town commands the Queen Maud Land (QML) region of the Antarctic, which is dominated by scientific expeditions and has very little tourism potential. The QML region accounts for about 11% of the “population” of the Antarctic.

Transport

Traditionally, access to the Antarctic has been by sea. However, for the last 10 years, air transport has become a prominent mode of transport to the Antarctic for personnel. Currently some 200 persons fly to the QML sector from Cape Town and return each year. Since the aircraft currently used from Cape Town need to refuel in the Antarctic with fuel brought in by sea in drums, flying to the Antarctic remains very expensive and risky.

Heavy cargo, fuel and the remainder of the personnel going to the Antarctic still go by sea. During the four years spanning 2003 to 2006, Cape Town harbour had 68 visits by 11 polar vessels, altogether spending 1,025 days in port. The bulk of this activity stems from the SA Agulhas, although a modest increase in polar shipping activity seemed to exist in this period.

Commercial and Industrial Opportunity

Commercial activity generated in Cape Town at present as a result of its gateway position is estimated at between R100 and R150 million.

Cape Town is the only Antarctica Gateway city that has a significant industrial capacity, dry docks and ship repair industry and the ability to supply and equip Antarctic expeditions.

A coordinated effort on the part of Cape Town could see some increase in this spending – largely by relocating acquisition from Europe to Cape Town. There would be minimal East West effect. The total Antarctic business activity is expected to grow considerably in the future and a coordinated Cape Town effort will maximize the capture of this activity.

Cape-Antarctic Gateway Concept

A Cape-Antarctic Gateway's key strengths would be:

- One-stop destination for supplies, repairs and dry docking.
- Primary focus on logistics and convenience.
- Impartiality and neutrality, relating to territorial claims or the science-tourism debate.
- World-class stopover for Antarctic personnel, in terms of accommodation, leisure and recreation.
- World-class conference facilities.

Special Purpose Vehicle

To be an effective gateway, an institutional structure should be established wherein the focus, ownership and accountability for the roles can reside. To this end, an Antarctic special purpose vehicle (SPV) or agency is needed to fulfil the following roles through an integrated strategy:

- Coordinate customs and immigration requirements.
- Control travel to the Antarctic of South African and foreign nationals via Cape Town through the double permit system.
- Establish a cluster development programme for local businesses providing goods and services for the Antarctic.
- Sponsor and Arctic science education and awareness.
- General promotion of the Antarctic as a place of geopolitical importance and interest to the broader informed public.

- Manage relationships with all National Antarctic Programmes.
- Provide workshop and laboratory facilities on a book-and-rent basis
- Coordinate essential support services such as communications, meteorology and emergency response.
- Support the retention of essential Antarctic expertise.
- The Western Cape Department of Economic Development and Tourism is willing to assist in establishing a suitable SPV.

Antarctic Visitor Centre

There was an early notion, prior to this study, that one facility could be constructed which would support all the functions of a gateway. The findings of this study indicate that at least in the short term, this is not feasible. From discussions with the V&A Waterfront it would appear that there are no longer any economically viable sites in the waterfront, current rentals running at R 145/m2/month; the Antarctic Directorate of DEAT have entered into a 20 year lease agreement with the V&A Waterfront for a facility on East Pier and the Two Oceans Aquarium have committed themselves to the construction of an Antarctic exhibit that will cover most of the needs of an Antarctic Awareness Centre.

Constructing a freestanding visitor centre, in itself, would have questionable feasibility. Constructing such a facility in competition with the Two Oceans Aquarium (since they are pressing ahead regardless), is not recommended at all. Specifically, the construction of a 2nd Floor Antarctic Display at the TOA, which will be a dedicated Antarctic science facility, should be pursued.

There exists an opportunity for DST to join in this Two Oceans Aquarium venture, in particular, in the construction of a second floor to allow DST to mount a dedicated Antarctic science facility display. The Weather Office has indicated a strong desire to participate in this second floor development to promote their Antarctic work.

Two oceans aquarium will be undertaking these improvements during 2007. Thereafter, there will be a moratorium on any further construction work at their site. One way or another, DSD will have to take a decision on their participation in this project in the near future even if this is to be the “no action” option.

Conclusion

Cape Town is a natural gateway to the QML region of the Antarctic and significant benefits can be derived, in economics, profile, education and awareness, if more can be made of Cape Town's gateway role. This can be achieved by the establishment of a formalised Antarctic Gateway in Cape Town – a matter that is long overdue.

The following action should be taken:

- An organisational entity, that could be called Cape-Antarctic Gateway Company (CAGO), should to be established, in consultation with DEAT and the PGWC, to pursue these goals

- The demarcation of roles between CAGO and DEAT should be carefully considered and agreed upon. In broad terms, it is foreseen that CAGO's role would be to focus on the gateway activities, whereas DEAT's focus is on the SANAP programme.

- The opportunity to partner with the Two Oceans Aquarium in establishing an Antarctic visitor centre should be pursued.

1 Terms of Reference

KPMG was contracted by the Department of Science and Technology (DST) to conduct a pre-feasibility study into the establishment of an Antarctic Gateway in Cape Town. The key gateway functions were foreseen to be:

- To raise public awareness of research activities in the Antarctic
- To be a co-ordination centre for maritime and aviation services to the Antarctic
- To provide a service to logistical, scientific and social science requirements of research into the Antarctic

The study requirements were anticipated to include the following:

- Desk research into existing gateways
- User needs assessment
- Concept development
- Site evaluation
- Market assessment
- Indicative project selection
- Financial and economic assessment (high-level)

This report contains the findings of the above study.

2 Description of study approach

A Pre-feasibility study depends heavily on gathering pertinent information from a broad range of sources, assessing the reasonableness of such information, before structuring it into a logical format by which decision-making can be advised. In this instance, the study approach employed three mechanisms to gather information:

a) Desk research, mainly via the Internet. The number and quality of web-sites on Antarctic matters were extremely good.

b) Interviews with various stakeholders, from both the public and private domains. About 30 interviews were conducted and recorded.

c) Survey instruments. Two surveys were distributed; one for benchmarking visitor centres, and one for assessing scientists needs. Regrettably, the survey aimed at comparable visitor centres yielded no results, as the foreign centres felt that competitive considerations and confidentiality were paramount.

3 Background

3.1 Human activity on the Antarctic continent

The Antarctic continent has been a source of great interest to mankind, since it was discovered in the 1820's. Much of the exploration of the Antarctic islands and coastal waters that occurred during the early 19th century was a by-product of commercial sealing and whaling activities. As seal colonies were progressively wiped out a number of commercial operators extended their exploration and mapped substantial areas of the Antarctic coast in their search for wildlife resources. In addition, a number of countries mounted national expeditions of exploration during the 19th and early 20th centuries. Early ship-based exploration achieved much in charting the hazardous and unknown regions of Antarctica, which is a testament to the courage and seamanship of the early mariners. It is remarkable that much of the early exploration work was undertaken using timber-hulled, sailing ships which lacked the structural strength, power and sophisticated navigation aids of modern vessels.

The first recorded ongoing settlement dates back to 1903 when the Scottish National expedition established a building on Laurie Island. In the early 1950s the 67 member nations of the International Council of Scientific Unions (ICSU) endorsed a proposal to conduct an International Geophysical Year (IGY) in 1957/58. It was agreed that the IGY would focus especially on research in Antarctica and in outer space. Twelve of the ICSU member countries (Argentina, Australia, Belgium, Chile, France, Japan, New Zealand, Norway, South Africa, the United Kingdom, the USA and the Soviet Union) met in July 1955 to commence planning the Antarctic science program. [The same twelve countries subsequently negotiated and signed the Antarctic Treaty in 1959.] More than 40 stations were established in Antarctica for the IGY including two on the Antarctic plateau; one at the South Pole by the USA and the other at the Pole of Inaccessibility (farthest points from the coasts) by the Soviet Union. Prior to the IGY, only a few permanent stations had been established in Antarctica.

Seven countries have made territorial claims to the Antarctic continent, but not all countries recognise these claims. In order to establish a legal framework for the activities of the various national stations on the continent, an Antarctic Treaty was drawn up in 1959, which neither denies nor recognises the territorial claims. It came into effect in 1961.

Whereas Antarctica has no indigenous inhabitants, today it has a visiting population of scientists and support personnel that varies in size between one thousand in winter, and four thousand in summer. Altogether 26 nations now have Antarctic programmes, and together they operate 37 year-round stations and 15 seasonal stations.

Antarctica is, on average, the coldest, windiest, driest and highest continent on earth. It has the largest recorded hole in the ozone layer, resulting in higher levels of solar radiation in summer than at the equator. Only two percent of the continent is exposed barren rock. The remainder is covered by a thick continental ice sheet. Average elevations are in the order of 2000 to 4000 metres, and mountain ranges go up to 5000 metres above sea level. About 1.5 times as large as the USA, with a coastline of nearly 18,000 km, Antarctica is the fifth-largest continent. In summary, it is an extremely inhospitable place; its vastness and extreme climatic conditions can pose severe and unique challenges to people and equipment.

Nonetheless, the pattern of growth of human activity and occupation in the region over the historical period has probably been exponential, and this pattern is expected to continue into the future.

3.2 The Importance of the Antarctic

To understand the reasons for venturing to the Antarctic, at great cost and risk, one needs to understand the importance of the continent, within the context of the challenges faced by humanity in the 21st century.

Antarctica is a key part of the Earth's climatic system. Processes taking place in the Antarctic affect the world's climate and its oceans, linking the continent inextricably to what is experienced thousands of kilometres away. Within its 4 km thick ice sheet is a record of past climate for the last 500,000 years, effectively an archive of atmospheric gases. It holds evidence of levels of global pollution by industry, agriculture and nuclear explosions, captured in the frozen ice.

Furthermore, there is evidence of ozone depletion in the upper atmosphere. Studies on the ice sheet and its contribution to world sea level rise are vital to our understanding of global change, and how it will affect billions of people elsewhere on the planet.

On the outer edges of our atmosphere, charged particles sent out from solar flares on the Sun produce the stunning polar displays of Southern Lights. However, these electrical storms can seriously damage satellites and even power systems on Earth. Early detection of these storms and prediction of their possible damage could mitigate the risks of power supply interruptions.

The Antarctic Treaty seeks to preserve the environment of Antarctica. There is a voluntary protocol whereby national bases may inspect one another, to ensure compliance with environmental restrictions. Furthermore, all scientists visiting Antarctica must attend an Antarctic environmental orientation course and have a valid certificate to that effect before they are allowed to go down.

There is a substantial case for Antarctic research, and an indication that the scientific presence in Antarctica matters to the future of all of humanity.

3.3 Logistics

Due to its relative isolation at the Southern end of the globe, the logistics of reaching Antarctica will remain a challenge in years to come, irrespective of the mode of travel. Air travel to the continent is on the increase, but it comes with new concerns over safety and atmospheric pollution. Surface travel remains slow, uncomfortable and expensive.

The logistical constraints have given rise to the importance of a small number of towns and cities which are well-positioned as transport nodes, en route to the Antarctic. Five ports are generally regarded as "Antarctic gateways": Christchurch in New Zealand, Hobart in Tasmania (Australia), Cape Town, Ushuaia in Argentina and Punta Arenas in Chile. Each gateway has, to a greater or lesser degree, positioned itself to serve the polar expeditions of some countries.

The vast distance between the respective gateway cities, and the vastness of the Antarctic continent, compels one to regard each gateway as having a specific sphere of

interest. As an example, a destination on the Antarctic Peninsula is very much easier to reach, irrespective of the mode of travel, from Ushuaia or Punta Arenas, than from any of the other gateway cities. In the same way, the South African “sphere of Interest” is centred on the Dronning Maud Land (DML) sector (It is not limited to the treaty boundaries of the sector, however). DML is on the same time zone as South Africa and Europe, hence it facilitates easier communications.

The distance from South Africa is about 4 500 kilometres to DML. The Peri-Antarctic, from a South African Government perspective, is mainly Marion and Edward Islands but from a shipping perspective, can include all the islands from St Helena to Kergulen.

3.3.1 Ship operations

Most national Antarctic programs continue using vessels as the principal means of transporting supplies and personnel. The use of ships to re-supply and transport expedition personnel continues to be a challenging operation because of the remoteness of stations from established ports, and the harsh climatic conditions.

Ship operations are constrained by the seasonal formation and decay of sea-ice. During winter the sea-ice can extend for several hundred kilometres offshore, which limits access to the stations to the Austral summer period of November to February. Even so, during summer, vessels have to transit the rough conditions of the roaring forties before penetrating pack ice that, at times, can trap ships even at the height of summer.

Early season voyages may terminate at the edge of the fast ice (that is, sea ice attached to the shore), perhaps some 40 km off shore, and personnel and materials transferred by helicopters. Helicopters are often carried by vessels to help navigate through early season pack-ice.

The re-supply of stations must wait until the ice conditions enable vessels to gain close access. Often it is possible to achieve only a single re-supply visit. Because of the restricted period of access to stations, meticulous forward planning is necessary to ensure that essential items of equipment needed during summer operations are delivered during the previous summer season. Furthermore, in view of the variable nature of ice and weather conditions, it is usual for more southerly stations to hold substantial reserves of food, fuel and other essential supplies.

All waste and equipment must be removed from Antarctica. For bases served from Cape Town that means the waste and equipment is returned to Cape Town for disposal or recycling.

Despite the challenging conditions, sea transport remains the dominant mode of transport to the region. All heavy equipment and fuel go by sea, and so do a significant number of scientists. Traction equipment, vehicles and machinery must be brought back for servicing and overhaul. Scientists bring back various types of samples from cores from deep ice drilling to live marine biota. Some of these must be kept in a refrigerated condition – in some cases as low as -80°C.

Given the enormous cost of obtaining these samples, stringent precautions must be taken to ensure their safety – in the case of refrigerated samples, stand-by refrigerated containers and power generators must be provided.

There is a wide variety of vessels used by national Antarctic Programs. Some are ice-strengthened (that is, designed to withstand the rigors of working in ice-infested waters) and others are true icebreakers. Some are state-owned while others are chartered from commercial shipping companies.

Desk research has yielded the following list of vessels that have operated in the Antarctic region during the past few years (Some of these vessels operate predominantly in the Arctic region, and are only occasionally found in the Southern Hemisphere, e.g. the Yamal):

Polar vessels that have berthed at Cape Town during period 2003 to 2006:

SA Agulhas (South Africa)	Paardeberg (India)	Akademik Federov (Russia)
Meteor (German)	Polar Stern (German)	Lance (Norway)
Marion Dufresne (France)	Nathaniel B Palmer (USA)	BBC Singapore
Akademik Sergei Vavilov (Russia)	HMS Endurance (UK)	

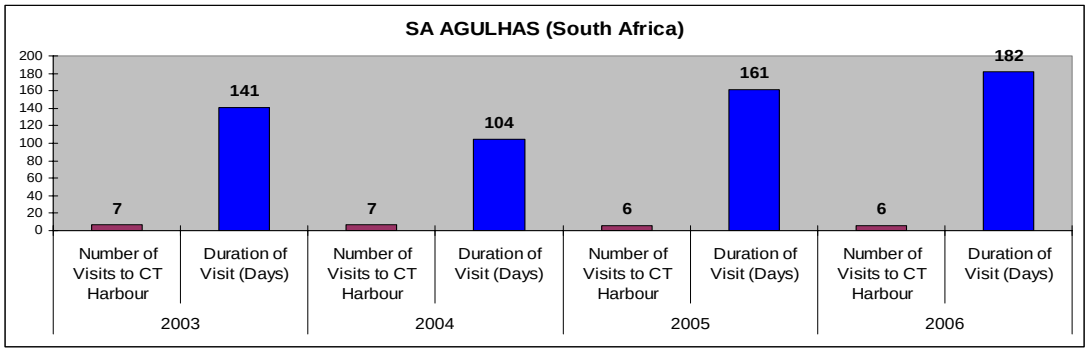
Polar vessels that have not berthed at Cape Town during period 2003 to 2006, but are occasionally active in the Antarctic region:

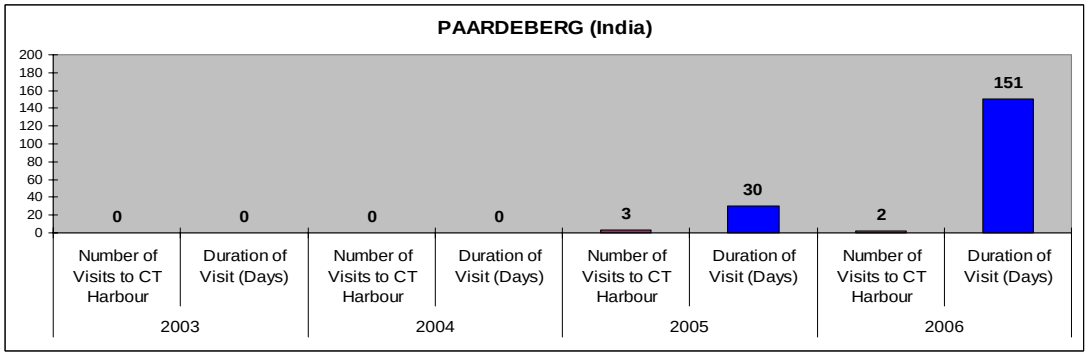
Amundsen (Norway)	Oden (Sweden)	OGS Explora (Italy)
Polar Queen (Italy)	Italica (Italy)	Yamal (Russia)
Vasiliy Golovnin (Russia)	Krasin (Russia)	Spirit of Enderby (Formerly Professor Khromov)
Akademik Shokalskiy (Russia)	Professor Multanovskiy (Russia) Cruise ship	Professor Molchanov (Russia) Cruise slip
Akademik Ioffe (Russia)	Grigoriy Mikheev (Russia) Tourist ship	Polar Pioneer (Russia) Tourist ship
Yuzhmorgeologiya (Russia)	L'Astrolabe (French)	Xue Long (China)
James Clark Ross (UK)	Ernest Shackleton (UK)	Hesperides (Spain)
Las Palmas (Spain)	Magdalena Oldendorff (German)	Archangelgracht (Dutch)
Paul Buck (USA) tanker	Laurence M. Gould (USA)	Almirante Irizar (Argentina)
Polar Sea (USA)	Polar Star (USA)	U.S.C.G.C. Healy (USA)
Humboldt (Peru)	Ary Rongel (Brazil)	Sir Hubert Wilkins (Aus)
Green Wave (USA)	Southern Champion (Aus)	Polar Bird (Aus)
Louis S St Laurent	American Tern (USA)	Aurora Australis (Aus)

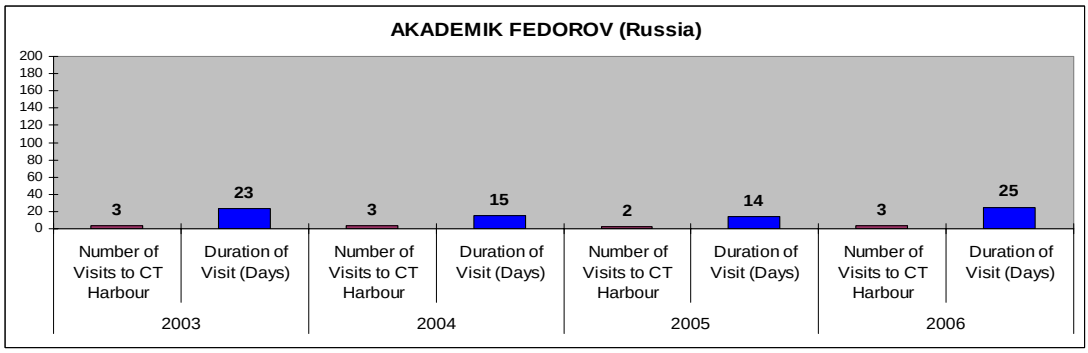
(Canadian)		
Shirase (Japan)		

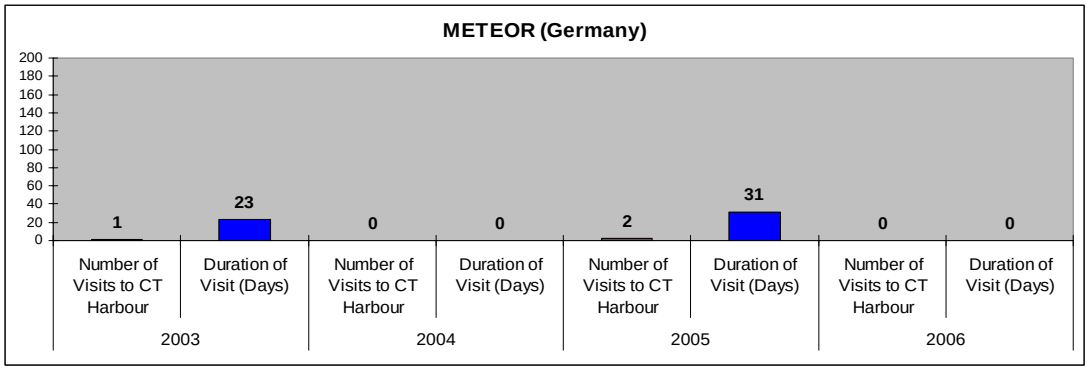
Vessels like the Polar Stern that are designed as ice-breakers can go down early and return late. Others, like the Agulhas, that are merely ice rated have a smaller window of opportunity for their voyages to the Antarctic. Vessels built as ice breakers generally have a deep draft. The draft of the Polar Stern, fully laden, is 11.5 m. It cannot be accommodated in the V & A and must dock in Table Bay – generally around J berth.

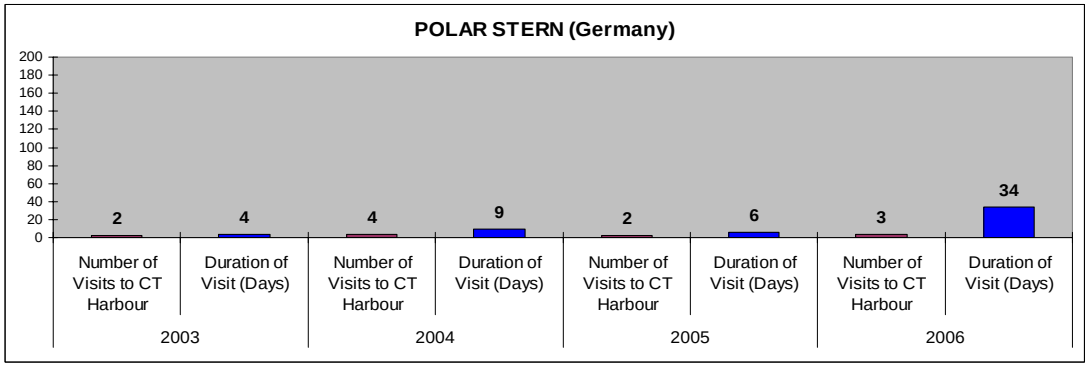
The standard wisdom in shipping is that ships make money at sea and lose money in port. By and large competent management of polar vessels not only keeps them at sea as much as possible, but also tries to find alternative work such as charters and scientific cruises during the southern winter to keep them at sea for as much of the year as possible.
An analysis of visits made by polar vessels to the Cape reveals the following:








METEOR (Germany)
200
180
160
140
120
100
80
60
40
20
0
1
23
0
0
2
31
0
0
Number of Visits to CT Harbour
Duration of Visit (Days)
Number of Visits to CT Harbour
Duration of Visit (Days)
Number of Visits to CT Harbour
Duration of Visit (Days)
Number of Visits to CT Harbour
Duration of Visit (Days)
2003
2004
2005
2006


POLAR STERN (Germany)
200
180
160
140
120
100
80
60
40
20
0
2
4
4
9
2
6
3
34
Number of Visits to CT Harbour
Duration of Visit (Days)
Number of Visits to CT Harbour
Duration of Visit (Days)
Number of Visits to CT Harbour
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Number of Visits to CT Harbour
Duration of Visit (Days)
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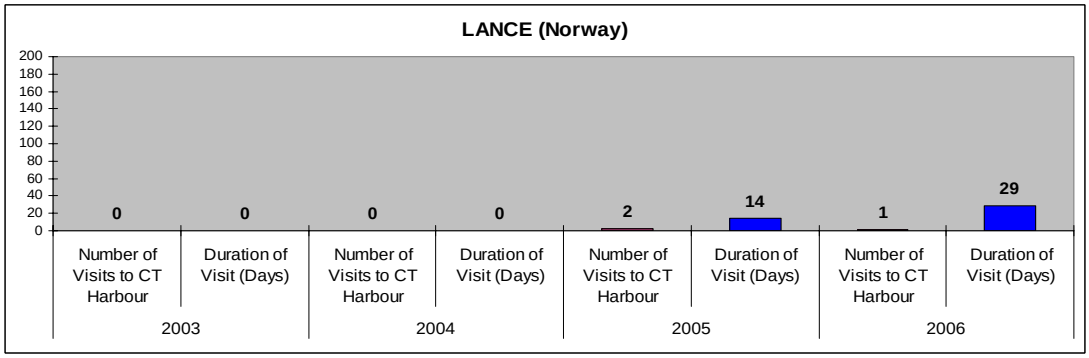
2004
2005
2006


LANCE (Norway)
200
180
160
140
120
100
80
60
40
20
0
0
0
0
0
2
14
1
29
Number of Visits to CT Harbour
Duration of Visit (Days)
Number of Visits to CT Harbour
Duration of Visit (Days)
Number of Visits to CT Harbour
Duration of Visit (Days)
Number of Visits to CT Harbour
Duration of Visit (Days)
2003
2004
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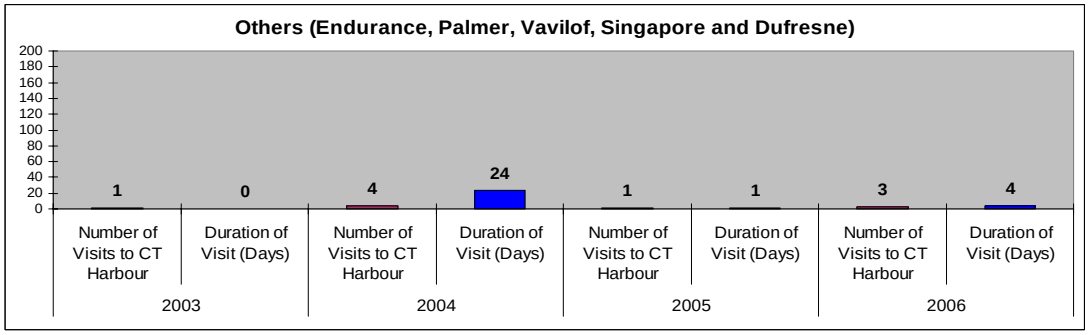
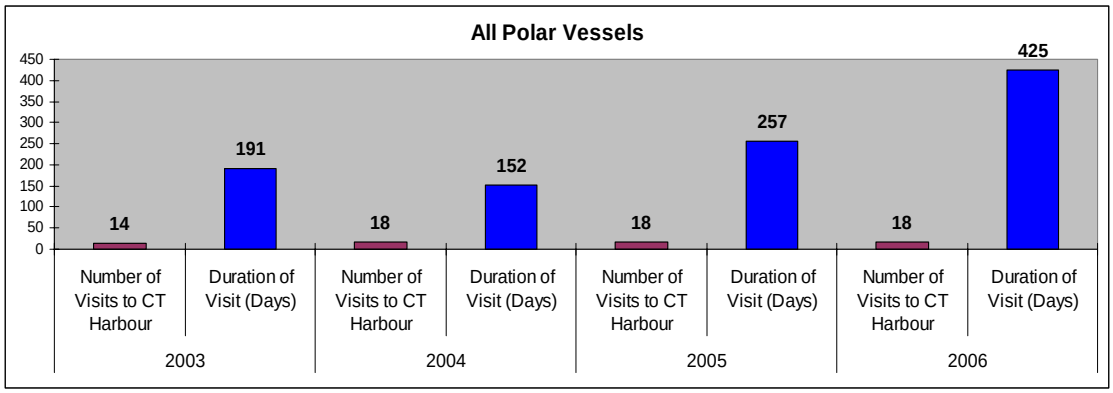
2006


Others (Endurance, Palmer, Vavilof, Singapore and Dufresne)
200
180
160
140
120
100
80
60
40
20
0
1
0
4
24
1
1
3
4
Number of Visits to CT Harbour
Duration of Visit (Days)
Number of Visits to CT Harbour
Duration of Visit (Days)
Number of Visits to CT Harbour
Duration of Visit (Days)
Number of Visits to CT Harbour
Duration of Visit (Days)
2003
2004
2005
2006



The analysis indicates that whereas the numbers of visits remain steady at around eighteen per annum, the duration in port seems to be increasing.

As can be expected, the bulk of this activity comes from the SA Agulhas, with the Indian-chartered Paardeberg, the Russian Akademik Federov, the German Meteor and Polar Stern, and the Norwegian Lance also regular visitors. Notably absent, however, are the British vessels, considering the location of the Halley base[1].

3.3.2 Air transport

Air transport is also used by many operators for inter and intra-continental movement of personnel and supplies. The IGY brought about the first regular inter-continental flights to Antarctica in 1957 when US Navy aircraft commenced operations between Christchurch, New Zealand, and the newly established McMurdo station in the Ross Sea region. Over the last few decades a number of National Antarctic Programmes have established airstrips (mostly scraped blue-ice landing strips, up to 3000m in length) in Antarctica to support regular intercontinental flights.

Air travel to Antarctica remains risky, even today. The Antarctic weather can change very rapidly, the navigational support structures are rudimentary, and the alternative landing strips are generally few. Even though the level of aviation activity in Antarctica is negligible compared with that of developed countries, more than fifty aircraft have been lost since 1957, largely as a result of adverse weather conditions.

In 1977 the Australian airline, Qantas, and Air New Zealand commenced tourist over-flights to Antarctica. Over forty flights were undertaken during the following few years but were suspended when an Air New Zealand aircraft crashed in 1979, killing all 257 persons onboard. Qantas recommenced the flights in 1994, and typically ten flights are now flown during the summer season.

On the Peninsula side of Antarctica, the operator Lan Chile does tourist over-flights from Punta Arenas using a Boeing 737 aircraft. Other Chilean regional airlines run flights from Punta Arenas to the Peninsula region and, in particular, King George Island.

In 1985 a private company, Adventure Network International (ANI), was established to provide flights from Punta Arenas in Chile to Antarctica. The operation has steadily grown

[1] This situation may change in the short term, as South African contractors are involved in the construction of the new base at Halley.

and ANI's successor, Antarctic Logistics and Expeditions, continues to operate a number of aircraft and airfields in Antarctica every summer.

Of greater relevance to this study, is the establishment of Dronning Maud Land Air Network (DROMLAN) in 2002 (DROMLAN was later renamed ALCI). The initiative was taken in the 1990's by Norway to establish a collaborative air network, involving all the national stations located within the Dronning Maud Land (DML) region of the Antarctic. Today, ALCI operates inter-continental flights between Cape Town and the Antarctic bases of Troll (Norway) and Novolazarevskaya (Russia), using Ilyushin 76 and Hercules aircraft. There is currently no landing strip at SANAE, but the Norwegian and Russian landing strips have been operational since the 2004/2005 season. A further development towards safe air travel in the region has been the establishment of a detailed and individual weather forecast capability at the German Neumayer station. ALCI continues to undertake between five and seven flights between Cape Town and the DML bases during the summer season each year, from early November to mid February. During the 2005-2006 season, ALCI transported about 200 people from Cape Town to the Antarctic for various national Antarctic programmes, all of them scientists.

A very real limitation is that the aircraft in current use cannot do the round trip without refuelling, which means that they reach a "point of no return" on the way to the Antarctic, after which they must land regardless of conditions. This is a considerable risk factor, which causes Antarctic trips to be unpopular with many pilots. Furthermore, the cost of fuel delivered to Antarctica is very high, which raises the cost of refuelling considerably.

It is foreseen that this problem may be mitigated when the military Airbus aircraft are delivered to South Africa, as these would have the range to turn back, should the weather conditions preclude a landing.

4 Benchmarking to Other Antarctic Gateway Cities

In addition to Cape Town, four other cities are recognised as "gateways" to Antarctica: Christchurch (New Zealand), Hobart (Tasmania, Australia), Punta Arenas (Chile) and Ushuaia (Argentina).

Both Hobart and Christchurch actively promote their status as gateway cities and have developed a significant economy around the provisioning and support of Antarctic missions.

Both have created dedicated visitor/educational facilities enabling the general public to gain insight into the activities and life of research teams on Antarctica. In addition, various Antarctic research centres, and national and international bodies involved with the Antarctic, are based in these cities. In both instances, the cities act as gateways in facilitating the logistics for Antarctic research missions, serve as departure points for scientists, and educate the local populace and visitors on Antarctic matters.

Punta Arenas and Ushuaia have a somewhat different focus. They are major logistical gateways for the programmes with bases along the Antarctic Peninsula, but they have made no effort as yet in public education through visitor centres. Instead, they have also become major departure points for Antarctic commercial passenger vessels (mostly cruise ships and converted ice breakers) transporting tourists to the Antarctic Peninsula and Southern Ocean Islands.

Given the key requirement for South African public awareness to be raised on matters pertaining to the Antarctic, and the relative lack of importance of Antarctic tourism from a Cape perspective, it stands to reason that Hobart and Christchurch will serve as more prominent benchmarks.

4.1 Hobart, Tasmania (Australia)

Tasmania is one of the primary benchmark examples of what an Antarctic gateway city could be. Its link to the Antarctic is of great importance to Hobart, both in spirit and economy. The Australian Antarctic Division is located in Hobart, and between 70 and 100 Tasmanian companies do business with the Australian Antarctic Program. Australia spends $100 million a year on goods and services for the Antarctic program, and half of that is spent in Tasmania, which is a significant contribution to Tasmania's GDP.

Hobart is the base for the administration of Australia's Antarctic program. The French regularly re-supply their Antarctic base from Hobart, and American, Chinese, Russian and Italian ice breakers regularly visit.

Tasmania has the highest density of scientists in Australia, and 65% of all Australian Antarctic scientists are working in Hobart. In addition, about 200 scientists from around the world come to Hobart for the annual meeting of the Commission for the Conservation of Antarctic Marine Living Resources.

Hobart also plays up its Antarctic connections to draw tourists. For the past four years, the Polar Network, an organization of about 60 companies with Antarctic links, has sponsored a Midwinter Festival in June to highlight the Antarctic ties. In 2002, the festival drew 26,000 people for film festivals, picnics with sled dogs, lectures and other activities.

In terms of promotional and informative material, Hobart has probably the definitive brochure – A comprehensive and accessible document of high value.

The Antarctic Adventure in downtown Hobart is an educational amusement park, with a ski-run simulator, snow-filled cold room, planetarium, movies and a mock-up of an Antarctic base camp. Computer games allow people to try their hand at field science, including counting seals from helicopters. The Antarctic visitor experience consists of an array of dispersed facilities containing Antarctic exhibits, each focussing on different aspects.

The key facilities are:

- The "Antarctic Adventure at Salamanca Square" contains interactive and informative displays and activities covering topics such as life in Antarctica, the wildlife and weather, stories of polar history and scientific research, and interactive simulated experiences of how expeditioners, adventurers and explorers live and work in Antarctica.

- The "Australian Antarctic Division" has a public display area, which presents information on Australia's current Antarctic research, and also features artefacts, rocks, flora and fauna, and other historical items of interest from the 'heroic era' of Antarctic exploration. Dress up in authentic Antarctic clothing, or watch a short videotape explaining Australia's role in Antarctica

- The "Sub-Antarctic Plant House" at the Royal Tasmanian Botanical Gardens holds an unusual collection of sub-Antarctic plants. It is the only refrigerated greenhouse in the world, featuring plants from the Peri-Antarctic Macquarie Island.

- A dedicated Antarctic Gallery at the "Tasmanian Museum and Art Gallery" opened in 2006.

- Maritime Museum of Tasmania

The various facilities are marketed collectively under the 'Polar Pathways' walking experience that explores Tasmania's Antarctic connections. It is a guide to some of Hobart's and southern Tasmania's unique Antarctic and Southern Ocean sites.

Christchurch, New Zealand

Christchurch is South Island's largest city, with a population of 338,000 people, and has one of New Zealand's two major international airports. Christchurch has had a long history with Antarctic explorers, including being the final port call for Robert Falcon Scott. Today, it is still the last stop for the majority of people in the U.S. Antarctic Program. The city itself is very pleasant. Often called the Garden City, it has a wealth of parks and gardens which makes it a very pleasant place for people in transit to or from the Antarctic.

The International Antarctic Centre was established in 1992 at a cost of more than $8million, by Christchurch International Airport Limited to support Antarctic scientific programmes. Its architecture was inspired by the icebergs, ice shelves and glaciers of Antarctica. The facility is owned by The Antarctic Attraction Ltd, and is operated as a commercial venture.

In over 13 years of operation the International Antarctic Centre has twice been judged New Zealand's best visitor attraction, and has now become one of Christchurch's "must-do" activities attracting more than 25% of all visitors to the city's paying attractions. The International Antarctic Centre attracts over 200,000 visitors a year (By comparison, the Two Oceans Aquarium in Cape Town, attracted some 380 000 visitors during 2005, although visitor numbers exceeded 400 000 in 2003 and 2004).

The International Antarctic Centre has signed a memorandum of agreement with Antarctica NZ. The agreement has been developed to bring the two organisations closer together and formalise the important Antarctic relationship.

The International Antarctic Centre is home to the New Zealand, United States and Italian Antarctic Programmes and comprises administration offices, warehousing, a US & NZ clothing store, a post office and travel agency, the Antarctic Passenger Terminal and of course the Visitor Centre, now known as The Antarctic Attraction.

The **Antarctic Attraction** aims to re-create the atmosphere and environment of Antarctica, providing visitors with an interactive, fun and exciting experience of the "Great White South". The Antarctic Attraction comprises the following elements:

- The Four Seasons, a 6-minute audio visual show simulating the four seasons in the Antarctic.

- A replica of the 'Scott Base' with exhibits provided by the New Zealand Antarctic Programme, including a touch screen photographic diary.

- The "Snow & Ice Experience" – a custom-built polar room contains real snow & ice and a constant temperature of minus five degrees Celsius. Visitors can slide down an icy slope, shelter in the ice cave, brave the wind chill machine at minus 18 degrees

Celsius, or get 'exhilarated' in the 'Antarctic Storm'. Complete with stunning lighting, authentic storm audio and 40 km/h winds, the Antarctic Storm blows every 30 minutes.

- The Gallery area with informative displays showcasing modern-day Antarctica, including the Antarctic Treaty and it's member nations, the impact of humans on the continent, the flora and fauna ecosystems and Antarctica's effect on the globe.

- An aquarium displaying some of the actual specimens from the Antarctic ocean floor in McMurdo Sound.

- A replica Antarctic field camp with visitors dressing up in survival clothing, sit astride a 'skidoo' or pose by a polar tent, with an ice vista back-drop.

- "The Great White South" audio visual show, a 14-minute theatre show.

- A 15-minute ride on a Haggelund, an Antarctic all-terrain amphibian vehicle commonly used by the New Zealand base.

- The latest development is the $2.6 million Penguin Encounter, built adjoining the existing centre, which opened in September 2006.

- The facility hosts nine breeding pairs of Little Blue Penguins in a 600 square metre, “Banks Peninsula” - themed enclosure. A specially constructed 6m by 3m window provides excellent viewing of the Penguin Encounter’s centrepiece, a 70,000 litre pool, which can also be seen from an above ground platform.

- An Antarctic Café and Bar

- Function rooms

- A number of educational programmes are offered:

- Polar Pals Pre-School Programme for 3-5 year olds featuring stories and a puppet show starring three animal characters – penguin, orca and a seal.

- Primary School Programme: programmes for the Social Studies - Place and Environment and Science - Living World curriculum strands Levels 1-4

- Secondary School Programmes: Levels 5-8 programmes examines physiological and behavioural adaptations, food webs and the impact of changing technology on the environment; Gondwanaland, plate tectonics, volcanoes and the geology of Antarctica: environmental awareness; global conservation issues and the Antarctic Treaty system: tourism versus science in Antarctica

- Overseas Schools/Universities and Exchange Groups

- Tertiary Groups

- Teaching practice section for College of Education students

- Themed presentations for community groups
- Sleepovers
- Antarctic Explorers Tour - personalised tour of the indoor attraction in the company of an Antarctic pioneer, men and women who have a pedigree of work experience, research or pioneering in Antarctica.

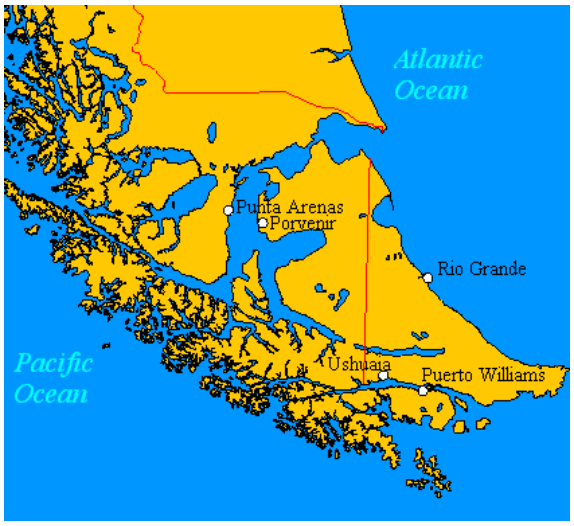
Current admission prices are as follows (Quoted in NZ Dollar. One NZ Dollar equaled about R4.40 in 2006, on average):

	Attraction	**Combo**	**Penguin backstage pass**
Adults	$30	$48	$20
Child (0-4 years)	Free	Free	Free
Child (5 – 15 years)	$20	$36	$12
Family (2 adults & 4 children)	$80	$135	N/A
Seniors and students (with ID)	$28	$46	N/A

4.2 Ushuaia (Argentina)

Ushuaia, the capital of Argentina's province of Tierra del Fuego, is often regarded as the world's southernmost city. It is located on the southern coast of the island of Tierra del Fuego, in a setting surrounded by mountains and overlooking the Beagle Channel. The city has about 50,000 inhabitants.

Not much information could so far be located on Ushuaia's role as a gateway city. Indications are however that the gateway is mostly used for Argentine support to its Antarctic stations, and the relatively minor Ukrainian, US and UK interests on the Peninsula. It is however prominent as a base for commercial tourist excursions. There is no indication of a significant visitor / educational / experiential centre or facility.



4.3 Punta Arenas (Chile)

Punta Arenas is the main city on the Strait of Magellan, and a regional capital. Depending on the definition of word "city," it makes a claim for the world's southernmost city. In 2000, it had a population of 120,000. It is roughly 1420 km between Punta Arenas and the coastline of Antarctica.

The Punta Arenas harbour, although exposed to storms, was considered one of the most important in Chile before the construction of the Panama Canal, because it was used by ships to prepare for the difficult passage around Cape Horn. Today it is mostly used by tourism cruises and scientific expeditions, en route to the Antarctic, even though Ushuaia is the more frequently used port in recent years.

A modern airport serves international connections and is often a stopping point for aircraft going to or coming from Antarctica. Paved highways connect Punta Arenas with Argentina. The geographic closeness between Chile and the Antarctic peninsula make Punta Arenas a natural port for the U.S. Antarctic Program ships going to and from Palmer Station. Many cruise ships also set sail for Antarctic tours from Punta Arenas.

Chileans consider Punta Arenas, near the tip of South America, to be the centre of their country; their maps extend in a wedge all the way to the South Pole. As is the case with Ushuaia, there is no evidence of an Antarctic visitor centre.

Stakeholder Perspectives and Needs

A very broad range of stakeholders exist, in relation to an Antarctic gateway. As far as possible, they have all been approached for their opinion, and given the opportunity to contribute either through an interview, an E-mail or a survey instrument.

It is important to note that a gateway already exists in Cape Town, insofar as Cape Town is being used informally by a number of parties as a base from which to venture to the Antarctic. Private enterprise has already, and will continue to, fill the voids left behind by demand exceeding supply, and new opportunities presented. Another observation is the general enthusiasm relating to the Antarctic, and the prospect of establishing a greater appreciation for it.

The net result is that some activities and events which fall into the definition of a gateway, already take place and will continue to do so, regardless of the decision by DST to establish a formal gateway or not, as the case may be.

4.4 Scientific Interests

Human activity in the Antarctic and Peri-Antarctic Islands has, over the past four decades since the signing of the Antarctic Treaty, been mainly science driven. Scientific study today covers a wide range of activities, both marine and terrestrial. Some of it is directed at the Antarctic itself and some of it is of broader significance, as in meteorology.

As a gateway for scientists in transit, Cape Town is well-positioned relative to the European and Scandinavian countries and their respective bases, and it has a "sphere of influence" spanning from about 30 degrees west to about 40 degrees east, which in Antarctic terms extends from the British Halley base west to the Japanese Syowa base in the East.

This area can also be described as Queen Maud Land or QML, as QML makes up most of it. Considering the total Antarctic summer population of about 4,000, only about 440 are based at stations within the "sphere of influence", i.e. about 11% of the total[2].

Generally, foreign-based scientists would fly into Cape Town at the start of the summer season, to either join a polar vessel departing from Table Bay, or to take an ALCI flight from Cape Town International to either one of the landing strips at Troll or Novolazarevskya. A similar schedule is followed on the return leg. Some scientist follow very tight schedules, and arrive just in time to embark before the vessel leaves or are booked on return flights within hours of the scheduled return date. The vessel itself must maintain a tight schedule and cannot afford to wait in the roadstead for a berth. Others regard Cape Town as an amenable stop-over whilst in transit, and they expect the standard tourist treatment while in Cape Town.

Local scientific interest in the Antarctic comes from two groups, namely the SANAP-approved researchers and the Weather Bureau.

The former group consist of researchers from various scientific disciplines who conduct research either home-based, on one of the Southern ocean islands, or on the Antarctic itself. There are only a few of these, as the following schedule of approved research projects indicate:

SANAP PROJECTS APPROVED FOR 2006/07 (*Continuing from 2005/06)*		
PRINCIPAL INVESTIGATOR	**PROJECT (short title)**	**LOCATION**

[2] As population numbers are closely related to the supplies, equipment and waste that needs to be transported, it is probably a good indicator of the logistical intensity through a Cape Town gateway.

Dr B J van Vuuren *University of Stellenbosch*	The evolution of variability	Marion
Prof D A Cowan *Univ of the Western Cape*	Molecular microbiology of Antarctic biotopes	Marion & Antarctica
Prof J R E Lutjeharms *University of Cape Town*	Southern Ocean climate and biodiversity (SOCAB)	Marion, Gough & Antarctic waters
*Prof L G Underhill *University of Cape Town*	Disturbance of wildlife at Marion Island	Marion
*#Prof S L Chown *University of Stellenbosch*	USAID	Marion
#Dr P G Ryan *University of Cape Town*	Conserving seabirds at Gough Island	Gough
** Final year (need to reapply for rating in NRF system) – the rest will continue until 2009/10* *# Logistic support only*		

SANAP PROJECTS APPROVED FOR 2006/07 (New)		
PRINCIPAL INVESTIGATOR	**PROJECT (short title)**	**LOCATION**

SANAP PROJECTS APPROVED FOR 2006/07 (New)		
PRINCIPAL INVESTIGATOR	**PROJECT (short title)**	**LOCATION**
Dr P G Ryan University of Cape Town	Individual variation in albatross reproduction	Marion & Gough
Prof M A McGeoch University of Stellenbosch	Drivers of sub-Antarctic terrestrial ecosystems	Marion
Dr P J Cilliers Hermanus Magnetic Observatory.	Polar space weather studies during IPY/IHY	Antarctica & Marion
Dr I J Ansorge University of Cape Town	Dynamics of the STC in the South Atlantic	Gough
Prof D S Butterworth University of Cape Town	Antarctic marine assessment and management	Home-based
Dr R J M Crawford Marine & Coastal Management.	Seabirds at Marion Island	Marion
Prof J I Glazewski University of Cape Town	Social science aspects of the Antarctic area	Home-based

A brief survey of this group indicated perceptions that Cape Town has significant potential as a gateway. However, certain inhibitors were flagged, such as crime levels, poor coordination in customs and migration, and poor logistical coordination.

The interest of the Weather Office in the Antarctic stems from its need for information from data sparse regions – in effect the Antarctic and the Islands. The main area of concern for the Weather Office is the “Roaring Forties”.

The Weather Office maintains the following staffing in the Antarctic and Peri-Antarctic:

- Gough – 7 people, 3 met officers
- Marion – 3 met officers attached to the base
- SANAE – 1 met officer

From Ascencion Island, the American military provide data, and similarly with the British on St Helena.

4.5 Tourism

Antarctica is regarded as one of the last truly unspoilt wilderness areas on the globe and therefore, ironically, it has become a compelling tourist destination for the more intrepid traveller. Antarctic tourism has grown rapidly in the past 15 years.

According to the Antarctic and Southern Ocean Coalition (ASOC), only 4,698 tourists visited Antarctica in the 1990-1991 southern hemisphere summer. This figure rose to

24,281 in 2003-2004, and is expected to be over 30,000 in the current summer season (2006–2007).

Visits to Antarctica are generally organised by the International Association of Antarctica Tour Operators (IAATO), which has a self-regulatory code of conduct, e.g. Rules limit the number of passengers who disembark at any site to 100, and tourists should get no closer than 15 feet to seabirds. Yet, indications are that these rules are often not adhered to.

In broad terms, there appears to be three types of Antarctic tourist:

The Adventure Tourist: This is the person who embarks on thrill-seeking, high-risk activities within the polar region, which often results in tragedy, or the need for rescue assistance. There appears to be consensus that these activities need to be actively discouraged.

The commercial air tourist: This activity is already underway mostly from Australia (Antarctic overflights), Chile and Argentina. The latter two support inter-continental flights to destinations on the Antarctic Peninsula, which is also more attractive as a tourist destination. A key concern with this form of tourist is pollution, as this mode of travel involves relative ease, large numbers of tourists, and high levels of gas emission.

The commercial sea tourist: This is the more intrepid traveller who is willing to undergo a 14-day sea journey through the Roaring Forties3, in order to take a short helicopter trip to visit penguin colonies on the continent. This class of tourist should have a minimal impact on the environment, and should not grow to vast numbers, due to the relative hardship and travel time involved.

From the outset, it is clear that Cape Town is not well-positioned to be a tourist gateway to the Antarctic, despite being a popular tourist destination in its own right. Of the five gateway cities, Cape Town is the furthest from the Antarctic continent, and sea journeys pass through four or five days of very rough seas, due to the Roaring Forties.

Cape Town is oriented towards the QML area, which favours scientific bases, and at present appears to be of lesser interest to tourists. However, this could change as tourism grows and perceptions change.

Elsewhere, conventional commercial tourism is gaining momentum, particularly from Chile, Argentina, Australia and New Zealand. The following map indicates the route of a sea voyage originating in Ushuaia, to destinations on the Antarctic Peninsula. It also illustrates the relatively greater distance from Cape Town to the Antarctic continent.

At present, South Africa has no formal policy on commercial tourism to the Antarctic. The current stance of SA has been influenced by a previous Minister of Environmental Affairs and Tourism, in that commercial tourism via air travel will not be encouraged.

[3] There appears to be divergent opinions on the hardship of the voyage down to the Antarctic from Cape Town. Some say the voyage down is "10 days of hell" through the "Roaring Forties", others that it only lasts 2 to 4 days out of the ten. Some who have made the voyage say they would like to go back.

The question of commercial tourism, and the degree to which it should be allowed or restricted, is not an easy one. The position of DEAT on this matter is being formulated through ongoing discussions with other stakeholders, and the expectation is that DEAT will draft policy suggestions by the end of 2007. Generally, DEAT is aligned with the principles of the Antarctic Treaty, which regards commercial tourism as a legitimate activity that should be regulated within the Antarctic region.

Should tourism to the QML area take off, the relatively under-utilised SANAE IV base could play a role. The base is very large with plenty of excess capacity, to the extent that it is referred to as the "Antarctic Hilton". With permissive regulation, tourists with a scientific interest can fly in, spend a few days experiencing the science then fly on to offshore vessels busy cruising the Antarctic waters in summer.

Given the current indicators, there is little to suggest that Antarctic tourism through Cape Town will grow to significant numbers in the short and medium terms.

4.6 Education and Awareness

There appears to be a very low level of general public awareness of the Antarctic continent, the reasons for a human presence conducting science there, and the role of Cape Town as a gateway to the Antarctic. This is a key weakness that would need to be addressed, for a number of reasons:

- For Cape Town to rise in prominence as a gateway city, the commercial and promotional opportunities need to be identified by entrepreneurs and decision-makers in the public and private sectors. Without awareness of Cape Town's role in relation to the Antarctic, the business development process will remain slow and piecemeal.

- The Antarctic, in all its rich dimensions, presents an accessible and gripping portrayal of pure science, social science and engineering at work. It represents very good material for stimulating interest amongst learners and students, thereby influencing tertiary education choices and career choices. Even though they may never become Antarctic researchers, exposure to the Antarctic experience could feasibly steer many young people into related field of study and work, simply because it captured their imagination.

- The Antarctic will be a key barometer of climate change in years to come. General public awareness of the Antarctic in that context will support changes in public behaviour (e.g. greater awareness of responsible energy use and limiting greenhouse gas emissions) and the regulatory environment (e.g. enhancing the placement of sustainable development and environmental issues on the political agenda).

Hence, the importance of educating the general public on the importance of the Antarctic remains a key objective of the gateway. It is foreseen that any gateway facility will need to embrace a very prominent informational, educational and experiential approach. Within this context, an Antarctic visitor centre is foreseen, which would contain many of the successful components of science centres and visitor centres to be found locally and abroad.

Notwithstanding the establishment of a compelling and world-class Antarctic visitor centre, the realities of our developing country should not be ignored. A well funded and co-ordinated outreach programme, whereby mobile exhibits are taken to remote

communities, and learners from disadvantaged communities are sponsored to visit the Antarctic visitor centre, is essential. The visitor centre, whilst world-class in execution, needs to be fully democratised in accessibility, and not be the exclusive privilege of the middle class or the foreign visitor.

As an additional dimension of learning, the development of a high-quality website (with links to the ample number of quality websites on the Antarctic already in existence), should be considered.

On an international and domestic scale, the awareness of Cape Town's role as a gateway, and our long history in relation to the Antarctic, should be enhanced. Various initiatives could be undertaken in this regard, but the opportunity to host Antarctic conferences and host an Antarctic-themed festival, seem to have merit.

Commerce and Industrial Opportunities

Numerous discussions were held with stakeholders within the private sector commercial and industrial sector, as well as the provincial government bodies whose aim it is to stimulate economic development. The aim throughout, was to gain an understanding of the opportunities foreseen by the stakeholders, and the potential obstacles, especially when they arose from the lack of having a formal gateway in Cape Town. Discussions were held with, inter alia, Atlatech, RNC Ships, Wesgro, Barloworld, Petrel Engineering, ALCI, Smit Amandla, Meihuizen International, SAGOA, Department of Economic Development and Tourism of the PGWC, Cape Ship-repair and Cape Union Mart.

The following is a synopsis of the discussions and key points made:

4.7 Commerce

Air Logistics

- ALCI is the only notable operator linking Cape Town with the Antarctic. During the summer season 2005-2006 they transported 200 people, all scientists, between Cape Town and the Russian or Norwegian bases.

- Presently the only aircraft suitable for the run to the Antarctic are the C130 and the Ilyushin 76. These planes do not have fuel capacity to do a round trip and must refuel in the Antarctic on fuel shipped in and is very expensive. The SAAF is expected to get the military version of the Airbus that does have the round-trip range of about 9,000 km.

- One can expect environmental impact resistance with increased air traffic to Antarctic.

- The Norwegians want to station civil aircraft in Cape Town permanently -- year around. This will be the start of a permanent air bridge to the Antarctic. They are planning to get their own Orion aircraft, which will also need to refuel in the Antarctic. In general, they will fly from Norway via Cape Town to the Antarctic, and use Cape Town as a base while in the South.

- Flying time is about 6 hours. Most Antarctic scientists prefer to fly and maximize time in Antarctic. Current cost of a flight to Antarctica from SA is about R80,000. Last year ALCI took 200 people to the Antarctic – all scientists. The Norwegian, German,

Belgian and Swedish and Finnish contingents amount to around 150 people each year, who move through Cape Town. Generally they spend a minimum of seven days each, each way. The aircraft has a crew of about 12 people.

- Air logistics could be SANAE IV - based with proper landing strip. Currently SANAE has no air strip – Russian planes from Cape Town must use Russian air strips. The current air service could service at least four bases out of Cape Town.

- Estimated annual expenditure on flights to and from Antarctica: 200 flights at R80,000/seat each way: 2 x 200 x 8000 x 9.5 = R 32 million

Extreme-weather Clothing

- Cape Union Mart is a retailer and has no intention to become a wholesale supplier to Antarctic programmes. They have been supplying Antarctic equipment for going on 25 years, and see it as a modestly profitable, niche market.

- They have a large warehouse in Montague Garden and can fit out large groups. They supply both cold weather, and heavy duty clothing. They wrote the specifications for Antarctic clothing and have these manufactured in Cape Town. Specialised items such as gloves, steel toe caps, fur lined boots etc are imported, mainly from Canada.

- SANAE Antarctic business used to be lucrative but has declined in volume and return in recent years. Currently the business runs at about R 1 million per annum. About 75% of this comes from the Indian expedition.

- Cape Union Mart has staged Antarctic exhibits in malls where they have shops with the assistance of DEAT. These have been done for general advertising purposes not specifically Antarctic. They commonly include skidoos, photos, snow and ice etc. Cape Union Mart has no budget for education.

Hence, the estimated annual expenditure on clothing in Cape Town is about R1 million.

Shipping

- About 4 to 5 Antarctic ships call at Cape Town en route to the Antarctic. Most make two calls (one on way down, one on way back) but some call 3 times a year. Most of the Antarctic ships are government ships or government chartered ships.

- Normally only one Antarctic vessel is in port in Cape Town at any one time.

- Including both sea and air links, up to 10 countries already use Cape Town.

- The sea voyage to the Antarctic takes about 10 days of which only 2 to 4 days are in the “Roaring Forties”.

- The following national Antarctic programmes use polar supply vessels, as described here:

    - India: Charters ships (currently the Maria Oldendorf, Emerald Sea and the Paardeberg)

- Germany (also accommodating France): Polar Stern and Meteor (about 130 m Lo/a), 2-3 times a year from Cape Town

- Russia – Akademik Federof and Akademik Kapinski – twice a year from Cape Town

- South Africa: Agulhas (about 112 m Lo/a), 2-3 times a year, operated by Smit Amandla

- Norway (also accommodating the Finns, Swedes, Belgians and Germans): Charters the Russian icebreaker Ivan Patini for heavy cargo to the Antarctic.

- With the popularity of air cargo, the function of ships is increasingly to carrying fuel and heavy cargo to and from the Antarctic.

Marine research continues to be done by scientists on voyages to and from Antarctic. If air transport takes over, special research ship voyages would be needed to continue this work. Already a number of research vessels from Northern countries call at Cape Town every year for oceanography cruises in the Southern Ocean. They are a potential market for an Antarctic Gateway.

Polar vessels docking in Cape Town spend on average about R3.5 million per year including ship chandling, fuel and port charges.

Ships' agency for Antarctic vessels is a very complex business and hard work. There have been some problems with some of the Cape Town based agents.

Ships agents need to undertake both ship's agency and cargo logistics. They also make hotel bookings for crew and scientific staff. They also handle the transhipment by sea or air of scientific samples from polar vessels, which could include ice cores from ice drilling – could be up to a few thousand metres – that have to be held at -80°C. Transhipment of these specimens requires significant logistics, e.g. refrigerated containers, standby generators and standby containers held at the required temperature. World Shipping Agencies is the agent for the Norwegian Polar Institute, and Ztrans are agents for the Indian national Antarctic programmes.

Estimated annual expenditure by ships on calling at Cape Town: Assuming 4 ½ calls per year at R3.5 million = R 15,7 million.

(Note: This figure excludes the bulk of the vessels operating cost, which is expended at other ports, typically in the Northern Hemisphere.)

Ship chandling (Re-supply of vessels)

- A problem is the shelf life of perishable commodities: Antarctic bases need two years.

- Norwegian national Antarctic programme obtains fuel from the Durban refinery (80 x 220 litre drums of polar diesel, 1140 drums jet fuel, 30 drums petrol) Total fuel cost is R3 million. SANAP alone use one million litres of polar diesel per trip.

- Total other spending for the whole annual Norwegian expedition is about R10 million.

- Recently the Polar Stern has been kept in the southern hemisphere doing oceanographic research cruises during the winter. Maintenance and re-supply are being done mainly in Cape Town.

Estimated annual spend in Cape Town: Assuming an average of 4 ½ expeditions per year passing through Cape Town, and expenditure of R10 million less R3.5 million for ship costs, hence 4.5 x R6.5m = R30 million

Accommodation of In-transit personnel and scientists

The Norwegian, German, Belgian and Swedes and Finns amount to about 150 people each year, who transit through Cape Town. Generally they spend a minimum of seven days in Cape Town, each way. Their accommodation and sustenance allowance is ample by most standards: Seventy thousand Rand per person per week, which amounts to about R 20 million spent in Cape Town each year.

Estimated annual spend of expedition personnel passing through Cape Town: R20 million

4.8 Industry

Ship Repair

Cape Town is the only Antarctic gateway city that has significant ship repair and dry docking capacity, and its ship repair facilities is as large as that in any of the other main Southern Hemisphere centres. As a gateway, Cape Town has the potential to attract all polar supply vessels and oceanographic research vessels working the Southern Oceans most way to South America to the West and Australia to the East. The proposition would be to do their regular dry docking in Cape Town and not have to return to Europe for refit and survey.

However, the value proposition of Cape Town as a dry docking port has to be enhanced.

A review of the other Antarctic Gateway ports, and Southern Hemisphere ports in general, revealed the following dry docking facilities:

Other gateway ports:

- Punta Arenas and Ushuaia: No significant dry docking capacity.

- Hobart, Tasmania: Three small slipways, 1200 tons, 180 tons & 25 tons.

- Lyttleton (near Christchurch): Small graving dock of same size and vintage as the Robinson dock, i.e about 150m.

Other Southern Hemisphere ports:

Significant dry docking facilities and ship repair capacity in the Southern Hemisphere is only found in the large ports of the region:

- Valparaiso: 2 x Graving docks, 96000 dwt & 18000 dwt, 6 x Floating docks, 4500 tlc, 1 x Slipway, 4000 tlc

- Bahia Blanco: 2 x Graving docks, 215 m & 205 m

- Buenos Aires: 1 x Shiplift, 25000 tlc(?), 1 x Graving dock (15000 t).

- Montevideo: 2 x Floating docks, 192m & 60 m

- Walvis Bay: 1 x 8500 tlc floating dock, 1 x 2000 tlc shiplift

- Durban: 1 x Graving dock, 345m, 2 x Floating docks, 8000 tlc & 4500 tlc

- Perth: 1 x Graving dock, 1 x Shiplift 5000 tlc

- Melbourne: 2 x Graving docks, 155 m & 145 m

- Sydney: 1 x Graving dock, 335 m

- Newcastle: 1 x Floating dock, 195 m

- Aukland: 1 x Graving dock, 160 m

Dry Docking facilities in Cape Town:

- Table Bay: 2 x Graving docks, 360m and 155m, 1 x Shiplift, 1750 tlc.

- Simonstown: 1 x Graving dock, 235 m, 1 x Shiplift, 2000 tlc

There are however a number of issues relating to dry docking in Cape Town, which could hinder the development to full potential. Cape Town's port is renowned in shipping circles for inefficiency, yet it has some of the highest dry docking charges in the world. Business is often lost to Monte Video, mainly as a result of this. Walvis Bay, by contrast, is dropping its docking charges, and is becoming increasingly competitive. It is believed that currently the political will does not exist to upgrade the Cape Town ship repair industry. Cape Ship-repair (the WCPG-initiated SPV for ship repair) is initiating a benchmark study of best practice.

Another view is that vessels will dry dock in Cape Town regardless of the current problems with NPA facilities. Half a dozen ships, maybe more, would be happy to use dry docking facilities in Cape Town if they are suitable.

The nature of the demand is highly variable from the dry docking and repair of conventional ice breakers and ice-rated logistic vessels to temporary conversions of Offshore Service Vessels for once-off special voyages to the Antarctic.

The Polar Stern will be based in Cape Town for the next 5 years and will dry dock here. The Meteor, her sister ship, did refit in Cape Town about 18 months ago.

The total cost to the owners of vessels dry docking in Cape Town is thought to run to the order of R3 to 5 million per vessel. Probably about 6 to 7 Antarctic and oceanographic vessels have been dry docked in Cape Town in the last 5 years.

Hence, an estimation of average annual expenditure on ship repairs to Antarctic vessels in Cape Town: Assuming an average of R4 million per dry docking event, and 1.2 dry dockings per year = R5 million. If the Cape is well-developed as a gateway, and promoted accordingly, this expenditure could be increased. However, the limit is unlikely to exceed R10 million per annum, at current values.

Machinery, Transport and Traction Equipment

There is a small market for the conversion, servicing, repair and overhaul of heavy kit, generators, snow-cats, tractors and surface transport equipment. This work could all be done in Cape Town, but it would need to be a multi-product, Antarctic-dedicated workshop, due to a range of products being in use at the various national bases. It is highly specialized, and one opinion was that key staff for such an operation should all have spent at least a season in the Antarctic.

Almost everything taken to the Antarctic must be returned, as an environmental requirement. That includes snow-cats and large 50 ton tractors.

Barloworld supplies SANAP with Caterpillar machinery and service. To this end, they keep a mechanic at the SANAE base on a permanent basis. The cost to DEAT for this service is in the order of R1-2 million per annum.

There appears to be very little enthusiasm to grow this market, as Antarctic stations are typically government-owned, and very difficult to market to.

Hence, the estimated annual spend on machinery repair is about R2 million.

Waste Disposal

An environmental requirement is that all garbage, waste and used equipment must be brought back from the Antarctic. It arrives separated but it must be properly documented, cleared by customs, collected from the ship by a waste management company, before being taken to a waste disposal site and appropriately disposed of. Hence, and estimate for expenditure on waste disposal is about R1 million.

Base Construction

A Cape-based engineering firm built the new SANAE IV, which was intended as an international collaborative base. It is one of the largest and best equipped bases in the Antarctic. The same organization built the new Marion Island base, and is now part of a South African consortium appointed to build the new British base at Halley, for an estimated R280 million.

Whereas the expertise for such projects exists, the frequency should be quite low, as the current potential for base construction is probably in the order of one per decade. It also implies that much of the expertise could have gone, by the time the next opportunity arises.

Hence, base construction could feasibly contribute about R28 million per annum to the Cape's economy, on average.

The following table summarises the current estimated commercial and industrial-based economic impact on the economy of the Western Cape, derived from Antarctic gateway activities:

Summary of estimated annual spends in Cape Town:

Commercial	
Air Transport	R32 million
Clothing	R1 million
Shipping	R15.7 million
Ship Agencies	N/A
Ship Chandling	R30 million
Accommodation in Cape Town	R20 million
Industrial	
Ship Repair	R5 million
Machinery, Transport and Traction Equipment	R2 million
Waste Disposal	R1 million
Base Construction	R30 million
Total	**R136.7 million**

4.9 Growth opportunity

If the current expenditure on Antarctic-related goods and services by the eight national Antarctic programmes using Cape Town as a base amounts to about R137 million, then it raises a few questions:

- To what degree can this amount be grown?
- If so, where will the growth come from?
- It seems reasonable that the R137m can be grown, simply by considering the fact that no concerted efforts have been made to grow it. However, there are a number of constraints in this regard:
- Tourism to the Antarctic is not anticipated to contribute much in terms of commercial activity in the Cape, for reasons set out in Section 5.2.

Only about 11% of the total Antarctic "population" reside in South Africa's "sphere of influence", as explained in Section 5.1. This equates to about 440 people from eight different national Antarctic programmes. The opportunity to serve other national Antarctic programmes beyond the QML area is limited, mainly due to logistical constraints. Hence, unless there is a meaningful increase in the research activity in the Southern oceans, with more vessels, researchers and support resources going there, the market will be stagnant.

It is anticipated that growth could be pursued along two tracks, at least. One track would be to gain national Antarctic programme -related expenditure by shifting commercial opportunities along the North-South axis.

It seems feasible that, through adequate coordination and industry development, an increased number of contracts from other national Antarctic programmes for equipment repairs, supplies and services can be sourced from Cape-based and South African businesses, instead of the national Antarctic programme's home country. This would inter alia depend upon the local industries and service organisations offering a compelling value proposition, and an institutional structure facilitating the efficient procurement of such goods and services. A consideration which may oppose this initiative is political pressure in some instances, on the national Antarctic programmes to procure goods and services from its home country, even if it is less economical.

Yet, a good example of what can be achieved is the current contract placed with a Cape-based engineering firm for the construction of the new British base at Halley. The base

could feasibly have been constructed in Britain, but the Cape presented a better value proposition in this instance.

The second track, along which gains could be made, is to attract dry docking business along the East-West axis, since Cape Town is the only gateway city with significant dry docking and ship repair capability. As an example, it has the capability of dry docking the typical Russian-built ice breakers, which are popular on the Antarctic routes. Section 6.2 deals with this opportunity in more detail, and suggests that a gain of up to R5m per annum could be made.

It is estimated that efficient promotion of the Cape as a gateway, and effective industry cluster development, could grow the current estimated value of R137 million to perhaps R180 million per annum. Increases beyond this figure will need to come from growth in the Antarctic expedition activity, and the body co-ordinating the gateway in Cape Town will need to be positioned to capture its share of that growth.

5 A Cape-Antarctic Gateway: Concept Development

This section aims to address a number of fundamental questions pertaining to the establishment of a gateway:

- How can Cape Town assume and develop a unique identity as a gateway?
- What are the high-level initiatives and roles that will need to be undertaken to establish and sustain a Cape-Antarctic Gateway?
- What are the institutional alternatives that will be required to sustain the above?
- What facilities will typically be required to house and accommodate the roles?

5.1.1 Cape Town as a Unique Gateway

Cape Town's positioning as gateway, from a geo-political and infrastructural perspective, is quite unique compared to the other Gateways, in the following ways:

Cape Town has substantially more industrial and dry docking capability than any of the other gateway cities; hence it has the capacity to take on a substantial gateway role in the short term. In this instance, the “gateway role” is broadly defined to include industrial and support services, logistical coordination, ship repairs and other institutional roles.

- Contrary to most (if not all) of the other countries hosting gateway cities, South Africa does not exercise any territorial claim on the Antarctic, and therefore does not treat the Antarctic as part of its own territory. This position South Africa well in relation to the Antarctic Treaty, and creates a positive environment in which a multi-national gateway can be established. It lends South Africa a degree of impartiality and perceived neutrality, to allow Cape Town to become an international gateway to the Antarctic.

- Cape Town’s weak potential to facilitate Antarctic tourism, suggests that it will be easier to avoid the anticipated conflict between the scientists and the tour operators.

- Cape Town is the logical gateway for all the national Antarctic programmes in Europe and Scandinavia.

- The above suggests that Cape Town could feasibly be positioned as the premium logistical and supply gateway, for SANAP and for the other national Antarctic programmes. The Cape-Antarctic Gateway's key strengths would be:

- One-stop destination for supplies, repairs and dry docking.

- Primary focus on logistics and convenience.

- Impartiality and neutrality, relating to territorial claims or the science-tourism debate.

- World-class stop-over for Antarctic personnel, in terms of accommodation, leisure and recreation.

- World-class conference facilities.

5.1.2 Institutional Considerations

Through the use of the word "gateway", one runs the risk of thinking of the Cape-Antarctic Gateway as primarily a physical structure. Yet, a gateway is primarily about activity, focus, roles, coordination, ownership and promotion, i.e. what gets done. Where all this gets housed, albeit important, is a secondary consideration.

To be a truly effective gateway, an institutional structure should be established wherein the focus, ownership and accountability for the roles can reside. Without this, the gateway will remain an interesting idea, be on many people's minds, but on nobody's agenda and task list. The concept of a Cape gateway has been under discussion for about ten years or more, yet nothing concrete has been established.

An Antarctic Special Purpose Vehicle (SPV) or agency is needed to fulfil the following roles through an integrated strategy:

- Coordinate the customs and immigration requirements for SANAP and the other national Antarctic programmes passing through Cape Town. The aim would be to ensure efficient clearance for people, goods and supplies[4].

- Control the travel to the Antarctic of South African and foreign nationals via Cape Town, through the double-permit system. This will be an essential role if travel and tourism is to be regulated, even on a very small scale.

- Identify local businesses who could provide goods or services to the Antarctic, then coordinate efforts through a cluster development programme.

- Sponsor Antarctic science education and awareness. This can be done through a number of initiatives, primarily by being a shareholder in an Antarctic visitor and science centre, sponsoring an outreach programme and lobbying for corporate-sponsored school visits.

[4] In practice, people travelling to and from the Antarctic, as well as the transport of supplies and equipment, are often frustrated by South African customs and immigration requirements

- General promotion of the Antarctic, as a place of geo-political importance and interest, to the broader informed public. An idea may be to host an event similar to the Antarctic Midwinter Festival, held in Tasmania during June each year.

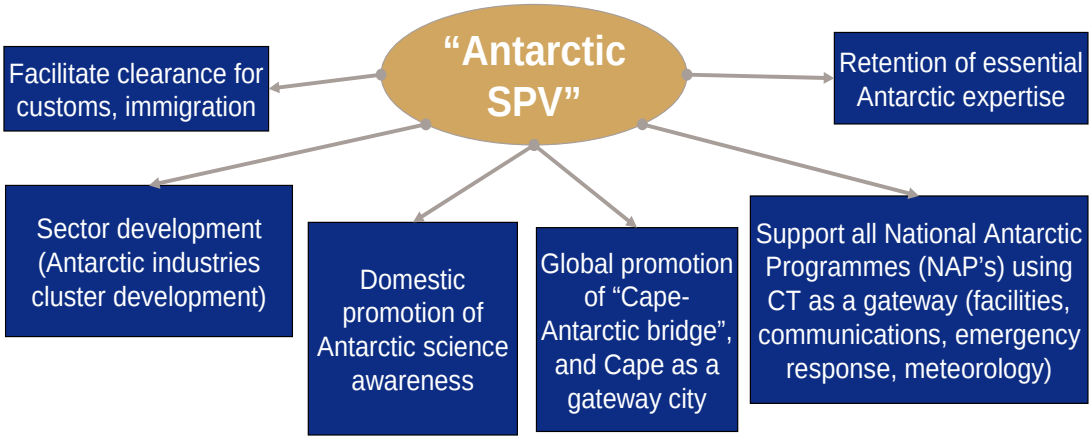
- Manage relationships with all national Antarctic programmes, including SANAP, with a view towards understanding their requirements of a gateway city, and facilitating the fulfilment of those needs. These could include the procurement of specialised services and supplies, through the Antarctic industry cluster.

- Provide workshop and laboratory facilities on a book-and-rent basis to any national Antarctic programme.

- Coordinate essential support services, such as communications, meteorology and emergency response.

- The retention of essential Antarctic expertise, through knowledge management and succession planning.

The current absence of such an agency was described by one stakeholder to be like a 'black hole', in that many of the above activities and roles occur ad hoc and at random. As a result, it is believed that many national Antarctic programmes tend to rely on home country resources, doing detailed advance planning and using private companies like ALCI to overcome this void. The following diagram illustrates the point:



Similar SPV's have already been established by the Western Cape Department of Economic Development and Tourism, in an effort to stimulate a particular sector of the regional economy. About 15 SPV's are in existence, covering a multitude of industries and sectors, e.g. ship repair, boat building, oil-and-gas, materials and tooling.

5.1.3 Facility Alternatives

During the early stages of this study, the notion existed that one facility could be constructed, which would support all the functions of a gateway. This was envisaged to be a working facility with space for logistical and scientific activities, as well as a visitor section where the operations could be witnessed and experienced.

As the concepts developed, and site alternatives were explored, the realisation emerged that the requirements of an operational facility and a visitor centre are quite different, and that one location that meets the requirement of both is simply not available, or feasible, at this stage. The main disparity in requirement stems from the need of a visitor centre to be ideally located in a proven leisure or recreational environment. However, the typically high cost of such space is at odds with the requirement of the operational side of the gateway facility.

Furthermore, it became clear that the Antarctic gateway is not a completely green field initiative, in that certain events have already been set in motion; The Antarctic Directorate has entered into a twenty-year lease agreement with the V&A Waterfront for a facility on East Pier, which will host SANAP for the foreseeable future. Similarly, the Two Oceans Aquarium has indicated that they are establishing a substantial Antarctic exhibit, containing many elements of an Antarctic visitor centre, within a purpose-reconstructed section of the aquarium. These commitments, and the lack of feasible sites that would address the full spectrum of needs, guided the development of site alternatives.

As a result, the alternatives in this study address separately the needs for a visitor centre on the one hand, and accommodating the logistics of Antarctic programmes on the other. It is however foreseen that feasible site alternatives could become available in the 6 to 7 year planning horizon, which would allow for the establishment of an integrated gateway facility.

5.1.4 Rationale for an Antarctic Visitor Centre

There is broad consensus that processes taking place now in the Antarctic affect the world's climate and its oceans, and that research on the continent has a key role in our understanding of how the world works. South Africa's research in Antarctica, surrounding islands and ocean cover a broad science spectrum including physics, engineering, oceanography, biological science, earth science and the history and sociology of Antarctica. Current knowledge regarding Antarctica is concentrated in a small number of higher education institutions, and the results of research conducted by scientists under the SANAP are not easily accessible to the general public. Although various science centres and museums in the Cape Town metropolitan area contain exhibits (e.g. South African Museum) or have in the past hosted special exhibits (e.g. MTN Science Centre) touching or focussing on Antarctica, the majority of South African adults and youth remain unaware of the significance of Antarctic and South Sea research. It is the intent of the DST that the proposed Antarctic Gateway should "*Promote an awareness of Antarctica and South Sea research activities to the public."*

A preliminary discussion with the Weather Office elicited a strong enthusiasm for participation in the Antarctic visitor centre, based upon the conviction that the Weather Office should promote their Antarctic work. This position was later verified at a more senior level in the Weather Office, but with the proviso that any arrangement of that nature would have to be cleared through appropriate channels.

5.1.5 Assessment of Site Alternatives for a Visitor Centre

The Terms of Reference for the pre-feasibility study required that the study team "Evaluate suitable site locations in and around Cape Town Harbour". The specific

distance from the harbour is not indicated. Drawing on our knowledge of the distribution of suitable infrastructure, current tourist facilities and visitors in Cape Town, our team selected the following sites in the Cape Town Metropolitan Area for evaluation (Refer Fig X):

a. Hout Bay Harbour

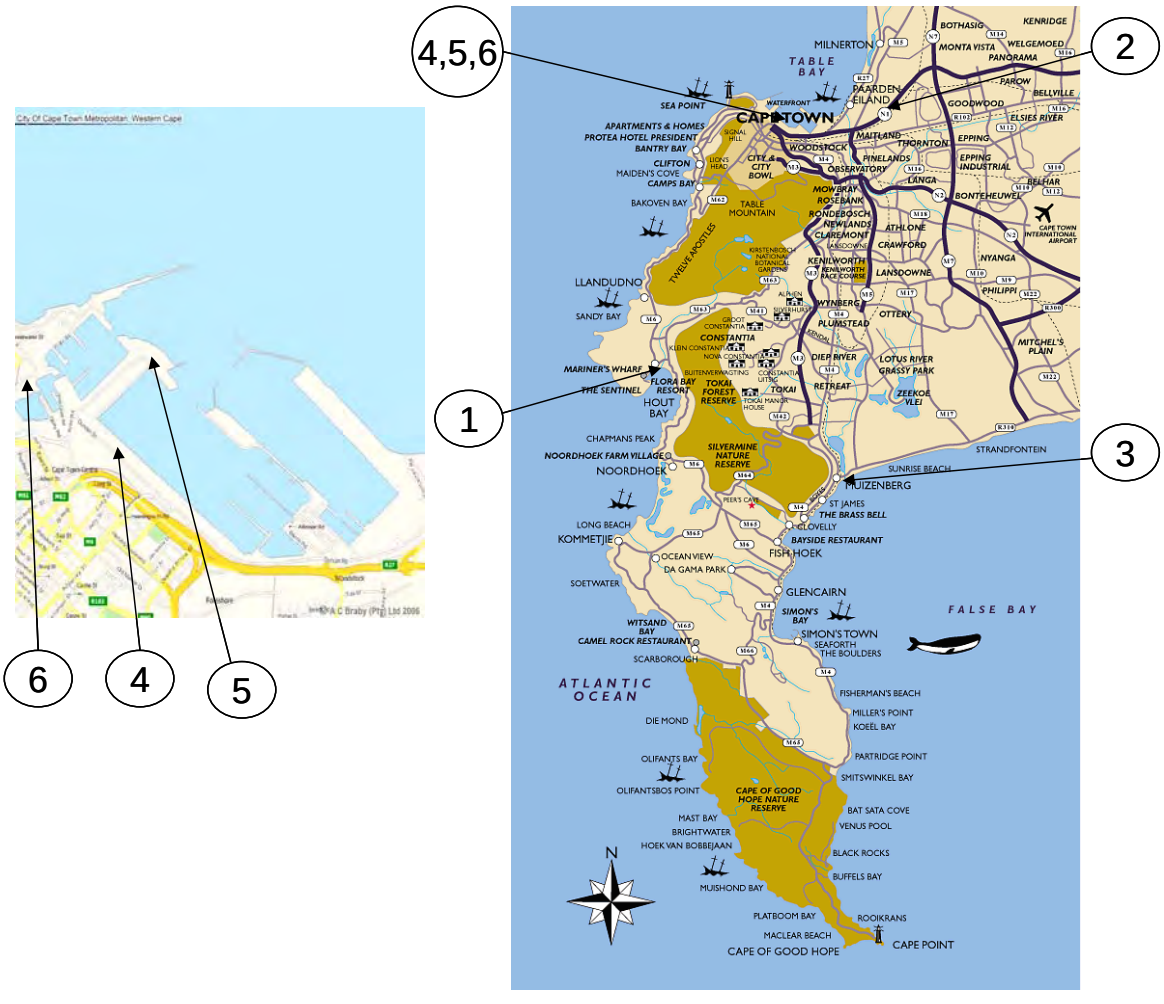
b. MTN Science Centre, Century City

c. False Bay Coast (Muizenberg Pavilion/Monwabisi)

d. Duncan Dock

e. South Arm (current SAGOA lease area)

f. Victoria & Alfred Waterfront



The following criteria for the evaluation of the alternative sites were agreed to:

- Current visitor volumes

- Presence of Antarctic-related theming or exhibit
- Available infrastructure (visitor facilities, public transport access)
- Availability of education programmes for learner groups (facilities & educators)
- Availability of space for development or expansion
- Fit with long-term planning for area
- Other education facilities in vicinity supporting objectives (e.g. Higher Education institutions, environmental education centre)

The findings of our evaluation of the alternative sites are set out below:

Criterion:	**Duncan Dock, Cape Town**	**False Bay Coast (Muizenberg / Monwabisi)**	**Hout Bay Harbour**	**MTN Science Centre, Century City**	**South Arm (current SAGOA lease area)**	**Victoria & Alfred Waterfront**
Current leisure visitation	Leisure visitors discouraged	Unknown	Unknown – no central visitor access point recording visitation	160 000 visits per annum	Leisure visitors discouraged	21.3 million visits to site as whole (58% Capetonians; 42% domestic and international tourists)Two Oceans Aquarium – 400 000 visits per annum
Presence of Antarctic-related theming or exhibit	None	None	None	Have hosted temporary exhibits	None	400m^2 Antarctic exhibit planned, construction to commence 2007
Accessibility (public transport access)	Served by mini-bus taxis	Served by minibus taxis	Served by minibus taxis	Served by minibus taxis	Served by minibus taxis	Served by mini-bus Golden Arrow bus service, stop-off point on circular tour of city
Available infrastructure (visitor facilities)	Working harbour with limited access for visitors Access for visitors not directly involved in harbour activities discouraged	Muizenberg Pavilion: Visitor information centre and function facilities Monwabisi: beach resort including self-catering accommodation	Sea Fisheries Museum Various warehouses possibly available for conversion	Science centre measuring 4000m^2	Working harbour with limited access for visitors Access for visitors not directly involved in harbour activities discouraged	Two Oceans Aquarium

Criterion:	Duncan Dock, Cape Town	False Bay Coast (Muizenberg / Monwabisi)	Hout Bay Harbour	MTN Science Centre, Century City	South Arm (current SAGOA lease area)	Victoria & Alfred Waterfront
Availability of education programmes for learner groups (facilities & educators)	None	None	None	Exhibits used by schools for science & mathematics education of learners of range of age group Dedicated team ed educational programme and material developers Established corporate sponsorship programme enabling educational visits by disadvantaged learners	None	Old Mutual Environmental Education Centre with dedicated classroom space TOA exhibits used by schools for science & mathematics education of learners of range of age group. Dedicated team ed educational programme and material developers. Established corporate sponsorship programme enabling educational visits by disadvantaged learners
Availability of space for development or expansion	Implementation of port masterplan delayed by on-going stakeholder discussions regarding expansion of container terminal		Redevelopment of harbour pending feasibility study led by Department of Environmental Affairs and Tourism, 2 year study period commencing 2007 expected	MTN Science Centre located in prime regional shopping centre – currently no space for expansion	Implementation of port masterplan delayed by on-going stakeholder discussions regarding expansion of container terminal	Various sites available for development. TOA currently undergoing upgrading and expansion programme, possibility of creating 1 000 m2 dedicated Antarctic exhibition space

Criterion:	Duncan Dock, Cape Town	False Bay Coast (Muizenberg / Monwabisi)	Hout Bay Harbour	MTN Science Centre, Century City	South Arm (current SAGOA lease area)	Victoria & Alfred Waterfront
Fit with long-term planning for area	Implementation of port masterplan delayed by on-going stakeholder discussions regarding expansion of container terminal	The Metro South East area is a priority Tourism Development Area in the City of Cape Town's Tourism Spatial Framework.	Long terms plans for Hout Bay Harbour do not currently exist. The DEAT feasibility study and long term plans for the development of the harbour will only be completed at the end of 2008/beginning 2009.	The MTN Science centre is a multifunctional science centre with a range of permanent exhibits and a programme of themed temporary exhibits. The current site size cannot accommodate an extensive permanent Antarctic exhibition	Implementation of port masterplan delayed by on-going stakeholder discussions regarding expansion of container terminal	Locating a future Antarctic Visitor Centre in the V&A fits the objectives of the V&A Waterfront Company. The TOA is seen as the preferred site. The availability of other sites is dependent on market uptake of remaining vacant sites within the V&A.
Other education facilities in vicinity supporting awareness and educational objectives	University of Cape Town Cape Peninsula University of Technology	False Bay College	None	None	University of Cape Town Cape Peninsula University of Technology	University of Cape Town Cape Peninsula University of Technology

Criterion:	Duncan Dock, Cape Town	False Bay Coast (Muizenberg / Monwabisi)	Hout Bay Harbour	MTN Science Centre, Century City	South Arm (current SAGOA lease area)	Victoria & Alfred Waterfront
Overall assessment of site	The site is not easily accessible for leisure visitors, mainly because of the nature of activities in a working harbour, security measures and lack of visitor facilities. Potentially suitable quayside not currently accessible due to uncertainty regarding the long-term plans for the Duncan Dock.	Although the area is a priority area for tourism and economic development, current buildings and facilities are not suited to the establishment of an Antarctic Gateway. Visitor numbers are relatively low and purpose of visit focused on the beaches and sea. Selection of this site would require construction of a dedicated Antarctic Gateway Visitor Centre, with associated capital costs and the necessity to build sufficient demand to sustain the facility.	Hout Bay Harbour has good potential in terms of the availability of land and buildings for conversion. The lack of clarity regarding long term plans is a constraint in the short to medium term. Selection of Hout Bay Harbour will require the construction of dedicated Antarctic Gateway Visitor Centre as existing facilities are not suitable.	Although there are strong synergies between the objectives of the MTN Science Centre and a future Antarctic Gateway Centre, the current location of the MTN Science Centre does not allow for expansion.	The site is not easily accessible for leisure visitors, mainly because of the nature of activities in a working harbour, security measures and lack of visitor facilities. Potentially suitable quayside not accessible due to current lease agreement and uncertainty regarding the long-term plans for the Duncan Dock.	The V&A Waterfront and TOA already attract significant numbers of visitor, and are readily accessible by different types of public transport. The TOA already has extensive facilities and programmes for environmental education. The current TOA upgrading and expansion programme includes the establishment of an Antarctic exhibit.

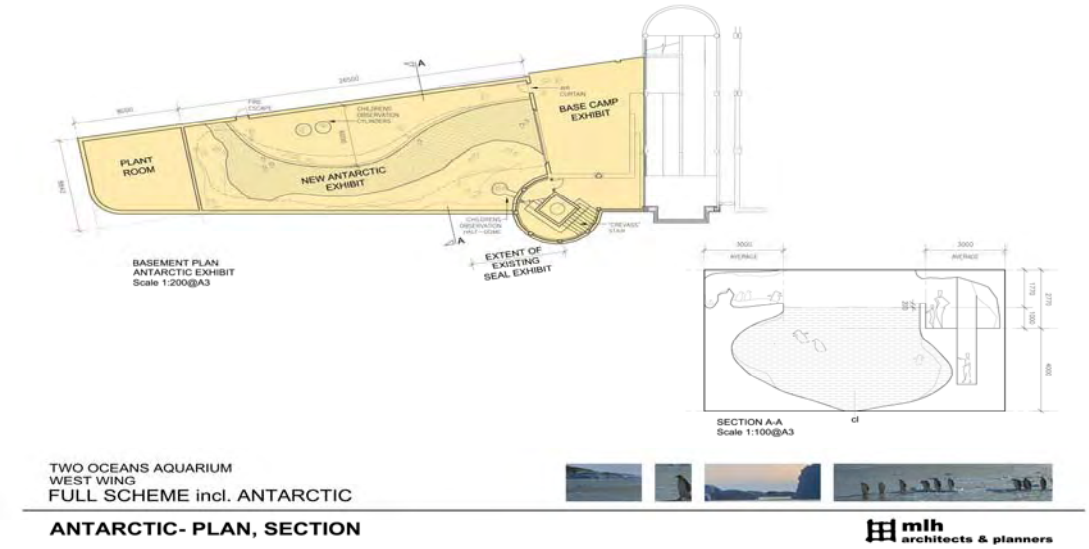
5.1.6 Conclusion on Site Assessment

In considering factors such as accessibility to the general public, high levels of visitation, availability of visitor infrastructure, the availability of established environmental education programmes and facilities, current plans to establish an Antarctic exhibit at the Two Oceans Aquarium, short and medium term constraints to obtaining development rights at other sites, the likely significant costs associated with establishing a visitor centre anew, and adequate demand levels to sustain such a centre, the V&A Waterfront appears to be the most suitable location for the establishment of an Antarctic Visitor Centre.

6 Assessment of alternatives within the Victoria & Alfred Waterfront (Optimal site alternative for a Visitor Centre)

During the course of the pre-feasibility study, the project team was alerted to the planned expansion of the Two Oceans Aquarium (TOA). In addition to the expansion of existing habitat exhibits and the re-modeling of large parts of the visitor attraction, the plans include the construction of a cold room and pool to house Emperor penguins, a simulation of the interior of SANAE, and various interpretive panels regarding Antarctica and the Southern Ocean. It is understood that this exhibit will focus on the biological and habitat aspects of Antarctica. The planned Antarctic exhibit will be located at basement level, replacing the current seal pool and children's play centre. Construction is scheduled for 2007. This development will proceed as planned, and is not dependent upon decisions by other parties to establish similar facilities. Yet, Dr Patrick Garratt, Managing Director of the TOA, has expressed a preference for a partnership with the DST, as it is foreseen that a joint undertaking can achieve greater scales of economy, and mitigate some business risk. It could also pave the way for an integrated Antarctic visitor centre, with a fauna and flora dimension, and a human presence / scientific activity dimension.

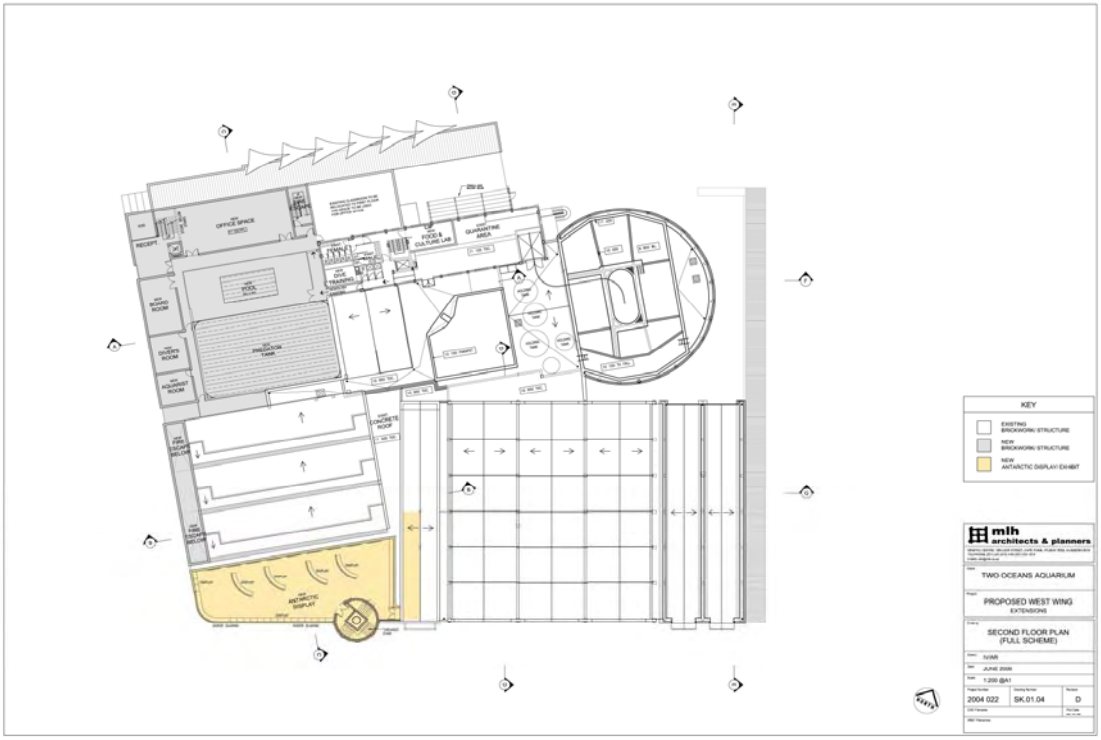
The following graphics illustrate the planned development at the Two Oceans Aquarium:



Plan Drawing of the Cold Room and Pool, with Antarctic Base exhibit

Artist's impression of the view inside the Antarctic Base exhibit, towards the entrance to the Cold Room

An artist's impression of the view inside the Cold Room, towards the Penguins and the ice shelf. Note visibility into the pool itself.



Plan view of the 2nd Floor, indicating the optional Antarctic Display in the bottom left corner

An artist's impression of the view of the optional Antarctic Display on the 2nd Floor. It is proposed to have a purely Antarctic science and meteorology theme.

Given the Antarctic exhibit planned for the Two Oceans Aquarium, four alternatives are available to the DST for the establishment of an Antarctic education centre:

Alternative 1: No action by DST in the short-term: The TOA proceeds as planned, but only the Cold Room and Antarctic Base components get built (i.e. a focus on Antarctic fauna and flora only). The opportunity to build the 2nd floor Antarctic Display is foregone, as the construction moratorium becomes effective. This involves an agreement whereby no further construction will be allowed on the TOA site, partly in consideration of the luxury hotel to be built on the adjacent site.

Alternative 2: The DST, perhaps through an SPV, enters into an agreement with the TOA to contribute finance and technical expertise for the creation of the Antarctic exhibit as described above in Alternative 1. (TOA co-location Option A)

Alternative 3: The DST, perhaps through an SPV, enters into an agreement with the TOA to create the additional 2nd floor Antarctic Display to house an extensive Antarctic science exhibit that will incorporate interactive displays relating to all the relevant research streams. The upper and basement levels will be planned to be experienced as an integrated visitor experience, linked by means of a replicated ice crevice. (TOA co-location Option B)

Alternative 4: The DST, perhaps through an SPV, enters into a lease agreement with the V&A Waterfront to construct a dedicated and separate visitor facility at another location in the V&A Waterfront.

Each of the alternatives, including Benefits and Risks, is described below.

Alternative 1 (No immediate action)

In this scenario, the TOA proceeds with the development of the Antarctic exhibit with input from DST in the design of the interpretive material as requested by the TOA. The DST sponsors educational groups visiting the Antarctic exhibit. The DST continues to monitor visitor demand for the TOA Antarctic exhibit with a view to determined whether there is a need for a dedicated stand-alone facility.

Benefits	**Risks**
Limited or no financial risk	Possible queries regarding DST's commitment to public education regarding Antarctica
	Limited control over content of interpretive material
	No or limited publicity opportunities for the SANAP
	Limited control over scope and content regarding Antarctic educational programmes
	Suitable sites currently available in the V&A unlikely to be available in future
	Political will and/or funding may not be in place at a later stage

Alternative 2 (Two Oceans Aquarium Co-Location, no 2nd floor Antarctic Display)

In this scenario, the DST enters into a partnership agreement with the TOA to provide financial and technical assistance for the development of the Antarctic exhibit at the basement level of the Two Oceans Aquarium. The total area available for the Antarctic exhibit is approximately 600 m^2, with the penguin enclosure and pool taking up some 450 $m^{2.}$ The primary focus of the exhibit is the biological and habitat elements of Antarctica.

The TOA remains the primary funder or contributes the bigger portion of the funding required for the development and equipping of the exhibit. Access to the Antarctic experience is included in the TOA entrance charge. The DST sponsors educational groups visiting the Antarctic exhibit. Educational programmes are developed jointly, with involvement of SANAP scientists.

DST uses the facility as a platform to host themed guest lecture series exploring the various dimensions of Antarctic research for young adults and adults.

Benefits	Risks
Limited financial risk – DST does not carry capital investment or operational cost	Limited opportunity to attach DST corporate identity to the Antarctic exhibit
Greater control over scope and content of Antarctic educational programmes	Limited opportunity to showcase findings and significance of other research streams
Greater control over content of interpretive material	Visitor demand may outstrip facility size in short term - Suitable sites currently available in the V&A are unlikely to be available in the future and agreement with One & Only group prohibits future construction on TOA site
Publicity opportunities for the SANAP	Political will and/or funding for an expanded facility may not be in place at a later stage
Audience already exists – limiting operational costs related to marketing and audience development	Antarctic exhibit may not receive significant share of visitor time if part of general aquarium visit – consequently not achieving awareness raising objectives of DST
Location in area with established visitor movement	
Aligns with V&A Waterfront Company's objective to create cluster of educational facilities	
Sufficient parking	
Ability to slot into experienced visitor attraction management and marketing team	
Synergy with an established and popular visitor attraction with a strong educational purpose	

Alternative 3 (Two Oceans Aquarium Co-Location, with 2nd Floor Antarctic Display)

The DST enters into a lease agreement with the TOA for a new floor built to house an extensive "Antarctic Experience" or enters into a partnership with the TOA to substantially fund the development of a third floor. An additional floor will add some 400 m^2 to the planned 600 m^2 at basement level. The combined floor space would be significantly bigger than the floor area allocated to the Penguin Exhibit and the replica of Scott's Hut at Kelly Tarlton's Antarctic Encounter.

The exhibit will incorporate all aspects of research taking place on Antarctica and the Southern Ocean. Access to the Antarctic experience is included in the TOA entrance charge. The DST sponsors educational groups visiting the Antarctic exhibit. Educational programmes are developed jointly, with involvement of SANAP scientists, and perhaps with advisory inputs from the MTN Science Centre. Closely aligned entities could be

hosted through permanent displays, e.g. the Weather Office, who has expressed an interest in being represented.

DST uses the facility as a platform to host themed guest lecture series exploring the various dimensions of Antarctic research for young adults and adults. The Antarctic Experience is managed as part of the TOA, although the DST may decide to second specialists to staff the exhibition.

Benefits	**Risks**
Financial risk can be contained	TOA has experienced difficulties with joint corporate identities in past – this aspect will require careful consideration by DST
Significant opportunity to showcase findings and significance of other research streams	The identity of the Antarctic Experience and the wider range of topics contained in the exhibits may be 'lost' through co-location with an aquarium – this can be addressed through dedicated marketing drives and awareness raising in target audiences.
Control over scope and content of Antarctic educational programmes	Antarctic exhibit may not receive significant share of visitor time if part of general aquarium visit – will require on-going monitoring to determine success of centre in achieving DST objectives
Control over content of interpretive material	
Publicity opportunities for the SANAP	
Audience already exists – limiting operational costs related to marketing and audience development	
Opportunity to attach DST corporate identity to the Antarctic exhibit	
Location in area with established visitor movement	
Aligns with V&A Waterfront Company's objective to create cluster of educational facilities	
Sufficient parking	
Ability to slot into experienced visitor attraction management and marketing team	
Synergy with an established and popular visitor attraction with a strong educational purpose	

The V&A Waterfront Company has indicated their support for Alternatives 2 and 3. It must be noted that the V&A Waterfront Holdings (Pty) Ltd currently has controlling interest in the Two Oceans Aquarium, which interest will presumably be passed to the L&R Consortium should the recent sale of V&A Waterfront Holdings (Pty) Ltd by Transnet be approved by the Competition Commission.

Alternative 4: Purpose built facility

The fourth option involves the construction of a dedicated "Antarctic Visitor Experience" at a site within the V&A Waterfront. A variety of operational and management options are available to the DST under this scenario. The two primary options are: appointment of a management company to operate the facility on behalf of the DST or DST staff operating the facility. Three locations are currently available for such a purpose-built facility. The respective sites are shown in the figure below.

Available in short term:

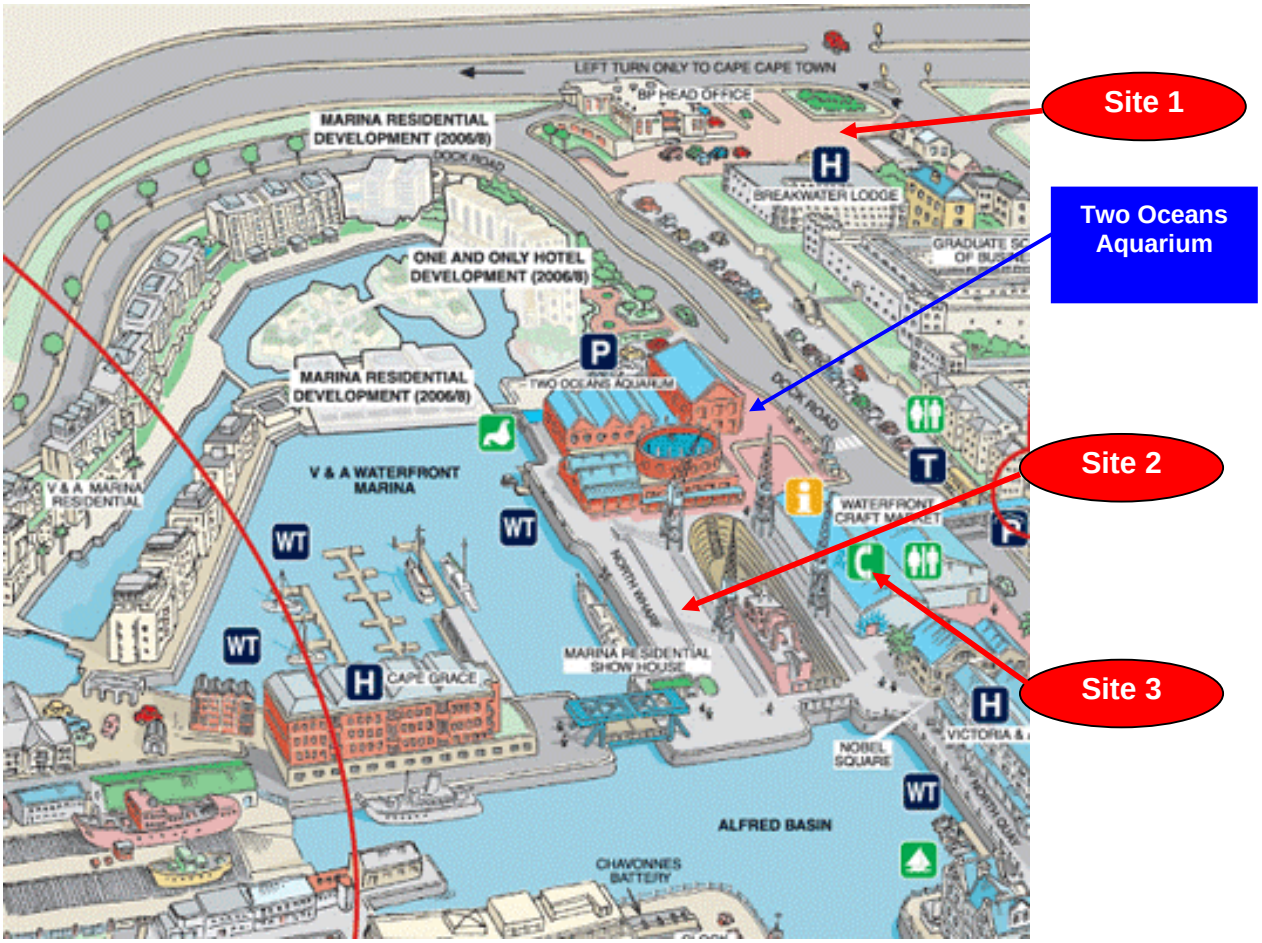
Site 1: Adjacent to the BP Head Office and west of the University of Cape Town's Graduate School of Business. Two commercial buildings, measuring 3000m^2 and 5000 m^2 respectively, are planned for this site.

Site 2: North Wharf, to the south of the Robinson dry-dock. This site is earmarked for the construction of a commercial building of 4000m^2. The quayside level of the building is reserved for water and maritime events, leaving 3 levels measuring 3000m^2 to be tenanted.

Medium term option

Site 3: The old Maritime Museum site (Shop 17) to the east of the Two Oceans Aquarium – following on the relocation of the Maritime Museum the V&A Waterfront Company has awarded an 18-month lease for the operation of this space as an events venue. The site will become available for redevelopment in 2008. It is our understanding that concepts for the redevelopment of the site are not yet fixed. This site represents medium–term opportunities for the expansion of the facility created at the Two Oceans Aquarium in the short term.

Rental levels in the buildings to be constructed on these sites will be full commercial rentals with the going rate at R 145/ m^2/month.



Benefits	Risks
Superb opportunity to showcase findings and significance of other research streams	Significant financial exposure for DST
Full control over scope and content of Antarctic educational programmes	Risk of direct competition with established visitor facility
Full control over content of interpretive material	Requires high levels of investment in marketing and audience development
Superb publicity opportunities for the SANAP	Management of visitor attractions is not a core function of DST
Sites 2 and 3 located in area with high volumes of visitors	Requires recruitment and appointment of full management and operational team
Opportunity to attach DST corporate identity to the Antarctic exhibit	Suitable sites currently available in the V&A are unlikely to remain available in the long term

Benefits	**Risks**
Sufficient parking	Site 1 located away from area with high volumes of visitors
	Not fully aligned with V&A Waterfront Company's development objectives
	Damage to DST image in event of financial failure

7 Assessment of Facility Alternatives: Logistical Support to National Antarctic Programmes (NAP's)

At present, polar vessels have two alternatives for docking in Cape Town.

Victoria Basin

If the vessel has a length shorter than 224 metres[5], and a draft of less than 9.5 metres, it could be accommodated at East Pier, at the berth normally reserved for the SA Agulhas. This would locate the vessel in close proximity to the SANAP facility currently being refurbished on East Pier, and it would benefit from the existing collaborative arrangement between SANAP and the other national Antarctic programmes. With DEAT committed to a twenty year lease, this facility should remain available for the foreseeable future.

There are however no bunkering facilities in the V&A or at East Pier, and the V&A has no intention of installing any. A bunkering barge can be used but only for partially filling, as vessels need to limit their draft in the Victoria Basin.

The ex SAN ice breaker Outeniqua (now called the Paardeberg) has done heavy cargo trips to the Antarctic. She, and other vessels such as the Russian Akademik Federof and Akademik Kapinski, could be berthed at Quay No 2 in the V&A but will probably stay in the commercial port. However, some polar vessels, and in particular ice breakers, have a draft exceeding 9.5m, and cannot be accommodated in the V&A Basin at all.

Duncan Dock

As part of the commercial port under management of the National Ports Authority, Duncan Dock offers berthing alternatives to larger vessels. The current practice is for the NPA to lease out warehouses and wharfage up to 1m from the edge of the cope to the quay. No space is dedicated to any particular vessel, and berthing at the quays is run on a common user basis, also for polar vessels. A recent example was the docking of the German Antarctic research vessel Polar Stern. As an icebreaker her draft was too deep to go into the V&A. Instead she berthed at H/J berth in the Duncan Dock where the bottom has been deepened.

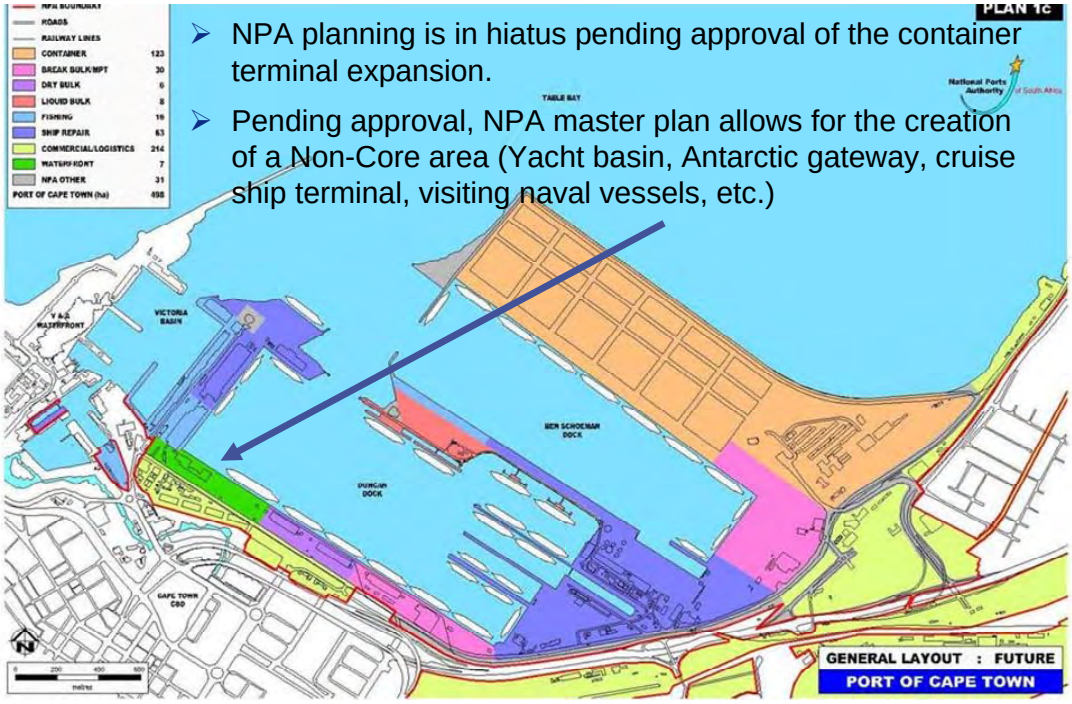
Facility Alternatives: Long Term

Depending on the facility options taken in the short term, the financial and lease commitments made in doing so, and the market demand experience within the 5 to 10 year time horizon, it may be feasible to consider the longer term alternatives:

Duncan Dock, Integrated Antarctic Gateway Facility: Within the framework of the NPA's long term "Master Plan" for Table Bay Harbour, it is being anticipated that a zone will be established for "non-core" activities, which could include a yacht basin, a cruise ship terminal and an Antarctic gateway facility.

[5] In practice, this would probably be limited to vessels of less than 150 m L o/a.

The implementation of this plan has been put on hold temporarily, subject to resolving the environmental issue of the expansion of the container berth. Should there be no undue delays in that regard, construction work and the establishment of the container handling area can be complete in the next 5 to 10 years. The “Non-Core” area will be re-zoned as a public access region with only limited restrictions on access to the area by the public. It will be an area functionally intermediate between the V&A Waterfront and the fully commercial port. In concept, this could develop into a suitable location for an integrated gateway facility, providing both a visitor centre and a logistical support facility.



Hout Bay: An alternative in the longer term planning framework would be to locate the gateway outside of Table Bay. Given the potential economic growth, the shortage of amenable sites within the Table Bay Harbour and potentially increasing congestion after the 2010 Soccer World Cup, a location in Hout Bay may become feasible. Considering the Hout Bay Harbour layout, a second basin to seaward of the existing main breakwater, with a breakwater taking off from the region of the sewerage works, is eminently possible.

The bottom is presently at a draft of about 10 metres and consists of sand, so it should be possible to dredge easily to at least 13 metres – quite enough for icebreakers. A basin of this sort would be quite sufficient for up to half a dozen Antarctic and oceanographic research vessel. Cost can be expected to exceed R100 million. A brief reflection on the potential advantages and disadvantages of this alternative renders the following:

Positive	**Negative**

Dedicated Antarctic & research vessel port	Hout Bay is not a proclaimed "Port of Entry" Vessel will not be keen to proceed first to Table Bay to clear customs & immigration then move to Hout Bay.
The site is an extremely attractive position that should receive the support of most people involved with the Antarctic	Vessels planning to dry dock in Cape Town will have to sail round to Table Bay to dry dock.
The development will provide more reclaimed land for harbour functions	Road access to Hout Bay is not as easy as to Table Bay.
Hout Bay is already a DEAT harbour	DEAT have problems at present in their capacity to manage their existing harbours.
A development of this nature will act as a major boost to the rational development of the existing harbour and to the valley of Hout Bay and make a significant contribution to the attractiveness of the valley from a tourist perspective.	This development will add to the congestion in the valley.
The proposal will increase the exposure of the valley and help focus public funding on resolving the current problems in the valley.	The increase in commercial activity may exacerbate the current planning problems in the valley

8 Conclusions and Suggestions

The establishment of a formalised Antarctic gateway in Cape Town, insofar as a specific organisational entity becomes mandated to fill the roles of a gateway, is long overdue. Cape Town is a natural gateway to the QML region of the Antarctic, and will continue to be used as a gateway by other Antarctic programmes, regardless of interventions to coordinate. Similarly, private businesses will continue to provide services in the Antarctic sector, and develop new services, where the demand requires it.

However, greater benefits can be derived, in the dimensions of commercial activity, profile, education and awareness, if more could be made of Cape Town's gateway role. But it remains unlikely that a dynamic and efficient gateway activity will have a significant impact on the Cape's regional economy, in the same way that Hobart benefits from it – the scales appear too limited. The need to educate and raise general awareness, is however a more compelling imperative.

Our considered suggestions would be as follows:

- Following a consultation process with DEAT and the PGWC, an organisational entity should to be established, with the mandate to pursue the roles described in Section 7.2. For the sake of brevity, this entity could be called Cape-Antarctic Gateway Company (CAGO)

- The demarcation of roles between CAGO and DEAT should be carefully considered and agreed upon. In broad terms, it is foreseen that CAGO's role would be to focus on the gateway activities, whereas DEAT's focus is on the SANAP programme.

- The opportunity to partner with the Two Oceans Aquarium in establishing an Antarctic visitor centre should be pursued. Had the Two Oceans Aquarium not been underway with this initiative, a freestanding Antarctic visitor centre may have been feasible, given that certain criteria were met. However, constructing a facility in competition with the TOA (since the TOA is pressing ahead regardless), could not be recommended at all.

Specifically, it is suggested that Alternative 3 be pursued, which involves the construction of a 2nd Floor Antarctic Display, which will be a dedicated Antarctic science facility. The rationale is driven by three considerations:

- The importance of the Antarctic as a place of science and human endeavour needs to be part of the public awareness "curriculum". The TOA does not have that mandate – their focus is solely on fauna and flora.

- The construction moratorium would effectively close the door on this option, so it could not be had at a later stage.

- This is an opportunity to host an important visitor attraction inside a very successful existing attraction, with a complementary theme, inside a highly successful visitor precinct. As a showcase for South Africa's Antarctic heritage, and future role, this positioning should be ideal.

9 Appendix A: Interview Notes

Antarctic Gateway Pre-feasibility Study - Interview 1

DEAT – 6/07/06 – Phone to Monwabesi Mkomentaba

1. Department is “Antarctic and Islands

2. People are:

   Harry Valentine

   Monwabesi Mkomentaba Ph 083 727 4118 / 405 9423

   Sam Oosthuizen Ph 083 627 0213 / 405 9406

Valentine had gone to Antarctic Gateway conference in Australia. Mkomentaba was leaving the following day. Asked Mkomentaba to look for info pertinent to this study.

Have not yet followed up.

Antarctic Gateway Pre-feasibility Study - Interview 2

Meeting with Atlatech Ship repair

10th July 2006, 08h00

Present: K.P. Mackie

J. Cooke Atlatech

K. Davies Naval Architect

1. He could think of half a dozen ships maybe more that would be happy to use facilities in Cape Town is suitable. This would include dry docking

2. The nature of the demand is highly variable from conventional ice-rated logistic vessels to temporary conversions of OSV's for once-off special voyages to the Antarctic.

3. Vessels will dry dock in Cape Town subject to current problems with NPA facilities.

4. Door was left open for further discussions as our picture of the problem clarified.

Antarctic Gateway Pre-feasibility Study - Interview 3

Meeting with RNC Ships

21st July 2006, 08h00

Present: K.P. Mackie

R. Caris RNC Ships

1. The St Helena visits Tristan da Cunha once a year in January when the weather is acceptable for the Govenor's visit and takes passengers on that voyage.

2. Countries with Antarctic bases:

   - India – charters ships (Maria Oldendorf)
   - Germany – Polar Stern – 2-3 times a year from Cape Town
   - Russia – Academic Federof – twice a year from Cape Town
   - South Africa – 2-3 times a year (Smit Pentow – Eric Walker 507 5777/5714)
   - France – Piggy-back on Germans
   - U.K. – not sure – may use Falklands – have RN base there and fly there twice a week from U.K. via Ascension.
   - Norway – no info
   - Japanese – do call, not sure of set-up.

3. Islands from Ascension to Kergulen including Falklands and South Georgia should be included in Antarctic Gateway concept.

4. For tourism info contact:

   Andrew Weir Shipping, London

   Capt Bill Langworthy,

   0944 207 575 6486

5. Expect environmental impact problems with increased air traffic to Antarctic.

6. Quite a lot of marine research is done by scientists on voyages to and from Antarctic. If air transport were used special research ship voyages would be needed to continue this work.

7. Garbage and used equipment is brought back from the Antarctic

8. Even if air transport takes over, there will still be a need ships for fuel, heavy cargo etc.

9. There could be a market for the overhaul of heavy kit, generators, snowcats, tractors etc.

10. It is probably cost effective to take relatively light scientific equipment back to Northern Hemisphere for overhaul.

11. About 4 to 5 ships a year call at Cape Town on way to or back from the Antarctic, Most make two calls (one on way down, one on way back) but some make 3 calls a year.

12. Ron has only ever seen one Antarctic vessel in port in Cape Town at a time.

13. Most of the Antarctic ships are government ships or government chartered ships.

14. There is lay-up mooring in Saldanha Bay and in Simonstown – if the Navy agree.

15. D berth could make ideal berth for Antarctic when fruit export is moved – also B or C berths. D berth has a good deal of working space behind it inside a secure area. The berth is in the order of 150 m long and could accommodate 2 small vessels or one larger at a time. Contact Billy Cilliers 449 2325.

Antarctic Gateway Pre-feasibility Study - Interview 4

Meeting with DST and Wesgro

26th July 2006, 10h00

Present: D. Bosman

K.P. Mackie

H. Keyser

Prof. Jan Glazewski DST

F. Kolala Wesgro

1. The TOR should be seen as covering both the Antarctic and the Peri-antarctic.

2. The study should include the science and sociology aspects.

Antarctic Gateway Pre-feasibility Study - Interview 5

Meeting with NPA

26th July 2006, 12h30

Present: D. Bosman

K.P. Mackie

Billy CilliersNPA

Selma Schwartz NPA

Johan Claasen NPA

1. NPA is unable to provide a dedicated Antarctic site but can always accommodate polar vessels somewhere in the harbour.

2. Depending on developments in the container terminal, this picture may change.

Contacts:

Endekon (Hennie Stassen)

012 6646770 / 082 8934754

Propnet (Koos Theron)

449 5888

Antarctic Gateway Pre-feasibility Study - Interview 6

Meeting with DEAT

31st July 2006, 13h00

Present: D. Bosman

K.P. Mackie

H. Valentine DEAT – A&I

Monwabesi Nkomentaba DEAT – A&I

1. DEAT has taken a 20year lease on the East Pier site at the V & A. It includes the whole of the warehouse shed (which is currently being renovated to suit DEAT) and 128 m of east end of quay face.

2. Currently the SA Agulhas is operated by Smit Amandla Marine and lays up at space permanently rented at Quay 500.

3. The German Polar Stern is a powerful ice breaker and goes down early. The Agulhas doesn't have her ice capacity and goes down later. Cargo is split between the two vessels to optimise delivery.

4. The Polar Stern will be based in Cape Town for the next 5 years and will dry dock here. The Meteor, her sister ship did refit in Cape Town a year or so ago.

5. Including both sea and air, up to 10 countries already use Cape Town

6. Polar vessels docking in Cape Town spend on average about R 3 500 000 per year including ship chandling, fuel and port charges.

7. South Africa alone used 1 000 000 litres of polar diesel per trip.

8. Present planes do not have fuel capacity to do a round trip and must refuel in the Antarctic on fuel shipped in and is very expensive. The SAAF is expected to get the military version of the Airbus that does have the round-trip range (9.000 km)

9. One of the biggest problems is the shelf life of perishable commodities. The Antarctic bases need two years.

10. In the matter of harbour facilities, the V & A is very accommodating, the NPA is not.

11. South Africa has no policy of encouraging or discouraging tourism to the Antarctic.

12. There is not much tourist potential in Queen Maud Land and there is an environmental need to discourage tourism to the area by air.

13. There is excellent co-operation between South Africa and other countries with respect to the Antarctic.

14. DEAT has already given some thought to an Antarctic Gateway. Their definition – a one-stop-shop.

15. Christchurch in New Zealand already has an Antarctic Awareness Centre with a cold room refrigerated to -30° C to give a sense of the Antarctic experience. This would be a good idea for a similar facility at the V & A. They have already offered the old Maritime Museum building adjacent to the aquarium. Any upgrade, however, must retain the existing structure.

16. Ushuaia in the Argentine already has a well developed Antarctic Gateway.

17. Port William in Chile is now being developed as an Antarctic Gateway.

18. An awareness component of an Antarctic Gateway helps to promote the SANAE base amongst the general population in South Africa.

19. South Africa has pioneered a Comprehensive Environmental Evaluation (CEE) program for assessing the environmental impacts of any developments, new bases, etc. It is being adopted by other countries.

20. There is an initiative for rationalizing Antarctic logistics but at the same time there is an expectation of continued growth in activity and of numbers of people in the Antarctic. Currently the growth rate averaged over time is expected to be exponential.

21. The servicing and overhaul of Antarctic tractors and vehicles can all be done in Cape Town.

22. With the experience of building the SANAE base and the new Marion Island base, Cape Town has the expertise to build Antarctic bases for other countries.

Antarctic Gateway Pre-feasibility Study - Interview 7

Meeting with Barloworld Equipment

3rd August 2006, 10h30

Present: K.P. Mackie

J. Wagner Barloworld Equipment

1. DEAT approached Barloworld to undertake to service their equipment. DEAT only use CAT equipment.

2. Barloworld keeps a mechanic at SANAE to maintain equipment on site and he overwinters there.

3. Vehicles are brought back to Cape Town for service and overhaul.

4. Cost to SANAE – R 1 000 000 to R 2 000 000 per year

5. Working with DEAT, Barloworld had brought out the “CAT Challenger”, a rubber tracked vehicle that is superior to 4 x 4 wheeled tractors. With DEAT they had modified it to suit Antarctic conditions. Other countries are now starting to use this machine.

6. Barloworld had also worked with DEAT generally to modify other traction equipment to suit Antarctic conditions.

7. Antarctic stations are universally government bases and it is virtually impossible to market to foreign governments – hence Barloworld’s reluctance to try to expand their Antarctic service.

Antarctic Gateway Pre-feasibility Study - Interview 8

Phone call from:

Michael Franzen

Petrel Engineers

21st July 2006

1. The British are planning a new base comparable to the SANAE base in Queen Maud Land. (To be called “Halley” base?)

2. They are part of a consortium that expects to be awarded the contract (based in large measure on using men who worked on the SANAE project. Value of contract expected to be in the order of £ 20 000 000.

3. Unlike SANAE which is founded on a rock outcrop, this will be placed on moving ice shelf on skis. It will be designed to be jacked up to correct for sinkage into the ice and every few years to be towed inland to hold station and compensate for the seaward movement of the ice

4. Units are too large to road transport to the harbour. They will need large assembly area behind Quay 500(?) near Panama Jacks for this operation. NPA rental charges are excessive

5. Today almost everything taken to the Antarctic must be returned – environmental requirement. That includes snowcats and large (50 ton) tractors.

6. Heavy loads like the 50 ton tractor must be taken down in November, the earliest the pack-ice opens up but while the low level shelf ice where off/onloading can take place is still strong enough to carry these heavy loads.

7. There would be a market for the servicing/overhaul of heavy machinery, tractors, generators etc., that cannot be done at the bases and that must be brought back.

8. Russians do fly heavy cargo planes to the Antarctic from Cape Town. He was quoted R140 000 for a seat on a flight. Planes land on ice that must be cleared before each landing. Weather conditions are tricky for flying.

9. Don’t use term “industrial” for non tourist activities. Use “logistics” that better describes this component.

Antarctic Gateway Pre-feasibility Study - Interview 9

Meeting with ALCI

10h00 14th Aug 2006

Present: K.P. Mackie

Bernard Gaum ALCI

Vasily Kaliazin ALCI

Summary of discussion.

1. Bernard Gaum was promoting the Antarctic Gateway Concept as far back as the 1980's. Gaum was project leader of the development of the SANAE base.

2. Kaliazin joined Gaum in 2000 to start air transport.

3. In 2003 the Minister of DEAT and 3 DGs were frown to Antarctica.

4. Valle Moosa as Minister was opposed to Antarctic tourism on environmental grounds.

5. The Antarctic is effectively managed by the lawyers of the Foreign Affairs departments of the various treaty countries and are advised by a closed club of aging scientists (all old men) with out-of-date ideas who had served in the Antarctic many years ago.

6. SANAE was intended as an international collaborative base – is known as the "Hilton of Antarctica" and is one of the largest and best equipped bases.

7. Currently SANAE is a white elephant. There is a general lack of vision. It has no air strip – Russian planes from Cape Town must use Russian air strips.

8. Air logistics is big business and could be SANAE based with proper landing strip. Flying time is 6 hours. Most Antarctic scientists prefer to fly and maximize time in Antarctic.

9. Currently the Russian air service could service at least four bases out of Cape Town.

10. SANAE could host tourists – fly into SANAE from Cape Town, spend a few days at SANAE observing scientific activities then helicopter to other areas and to ice-breaker cruise ships operating in Antarctic waters in the summer. There is a market for both extreme tourists and the shirt-sleeves types. The estimated potential is currently in the order of 1000 per year of each type.

11. Current NPA service involves delays in providing berths and is unsatisfactory in other respects. The situation is embarrassing. Although Cape Town's climate is considered ideal for dry docking, dry docking charges and repair charges are

considered excessive and the service poor. Some vessels have gone to Monte Video to dry dock.

12. Ships' agency for Antarctic vessels is a very complex business and hard work. There have been some problems with some of the Cape Town based agents.

13. There is an enormous potential for the conversion, servicing, repair and overhauling of traction and surface transport equipment in Cape Town but it needs to be a single, multi-product, Antarctic dedicated workshop. The key staff should all have spent at least a few seasons in the Antarctic.

14. The Antarctic Gateway project needs to be as much a Bridge between Cape Town and SANAE as a general Gateway.

Comment:

Baum and Kaliazin have a vested interest in Antarctic logistics to the extent that they are excessively enthusiastic for the Gateway concept and have a vision that may be beyond the terms of reference of this project.

Their name ALCI – Antarctic Logistics Centre International – suggests that they see themselves, in many ways as a commercially based Antarctic gateway – that their interests would be best served by a collaborative venture with a state sponsored gateway.

K.P. Mackie

15th August 2006

Antarctic Gateway Pre-feasibility Study - Interview 10

Meeting with V&A Waterfront – Planning and Development

14th August 2006, 14h00

Present: K.P. Mackie

H. Keyser

P.S. van Zyl V & A

S. Borchardt V & A

R. Carr V & A

Summary:

1. V & A has plans for the reclamation at East Pier – possible pilot desalination plant for City Council and possible new site for Oceana PBC – and also intends to keep the helicopters in their present location. There is no scope for expansion of the present site on East Pier that DEAT where has taken a 20 year lease.

2. V & A considers the precinct of the East Pier to be commercial and there is no scope for tourist activities in this area. When this area is fully developed – currently an office block of 4500 m2 is planned for the present parking to the east of the DEAT office – there will be no public parking in the area.

3. When renovations to the sheds at East Pier are complete, they will have two levels including offices for a total area of 8500 m^2.

4. If DEAT is not using the quay at East Pier for the Agulhas, it may allow other polar vessels to use the quay. This is likely to be very practical subject to vessel size and draft.

5. Subject to availability, i.e. early booking, Jetty No 2 can be used for polar vessels. This jetty can be left open to allow tourists to visit the vessel or it can be closed for security.

6. Total length of both East Pier and Jetty No 2 is about 220 m.

7. The Robinson Dock precinct, either the one time maritime museum or the North Wharf on the opposite side of the dock can be made available for Antarctic Gateway functions. Since this is close to the present Aquarium, it lends itself to Antarctic publicity, Antarctic experience cold store etc., and these activities can be integrated with those of the aquarium.

8. V & A is at present in the process of planning further development of the Clock Tower precinct and any intention for Antarctic Gateway activity in this region could be

integrated into their planning. The area is not far from “D” berth. Should NPA have a change of mind and make “D” berth available as a dedicated Antarctic quay (unlikely) then the Clock Tower precinct becomes more attractive for non-logistic Antarctic activities.

9. Contact:

Pat Garret – Head, Aquarium

Stephen Bentley – V & A Harbourmaster

Andre Blain

Antarctic Gateway Pre-feasibility Study - Interview 11

Meeting with Smit Amandla Marine

17th August 2006, 08h00

Present:	K.P. Mackie	
	Eric Walker	Technical Manager, Smit
	Ian Calvert	Vessel Manager, Smit

1. There is a high risk to flying as compared to sea travel

2. In terms of the Antarctic Treaty, the Antarctic is defined as the region south of 60° south.

3. The Antarctic Committee do not permit tourism beyond 60° south. However, enforcement is not strong and some countries flout this restriction.

4. DEAT has adopted a policy of conforming to the international requirements and has stopped tourism to the Antarctic from South Africa.

5. All waste must be brought back from the Antarctic.

6. Marion and Edward Islands are controlled by the "Marion and Edward Islands Committee" headed by Peter Ryan, an ornithologist and environmentalist from UCT.

7. DEAT, through the Marion and Edward Islands committee, impose very strict quarantine on any vessels sailing to the islands and between the islands.

8. The voyage to the Antarctic takes about 10 days of which only 2 to 4 days are in the "Roaring Forties".

9. Smit has taken tourists as passengers on board the Agulhas on voyages to the Antarctic. On these voyages, the scientists on board present talks for the entertainment of the passengers. DEAT have stopped this tourism.

10. Smit has taken tourists as birdwatchers on the Agulhas on voyages to the islands and generally above 60° S.

11. The replacement for the Agulhas must have quality fittings in the cabins or the public rooms for passengers, whether tourists of scientists.

12. Voyaging to the Antarctic is seasonal, summer only. Currently, while the new Marion Island base is being built, the Agulhas does between 200 and 220 days per year at sea on voyages to the Antarctic or to the islands. This figure is expected to drop to 150 days per year when the new Marion base is completed.

This will leave up to 200 days per year open for charter. In order to maximise the usage of the vessel, Smit will market the Agulhas for scientific cruises, including passengers, to the south and up the African coast.

13. There is significant co-operation between Antarctic Gateway countries. Twice Smit has loaned captains with ice experience to New Zealand.

14. An Antarctic Gateway office could act as a marketing facilitator between commercial interests and the Department of Foreign Affairs.

15. Marketing of goods and services for the Antarctic is very conservative. Appointments tend to be by word-of-mouth – countries tell each other who they use. At international committee meetings suppliers can put up promotional stalls in the foyers to the meeting hall.

16. Ships servicing the Antarctic in the South African sector are:

    Agulhas – about 112 m Lo/a
    Polar Stern – about 130 m Lo/a
    Meteor
    Two Russian ice breakers.

17. The inboard end of East Pier is becoming available soon and could be added to the DEAT lease.

Antarctic Gateway Pre-feasibility Study - Interview 12

Meeting with Meihuizen International

18th August 2006, 09h00

Present:	K.P. Mackie	
	P.Meihuizen	Meihuizen
	G Hagermann	Meihuizen
	M de Kock	Meihuizen

1. ALCI is controlled by Alexei Turchin who is based in St Petersburg. Another company of his controls Russian sea and air logistics.

2. ALCI organise their own flights to the Antarctic and the Antarctic Club is just accommodation for their own flight crews.

3. The only aircraft suitable for the run to the Antarctic are the C130 and the Illushion 76.

4. Currently the Agulhas runs to Marion Island about every second month while the new base is being built.

5. Meihuizen undertakes both ship's agency and cargo logistics. They also make hotel bookings for crew and scientific staff.

6. Meihuizen handles the shipping by sea or air of scientific samples transhipped in Cape Town from polar vessels. These include ice cores from ice drilling – could be up to a few thousand metres – that have to be held at -80°C; also other ice specimens and cold water samples that must all be kept refrigerated. Transhipment of these specimens requires refrigerated containers, standby generators and standby containers held at the required temperature.

7. All waste must be brought back from the Antarctic. It arrives separated but it must be:

   - Properly documented
   - Customs cleared
   - Collected from the ship by a waste management company
   - Taken to a waste disposal site and appropriately disposed.

8. There is a limited draft at East Pier for polar vessels.

9. Jetty no 2 could be used for two Russian vessels:

- Akademik Federof

- Akademik Kapinski

10. About 10 % of summer population at Antarctic bases overwinter.

11. Scientists all fly into Cape Town to join their ship and fly back when their ship returns. They expect tourist treatment while they are in Cape Town both before joining their ship and on their return. They quite often spend extended periods of a week or more in Cape Town. Currently Cape Town will host up to 100 people each way per year.

12. Meihuizen sees Cape Town as the site for an Antarctic Gateway.

13. The Japanese are worried about crime in Cape Town and have chosen to use Hobart instead

14. Cape Town and South Africa need a brochure like the Hobart Brochure.

15. The Antarctic Gateway needs to have a voice in local tourism

16. Perhaps the Antarctic Gateway should be a Section 21 company with a representative board.

17. Contact Vice Admiral Johannes Mudima regarding the use of Simonstown Naval Harbour – now administered by Denel.

18. Contact Capt. Dick Hillard of CHC Helicopters regarding the use of helicopters in the Antarctic.

Antarctic Gateway Pre-feasibility Study - Interview 13

Visit to Polar Stern & meeting with Captain

23rd August 2006

1. Polar Stern is an ice breaker and too deep to go into the V&A. Instead she berthed at H/J berth in the Duncan Dock where the bottom has been deepened.

2. The vessel has accommodation for a total of 100 persons – 51 scientists in double and triple cabins except for the chief scientist who has a single and 49 crew.

3. Some of the scientist work on a tight schedule and arrive in Cape Town just in time to catch the vessel and have bookings to fly out within hours of the vessel docking in Cape Town. The vessel has to plan its voyage schedule a long time ahead and book the berth it requires at that stage to ensure availability when it arrives

4. The vessel is well equipped with laboratories.

5. Container storage below decks is arranged so that they can be accessed during the voyage – many are fitted out as specialist laboratories or as special refrigerated storage.

6. The stern of the vessel has been built as a stern trawler for oceanographic work

7. The Polarstern used to travel from northern to southern hemisphere and back each year to do both arctic and Antarctic research and call in Germany for maintenance and resupply. Recently she has been kept in the southern hemisphere doing oceanographic research cruises during the winter. Maintenance and resupply are done in this hemisphere – essentially Cape Town.

8. Since the area of operation of the Polarstern is Cape Town-Ushuaia-Antarctic it is impractical to sail to the Rio Plate for dry docking and she has recently dry docked in Cape Town.

Antarctic Gateway Pre-feasibility Study - Interview 14

Meeting with Pat Garrett – Two Oceans Aquarium

14th September 2006, 14h00

Present: Dawid Bosman
Heidi Keyser
K.P. Mackie
Pat Garrett

1. The aquarium has planned to construct extensions to the south side with work scheduled to start with the beginning of the builders' year, 2007

2. The extensions are planned to include an Antarctic display in a refrigerated area of 30m x 15m. It is planned to include a pool and Antarctic penguins. Visitors will be allowed to enter this area.

3. Current ramp areas outside this proposed cold room can be used for a permanent Antarctic experience exhibit. A circular stairwell linking the upper and lower sections can be modeled into a replica of an ice crevasse.

4. Deadline for DST participation in larger aquarium development is mid 2007

5. An estimated 60 000 visit the aquarium each year.

Antarctic Gateway Pre-feasibility Study - Interview 15

Phone discussion with Prof. Frank Shillington, Oceanography, UCT.

21st September 2006

1. Australians are busy establishing an International Antarctic Institute. South Africa has been left out.

2. Two new institutes are being established at UCT that both have Antarctic interests. These are:

- MARE – Marine Research Institute to be headed by John Field, 650 3283, jgfield@botzoo.uct.ac.za

- ACCESS – African Centre for Co-ordinated Earth Stewardship Science to be headed by George Philander currently of Harvard.

Antarctic Gateway Pre-feasibility Study - Interview 16

Meeting with Billy Cilliers, NPA

27th September 2006, 14h00

Present: Dawid Bosman
K.P. Mackie
Billy Cilliers

1. NPA leases out warehouses and wharfage up to 1m from the edge of the cope to the quay.

2. Berthing at the quays is run on a common user basis.

3. Assuming that there are no excessive delays in resolving the environmental issue of the expansion of the container berth, construction work and the complete establishment of the container handling area can be complete in the next 5 to 10 years.

4. At present all planning in the Duncan Dock area is in hiatus pending the resolution of the container berth problem.

5. Given the resolution of the container problem, all cargo vessels will be berthed and worked in the Schoeman Dock. The west end of the Duncan Dock berths, A to F, will be allocated to “non-core” business such as visiting naval vessels, passenger liners, Antarctic vessels etc.

6. This area will then be rezoned as a public access region with only limited restrictions on access to the area by the public. It will be an area functionally intermediate between the V&A Waterfront and the fully commercial port.

7. The area behind berths E – F has been suggested as a “dig-out” for a new yacht basin for the RCYC with a channel into the Duncan Dock between E and F berths.

Antarctic Gateway Pre-feasibility Study - Interview 17

Meeting with Stephen Bentley

28th September 2006 at 08h00

Present: Dawid Bosman
Keith Mackie
Stephen Bentley

1. Bathymetric data:

   - Port Captains draft is got from:
   - Harbour Engineer's sounding sheets +1.00 m
   - The 1.0 m is made up of 0.3 m for echo sounder error
   - 0.3 m for obstructions (pinnacles missed)
   - 0.3 m for obstructions on keel
   - Total rounded to 1.0 m
   - Navy charts will show Port Captain's draft.

2. Chart Datum Harbours is 0.7 below MSL

3. East Pier: Working draft is -9.5 chart datum harbours

   - Total ship docking length is 224 m i.e. maximum ship accommodated
   - For more than one smaller vessel allow sum of lengths o/a +20 m per gap between vessels for head and stern lines to cross.

4. There are no bunkering facilities in the V&A nor at East Pier. V&A has no intention of installing any. Bunkering barge can be used but only for partially filling. Vessels need a good steerage way to manoeuvre through the entrance etc., if they fuel fully to full draft the bottom clearance reduces and squat increases to unacceptable levels.

5. The ex SAN ice breaker Outeniqua, now called the Paardeberg has done heavy cargo trips to the Antarctic. She could be berthed at Quay No 2 in the V&A but will probably stay in the commercial port.

6. Aquarium worked when V&A sponsored bus transport for school kids. To really work these school outings also need a subsidised meal.

7. The summer theme (beginning November to end February) at the V&A Waterfront will be "Ice". It has no intentional background. Thor Ice will be putting up a

refrigerated marquee for an ice experience. Another entrepreneur will be constructing a snow experience (toboggan rides etc.) in Shop 17 (the old Maritime Museum)

8. The impact of the impending sale of the V&A is uncertain. The purchasers are London & regional and Istimar. They have stated that they are happy with the V&A master plan but wish to increase activity levels.

Antarctic Gateway Pre-feasibility Study - Interview 18

Meeting with Mike Bruton, MTN Science Centre

28th September 2006 at14h00

Present: Dawid Bosman
Heidi Keyser
Keith Mackie
Mike Bruton

1. There is an Antarctic Museum in Pretoria under Dept. Transport but it is now closed.

2. SANAE falls under Pretoria Municipality

3. International Antarctic Year starts June 2007 for two years.

4. The MTN Science centre has put on a 70 m^2 Antarctic exhibit which did draw visitors to Century City

5. The location of an Antarctic exhibit is absolutely critical. It needs high traffic but not excessive costs.

6. Two Thirds of visitors to the Science centre are under 18. Half of all visitors come in school groups.

7. The MTN Science Centre only needs 1% of the 18 million visitors to the Century City mall to be viable.

8. A Science Centre based Antarctic exhibit would be best in the V&A, possibly in Shop 17 (old Maritime Museum).

9. The SA Museum is another venue that could host an Antarctic exhibit – one tailored to its style. Contact Prof Jattie Bredenkanp.

10. Contact Lizzie Cox of Science Museum in South Kensington. They have a traveling Antarctic exhibit and the Intellectual Property rights therein may be for sale.

Antarctic Gateway Pre-feasibility Study - Interview 19

Meeting with Hennie Stassen

2nd October 2006 at 16h00

Present: Dawid Bosman
Heidi Keyser
Keith Mackie
Michael Franzen
Hennie Stassen

1. The Antarctic is dominated by international interests and there is a significant co-operation between countries.

2. The Antarctic Gateway concept started in 1994 when a stall was put up at the meeting of the Council of Antarctic Managers to market Cape Town – mainly the air bridge concept.

3. The first flight from Africa to the Antarctic was a British C130 from Luanda in 1996.

4. The original intent of the Antarctic Gateway concept was to create the Antarctic experience by:

    i) A boat ride through the Roaring Forties using a capsule on hydraulic rams.
    ii) 360° diorama
    iii) Penguins
    iv) -40°C cold room with wind, snow etc.

5. The Antarctic is not a saleable package at the moment.

6. SA programmes are being closed down and SA is falling behind in Antarctic research.

7. University of Potchefstroom wanted R2 000 000 for a core drilling program and this was turned down.

8. Currently scientific research budget and allocation of funds is controlled by NRF. Previously DEAT had a budget for Antarctic research and allocated funds for Antarctic research projects.

9. There is a need for an Antarctic Gateway lobby to promote Antarctic science at the NRF.

Antarctic Gateway Pre-feasibility Study - Interview 20

Meeting with SAGOA – South African Gas and Oil Association – Steve Hraber

4th October 2004 at 15h00

Present: Keith Mackie
Steve Hraber

1. See appended extract of SAGOA contribution to NPA planning report

2. Contact persons are:

   i) Kwanda Modise – Cape Town City Council – PR

   ii) Niels Warner – Norwegian Consul, 28th Floor, ABSA Centre – handles Norwegian and other Scandinavian countries Antarctic logistics in Cape Town

   iii) Dr "Bramko" Bronislaw Corner 09 254 81 12 46 757 – previously professor of geophysics at Bernard Price Institute, now consulting to mining industry in Namibia. He was very involved in SANAE and Antarctic research.

3. SAGOA is a section 21 company instituted to promote Cape Town as a service and construction base for the offshore oil industry on the west coast of Africa. It is owned jointly by the Cape Town City Council, by PGWC and by industry.

4. Under the umbrella of SAGOA, the Aberdeen based Rig Blast Group (RBG) who specialise in refinery type steelwork and have bought into the local SA group are expected to sign a renewable 10 year lease with NPA for the area behind A berth as an oil and gas base. Dorbyl and Globe are expected to act as subcontractors to them or, when they obtain their own jobs, to lease space at the site.

5. Much of the initiative for the SAGOA involvement at A berth came from Hennie Stassen who had secured funds and political support and wanted SAGOA to partner his Antarctic Gateway project in developing the whole area in front of the Port Control Building

Antarctic Gateway Pre-feasibility Study - Interview 21

Meeting with DEAT – Sam Oosthuizen

6th October 2006 at 08h30

Present: Dawid Bosman
Keith Mackie
Sam Oosthuizen

1. The correct title for the DEAT Antarctic section is “Directorate Antarctic and Islands” (DAI).

2. The PWD project manager for the new East Pier Buildings is: Gary Hartenberg, cell phone 083 700 5929

3. The revamped building will have warehousing on the ground floor (double volume), offices on the 1st floor and space on the 2nd floor (steel framed structure erected on the roof slab of the 1st floor with multi-uses capacity. MCM intend using part for net storing and repair. The building will have facilities for international Antarctic meetings.

4. There is a large block of state land off Portswood road behind the Somerset hospital that could be available for Antarctic Gateway activities. Current status is unknown.

5. Some sort of section 21 company for SA Antarctic activities and a gateway was investigated by a committee chaired by the Norwegian Prof. Olav Orheim in 1997. It was found that the concept could have been viable but nothing materialised.

6. Hennie Stassen was ex PWD and was introduced to the Antarctic during his tenure with them.

7. DAI collaborate with Smit Amandla, operators of the Agullas on chartering the vessel when not on DAI cruises.

8. Oosthuizen corroborated Stassen’s view that SANAE budgets and research projects had fallen away and the base was underutilised. In particular there is a need for more overwintering research. DAI actively market the facilities.

9. There has been no real study of the potential for marketing the SANAE facilities.

10. The DAI assets are: East Pier, Marion Island Base, Gough Island Base (The island is a British possession, an important meteorological station although there is some thinking of automating this function and is well used by ornithologists.) and SANAE

Antarctic Gateway Pre-feasibility Study - Interview 22

Meeting with ALCI

18th October 2006 at 14h00

Present: Dawid Bosman
Keith Mackie
Bernard Gaum
Vasily Kaliazin

1. There is a need for the Antarctic gateway process to be managed.

2. ALCI also handles Russian ships calling at Cape Town

3. ALCI is in discussion with other suppliers to form a co-operative of a cluster of Antarctic commercial activities. Consumers of these resources need an organisation that can advise and assist them and there is a need for such an organisation to set and maintain such matters as reliability, ethics and legality of the suppliers.

4. There is no banking in Antarctica, there needs to be a specialist office in Cape Town to handler financial matters.

5. Passports are not needed in Antarctica but all persons passing through South Africa to the Antarctic currently pass through the existing immigration processes. This could be streamlined.

6. It is the intent of the Antarctic treaty that all private citizens planning to visit the Antarctic get a permit to do so from their own country and, if travelling via South Africa, a separate permit from this country. However, India for one, does not issue such permits and South Africa is not equipped to issue them.

7. Antarctic Logistics Expedition (ALE) is a private company working under USA permit exclusively for the private sector and has USA government support.

8. Current cost of a flight to Antarctica from SA is € 8 000.

9. There is a need to conserve the expertise that Hennie Stassen has built up.

10. The proposed Belgian station is to be an international station constructed with Belgian finance.

11. The current Antarctic treaty is not a UN instrument.

12. On the matter of general awareness of the Antarctic, air traffic controllers in Cape Town airport don't accept "Antarctic" as a destination.

13. The Antarctic is a very delicate environment and a very good indicator of climate change.

14. Current population of Antarctica is probably on the order of 5000 persons in summer and a maximum of 1000 in winter.

15. Tourism to the Antarctic on cruise ships may be as high as 20 000 to 30 000 per year.

16. Last year ALCI took 200 people to the Antarctic – all scientists.

17. ALCI will not carry private tourists to the Antarctic without approval, insurance, etc and is expected to monitor them until they arrive at a base of some other country.

18. General level of service in all spheres in Cape Town has fallen badly in the last few years.

Antarctic Gateway Pre-feasibility Study - Interview 23

Meeting with Weather Office

Present: Dawid Bosman
Keith Mackie
Johan Stander
Keith Moir
Sydney Maree
Peter Roux

1. Weather Office needs information from data sparse regions – in effect the Antarctic and the Islands

2. The main area of concern for the Weather Office is the “Roaring Forties”.

3. Two important manned stations are Marion and Gough islands. Gough is a British island and the station is maintained by permission. They see it continuing to be manned for a long time to come and not converted to automatic.

4. There are automatic stations on Bouvet (Norwegian island and station), Tristan and South Sandwich.

5. Normal summer voyage of the Agulhas is C.T – SANAE (one month at SANAE); SANAE to South Sandwich and back to C.T. The Weather Office tries to deploy weather buoys wherever the Agulhas is voyaging.

6. Staffing:
   Gough – 7 people, 3 met officers
   Marion – 3 met officers attached to the base
   SANAE – 1 met officer
   Ascencion – American military provide data
   St Helena – British data

7. The Weather Office deploys about 20 buoys per year from the Agulhas.

8. The Weather Office also deploy buoys from the Polarstern

9. Every 2nd year the Norwegian weather station on Bouvet is changed.

10. The weather station on South Sandwich is changed every year.

11. A number of research vessels from Northern countries call at Cape Town every year for oceanography cruises in the Southern Ocean. They are a potential market for an Antarctic Gateway.

12. There will probably be a market for laboratory and workshop facilities in Cape Town for preparatory work prior to departure and on return of many expeditions.

13. There may be a market for specialist equipment and instruments.

14. Why can't Smit Amandla use SA weather Office for forecasts instead of a commercial company.

15. The Cape Town office of the Weather Office needs to grow and will need new accommodation. Accommodation in a physical Antarctic Gateway could serve very well and could co-operate in the education function. Currently the requirement is for about 1800 m^2 to accommodate the Airport and the Stellenbosch offices and the workshops.

16. The Southern Ocean is becoming very important for climate studies.

17. Tourism – there is no soft snow in Antarctica, It is all frozen hard like gravel.

18. Agulhas has done dedicated bird tourism voyages to the Southern Ocean.

Antarctic Gateway Pre-feasibility Study - Interview 24

Meeting with V&A

20th October 2006, 11h00,

Present: Piet. van Zyl
Pat. Garrett
Andre Blain
Willem Dreyer
Heidi Keyser
Keith Mackie

1. General introduction by Heidi. Thinking has moved towards a co-location with the aquarium.

2. Garrett described proposal for Antarctic display at the aquarium and the option for a 3rd floor for an Antarctic awareness centre for the DST. The V&A commented that the suggested 3rd floor won't detract from the appearance of the building and may improve it.

3. Van Zyl commented that V&A have a good working relationship with the PWD and could get relatively rapid reaction from them for any proposal for State based Antarctic Gateway proposals for the V&A.

4. The V&A endorses a more commercial use of the Eat Pier precinct and has no objection to the conversion of DEAT activities to a Section 21 company or some form of parastatal to undertake commercially based Antarctic activities.

5. Present concepts for North Quay are a 3 to 4 story building of ca 4000 m^2 area, The bottom would be a column-free area for maritime, e.g. international yacht races, or multipurpose events. There would be no parking at the precinct.

6. The Clock Tower precinct planning is moving from office to retail, hotel and residential development. The East Quay at the Clock Tower precinct is being withdrawn from potential Antarctic Gateway use.

7. The Clock Tower precinct will be coming in at ca R145/m^2/month. North Quay should come in at about the same.

8. The Ridge area (where the V&A offices are) has units of ca 200 m^2 available.

9. Shop 17 has been leased for 18 months for an events centre. Over this Xmas it will be used for a cold, snow & ice event as part of the V&A ice theme.

10. Shop 17/Blue Shed is scheduled for redevelopment in 2008. Current expectations are to retain the craft centre but include an events area for up to 5000 people. It may

also include a gym. As part of this Shop17 may be demolished and rebuilt (it is just less than 60 years old).

11. Portswood West (BP precinct) has space for 3000 m^2 at the back and 5000 m^2 at the front, next to the GSB. Rentals are expected to be in the order of R 140 – R150/m^2/month. The area can be developed as soon as a tenant comes forward.

12. V&A has no objection to a co-location of DST Antarctic Awareness at the aquarium nor to DST entering into a PPP with the aquarium.

Antarctic Gateway Pre-feasibility Study - Interview 25

Meeting with Provincial Government of the Western Cape

25th October 2006, 09h00

Present: Dawid Bosman
Keith Mackie
Nigel Gwynne-Evans

1. Indicative budget costs:
   Oil & Gas activity:

Industry supplies passing through Cape Town	R 10 000 000
Rig refit	$ 10 000 000
Annual SA Antarctic Budget	ca R 60 000 000
(50 – 50 split between the bases and the Agulhas)	
Annual budgets for all Queen Maud Land bases	ca R 500 000 000

2. An Antarctic Agency would have to work with Central Government, Foreign Affairs to support SA base building capacity.

3. PGWC needs a measure of commercial potential to set up a sector of cluster institution agency:
   Develop database
   Set up relationships – marketing
   Sort out day-to-day problems
   Intelligence re possible projects
   Should it be a section 21 company or a trust.

4. Threshold size of agency:
   Allow R 1 000 000 annual budget – mainly salaries
   Allow for three year funding
   CEO – business marketing
   Secretary
   Admin assistant

5. PGWC will supply samples of agencies

6. The agency needs a driver

7. PGWC expertise in the process of setting up an agency can be made available

8. PGWC will support the agency

9. If DST puts up the money, PGWC can run with it.

10. The agency can be up and running within 3 to 6 months.

11. Will start to see results within 1 to 3 years

12. The agency needs to be a “Triple Helix” – a three-way interaction between government, industry and academia.

13. The key is setting up the office and a business plan

14. The KPMG report must include a business plan

15. All DST need for an Antarctic Gateway is the agency.

16. PGWC will support the agency

17. The agency needs a board of ca 12:
    6 – 8 – institutions
    4 – 6 – commerce & industry

18. The International Polar year next year imposes urgency.

Antarctic Gateway Pre-feasibility Study - Interview 26

Meeting with Cape Ship-repair

30th October 2006, 09h00

Present: Dawid Bosman
Keith Mackie
Anthony Sckaidy

1. Problems with Cape Town are Port efficiency and high charges.

2. Cape Town has the highest dry docking charges in the world

3. Walvis Bay is dropping its docking charges

4. SEDCO have recently paid $ 300 000/day port charges to lay alongside to work on the rig

5. The recent semi-sub repair involved a total spend of $ 32 000 000.

6. Cape Ship-repair is initiating a benchmark study of best practice.

7. The political will to upgrade the Cape Town ship repair industry does not exist.

Antarctic Gateway Pre-feasibility Study - Interview 27

Meeting with World Shipping Agencies

31st October 2006, 15h00

Present: Keith Mackie
Nils Warner (Norwegian Consul in Cape Town)

1. Firm are agents for the Norwegian Polar Institute.

2. Scientists fly down to Cape Town from Norway, spend a few days here, and then fly on to the Troll base using ALCI. Currently three separate groups will go down with ALCI.

3. The Norwegians plan to get their own Orion aircraft. It also needs to refuel in the Antarctic. They are not happy with the Hercules. In general, they will fly from Norway via Cape Town to the Antarctic. They would use Cape Town for a base while in the south.

4. The Norwegians want to stationers civil aircraft in Cape Town permanently -- year around. This will be the start of a permanent a bridge.

5. The Norwegians haven't come out with a policy on tourism; they stick to science, and are very strict about the environment and the return of garbage

6. The Russian icebreaker, Ivan Patini, has been chartered to take heavy cargo to the Antarctic for the Norwegians, for the Swedes and Finns who share a base, and the Belgians and Germans.

7. The Norwegian, German, Belgian and Swedes and Finns amount to about 150 people each year, who move through Cape Town. Generally they spend a minimum of seven days each, each way. The aircraft has a crew of about 12 people. It is difficult to get rooms in decent hotels in Cape Town.

8. The Norwegian government pump a lot of money into the Antarctic. Scientists passing through Cape Town on the way out and separately on the way back have about R 70 000 spending money for their stay in Cape Town. This would probably apply to the whole 150, which amounts to about R 20 000 000 spent in Cape Town each year.

9. Total other spending for everything ships, hotels etc for the whole annual Norwegian expedition is about R 10 000 000.

10. The main Norwegian base in Norway is Tromso

11. Fuels supplied from the Durban refinery is polar diesel, 80 number 220 L drums; jet fuel 1140 drums; petrol 30 drums. Total fuel cost is R 3 million.

14. India charters 2 ships, Emerald Sea and one other.

15. Agents for India are Ztrans will (part of Barlows – contact Eric Wiley).

16. Petrel built sleds cost between R 20,000 and R 30,000.

Antarctic Gateway Pre-feasibility Study - Interview 28

Meeting with Cape Union Mart

1 November 2006, 15h00

Present: Dawid Bosman
Keith Mackie
Brian Murphy

1. Cape Union Mart has been supplying Antarctic equipment for going on 25 years.

2. Cape Union Mart is retailers. They have no ambition to move into other fields.

3. They have a large warehouse in Montague Garden and can fit out large groups.

4. They supply both cold weather, and heavy duty clothing.

5. Cape Union Mart wrote the specifications for Antarctic clothing manufacture this in Cape Town

6. Specialised items such as gloves, steel toe caps, fur lined boots etc are imported e.g. from Canada

7. SANAE Antarctic business used to be lucrative but has declined in volume and return in recent years.

8. Antarctic retail business currently runs at about R 1 million per annum. About 75% of this comes from the Indian expedition

9. Cape Union Mart have staged at Artic exhibits in walls, where they have shops with the assistance of teat, etc. These have been done for general advertising purposes not specifically Antarctic. They commonly include skidoos, photos, snow and ice etc

10. Cape Union Mart has no budget for corporate social responsibility.

Antarctic Gateway Pre-feasibility Study - Interview 29

Meeting with National Ship Chandlers

27th November 2006, 11h00

Present: Keith Mackie
John Crawford

1. Crawford felt very strongly that any Antarctic Special Purpose Vehicle would end up as a commercial parasite. He considered that such a SPV would rapidly limit participation in the commercial spin-offs of Antarctic activity to members of the SPV and require significant fees for membership.

2. A Belgian, Alain Hubert, an ex-Antarctic explorer, is promoting an Antarctic Polar Foundation in the EU. As president, Hubert draws no salary. He considers that that way his credibility, and that of his foundation, is far higher.

3. The Northern Europeans have specifications for materials and equipment appropriate to cold climates. We have no such specifications or experience in South Africa. For example, recently the Norwegians needed cement for the Antarctic. Local South African cement is not made to cold climate specifications, a sample had to be sent to Norway for testing and proved to be satisfactory.

4. The new Belgian base is being started from scratch. It is being established in special arctic tents sourced from Canada. Later more permanent structures will be constructed.

5. Allow cost of basic supplies to sustain a person in the Antarctic of R5 000/person/month.

6. A curious item supplied to Antarctic expeditions is lids and clamps for 220 l drums. Fuel drums have welded in tops but once they are empty, the tops are cut out and the drums are filled with waste and sealed with the loose lids for return to South Africa.