

International and Domestic Shipping and Ports Study



Prepared for

DTEI on behalf of the Australian Maritime Group (AMG)

Final

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EXECUTIVE SUMMARY AND CONCLUSIONS

This paper, prepared for the Australian Maritime Group (AMG), reports on three main topic areas:

- Implications of developments in the legislative and regulatory environment, shipping, ports and logistics chains with an assessment of likely impacts for Australia
- Implications of changes in the Australian international seafreight task over the period 2005-2020 covering the container, bulk and breakbulk trades with an assessment of existing plans to increase port capacity and the size/nature of any resulting capacity shortfalls
- Increasing shipping's share of the Australian domestic freight task which focuses on the current market, required success factors, potential contestable market based on 'optimal conditions', and opportunities government/industry may have to support the future viability of coastal shipping.

Developments in the international and domestic legislative and regulatory environment

Over the last ten years, and certainly recently, it is evident that there have been numerous developments in both the international and domestic legislative and regulatory environment. Many of the domestic legislative and regulatory developments have been responses to changes in the international shipping and ports situation, particularly the implementation of new or amended International Maritime Organisation (IMO) conventions to which Australia is often a signatory.

Since 2001, both the international community, lead by the United States, and Australia have focussed considerable effort and resources on tightening ship, port and supply chain security (the ISPS Code, etc.). The legislative aspects of this have been completed and should now fall off the priority list. However, there still remain operational aspects relating to container security which need to be monitored particularly if moves by United States' politicians lead to the requirement for blanket (100%) pre-arrival X-ray screening of US bound containers at foreign loading ports – something which would impact significantly on port and supply chain efficiency. The apparent taking over of the lead role on supply chain security by the World Customs Organisation (WCO) should help safeguard the more practical aspects of container supply chain security, but this is not a certainty.

The protection of the marine environment, reduction of air pollution and the role of maritime transport within global warming as a whole are items which are likely to have higher priorities than before and will certainly have national policy implications. A number of the IMO marine environmental protection initiatives have been picked up by the Australian government (ballast water management, prevention of air pollution from ships, and harmful anti-fouling systems on ships), but the growing need for more drastic measures (including the establishment of a mandatory global carbon trading system) will certainly require new or amended national policy initiatives relating to shipping and ports. The general lack of land-based powering of ships when in Australian ports and the lack of regulations specifying the types of fuel to be used whilst in Australian waters are cases in point.

The regulation of ship safety and quality appears to be well in hand with the Australian Maritime Safety Authority (AMSA) taking a leading role in the effective administration of the international Port State Control (PSC) regime as well as taking primary responsibility for implementing the new National Maritime Emergency Response Arrangements (NEMERA).

As far liner shipping competition policy is concerned, it would appear that necessary major reforms at both the international (United States and the European Union) and national level have been undertaken and implemented. However, this general climate of lower tolerance of liner conference activity may well create the effect of reinforcing mergers and acquisitions amongst the carriers as traditional forms of cooperation and trade management become increasingly difficult.

A focus in Australia is now on looking at avenues for increasing competition in the stevedoring sector at the main container ports. As such, port policy remains very much the domain of the state governments with some governments (notably NSW and Queensland) taking a more proactive stance on allowing increased competition in the bidding for the operation of new container terminals. It is unclear whether the Council Of Australian Governments (COAG) national reform agenda (2006) on competition policy will succeed in harmonising the various state government policies on port competition, as there appears to be a lack of momentum at present, but this could be potentially an area of future focus.

Developments in the shipping, ports and logistics industries

Changes in ownership in both liner shipping and container stevedoring has been moving at a rapid pace following the trend of increasing globalisation. Consolidation (horizontal integration) has been the name of the game with the top twenty liner companies now controlling almost 90% of world containership cellular tonnage – this was only 40% in 1990. A similar trend has occurred in the independent container stevedoring sector with the top three stevedoring companies now having a global footprint collectively operating over 100 terminals worldwide. The leading liner companies have also been expanding their global operation of container terminals as a way of securing dedicated port hubs with preferential operations. Vertical integration has also been occurring with liner companies increasingly offering door-to-door and secondary distribution services.

The expectation is that this consolidation in the container shipping market will continue. However, any future acquisitions of liner companies by the industry leader, Maersk Line, would most likely need to be monitored as their market share in a number of trades (including to/from Australia/NZ) is becoming increasingly dominant. This observation is also true for the independent container stevedoring market, particularly regarding any future mergers between the top three companies. The balance of power between carriers and ports has also been shifting towards the top tier of carriers as their container volumes, through consolidations, increasingly represent greater proportions of a port's total container trade. The implications of this trend are pressures on the ports' financial and strategic ability to provide or safeguard common-user facilities and open access policies.

Ownership in the international bulk shipping sector remains relatively diversified and, although further consolidation can be expected in the future, this trend is not yet considered to be a major issue for competition regulators.

Liner shipping operations and services continue to evolve to match increasing global container trade by a combination of more direct-calling services (particularly at Chinese and Black Sea ports) and the deployment of larger mainline vessels between hub ports with connecting feeder or relay vessels also increasing in size. The super post-Panamax era of 10-13,000 TEU containerships has arrived, newbuildings being deployed on the Europe – Far East trade. The planned completion of the widening and deepening of the Panama Canal in 2015 is likely to see a spurt in the 5-12,000 TEU containership size class which will mean larger vessels being used on many of the trades connecting the Americas to other areas of the world. This Panama Canal effect is also likely to happen for bulk shipping with the current maximum 70,000 dwt vessels used in many bulk trades increasing to the new Panama maximum of 170,000 dwt.

As far as the Australia end-to-end direct calling services are concerned, the maximum size of containerships is expected to increase from the current 4,100 TEU to around 6,000 TEU after completion of the planned Melbourne channel deepening in 2010. There may well be the opportunity for larger Trans-Pacific containerships to dip down (divert) to a single Australian hub port, such as Brisbane, using connecting feeder vessels along the Australian coast, but this will only happen in exceptional cases where carriers are able to obtain economic benefits by rationalising two or three existing vessel strings of chartered vessels – generally transshipment and feedering adds significantly to costs and fast transit times are a premium on the Trans-Pacific.

Dry bulk vessels are expected to increase in average ship size with Handy-size vessels increasingly being replaced with Panamax-size (70,000 dwt) and the increasing use of Cape-size vessels at the expense of current Panamax. Australian ports are aware of these trends and are preparing for them in as timely a manner as possible given increasingly difficult and complex development requirements.

Technologies for ships, ports and intermodal systems are continuing to be refined and introduced around the world. These technologies seek to solve environmental issues and increase transport system / infrastructure productivities. All of these technological advances could have a role in improving ports and shipping in the Australian context. Ultimately the market-place will decide the degree and location of the introduction of these advancing technologies in Australia but government can certainly play a role in their introduction by continuing to set and modify the policy framework on efficiency and environmental targets at national and state levels.

Forecasts of Australia's international cargo trades, 2005-2020

Forecasts for Australia's international maritime cargo trade have been conducted for the period 2005 to 2020 (financial years ending) with export and import cargoes clustered into four main commodity groups – containers, dry bulks, breakbulks, and liquid bulks.

The Australian international container trade is forecast to almost triple its current (2005) level of 4.3 million TEU to almost 12 million TEU in 2020. This level of expected increase represents a significant challenge for the main container ports in terms of developing new port capacity (terminals) but in terms of liner shipping capacity can be relatively easily accommodated by the shipping lines.

The Australian iron ore export trade is forecast to almost double from 272 million tonnes in 2006 to an optimistic level of around 510 million tonnes in the period 2015-2020. However, more conservative forecasts, which take account of worsening mining project economics, predict levels of around 440 million tonnes in the period 2015-2020. Both the private and public port sector recognise the need for iron ore port expansion or new iron ore ports. The bulk shipping sector will need to plan for these developments in the form of newbuildings as not all bulk vessels are technically capable of carrying full or part loads of iron ore, i.e. the hulls need to be specially strengthened for dense minerals.

The Australian coal export trade is forecast to almost double from 243 million tonnes in 2005 to 390 million tonnes in 2020. Both the private and public port sector recognise the need for coal port expansion. The bulk shipping sector will need to plan for these developments in the form of newbuildings particularly at the top size range (i.e. Cape-size vessels). The Handy-size and Panamax-size vessels tend to carry a mixture of dry bulk cargoes so can more easily switch from one trade to another when demand dictates.

The Australian grain export trade is perhaps the most problematic and volatile one to forecast. A combination of climatic factors, possible diversion into other uses (i.e. for bio-fuels), changes in industry structure and economics make any annual forecast for grain exports uncertain. The general consensus is that the long-term expectation is that grain exports will increase, albeit slightly, from 8.1 million tonnes in 2005 to around 11.5 million tonnes in 2020. However, some analysts predict Australia could be a long-term net importer of grain particularly for certain types of grain. The implications for the port sector and connecting landside infrastructure are more how to cope with grain market volatility as opposed to focussing on the need for expansions. There are no significant impacts expected from these forecasts for bulk shipping except that more shipments are expected to be carried in Panamax-size vessels at the expense of Handy-size.

The Australian alumina export trade is forecast to almost double from around 16 million tonnes in 2005 to 29 million tonnes in 2020. The port and private industry recognise the need for capacity increases but in terms of the magnitude of the iron ore and coal trades the required level of future development is relatively small and manageable.

The other dry bulk export trades covering commodities such as mineral sands (1.75 million tonnes in 2005), woodchips (11 million tonnes in 2005), sugar (around 5 million tonnes in 2005), and other minerals / salt / gypsum (collectively around 17 million tonnes in 2005) are not expected to significantly increase in volume by 2020, indeed some of the commodities may stay flat, which suggests that the focus for ports and shipping should indeed be on servicing the major dry bulk commodities.

The only breakbulk commodity which is likely to significantly increase and have additional, specialised demands on port planning and development concerns the motor vehicles import/export trade. This is forecast to increase from around 1 million vehicle units in 2005 to 1.7 million vehicle units by 2020 with the challenge of re-locating from old (inner) harbour areas to more distant regional ports (e.g. from Port Jackson to Port Kembla, and longer-term the potential to move from Melbourne to regional ports such as Hastings or Geelong). This is not seen as being problematic for the specialised car carrier ship operators (there are sufficient vessels with sizes increasing) but more of an issue of inland logistics economics and available infrastructure for the motor vehicle importers and distributors.

The Australian international liquid bulk trades, primarily consisting of crude oil imports and petroleum products imports and exports (including gases), is not expected to significantly increase by 2020. Crude oil and petroleum products are forecast to increase from a total of almost 50 million tonnes in 2006 to almost 70 million tonnes in 2020. The one exception concerns imports of caustic soda which, as an input in the production of alumina, are forecast to double from 2 million tonnes in 2005 to 4 million tonnes in 2020. The expectation is that ports and shipping can easily accommodate these liquid bulk growth forecasts.

Implications of changes in Australia's international seafreight task

At first sight, it would appear at the 'macro-level' that there are sufficient initiatives and plans to bring on-stream extra port capacity and increased channel depths to meet the forecast increases in Australia's international maritime freight task.

However, it is becoming increasingly apparent that the ability of ports and industry to fast-track new or upgraded port infrastructure (i.e. channels, new terminals, ports and connecting rail/road) is rapidly diminishing as project lead-times increase due to the need to deal with more stringent and time-consuming regulatory, community and environmental requirements. This issue is recognised by government as evidenced by the need for studies such as the DOTARS "National Intermodal Terminals Study (NITS)", the NTC study "Twice the Task", the various recent AusLink corridor studies in combination with port initiatives, and the current proceedings of the Neville Commission parliamentary inquiry on national port infrastructure.

This situation is further complicated by the commercial competition for land-use in the coastal city areas and the lack of integrated, long-term land-use planning between the various federal and state governmental agencies particularly regarding land adjacent or close to existing port facilities. The overall effect has been to increase the start-to-finish time for new port infrastructure projects by one or more years (Melbourne's channel deepening project is a clear example of this).

The implications of this trend is that for governments, ports and industry to be effective, they need to commence new port infrastructure projects much sooner than was the case in the past. This means that more funds and resources need to be committed and earlier. It is clear that demand forecasts will need to be re-visited/reviewed more frequently than before to make sure that expansion and access upgrade projects do not lag behind increases in trade.

There is also emerging another, somewhat hidden, driver of the ability of ports and governments to effectively tackle the planning of port infrastructure capacity at Australian bulk export ports. It is becoming increasingly apparent that the traditional ‘Free-On-Board (FOB)’ sales trade terms of Australian exporters mean that they, and the ports, are unable to control the inefficiencies of vessel planning by overseas buyers (i.e. a lack of coordination) which is often a significant cause of the growing congestion found at bulk export ports (particularly coal). The switching of sales trade terms to ‘Cost Insurance and Freight (CIF)’, which is an increasing strategic focus of industry, provides exporters, and ports, with the added benefit of a greater control over port capacity planning both daily and in the long-term.

Increasing shipping’s share of the domestic freight task

Shipping’s share of the inter-capital non-bulk freight task (movements parallel to the coast) is currently small, just 3% in terms of mass. Indeed, domestic containers along the coast between Perth and the Eastern States, and between Brisbane and the southern eastern seaboard ports totalled around 65,000 TEU (or around one million tonnes of freight) in 2005. Virtually all of these were carried on international vessels.

There is a desire by governments, and Australian shipping, to seek opportunities and methods to increase this share with the benefits of an increased coastal shipping industry and possible (indirect) reductions in road congestion, the movement of hazardous goods by road, and CO2 emissions. Another important reason why shipping is a focus is because of the other impacts of land (road) transport such as road toll, injuries, noise and investment required in road maintenance. Although Australia has a different geography to other parts of the world, it is encouraging to see that other countries (New Zealand, UK, etc.) and regions (European Union) are increasingly recognising the important role that domestic shipping can play in alleviating land transport bottlenecks, infrastructure constraints, safety and environmental impacts. Australia is therefore not alone in this respect.

There are already examples of established domestic shipping trades which service island or remote areas (the largest being Bass Strait) and the bulk trades such as fuel, minerals, cement and steel products. Moreover, the rise and subsequent fall of PAN Shipping’s coastal container shipping service in 2006, while it has undoubtedly not helped the cause of dedicated domestic container shipping, particularly amongst the shippers and forwarders, also demonstrates a resurgence of commercial interest in the use of sea transport for the carriage of domestic containers.

In our assessment, the reasons for the failure of PAN Shipping were largely specific to its operations, and do not reflect a fundamental failure of the dedicated coastal container shipping concept. Although further more detailed and focussed work would be necessary to reach a definitive conclusion on this point, in our judgment the information and analysis of this study indicates that the balance can be tipped in favour of a role for dedicated coastal shipping services in the transportation of inter-capital non-bulk freight. This could be achieved through a combination of:

- significantly improved service offerings than have yet been offered in the market, which provide a service quality similar to rail at a lower price

- the lead being taken by, or in partnership with, an existing door-to-door transportation company with the financial capability to invest in ships, domestic equipment and possibly co-invest in dedicated port infrastructure, and
- a supportive policy framework from governments which stimulates innovation in and promotes the use of non-bulk coastal shipping in a manner that facilitates efficient choices between the various modes of transport.

We also believe that the current domestic container shipping operations offered by international permit vessels is inherently volatile and unable to offer the level of service or space to contest additional cargoes currently carried by land transport modes. International cargoes will always take priority over domestic ones and the marginal-cost pricing used by shipping lines for domestic freight will never prove sufficient to switch priorities or re-design operations and equipment to better meet the needs of domestic shippers. This has been proven the case in the past in other parts of the world (in particular Europe and Asia) where decisions to move in and out of the carriage of intra regional cargoes on mainline international services have been regularly made by carriers prior to the introduction of dedicated intra regional vessel services.

Withdrawal of capacity by international operators would also have implications for land transport. The instability of the capacity offered by international services, who now carry a significant share of East-West container cargo, therefore implies that we must either accept the risk of a sudden and significant deterioration of land transport capacity, or provide excess 'buffer' capacity in the system. Indeed brief consultation with rail industry confirms this point (i.e. they would be unable to cope in the short-term with the demand surge caused by international vessels dropping the carriage of domestic containers).

Next to this, government transport policy on road and rail certainly has the capability to impact upon the future modal share of domestic shipping. Regulations on road limits (size and weight), driver fatigue, fuel emissions, carriage of hazardous cargoes, etc. and decisions whether to invest in new rail infrastructure, all can help to tip the balance in favour of an expansion in domestic shipping.

These considerations suggest that a gap or role does exist for dedicated domestic container shipping and increased coastal bulk shipping.

In addition, some potential may exist for regional niche operations which combine containerised freight flows with break-bulk or bulk cargoes – however, the long-term trend is for the deployment of dedicated (fully-cellular) containerships once trade volumes reach sufficient levels.

It should also not be forgotten that there are associated landside industries which support and benefit from an expansion of domestic shipping (ship-building, insurance companies, ship servicing companies, etc.) – in other words the benefits to the national economy are not exclusively maritime.

1. INTRODUCTION

1.1 Background

The underlying objective of the study is to increase understanding of current and future developments in international and domestic shipping and the implications of this for Australian ports and shipping. Australia relies on shipping for much of its international trade, but is a small player in the international liner shipping market and a minor provider of international shipping services. The recent consolidation of international liner cargo shipping companies and services is seen as having implications for Australian port, port operations, trade flows, land transport and transport infrastructure. The anticipated increase in bulk commodity exports and the container trade will have significant implications for Australian ports and landside linkages.

For governments to get an understanding of the implications of these changes over a timeframe of the next 10-15 years, information is provided on:

- how changes in the make up and operation of international shipping are likely to impact on Australia
- anticipated increases in the container trade and bulk commodity trades
- the extent to which existing port infrastructure can cater for any projected increases in demand
- the type and scale of additional port infrastructure which may be required.

The expected increase in the freight task is also seen as providing an opportunity for shipping to play a greater role in the movement of domestic freight around Australia's coastline. The benefits of using coastal shipping include relieving of pressure on the land transport network and reducing of the overall social and environmental impacts of freight transport. There is felt to be potential to shift existing cargo from land to sea transport if services and facilities were improved. To quantify the potential of the coastal shipping market, it is necessary to identify potential areas of growth for domestic shipping, candidate cargo-flows/routes as well as identifying and addressing the obstacles preventing the increased use of coastal shipping for the domestic freight task.

The result of the study is a tool which further informs governments as they develop and implement shipping and transport policies to address obstacles to efficient transportation and ensure that the assignment of freight between transport modes is in Australia's best interests.

1.2 Methodology

The methodology used in the study involved the integration of:

- Collective experience and expertise of Meyrick & Associates, GHD, and Booz-Allen-Hamilton
- Reviews of existing reports produced by third parties
- Trade and freight flow data collected by the Bureau of Transport and Regional Economics (BTRE), the Australian Bureau of Agriculture and Resource Economics (ABARE), and the Australian Bureau of Statistics (ABS)
- Industry-sector trade and freight forecasts, and
- Where necessary, discussions with the shipping industry to confirm/explore issues.

1.3 Structure of this report

The report is divided into three main topic areas:

- Implications of developments in the legislative and regulatory environment, shipping, ports and logistics chains with an assessment of likely impacts for Australia (sections two and three)
- Implications of changes in the Australian international seafreight task over the period 2005-2020 (forecasts in five year increments) covering the container, bulk and breakbulk trades with an assessment of existing plans to increase port capacity and the size/nature of any resulting capacity shortfalls (sections four and five)
- Increasing shipping's share of the Australian domestic freight task focuses on the current market, potential contestable market based on 'optimal conditions', required vessels to meet the potential market, and opportunities government/industry may have to support the future viability of coastal shipping (section six).

The reader should be aware of an abbreviations section (glossary) in Appendix One which aims to improve readability of the report. The report is also fully referenced to ensure that sources of information and opinions are clearly stated (i.e. Meyrick and Associates versus third parties).

2. DEVELOPMENTS IN THE LEGISLATIVE AND REGULATORY ENVIRONMENT

It is recognised throughout the world that maritime regulatory environments have a role to play in the successful operation of the maritime industry – the following quote illustrates the point.

“In sectors such as shipping and port infrastructure, where large investments are being made in innovative products designed to last for many years, a stable regulatory environment is important.”

(Source: European Union Maritime Policy Green Paper 2006 p21)

It is true that the legislative and regulatory regimes that shipping, ports, and logistics firms operate need to be stable, but at the same time these regimes should not be completely static or unresponsive. Recent events — in particular the attack on the World Trade Centre on September 11th, 2001 — have changed the world’s perception on safety and security. The effects of terrorism, coupled with factors including technological advancements and changing world trade patterns, require the legislative and regulatory environments to be flexible enough to adapt to the new world situation ensuring a framework for the continued smooth running of the global economy.

This section examines the recent and proposed international and domestic legislative and regulatory developments that have, or are likely to have, a significant influence on the shipping, ports and logistics industries in Australia. Topics covered comprise developments in security, the environment, ship safety and quality, liner shipping and port competition policy, and overseas coastal shipping policy.

2.1 Developments in the international legislative/regulatory environment

International legislative and regulatory environments have changed considerably during the past few years. The central theme behind a large number of these changes has been the heightened awareness of the need for stringent security arrangements throughout the supply chain — the United States has been the major contributor to these types of changes followed recently by the World Customs Organisation (WCO). Other important international developments include measures to protect the maritime/port environment, a further tightening of ship safety and quality, revisiting of liner shipping competition regulation, and a resurgence of interest in developing clear policies for short-sea/coastal shipping given its potential as a greener form of transport and possible way of helping to alleviate increasing road congestion in many countries.

2.1.1 International regulation of maritime security

The International Ship and Port Facility Security (ISPS) Code

The content of the International Maritime Organisation’s (IMO’s) “International Ship and Port Facility Security Code (ISPS Code)”, implemented in July 2004 through amendments to the Safety Of Life At Sea (SOLAS) convention and in various national maritime security legislation around the world, has been widely reported upon and we will not detail it further here.

However, it was felt useful to report upon its success, compliance status and any issues post-2004. Since mid-2004, various bodies, in addition to individual flag states, have been monitoring the compliance of ships and port facilities with the ISPS Code, among which the IMO, the United States Coast Guard, the European Sea Ports Organisation (ESPO) and the International Association of Ports and Harbours (IAPH). Some of these bodies' observations six to twelve months down the road are that:

- Within Europe - implementation of the ISPS Code has been smoother than feared with no disruption of port operations as a result of the ISPS procedures. However, some adaptations have been necessary and difficulties have been overcome through additional personnel, equipment and resources. Cases of ships without a security certificate are very seldom. A mixture of security cost sharing approaches varying from country to country.
- For US trades – 99% of vessels and port facilities are compliant with the ISPS Code. The US Coast Guard is aware of certain countries (not directly with maritime links with the US) which have either not properly implemented the ISPS Code (namely Gabon and Equatorial New Guinea) or have not reported their compliance to the IMO/US Coast Guard (namely five West African countries).
- IMO – there is a high level of global ISPS Code compliance (current figures not available but as of October 2004, 90% of ships and port facilities were compliant). However, it is recognised by the IMO that there are likely to be wide variations in the way the ISPS Code has been interpreted and the improvements in security that have resulted from it.
- Asia-Pacific region – Australia, in partnership with regional neighbours, is working towards a continuous improvement in the implementation of ISPS in countries such as Papua New Guinea (PNG), Pacific Island nations, Indonesia and the Philippines.

It should be noted that the United Nations Conference on Trade and Development (UNCTAD) has commissioned in December 2005 a study on the international effects (costs, etc.) of implementing the ISPS Code (including port survey input via the IAPH), but the results of this study remain, as yet, unpublished. The IAPH has also conducted a recent update survey (summer 2006) on the ISPS Code compliance but the results remain, as yet, unpublished outside of the IAPH membership.

The Container security initiative (CSI) in the United States

The Container Security Initiative (CSI) is an initiative of the United States Customs and Border Protection (CBP) to identify high risk containers, and to inspect these containers in overseas ports before they reach their destination in the United States.

The program —although initially starting off as a United States initiative whereby US CBP officials were sent into participating countries— now allows for international participants to send officials into US ports. However, the CSI still only applies to cargo travelling to and from the United States.

In April 2004, the European Union and the Department of Homeland Security signed an agreement that called for the expansion of CSI within the European Union. Largely as a result of this agreement, 44 ports have joined the CSI program (26 customs administrations committed to join CSI at its commencement in 2002) — a list of these ports (non-US) can be found in Appendix 6. However, the CBP aims to have 50 ports using the initiative by the end of the 2006 fiscal year (US Border and Customs Protection 2006 p2).

One critical feature of the CSI is widely known as the “24-hour rule”. This rule has been effective since February 2003. It requires fourteen data elements to be reported on cargoes traveling to the United States 24 hours prior being loaded onto a vessel. The rule also abolishes the vague categories of ‘freight of all kinds’, ‘general merchandise’ and household goods — it requires a detailed cargo description. Failure to adequately complete these data elements before the 24 hour period may result in the CBP officials issuing a fine or a ‘do not load’ order.

A similar 24-hour rule come into force on 11 May 2005 in Europe: Regulation 648/2005 requires shippers to provide customs authorities with a summary declaration of their goods before the goods enter the EU; for voyages longer than 24 hours, 24 hours notice is required; and for voyages less than 24 hours, four hours notice is required —two if the data is supplied electronically. The Regulation also affords less stringent customs procedures for recognised shippers.

Customs trade partnership against terrorism (C-TPAT)

The Customs trade partnership against terrorism (C-TPAT) is a voluntary joint government-business initiative within the United States that aims to improve overall international supply chain and US border security. This program takes a holistic approach to supply chain security and seeks the cooperation of importers, carriers, consolidators, licensed customs brokers and manufacturers to achieve its goals. Participants of C-TPAT are rewarded through less-burdensome customs procedures. To date, over 10,000 companies have applied to become members which includes virtually all of the US’ main importers (US Customs and Border Protection Website: <http://www.cbo.gov>). A list of members is not publicly available, but it has been reported that Qantas is a member of C-TPAT along with a number of key New Zealand exporters to the US.

The program became operational in March 2006 and has 22 key goals including:

- *Container integrity/security (high security seals, inspection)*
- *Physical access controls (boarding, disembarking)*
- *Personnel security (background checks, security training, process to challenge unauthorised/unidentified persons)*

(Source: <http://www.cbo.gov>)

World Customs Organisation – framework of standards to secure and facilitate global trade

The World Customs Organisation (WCO), with a lot of initial input from the US, has very much taken on board the C-TPAT and other regional initiatives to establish a framework of standards to secure and facilitate global trade. This framework was adopted by the WCO Council in June 2005 and is heralded as making world trade safer and more efficient through the international Customs community charting a common way forward. Some examples of the reported benefits will be:

- Efficiencies derived from a common global process, cost reductions and supply chain resiliency
- Shippers using advance automated trade information technologies will be granted the status of approved partners (“authorised economic operators”) by their relevant Customs authorities improving their reputation on the international marketplace
- Truly global standards of security, standardised processes, uniform data requirements and automated systems to facilitate world trade.

As of October 2006, 139 WCO member countries (including Australia and New Zealand) have expressed their intention to implement the WCO framework of standards to secure and facilitate global trade.

2.1.2 International regulation of the maritime environment

Marine pollution

It appears that international regulation of marine pollution, through the IMO’s Prevention of Pollution from Ships (MARPOL) convention, is, amongst other factors, having a positive contribution in reducing marine pollution. The IMO reports a substantial reduction in marine pollution over the last 15 years, especially oil spills and this is despite a massive increase in world seaborne trade (from around 20,000 billion tonne miles in 1994 to an estimated 30,000 billion tonne miles in 2006 – source IMO/Fearnleys). In 2004, 2.3 billion tonnes of oil was carried by sea, but only a total of 15,000 tonnes was (reported) spilt. It is expected that marine pollution will be held in check as vessel designs become safer.

Ship fuel emissions

The IMO have been tackling the issue of greenhouse gas emissions from ships through Annex VI of MARPOL and resolution A.963(23). The IMO’s Marine Environmental Protection Committee (MEPC) is identifying and developing the necessary mechanisms needed to achieve limits or reductions of fuel emissions from ships with the focus on CO₂ emissions. Special emission control areas for limiting nitrogen/sulphur oxides – namely the Baltic Sea (in 2005), North Sea and English Channel (to be fully implemented in 2007) – have been created.

There is also focus on preventing air pollution at ports caused by ships running their diesel engines for shipboard power. The idea is to have ships connected to and using land-based power only – a technique known as “cold ironing or alternative marine power (AMP)”. The technique is being used on a compulsory basis for containerships in the port of Los Angeles / Long Beach (since 2004) and is being currently recommended as a voluntary action by the European Union. However, there is lacking standardisation which makes it difficult (and costly) for shipbuilders to fit newbuildings for all circumstances. Various technical committees of international organisations (the ISO, IAPH and IMO) are studying the development of international standards defining and regulating shore-based electricity and the equipment to be used. Without these standards being developed and implemented, shore-based power supply for ships will remain sporadic and localised.

Ballast water management

The impact of introduced foreign marine species in port waters through a ship’s ballast water and hull fouling is of significant environmental and economic concern. It is estimated that three to ten billion tonnes of ballast water is transferred globally per year. This issue was first raised at the IMO by Australia in 1991 and thirteen years later (in February 2004) the International Convention for the Control and Management of Ships’ Ballast Water and Sediments (BWM) was adopted. Australia, Canada and the United States have all taken national measures to implement ballast water management procedures for international vessels. However, the required 30 countries representing 35% of the world fleet for the BWM Convention to come globally into effect is far from being reached (as of October 2006, only six countries have signed up representing less than 1% of global tonnage). In the meantime, the IMO has been producing policies and guidelines to implementing the BWM Convention and shipboard ballast water management technologies.

Ballast water management is currently an issue for Australia in that it is trying to achieve consistency and uniformity between the approach to managing international ballast water versus domestic ballast water (see section 2.2.3 for more detailed discussion).

Ship recycling

The issue of ship recycling in third world countries, with developed nations effectively transferring problematic ship-breaking operations to countries without the regulations or resources to protect workers and the local environment, has received the attention of the IMO’s Marine Environment Protection Committee (MEPC) with the goal of adopting regulations in 2008-2009.

2.1.3 International regulation of ship safety and quality

Port State Control

Port State Control (PSC) continues to play an important role in tackling sub-standard shipping (hull, machinery and crews) and safeguarding the marine environment through national ship inspection regimes and the operation of the SOLAS and MARPOL international conventions. There are a total of eight regional Memorandum of Understandings (MOUs) on PSC covering most of the world's ports and seas (Europe and North America, Latin America, Asia-Pacific, Caribbean, Mediterranean, Black Sea, Indian Ocean, and West and Central Africa). In terms of scope, the various PSC MOUs have to deal with a world trading fleet of some 46,000 ships with a combined tonnage of around 600 million gross tonnes (source – IMO as of mid-2005).

According to the IMO's 2005 annual report, the overall safety of shipping has been improving steadily for many years with the number and percentage of losses starting to dip significantly in 1980, and have continued on a downward curve ever since. IMO figures for 2003 show that the ratio of ships lost for safety-related reasons compared to the total number in the world fleet is just over 0.1%. The average number of lives lost during the past three years is around 170 per annum - a modest, but still tragic, figure compared with the 1.25 million seafarers employed on international ships.

An increasing trend in PSC inspections is the use of risk-based, targeted inspections of vessels – something which the Australian Maritime Safety Authority (AMSA) has been doing for a number of years. In the past, vessels were targeted for inspection on a fairly random basis. This allowed the operators of substandard vessels a fair amount of scope to gamble whether their ship would be inspected. Today, however, the situation has changed as PSC authorities have become increasingly sophisticated in the fight against substandard shipping with the use of complex algorithms targeting specific criteria and rewarding low-risk shipping operators. Risk-based targeting allows resources to be used more efficiently and overcome some of the financial burdens that are imposed on the PSC states. At the same time, it rewards better operated ships with less frequent inspections – which in turn serves as a bonus because of fewer delays resulting from inspections. This trend is particularly relevant for the European Union with its recent and further planned expansion. It has been recognised by the Paris MOU authorities that the requirement to inspect 25% of all vessels is no longer tenable and consequently a new risk-based inspection regime is being introduced. Arguably, the US Coast Guard's system remains somewhat less sophisticated than those of Australia and the new European Union approach.

There still remain critics of the PSC regime who claim that it imposes an inequitable financial burden on PSC states which should be borne by the flag state – particularly those found with relatively high levels of substandard shipping on their registries, often fishing vessels but also instances of cargo ships. Their argument (as expounded by the Food and Agriculture Organization of the United Nations, website: <http://www.fao.org>) suggests that flag states reap the financial benefits of registration fees, whilst PSC states are left to control and clean-up the mess of those flag states which do not properly control the quality of their fleets. This is not a criticism of PSC itself but rather it is a failure of certain Flag State regimes.

SOLAS update – long range ship tracking

It is worth noting an IMO SOLAS update which should improve the day-to-day operation of maritime safety and security policies. On January 1st, 2008, Long Range Identification Tracking (LRIT) will become mandatory for the following ships on international voyages: passenger ships, cargo ships of more than 300 gross tonnes, and mobile off-shore drilling units. SOLAS contracting governments will be sanctioned to receive about a ship's identity, location and time of the position up to 1,000 nautical miles off their coast (IMO website: <http://www.imo.org>).

2.1.4 International regulation of liner shipping competition

Over the last decade, many governments have revisited the treatment of liner shipping under competition law: the United States, Canada, the European Union and certain Asian countries have all made or prefigured major changes to their regulatory regimes over the last decade, and in Australia, the Productivity Commission recommended major changes to Part X of the Trade Practices Act of which only a few have implemented by the Australian federal government (this is discussed further in the report).

The following provides a short commentary of the most recent situation and developments in the United States, Europe and Asia which have been or are focussing on the regulation of liner shipping competition as a result of the significant policy changes introduced to US trades by the US Ocean Shipping Reform Act (OSRA) in 1998.

United States

Regulation of liner shipping in US foreign trades is the responsibility of the Federal Maritime Commission (FMC) as underpinned in the Shipping Act of 1984.

A major reform of the "1984 Act" occurred with the Ocean Shipping Reform Act (OSRA) of 1998 which was implemented by the FMC on 1st May, 1999. OSRA, four years in the making, represented a compromise between industry players and provided substantial de-regulation by transforming a highly regulated, common carriage system into a more flexible one of individualised, one-on-one confidential transportation contracts between carriers (shipping lines) and shippers (exporters/importers). OSRA continued the system of carrier agreements but with governmental safeguards and monitoring. A review of the impact of OSRA by the FMC in 2001 concluded that OSRA is achieving its objective of promoting a more market-driven, efficient liner shipping industry.

Europe

The European Commission has been in the process of reviewing block exemptions for conferences and discussion agreements (see footnote six for definition) for some time. In general, there has been a notable shift away from the blanket protection provided by the European Regulations. The current regime consists of two separate block exemptions:

- An exemption covering consortia¹

¹ Article 1 of the Commission Regulation (EC) 870/95 defines a consortium as: an agreement between two or more vessel operating carriers which provide international liner shipping services exclusively for the carriage of cargo, chiefly by container, relating to a particular trade and the object of which is to bring about cooperation in the joint operation of a maritime transport service, which improves the service which be offered individually by each of its members in the absence

- An exemption covering conferences²

Commission Regulation (EC) No 823/2000 of 19 April 2000 affords block exemptions for liner shipping consortia - this regulation is a continuance of Commission Regulation (EC) 870/95. The most recent review, undertaken in 2005, reaffirmed the position that in general, consortia help to improve the productivity and quality of liner transport services offered to transport users. The EC also renewed the block exemptions of consortium up to 2010.

On the other hand, the EU has made clear its intention to abolish, in 2008, the block exemptions covering conferences. At present, conference exemptions are covered for under Commission Regulation (EC) 4056/86; however, even if this is abolished, consortia will be able to form and reform without seeking authorisation from competition authorities – provided they do not drift above the market share threshold set by the EU.³

Asia

Despite some agitation from shippers councils, Asian governments have generally adopted a more permissive attitude to liner shipping conferences than European and North American governments.

Japan

Japan has historically —and continues to— supported the continuance of protectionism for ship-owner agreements. The Japanese Government accepts that the formation and operation of conferences are a necessary part of providing stable shipping services to Japan. The *Marine Transportation Law 1949* governs the regulations pertaining to conference liner shipping in Japan. It was last amended in 2000 and covers all forms of agreements. The act grants immunity from the Act Concerning Prohibition of Private Monopolisation and Maintenance of Fair Trade.

Singapore

Historically, Singapore has taken a *laissez faire* stance on general competition policy; however, in early 2006, the Singapore Competition Commission recommended that the Singapore Government should exempt categories of scheduled international cargo liner agreements. The block exemption orders cover consortium, conference and discussion agreements. Essentially, block exemptions are permissible where a consortium or conference operates with up to 50 per cent of the potential market share on a particular trade route.

As such, Singapore is in a tenuous position - over 80 per cent of the containers moving through Singapore is transshipment cargo. Arguably, any harsh or burdensome conference liner competition policy would lead to shipping lines moving their operations to the nearby ports in Malaysia. Consequently, the relatively relaxed market-share threshold of 50 per cent was adopted – ensuring that the laws would only be invoked in extreme circumstances of lack of market competition.

of an consortium, in order to rationalize their operations by means of technical, operational and/or commercial arrangements, with the exception of price fixing’.

² The 1974 UNCTAD Code of Conduct for Liner Conferences defines a conferences as: ‘a group of two or more vessel-operating carriers which provide international liner services for the carriage of cargo on a particular route or routes within specified geographical limits and which has an agreement or arrangement, whatever its nature, within the framework of which they operate under uniform or common freight rates and any other agreed conditions with respect to the provision of liner services’.

³ The market share threshold for conference participants is 30 per cent and the 35 per cent for non conference participants.

2.2 Developments in the domestic legislative/regulatory environment

The domestic arena has also seen recent developments on the legislative and regulatory front, some of which are in direct response to international developments (for example implementing ISPS through the Maritime Transport Security Act 2003, and international conventions on fishing vessel safety) and others which are more ‘home-grown’ (reform of the Navigation Act 1912, the Productivity Commission’s review of Part X and the federal government’s response, Australian Competition and Consumer Commission’s monitoring of container stevedoring performance and the impetus for more competition through a third player, cabotage aspects relating to the rise and fall of PAN Shipping, etc.).

2.2.1 Australian maritime security

Australia, like the rest of the world, had its perceptions on national security dramatically altered by the events of 11th September, 2001. In response, by December 2002, the international community, through the International Maritime Organisation (IMO), had developed the International Ship and Port Facility Security (ISPS) Code. The Australian Government passed the Maritime Transport Security Act 2003 (the Act), which implemented the requirements of the ISPS Code in Australia, and introduced additional measures beyond the original scope of the ISPS Code in a number of key areas. Both the ISPS Code and the Act came into effect on 1st July, 2004. It was generally felt in the industry that the introduction of the Act and its associated regulations went reasonably smoothly with only a handful of ships not initially having an International Ships Security Certificate (ISSC) as required by the ISPS Code. All ports, port facilities and port services providers who were required under the Act to take on security responsibilities also met the 1st July 2004 deadline. The Act and its associated regulations underpin a preventive maritime security regime, which is administered by the Department of Transport & Regional Services (DOTARS), through the Office of Transport Security (OTS).

In 2004, an Australian Government Taskforce on offshore maritime security concluded that there was also a need to regulate the security of Australia’s offshore oil and gas facilities, which contribute significantly to Australia’s economy. As a result, in 2005, the Australian Government extended coverage of the Act to the offshore oil and gas industry, with DOTARS responsible for preventive security and Border Protection Command (formerly known as Joint Offshore Protection Command) responsible for surveillance, response and recovery. The amended legislation is now entitled – the Maritime Transport and Offshore Facilities Security Act 2003.

There are 557 maritime industry participants operating 71 ports, 57 ships and 66 offshore facilities who are required, under Australia’s maritime security regime, to undertake a risk assessment and develop and implement a security plan which addresses identified risks.

Further enhancements to the maritime security regime since this time have included:

- Provision of additional move-on powers to maritime security guards, and to simplify the security plan approval process
- Implementation of the Maritime Security Identification Card (MSIC) scheme. From 1st January 2007, all persons requiring unescorted or unmonitored access to a maritime security zone must have an MSIC. Around 65,000 people will require an MSIC.

- A 24/7 Security Operations Centre in Canberra to respond to maritime security events and incidents, and issue control and security directions to maritime industry participants.

The Australian Customs Service (ACS) in conjunction with the Australian Defence Force have established the Border Protection Command (BPC). The BPC seeks to use airborne and maritime assets to respond to maritime and offshore security incidents, as well as conduct normal border protection activities to contend with illegal immigration, and unlawful fishing in Australia's Exclusive Economic Zone (EEZ). The BPC's Australian Maritime Identification System (AMIS), when fully operational, will provide a comprehensive awareness of Australia's maritime domain and will consolidate the collection of information from ships intending to visit Australian ports.

To date, the ACS have also received funding for additional enhanced maritime security measures such as:

- expanded coverage of risk assessed import containers from 5 to 7% at Customs Container Examination Facilities
- increased the percentage of first port boarding of vessels by Customs from 70 to 80%
- upgraded Customs Closed Circuit Television (CCTV) facilities at certain ports
- cross-checking of passengers on roundtrip cruises, increased general intelligence gathering, and development of a specific regime for High Consequence Dangerous Goods.

Government at the State and Territory level have worked cooperatively with the Border Protection Command in negotiating the development of counter-terrorism prevention and response arrangements for the maritime environment.

In support of the development of the enhanced national maritime security environment, some jurisdictions have been conducting reviews of their maritime security arrangements. In addition, some States have also enhanced their maritime protective security and response arrangements through significant equipment purchases and increased water police capability.

It is worth noting that the Australian government has already allocated over A\$ 3 billion for domestic security for the period 2001-2008. There has also been much debate about the real costs and benefits of security with the government stating that it is a "cost of doing business".

2.2.2 Fishing vessel safety

The IMO has asked its member states to take action to improve fishing vessel safety, particularly to bring into force and implement the 1993 Torremolinos Protocol for the Safety of Fishing Vessels and the International Convention on Training, Certification and Watch-keeping for Fishing Vessels 1995 (STCW).

DOTARS has raised this issue with Australian State and Territory marine administrations through the AMG forum and is working with AMSA to promote consideration of Australia's adoption of these treaties.

2.2.3 Reform of the Navigation Act 1912

The Navigation Act 1912 is the primary Commonwealth legislation regulating ship safety and the operational aspects of pollution prevention. It includes ship construction standards, survey and safety of ships, crewing and seafarer qualifications, cargo and passengers and the licensing of coastal pilots. It was subject to a general review under the national competition principles, which reported in 2000. A similar review had been completed in 1997 of the Shipping Registration Act 1981, which governs AMSA's administration of the Register of Australian Ships. While several recommendations from these reviews had been implemented, the legislation had not been comprehensively reformed and restructured to reflect more modern regulatory approaches.

DOTARS and AMSA formed a working group in late 2005 under the supervision of senior executives, to work on a major reform of the Navigation Act 1912 based on the recommendations of the 2000 review of the Act and implementation of amendments to the Shipping Registration Act 1981 flowing from its 1997 review. A discussion paper was released by DOTARS in July 2006 canvassing major issues being considered by the review team and inviting preliminary comment by interested parties, with a view to more intensive consultations with representative organisations in the maritime industry commencing in early 2007. The intention is to begin drafting new legislation in 2007 with the aim of its introduction to Federal Parliament in 2007/2008.

2.2.4 Australian port state control – the work of AMSA

The management of national and international ship safety in Australia is conducted by the Australian Maritime Safety Authority (AMSA) which carries out inspections of vessels and crews visiting Australian ports for seaworthiness and safety according to national law and international obligations (IMO SOLAS/MARPOL, Port State Control, etc.). AMSA also cooperates regionally as part of the Tokyo (the Asia area) and the Indian Ocean Port State Control (PSC) memorandums of understanding which have as part of their goals the eventual elimination of sub-standard shipping and crews as a means of protecting the marine environment and human safety.

In terms of the recent PSC work of AMSA, the following key points were reported in their 2005 PSC statement of activities:

- AMSA's objective is to inspect at least 50% of vessels visiting Australian ports – this figure based on the number of eligible (risk profiled) ships visiting during a given year
- There were 20,265 foreign-flag port visits, of which 41% bulk carriers and 21% container ships, made by 3,593 unique foreign-flag ships
- AMSA's 42 surveyors inspected 3,072 vessels in 55 ports, of which 59% bulk carriers, and recorded 7,980 deficiencies for the total 3,072 vessels inspected
- Out of the 3,072 vessels inspected, 154 (5%) were detained due to the seriousness of their deficiencies – of these 154, 104 were bulk carriers and 15 container ships
- Incidencies of deficiencies show that there has been a steady and major decline over the last seven years in deficiencies related to a ship's structure and operating equipment; whilst human and ship management deficiencies have risen slightly in the last two years

- As with previous years, visits by foreign-flag vessels to Australian ports continued to rise, and despite this trend, AMSA was still able to meet its inspection targets for each risk category of vessel.

As can be seen from the above facts, AMSA PSC continues to provide an important contribution to the protection of both the marine environment and the safety of crews – nationally and regionally.

AMSA leads the world in the introduction of a ship inspection targeting system aimed at improving the risk assessment of each foreign flagged ship visiting an Australian port. This system allocates a risk rating of a foreign ship based on age, type, size and its previous inspection record. Ships with a higher risk rating are targeted for inspection, which increases the likelihood of AMSA’s identification of the small proportion of visiting ships that are unseaworthy and are detained by AMSA until major safety deficiencies are addressed. The risk-based system allows AMSA to make informed decisions about the level and allocation of its inspection resources at commercial ports around Australia to best address the risks presented by each port’s shipping profile. Risk-based performance indicators have been adopted to show stakeholders that sufficient priority is being given to the inspection of higher-risk ships.

AMSA is undertaking further refinement of the ship inspection targeting system and has commissioned the CSIRO to examine the feasibility of incorporating further factors such as the ship owner, operator or charterer, which may be relevant to the system’s risk assessment formula. AMSA also is considering tailoring inspections to take into account the risk factors for the particular type and age of ship. For instance, a newer ship is less likely to have structural deficiencies so greater attention could be given during an inspection to operational matters, such as crew familiarity with the ship’s systems and procedures. AMSA is promoting adoption of inspection targeting on the basis of risk assessment in international forums.

It should be noted that the States also have jurisdiction of certain vessels trading exclusively intra State; however, the focus of this report has been on the activities of the main player - AMSA.

2.2.5 Australian marine environment

The following section concerns important developments in Australian marine environmental matters, specifically:

- National maritime emergency response arrangements
- National System for ballast water management
- Great Barrier Reef and Torres Strait compulsory pilotage scheme
- Marine fuel CO₂ and other gas emissions at sea and in port
- Harmful anti-fouling systems
- Liability for bunker oil pollution
- Oil pollution compensation
- Hazardous and noxious substances.

National maritime emergency response arrangements

Following the 2004 House of Representatives' Standing Committee on Transport's report Ship Salvage, the Australian Government decided in 2005 to establish the National Maritime Emergency Response Arrangements (NMEMA). AMSA had primary responsibility for implementation of the major elements of NMEMA. State and Northern Territory Governments agreed to the arrangements through the Australian Transport Council meeting in November 2005.

The major elements of the NMEMA are:

- Establishment of a dedicated emergency towage vessel in the northern Great Barrier Reef and Torres Strait region
- Contracting with commercial providers for an agreed level of emergency towage services to be available in other regions around the Australian coast
- Coordination, monitoring and regulation of the arrangements by AMSA, including legislative changes to allow AMSA to nationally coordinate responses to shipping incidents involving significant pollution risks
- Recovery of the full costs of the emergency towage arrangements from the shipping industry through the Protection of the Sea Levy, which is administered by AMSA to fund its marine environment protection functions.

AMSA completed contracts for the provision of emergency towage services around Australia by 30th June 2006 in compliance with NMEMA through a series of competitive tenders:

- Australian Maritime Systems Ltd was awarded the contract in December 2005 for providing the dedicated emergency towage vessel ETV Pacific Responder in the Great Barrier Reef and Torres Strait. The service commenced on 1st July 2006
- RiverWijs-Dampier Pty Ltd was awarded the contract in May 2006 for providing emergency towage services in the north Western Australian region with availability of a fleet of four ocean-going tugs based at Dampier. The service commenced on 1st June 2006
- Adsteam Marine Pty Ltd was awarded the contract in June 2006 for providing emergency towage services in the remaining seven regions, including the Northern Territory, southern Western Australian, South Australian, Victoria/Tasmania, New South Wales, southern and northern Queensland regions. The service commenced on 1st July 2006.

AMSA appointed a Maritime Emergency Response Commander (MERCOC) in November 2005 to manage the emergency towage arrangements and act as decision maker in the case of a shipping incident.

Legislative amendments to the Commonwealth Protection of the Sea (Powers of Intervention) Act 1981 came into effect on 23rd May 2006 to allow the Australian Government through AMSA to respond to a shipping incident involving potential or actual significant marine pollution.

The Protection of the Sea (Shipping Levy) Act 1981 was amended with effect from 4th October 2005 to remove the cap on the rate of levy, in line with the Australian Government's decision supporting full cost recovery from the shipping industry of the NEMRA. The then Minister for Transport and Regional Services announced in May 2006, as part of the 2006 Federal Budget, that there would be no increase in the levy rate during 2006-2007. AMSA is funding the emergency towage component from its accumulated surplus and cash reserves with the aim of minimising the costs to the shipping industry and allowing for their planning and budgeting for the levy rate rise in future years. A staged increase in the levy rate is proposed over the next three financial years with the aim of achieving full cost recovery in 2009-2010.

Ballast water management – the National System

Australia is at the forefront of preventing the introduction of marine pests through the discharge of ballast water taken up in overseas waters. In 2001, the federal government implemented a mandatory ballast water exchange program under the banner of the *Quarantine Act 1908*, and, in 2004, signed the International Convention for the Control and Management of Ships' Ballast Water and Sediments which is still subject to (international) ratification⁴. The ballast water (and biofouling) management schemes for international vessels are administered by the Australian Quarantine and Inspection Service (AQIS) with strategic and developmental aspects managed by the Australian Department of Agriculture, Fisheries, and Forestry (AFFA).

However, since 2004, it has become apparent that the management of domestic ballast water separately from international ballast water cannot be carried forward. Domestic ballast water management is the responsibility of state governments, whilst international ballast water management is a commonwealth government affair. The same vessels can be carrying both domestic and international ballast water (particularly containerships) and procedures/costs for domestic ballast water can vary by state. The Victorian state government (through its Environmental Protection Agency) has taken a proactive stance on ballast water management (mandatory advanced reporting) which appears divergent to the preferred methodology being proposed by the commonwealth government for the National system (being minimised advanced reporting with the focus on profiling and the targeting of vessels for inspection).

The principle outlines for the new system have been agreed at an inter-governmental level and the drafting of the detail of the system is due to be completed in early 2007 by working/steering committees as facilitated by AFFA. Given agreement on the detail, the implementation phase is planned to commence in 2007.

⁴ This does not bind Australia to ratify the Convention, or to the terms of the convention. However, it does give rise to a general obligation to refrain from acts which would defeat the object and purpose of the Convention.

Great Barrier Reef and Torres Strait – compulsory pilotage scheme

The IMO agreed to the extension of the Great Barrier Reef Particularly Sensitive Sea Area (PSSA) to include the Torres Strait in 2003 and in July 2005, the IMO adopted a resolution endorsing the joint submission by Australia and Papua New Guinea for the PSSA associated protective measure to extend the system of pilotage in the Great Barrier Reef to the Torres Strait. The new requirements for compulsory pilotage in Torres Strait became effective on 6th October 2006 and reduces the risk of marine accidents in this sensitive and unique marine environment.

However, an emerging problem concerns finding the next generation of marine pilots for this area and for harbour pilotage in Australia as over half of Australian pilots are over 51 years of age. AMSA is working with other marine administrations through the Australian Maritime Group (AMG) to address new approaches to the recruitment and training of marine pilots.

Marine fuel CO₂ and other gas emissions – at sea and in port

Reducing marine fuel CO₂ and other gas emissions is part of the wider debate and actions on global warming which is receiving increasing prominence, particularly after the recent release of the Stern economic review on climate change as commissioned by the UK government. The impetus being gathered by the IMO, European Union, and the state of California in the US suggests that the connecting of ships to land-based power whilst in port (California) and the creation of nitrogen/sulphur oxides emission control areas in Europe (Baltic Sea, North Sea and English Channel) are developments which Australia will need to plan and regulate for in the near future.

In December 2006, the Maritime Legislation Amendment (Prevention of Air Pollution from Ships) Bill 2006 was introduced to Federal Parliament seeking to implement Annex VI to the MARPOL Convention international law. Annex VI sets limits on sulphur oxide and nitrogen oxide emissions from ship exhausts and prohibits deliberate emissions of ozone depleting substances. Annex VI also allows for special sulphur oxide emission control areas to be established with more stringent control of sulphur emissions. Both the Baltic Sea and the North Sea are designated as such control areas.

Harmful anti-fouling systems

The IMO's International Convention on the Control of Harmful Anti-fouling Systems on Ships 2001 was signed by Australia, subject to ratification, on 19th August 2002. The Convention provides that by an effective date of 1st January 2003, all ships shall not apply or re-apply organo-tin (e.g. Tributyltin or TBT) compounds, which act as biocides in anti-fouling systems. By 1st January 2008, ships either shall not have such compounds on their hulls or external surfaces or they will have a coating that forms a barrier to such compounds leaching from the underlying non-compliant anti-fouling system. The Convention will enter into force twelve months after 25 States representing 25 per cent of the world's merchant shipping tonnage have ratified it. It is expected to come into force internationally in the near future.

The Protection of the Sea (Harmful Anti-fouling Systems) Act 2006 was passed by Federal Parliament in September 2006 aimed at enabling Australia to ratify the Convention and implement it into national law.

Liability for bunker oil pollution

The IMO International Convention on Civil Liability for Bunker Oil Pollution Damage 2001 was signed by Australia, subject to ratification, on 23th September 2002. The Convention provides for shipowners to be strictly liable for fuel oil spills and requires them to carry compulsory insurance to cover any pollution damage following a fuel oil spill. It was tabled in both Houses of Federal Parliament in March 2006 and the Joint Standing Committee on Treaties report in August 2006 supported the Convention and recommended that binding treaty action be taken by Australia.

DOTARS is progressing legislation for introduction into Federal Parliament in 2007/2008 to implement the Convention into national law, subject to the Australian Government's legislative priorities, so it can be applied as soon as it enters into force internationally.

Oil pollution compensation

The IMO Supplementary Protocol of 2003 to the International Convention on the Establishment of an International Fund for Compensation for Oil Pollution Damage 1992 is aimed at ensuring full compensation is available to victims of oil pollution damage from tankers where the total amount payable under the existing compensation regime is insufficient. The Protocol entered into force internationally on 3rd March 2005. It was tabled in both Houses of Federal Parliament in March 2006 and the Joint Standing Committee on Treaties report in August 2006 supported the Protocol and recommended that binding treaty action be taken by Australia.

DOTARS is progressing legislation for introduction into Federal Parliament in 2007/2008 to implement the Protocol into national law, subject to the Australian Government's legislative priorities.

Hazardous and noxious substances

The IMO International Convention on Liability and Compensation for Damage in Connection of Hazardous and Noxious Substances by Sea 1996 (HNS Convention) will enter into force when ratified by twelve States, including four States each with two million gross tonnes of shipping. It is expected to enter into force internationally by 2009/2010. The Convention is based on the two-tier compensation system already applying to oil spills under existing conventions. In addition to pollution damage, it also covers risks by fire and explosion, including loss of life and loss or damage to property. Liability will be shared by shipowners and they will have to provide evidence of insurance. Cargo interests will pay a levy into the HNS fund to be established under the Convention.

DOTARS re-engaged with other Australian Government agencies, State and Territory maritime administrations and the chemical and shipping industries during 2006 with a view to developing a final position on whether Australia should ratify the HNS Convention.

2.2.6 Australian maritime economic regulation

The following section on important developments in Australian maritime economic regulation specifically covers the topics of:

- Liner shipping competition – the review of Part X
- Port competition – Council of Australian Government's (COAG) national reform agenda

- Container stevedoring performance and competition – Australian Competition and Consumer Commission (ACCC) monitoring
- Cabotage – the regulatory impact of the rise and fall of PAN Shipping
- Maritime jurisdiction challenges – the handling of crimes outside national waters.

Liner shipping competition – review of Part X

Australia's international liner cargo shipping regulatory regime is contained within Part X of the *Trade Practices Act 1974* (Commonwealth). The Act outlines instances where shipping companies, operating on international routes, are permitted to form conferences. Essentially, the provisions have remained unchanged since the Act was assented in 1974.

On 23 June 2004, the Parliamentary Secretary to the Federal Treasurer initiated a review to be conducted by the Productivity Commission. In short, the Commission's report—released in October 2005— suggested the abolition of Part X being significantly influenced by the US Ocean Shipping Reform Act (OSRA) 1998, and moves by the European Commission to abolish competition exemptions for shipping conferences. However, this has not been fully acted upon by the federal government.

Essentially, the Productivity Commission suggested that significant changes have taken place in liner shipping markets since its last review and thus, Part X should be rescinded and liner shipping arrangements should be subject to the general authorisation provisions in Part VII of the act for the following reasons:

- Part X of the *Trade Practices Act* runs counter to the general provisions of the *Act*
- The shipping lines should be the ones to prove the case for keeping Part X (in other words allowing the continuation of the traditional forms of cooperation)
- There is no conclusive evidence that the agreements sanctioned by Part X provide significant public benefit
- There has been a move away from blanket protection afforded to conferences and consortia in the United States and the European Union
- There is nothing particularly special about the liner shipping industry: deregulation in other industries with similar market characteristics in Australia has not lead to severely detrimental outcomes

Following the release of the Productivity Commission's report, the federal government announced on 8 August 2006 that some alterations to Part X would occur, the main points being:

- *Clarification of its objectives*
- *Removal of discussion agreements⁵ from its scope*
- *Protect individual confidential service contracts between carriers and shippers*
- *Introduction of a range of penalties for breaches of its procedural provisions*

Source: The Commonwealth Treasurer's website: <http://www.treasurer.gov.au/tsr/content/pressreleases/2006/081.asp>

The largest impact on carriers will be the abolition of (rate and capacity management) discussion agreements, whilst shippers should now find themselves with more 'client-focussed' carriers and the ability to individually negotiate confidential freight contracts according to more normal market mechanisms.

Port competition – COAG's national reform agenda

The 17th meeting of COAG was held on 10 February 2006. One of the items discussed as part of the national reform agenda was competition policy reform covering, amongst other items, transport and infrastructure regulation and planning (COAG 2006 p4).

The aim of this agreement is to work toward a nationally consistent system of economic regulation for nationally-significant infrastructure — which in turn will promote the efficient use of this infrastructure and reduce compliance costs for owners, users and investors (COAG 2006 p5).

The agreement stated that each state and territory would review its regulation of ports and port authority, handling and storage facility operations at significant ports to ensure it conforms with the new access, planning and competition principles (COAG 2006 p6).

This development by COAG may well provide the impetus for future changes in state government policy towards port competition, particularly in terms of harmonisation at the national level.

Container stevedoring performance and competition – ACCC monitoring

Both the BTRE, with their six-monthly Waterline publications, and the ACCC have been monitoring container stevedoring performance in the main container ports. The ACCC's most recent monitoring report (number 8, issued November 2006) analysed the financial year 2005/2006 and presented the following key findings regarding container stevedoring performance, prices, costs and profits at the ports of Adelaide, Brisbane, Burnie, Fremantle, Melbourne and Sydney:

- Productivity levels have decreased, albeit marginally to an average five-port ship rate of 45 containers per hour, and an average five-port crane rate of 27 containers per hour
- Unit total revenue and unit total costs increased to A\$ 180 and A\$ 137 per TEU respectively

⁵ Discussion agreements (or stabilisation agreements) provide a forum for carriers to discuss and share commercial information relevant to a specific trade route. Such agreements often including both conference and non-conference lines, and may reach a non binding consensus over, for example, the charging of rates, surcharges, and a variety of service arrangements (Productivity Commission 2005, pXXI).

- Unit margins increased to A\$ 43 per TEU
- Profitability fell but remains high (above analysed overseas levels) at an average rate of return for Australian stevedores of 21.7%
- The industry's asset base continued to expand (18% increase) which is expected to result in additional capacity
- Stevedores and port managers are responsible for various aspects of stevedoring capacity. The benefits that can arise from competition both for and in the market for stevedoring services should not be underestimated when options for port expansion are considered
- A more proactive approach by port managers to managing certain land-side logistics arrangements may be necessary to ensure that the land-side interface does not emerge as a transport bottleneck.

The ACCC also noted the industry's view on container terminal capacities being limited by maximum achievable berth productivities with P&O Ports (now DP World) providing the view that current berth productivities in Australia are limited at around 1,200 TEU per metre of quayline and that with available automation introduced to all terminals this could increase to a maximum of 1,700 TEU per metre of quayline. The Port of Melbourne currently states that its berth productivity limit is around 850 TEU per metre of quayline (Swanson Dock) and that it predicts a level of 1,500 TEU per metre of quayline by 2017.

In terms of competitive developments, it appears that state governments are gradually, albeit cautiously, shifting policy (or exploring avenues) towards increasing competition in the container stevedoring sector in the main ports. Fremantle had offered the possibility of two of its inner harbour berths to the shipping line, Mediterranean Shipping Co (MSC), but this has recently been superseded by the port's decision to exclusively use the berths for breakbulk cargo handling. In August 2005, the New South Wales ports Minister – Joe Tripodi – announced that P&O Ports (now DP World) and Patricks (now Toll) would be excluded from bidding for the tenancy of Port Botany's third container terminal; whilst Brisbane recently opened bidding for its two new berths at Fishermans Island to third parties awakening both national and international interest with the result that the port has chosen the global terminal operator, Hutchison Ports Holdings, as its preferred operator.

Cabotage – regulatory impact of the rise and fall of PAN Shipping

Since 1998, the federal government has effectively liberalised and streamlined the issuing of permits to foreign vessels for the transportation of domestic cargoes due to a lack of an adequate Australian coastal fleet to service the freight task. This has resulted in a steady increase in domestic cargoes carried under permit by foreign vessels. These developments are discussed and quantified further in section 6.8 below.

However, the rise of the coastal container shipping operator, PAN Shipping, in 2005 activated administrative procedures which were largely just a formality and required clarifications by the federal government as to the interpretation of certain operational aspects of the permit system. PAN Shipping was close to capturing the coastal container permit market by introducing a weekly East-West service (Fremantle, Adelaide, Melbourne, Sydney) with three vessels but serious technical problems with the chartering of the second vessel (it was found by AMSA to be unseaworthy), and other market factors, eventually led to the fall and closing of PAN Shipping in October 2006. The coastal container market is once again being exclusively operated by foreign ships under the permit system.

2.2.7 Australian maritime legal jurisdiction

Plans for new legislation dealing with criminal acts committed at sea are currently under consideration as a result of the inquest into the death of Diane Brimble aboard P&O's cruiseship, Pacific Sky, in 2002. At present, when a vessel is outside territorial waters, the jurisdiction for any crime committed lies with the country or state where the vessel is registered. However, the Federal Government stated: 'Crimes occurring outside of Australia's waters involving Australians would have to be reported' (The Australian Wednesday, 9th August 2006). To date there have been no further advancements, but it remains an area of possible new legal developments.

2.3 Conclusions

Over the last ten years, and certainly recently, it is evident that there have been numerous developments in both the international and domestic legislative and regulatory environment. Many of the domestic legislative and regulatory developments have been responses to changes in the international shipping and ports situation, particularly the implementation of new or amended International Maritime Organisation (IMO) conventions to which Australia is often a signatory.

Since 2001, both the international community, lead by the United States, and Australia have focussed considerable effort and resources on tightening ship, port and supply chain security (the ISPS Code, etc.). The legislative aspects of this have been completed and should now fall off the priority list. However, there still remain operational aspects relating to container security which need to be monitored particularly if moves by United States' politicians lead to the requirement for blanket (100%) pre-arrival X-ray screening of US bound containers at foreign loading ports – something which would impact significantly on port and supply chain efficiency. The apparent taking over of the lead role on supply chain security by the World Customs Organisation (WCO) should help safeguard the more practical aspects of container supply chain security, but this is not a certainty.

The protection of the marine environment, reduction of air pollution and the role of maritime transport within global warming as a whole are items which are likely to have higher priorities than before and will certainly have national policy implications. A number of the IMO marine environmental protection initiatives have been picked up by the Australian government (ballast water management, prevention of air pollution from ships, and harmful anti-fouling systems on ships), but the growing need for more drastic measures (including the establishment of a mandatory global carbon trading system) will certainly require new or amended national policy initiatives relating to shipping and ports. The general lack of land-based powering of ships when in Australian ports and the lack of regulations specifying the types of fuel to be used whilst in Australian waters are cases in point.

The regulation of ship safety and quality appears to be well in hand with the Australian Maritime Safety Authority (AMSA) taking a leading role in the effective administration of the international Port State Control (PSC) regime as well as taking primary responsibility for implementing the new National Maritime Emergency Response Arrangements (NEMERA).

As far liner shipping competition policy is concerned, it would appear that necessary major reforms at both the international (United States and the European Union) and national level have been undertaken and implemented. However, this general climate of lower tolerance of liner conference activity may well create the effect of reinforcing mergers and acquisitions amongst the carriers as traditional forms of cooperation and trade management become increasingly difficult.

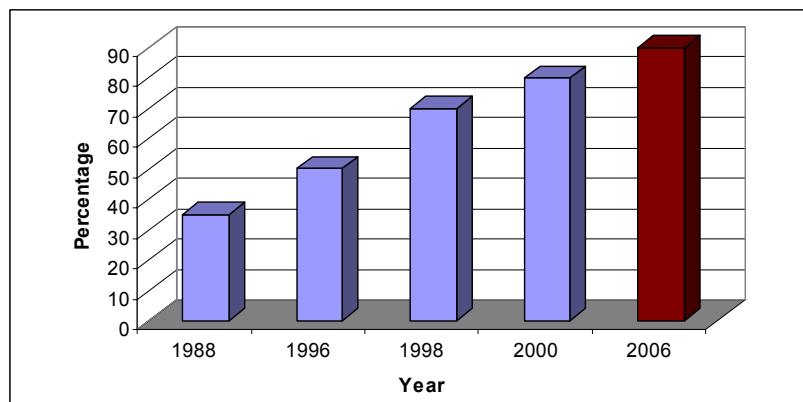
A focus in Australia is now on looking at avenues for increasing competition in the stevedoring sector at the main container ports. As such, port policy remains very much the domain of the state governments with some governments (notably NSW and Queensland) taking a more proactive stance on allowing increased competition in the bidding for the operation of new container terminals. It is unclear whether the Council Of Australian Governments (COAG) national reform agenda (2006) on competition policy will succeed in harmonising the various state government policies on port competition, as there appears to be a lack of momentum at present, but this could be potentially an area of future focus.

3. DEVELOPMENTS IN THE SHIPPING, PORTS AND LOGISTICS INDUSTRIES

3.1 Industry ownership

Ownership in liner shipping has been moving at a rapid pace following the trend of increasing globalisation. The recent acquisition of ANL by CMA-CGM, of P&O Nedlloyd by Maersk Line, and the acquisition of CP Ships (owners of Contship, Lykes and ANZDL brands) by Tui AG, the parent company of Hapag Lloyd, has transformed liner shipping services to Australia. It has meant the break-up and re-alignment of numerous alliances and vessel operating agreements. These developments are only three of a large number of mergers and acquisitions that have seen the share of full cellular containership capacity controlled by the top twenty container lines increase from around 40% in 1990 to almost 90% today. But structural change in the shipping industry has been more complex than simply increasing horizontal concentration. Vertical integration into terminals, storage and distribution has meant large liner shipping companies such as Maersk, NYK and APL are now also major global players in landside logistics operations. The forms of collaboration between shipping lines have also changed, with traditional conferences giving way to global operating alliances, and discussion agreements. In Australia, the Government has recently prohibited discussion agreements between carriers (as explained in detail in section 2.2.3 above).

FIGURE 1: CONSOLIDATION IN THE LINER SHIPPING INDUSTRY – MARKET SHARE OF THE TOP 20 CARRIERS



Source: Meyrick and Associates, based on Containerisation International data

Ownership in the bulk shipping sector remains diverse with some consolidation occurring but not to the same degree as in the liner shipping sector. Bulk shipowners continue to expand/contract their presences in the various bulk sectors and vessel size classes depending on supply-demand balances and movements in the spot- and time-charter markets. The expectation is that these trends in bulk shipping ownership will continue in the same way in the future.

Ownership in the stevedoring sector, particularly in the third-party container terminal market (i.e. non-carrier and non-port authority operations) has been and continues to be extremely dynamic with rapid takeovers and industry consolidation creating a top-tier of third-party stevedores with truly global reach – PSA International (20 ports in 11 countries), Hutchison Port Holdings (43 ports in 15 countries), and DP World (51 terminals in 24 countries, after absorbing P&O Ports). Indeed further consolidation or partnering can be envisaged with the recent acquisition of a substantial stake of Hutchinson Port Holdings by PSA International. The rationale for the top-tier of international stevedores has been the desire to be able to offer a global stevedoring product to shipping lines particularly linked network hubs (transshipment centres/main-ports)

The Australian container stevedoring market has seen the ownership of both its stevedores recently change hands as part of industry consolidations – the global P&O Ports becoming part of DP World, and Patricks part of the Toll organisation. Toll’s rationale for acquiring Patricks was one of integrating and controlling the door-to-door supply chain to achieve greater efficiencies. A third container stevedore is trying to break into the Australian market, AICT (part of the ICTSI Group), but is meeting resistance from the existing players on the grounds with the argument that the market is too small for a third player. However, the door appears to be opening with Sydney and Brisbane ports allowing bids to be made by companies other than Toll and DP World for a number of new container berths. Indeed the Port of Brisbane has recently announced its decision to accept Hutchinson Port Holdings as its preferred operator of the two new berths on Fishermans Island.

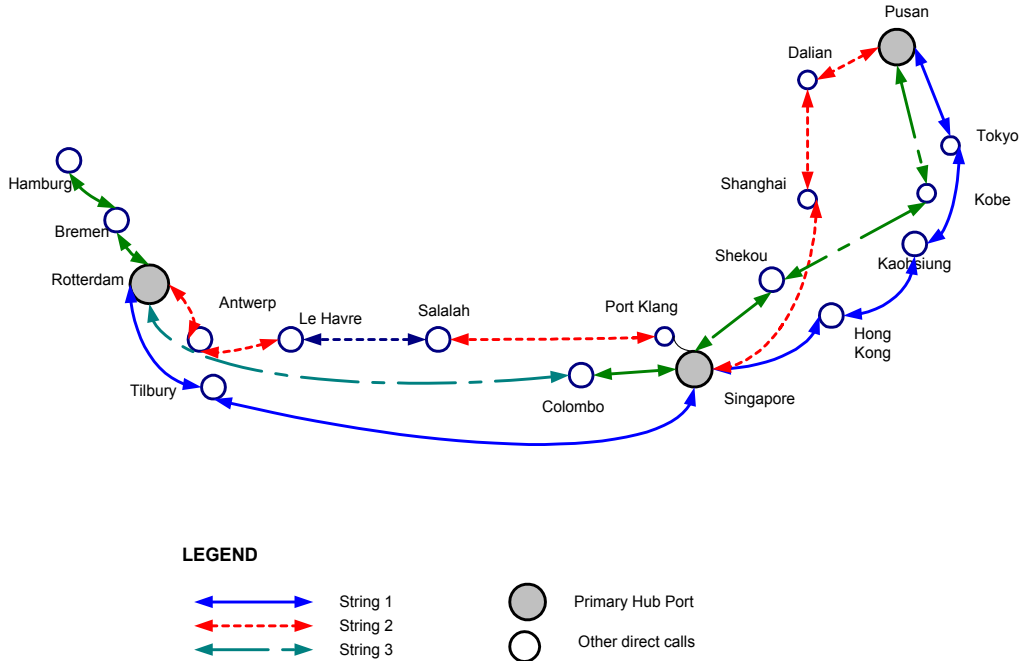
It should not be forgotten that, at the same time, carriers have been expanding their global operation of container terminals by partnering with port authorities and local stevedores – notable carriers being A.P.Moller (Maersk Line), MSC, CMA-CGM, COSCO and Evergreen.

3.2 Shipping operations and services

3.2.1 Liner

Predictions made by many in the early 1990s that the advent of very large container ships would transform the global liner shipping system into a singular network of hub-and-spoke operations have turned out to be misguided. Empirical work undertaken by Meyrick on global shipping patterns has shown that the reality is far more complex: while transshipment has, as expected, increased its share of a fast growing market, it is also true that more ports than ever before receive direct calls from major inter-continental services. Statistics from various sources on port container traffic shows that current global port container traffic is around 400 million TEU per year of which around 80 million TEU (20%) is estimated to concern transshipment volumes. The expectation is that the latest class of super post-Panamax 10-13,000 TEU containerships will continue to direct call at a similar number of ports as their 5-10,000 TEU predecessors, as evidenced by the recent deployments of Maersk, MSC and Cosco, with mainports increasing channel depths and/or upgrading handling equipment (for instance the port of Gothenburg taking delivery of new super-outreach gantry cranes to service the latest generation of Maersk vessels).

FIGURE 2: EXAMPLE OF THE COMPLEXITY OF LINER SHIPPING NETWORKS



Source: Meyrick and Associates, based on NYK data

Similar complexities can be observed in the Australian trades. While shuttle services to Singapore have played an increasingly important role in the carriage of West Coast (Fremantle) trade, an increasingly intricate network of interlocking direct services caters for trade between the East Coast (Melbourne, Sydney and Brisbane) and northeast Asia, North America and Europe. The recent mergers of CP Ships (Contship/Lykes/ANZDL brands) with Hapag-Lloyd, P&O-Nedlloyd with Maersk, and FESCO with Hamburg Sud, had the potential for major changes in how the Australian trades would be served – i.e. a fundamental shift towards transshipment.

However, this only happened in part with Maersk (the carrier with the most potential to transship) adopting a mixed direct/transshipment service approach (North America direct and Europe transhipped) and the other carriers, after re-alignment of vessel operating alliances, continuing direct services to Europe and North America using both Panama-routed pendulum and Suez-routed end-to-end services. The Europe and North America East Coast trades did see the end of the direct call east-about and west-about Round-the-World services, these being replaced by a combination of Panama-routed pendulum and Suez-routed operations by most carriers.

Recently Maersk, the market-leader in Australia, has decided to increase transshipment by routing all European cargoes to/from Australia and New Zealand over Tanjung Pelepas in Malaysia connecting with their Europe-Asia services. The pendulum Australia-North America East Coast-Europe service will now turn on the North America East Coast (using 2,400-2,800 TEU vessels instead of 4,100 TEU vessels) and average 4,000 TEU vessels will be deployed between Australia and Malaysia to feeder European cargoes. Brisbane – European cargoes will be feedered to/from Tanjung Pelepas on the New Zealand – Malaysia service.

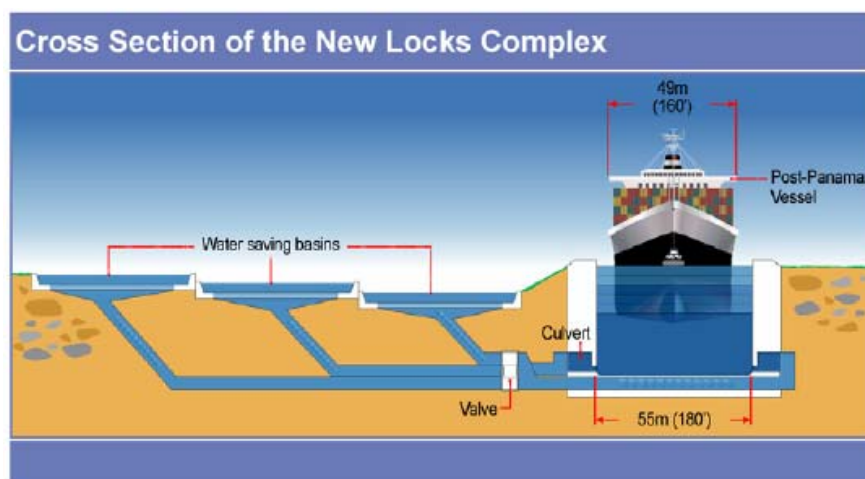
Predictions as to the likely future (long-term) size of vessels deployed in the Australia trades are discussed at the end of section 3.3.1.

3.2.2 Panama Canal

We believe that the future plan to widen and deepen the Panama Canal will have a significant impact on the global trading patterns of the current containership fleet and will most likely create a spurt in newbuilding activity in the 5,000 – 12,000 TEU size range with the existing class of 4,000-4,500 TEU Panamax containerships and 60,000-70,000 dwt bulk carriers cascading down to minor and newly developing trades.

According to the Panama Canal Authority, their plan is to cater for up to 12,000 TEU / 170,000 dwt vessels with a beam of 49m, length of 366m and draught of 15m. The largest size of vessels which can currently transit the canal have a beam of 32m, length of 294m and draught of 12m. The new locks complex will be built during 2007-2014 with the new locks open for transit in the beginning of 2015. The cost of the project is estimated at US\$ 5.25 billion (source- Panama Canal Authority) and a people's referendum has just recently endorsed the plan giving the green-light to the Panamanian Government to proceed. The outlook and funding of the project looks positive.

FIGURE 3: PLANNED PANAMA CANAL NEW LOCKS COMPLEX WITH MAXIMUM 12,000TEU VESSEL



Source: Panama Canal Authority

We believe that the likely impact of the upgraded Panama Canal on Australian trades is that the size of containerships used to service the North America East Coast and North Europe trades can increase unimpeded and a greater number of vessels over 4,500 TEU will be calling at Australian ports from 2015 onwards.

Similarly, the current size constraint on bulk carriers carrying Australian bulk commodities to the US Gulf/East Coast and North Europe via the Panama Canal will be removed and greater numbers of vessels over 70,000 dwt can be used from 2015 onwards.

3.3 Ship technology and characteristics

3.3.1 Container ships

In the mid 1990s, the largest containerships in service had a capacity of around 6,000 TEU deployed on the Europe – Asia trade by Maersk Line. Ten years later and Maersk Line is once again leading the way with the delivery of a series of 11,000 TEU newbuildings (rumoured to be possibly up to 13,500 TEU when taking account of 40ft high-cube containers) for deployment in the Europe – Asia trade. The flagship in this series of eight, the “Emma Maersk” (first sailing in September 2006), has main particulars as shown in Table 1.

FIGURE 4: WORLD’S LARGEST CONTAINERSHIP, THE 11,000 TEU “EMMA MAERSK”



Source: Maersk Line

TABLE 1: PARTICULARS OF THE WORLD'S LARGEST CONTAINERSHIP, THE "EMMA MAERSK"

Main particular	Detail
Container Capacity	11,000 TEU (of which 2,000 TEU reefers)
Dimensions	Length 397m, beam 56m, draught max 16.5m
Engine power / service speed	80,000 KW diesel / 25 knots
Crew	13 persons (due to highly automated vessel)

Source: Maersk Line

This Emma Maersk class of containership requires shore gantry cranes capable of handling 23 rows of containers across which means further upgrades/replacements of shore equipment by terminal operators (particularly at non-Maersk operated terminals).

The breakthrough of the 10,000 TEU size level by Maersk Line has been quickly followed by CMA-CGM (the French carrier) announcing the ordering of 8 x 11,400 TEU containerships (delivery mid-2009 to mid-2010) for similar deployment in the Europe – Asia trade. These vessels will have smaller dimensions (363m length and 45.6m beam) than the new Maersk class.

The size and characteristics of the current world full-cellular containership, and the fleet on-order as of 2006, is summarised as follows (sources- Meyrick analyses/Clarksons):

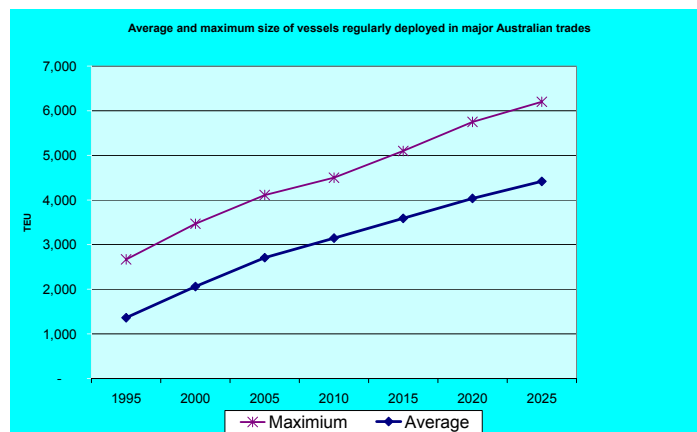
- The current fleet totals around 8.1 million TEU slot capacity (of which 58% comprising vessels over 3,000 TEU in size). This compares with 2.9 million TEU in 1996 (of which only 36% comprising vessels over 3,000 TEU)
- The fleet-on-order (as of 2006) totals around 4.3 million TEU (1,189 vessels or over 50% of the current fleet capacity) and 50% of this capacity is for post-Panamax vessels (i.e. some 265 ships over 3,000 TEU)
- The upper-end of the current Panamax-size fleet (i.e. 3,000-5,000 TEU) has average dimensions of 280m length, 32m beam and 12-12.5m maximum summer draught; whilst current 5,000-10,000 TEU post-Panamax vessels range from averages of 275-340m length, 38-45m beam and 13-15m draught. In terms of the vessels on order, the average dimensions for the 10,000+TEU vessels are 370m length, 49m beam and 15m draught.

The main Australian container ports are currently limited by Melbourne's current channel depth which implies maximum Panamax vessels of 4,100 TEU. However, stevedores have recently taken delivery of a number dual-lift post-Panamax gantry cranes at the main Australian container ports (Adelaide excepted).

As far as the Australian end-to-end (direct calling) container trades are concerned, we believe that it is unlikely that these 10,000+ TEU mega-sized containerships will be seen in Australian ports within the next 20 years. However, analyses we have performed for various port authorities suggests that the average and maximum containership sizes deployed on Australian trades will rise within 20 years from a current average of 2,700 TEU and maximum of 4,100 TEU to a future average of around 4,500 TEU and maximum of around 6,000 TEU (see Figure 5 for the past and predicted trends).

Vessels of 6,000 TEU would imply ship dimensions for Australian ports of around 300m length, 40m beam, and 14m maximum summer draught.

FIGURE 5: PAST AND PREDICTED TRENDS IN CONTAINERSHIP SIZES REGULARLY DEPLOYED IN MAJOR AUSTRALIAN TRADES



Source: Meyrick and Associates, based on historical analysis of Australian trades

These predictions are currently being borne out by recent announcements from various carriers that they intend to deploy larger containerships (including newbuildings) on several end-to-end (direct calling) Australia – Asia routes. In particular, OOCL and ANL plan to deploy 4,250 TEU ships (starting late 2006) on their joint North & East Asia service which will make them the largest vessels on Australian trades. In the recent past, MSC has trialled 5,000 TEU ships on its Europe – Australia service but has withdrawn them subject to completion of channel deepening at the port of Melbourne. These changes clearly have implications for Australian port development. The main West and East Coast ports and terminal operators are already responding to this by either deepening channels (Brisbane, Adelaide, Melbourne planned) and/or through the introduction of post-Panamax shore gantry cranes ahead of post-Panamax vessels calling in the future.

In our opinion, it is worth noting that a vessel deployment scenario could feasibly exist for large post-Panamax vessels on Trans-Pacific routes (possibly extending to the US East Coast) diverting down to Brisbane as a single (hub) call with feeders relaying cargoes to/from other Australian ports, New Zealand and the South Pacific Islands. The economics of such an operation become more attractive to carriers when they can rationalise existing services and combine volumes with domestic/coastal trades.

3.3.2 Bulk carriers

In the dry bulk trades, similar changes to the container trades, albeit less pronounced, can be detected with a drift towards larger shipment sizes and the corresponding use of somewhat larger bulk carriers.

Typical vessel sizes in the dry bulk fleet are:

- Capesize: 150,000 dwt / 280m long / 47m beam / 16m max draught
- Panamax: 75,000 dwt / 225m long / 32m beam / 12.5m max draught
- Handymax: 55,000 dwt / 190m long / 30m beam / 12m max draught
- Handysize: 32,000 dwt / 185m long / 27m beam / 10.3m max draught

Grain is increasingly being carried in Panamax vessels at the expense of handy-sized vessels, and the size of Cape class vessels used in the coal and iron ore trades continues to increase with growing demand for 185,000 dwt size of vessels. It is predicted by many in the industry that handy-sized bulk carriers will become a thing of the past being only deployed in specialised or niche markets. The smaller parcel sizes will then be carried in handymax vessels of 45-55,000 dwt. The opening of the new Panama Canal locks in 2015 will see the Panamax workhorse increase in size to around 80,000 dwt with a beam of 38m and fully-laden draught of 13.5m.

These global trends are also being seen in the Australia bulk commodity trades and the Panamax-2015 class of vessel is likely to be an increasing visitor at Australian ports ten years from now.

3.3.3 Tankers

Tankers, particularly chemical and product ships, tend not to be increasing much in size given the nature of their parcel / multi-port operations. Crude oil tankers are predicted to lose the 400,000 dwt Ultra-Large Crude Carrier (ULCC) class to be replaced by 300,000 dwt modern double-hulled vessels. Very-Large Crude Carriers (VLCCs) will remain the workhorse of long-haul routes with sizes likely to increase from the current typical size of 250,000 dwt to 300,000 dwt as the proportion of more modern vessels increases. The medium-haul routes are likely to be continued to be served by Suezmax vessels of similar sizes, whilst Aframax or Cape-size vessels are increasing in size from around 80,000 dwt to 105,000 dwt.

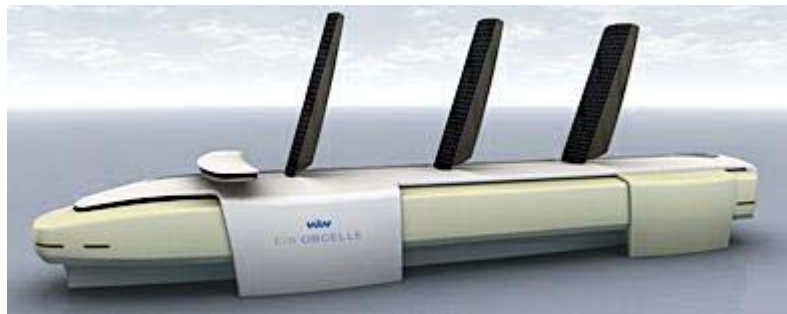
In the Australia crude oil trades, there has been a gradual shift towards the use of tankers in the upper Cape-size class and in the case of Melbourne, which is currently constrained by channel depth, Cape-size tankers have been part-loaded. Post channel deepening, these vessels will be able to be fully laden when entering the port of Melbourne.

3.3.4 Speed, ship propulsion and in-port powering

The design and service speeds of containerships have been increasing over the last ten years with 4,000-5,000 TEU ships of 21-23 knots considered fast in the mid-1990s. Today, containerships over 6,000 TEU are being built with speeds of 25-26 knots (i.e. up to 48km/h) which means higher fuel consumptions and fuel costs particularly in times of rising oil prices, although technical advances in engine design have helped offset some of these effects. To some degree, the cost of faster ships can be offset by deploying fewer containerships in a string or loop to maintain a weekly service.

Over the next 5-20 years, there is an expectation by some that fossil fuels will be in decline or at least more costly to extract making it important to develop alternative forms of ship propulsion given the high dependence we now have on global shipping. This is at same time as environmental (global warming) and sustainability issues rising up the agenda – a trend which shipping cannot and should not avoid but rather embrace. There are some naval architects and engineers who are giving us a glimpse of the future with the use of fuel cells, wave/wind/solar and ‘green’ ship design avoiding the need for ballast water systems. A good example is Wallenius Wilhelmsen Lines’ visionary car carrier design, the “E/S Orcelle”, for 2025 involving a zero-emission ship running on wave/wind/solar energy and fuel-cells (see Figure 6).

FIGURE 6: THE ENVIRONMENTALLY-SOUND ZERO EMISSION 2025 SHIP DESIGN “E/S ORCELLE”



Source: Wallenius Wilhelmsen Lines

In-port powering of vessels using on-shore power is expected to be the norm in the future as the regulation of ship fuel emissions is implemented globally. Currently, California has made on-shore powering of vessels compulsory, whilst in the European Union it is being strongly promoted but remains currently voluntary. The technology of on-shore powering of vessels has been successfully developed and used (in Californian ports) and is being implemented as an optional extra by shipyards for newbuildings (particularly in the latest generation of containerships).

3.3.5 On-board ballast water treatment systems

The introduction of invasive (non-indigenous) species into marine eco-systems, as a result of translocation in ships’ ballast water, has become a major concern for coastal communities and government environmental agencies, and for shipping companies as well. Whilst the IMO and national governments (such as Australia) have been tackling this issue of ballast water management through regulation and legislation, promising shipboard technology has been developed and trialled to provide a practical and effective solution to the problem. In 2000, the world’s first ballast water treatment system was installed on an operating vessel – the cruise ship “Regal Princess”. Since then prototypes of other systems have been installed on several commercial vessels. All of the ballast water treatment systems use a combination of irradiating ballast water with Ultra-Violet (UV) light and separating out solids and/or use of certain catalysts. It is the expectation that ballast water treatment systems will feature in all newbuildings over the next 5-10 years.

3.4 Port technology

Port technology developments are generally aimed at catering for increasing ship sizes, minimising the turnaround time of ships in ports, speeding up port-land interfaces, and meeting the increasing environmental pressures for cleaner greener port operations.

Areas where technology can play a role in reducing port turnaround times concern channel and terminal design, vessel and cargo handling equipment, and land-based storage and transportation systems.

Some general technologies, applicable to all cargo-sectors and vessel types, being increasingly used or under development are items such as dynamic under-keel clearance systems (DUKC), automated vessel mooring systems, high-response vessel de-ballasting systems, and preventative maintenance techniques without downtimes.

DUKCs allow for the maximum use of existing channel depths by taking into account individual vessel profiles, actual cargo loadings or intentions, vessel motions (wind/wave), and water level variations (principally tidal). The ports of Fremantle, Brisbane and many other bulk ports have introduced DUKCs with several versions being used.

The use of automated vessel mooring systems, such as Moormaster or similar, are decreasing ship mooring times and associated labour costs (line-handlers etc.).

Vessel de-ballasting systems have been limiting the capacity of shore-side loading systems, particularly for high density products such as iron ore. Quicker de-ballasting systems are being introduced and this problem is gradually being addressed.

There is also greater attention being paid to technologies which can offer preventative maintenance without system or equipment downtimes. Technologies used by airport operators for seeing the early signs of problems and optimising repetitive work patterns are being deployed in the marine terminal environment.

In addition to these general developments in port technology, there are a number of significant technologies which relate to specific cargo-sectors.

3.4.1 Containers

The container-sector is experiencing perhaps the greatest number of technological developments which can be broadly grouped into five areas, notably:

- Container terminal design
- Container handling equipment
- Land interfaces and transport modes
- Container security
- Container management
- Container refrigeration

In terms of container terminal design, there are some designers and engineers thinking ‘outside of the box’. The NYK/Ceres terminal in the port of Amsterdam is such an example with a design concept to increase ship turnaround time and berth productivity by working a ship simultaneously from both sides (see Figure 7). This approach has yet to be duplicated in other ports.

FIGURE 7: EXAMPLE OF NEXT GENERATION CONTAINER TERMINAL (NYK/CERES, AMSTERDAM)



Source: NYK/Ceres

The more conventional approaches focus on the various elements of terminal design. Typical examples are:

- The planning of the terminal layout to ensure operational continuation and minimise lost time during shift changes
- The use of enhanced terminal operations planning systems to minimise the number of container movements within the terminal
- Low gradient pavements (1:100) to allow higher container stacking
- The use of computerised un-manned gate systems to minimise delays.

Container handling equipment technologies cover the quay and yard container handling operations. Typical examples are:

- Dual hoist container quay cranes for higher movement rates and dual trolleys (80T wheel loads, wider tack) for larger reach (to 40m+) – a number of cranes with this technology have been recently delivered to the main Australian container ports
- Elevating trolley cranes to reduce winch lift heights, and as the crane uses two arms on the trolley it results in much less sway
- Driverless straddle carriers and stacking cranes for reduced labour costs and improved efficiencies (higher straddle speeds allowable in the container yard, lower straddle maintenance costs)
- Inter Terminal Vehicles (ITVs) for inter yard transport to take containers to/from cranes
- Automated Rail Mounted Gantry (RMG) cranes, with pivoting head capability, for port terminal and intermodal operations at the straddle/rail/road interchange

The interface with land transport modes (rail and road) and the operation of land transport modes themselves are all experiencing technological developments. Some examples are:

- Development of high productivity inland ports and intermodal terminals connected to ports to shift cargo off road
- Double-stack trains for greater container movements in and out of yards/ramps
- 24 hour / seven day a week truck and rail support for port terminals to reduce the container dwell times and queuing at the port terminal
- Enhanced tools to manage truck queuing at port terminal gates
- Moves to trial larger and more efficient trucks, super B-double or High Efficiency Container Transporters (HECTS), carrying 2 x 40ft or 4 x 20ft empty containers being 30 metres long and weighing 68 tonnes, to shuttle containers during slack hours (mostly night-time) between port and depots. The first 12-month trial will be out of the port of Melbourne.

The need for increased container security has the potential to create serious disruptions and delays to the transport chain. Port-located technologies (hi-speed x-ray scanners with intelligent profiling software for trucks and trains on the move) are playing a pivotal role in alleviating the potential problems.

Managing the supply chain more efficiently is leading to the introduction of real-time “Smart” technologies (intelligent radio identification container seals incorporating bar-coded cargo contents linked to terminal tracking stations at key points in the transport chain). The Smart technologies are also playing a role in container security by providing real-time alerts and risk profiles.

Container refrigeration technology has made significant advances in recent years with the old blown-refrigeration in container ships and in ports (container “porthole” technology) being fully phased-out in favour of plug-in integrated refrigeration units allowing both temperature and humidity-control giving exporters the potential to supply long-distance markets with real-time monitoring included. Indeed the top-end container refrigeration technology can now ripen product on-route according to the buyer’s needs.

3.4.2 Dry Bulk

The dry bulk sector is expected to see the continued introduction of technologies aimed at increasing efficiencies and cleaner operations, notably:

- Increased use of sophisticated materials handling and logistics modelling techniques to determine the capacity constraints in transportation chain systems
- Longer trains for larger bulk mineral product transfers from mine to port
- Higher capacity loading rates with less product degradation by soft handling and more blending of products at the port of loading
- Automation in receiving, stacking, reclaim and ship loading equipment together with the use of pneumatic ship un-loaders
- Enclosed conveyor systems to minimise dust and cross-contamination and in particular the covered storage of coal.

3.4.3 Liquid bulk

The liquid bulk sector is expected to see a similar focus on introducing technologies which will improve operating efficiencies but also meet the extra goals of increasing safety and security, notably:

- Upgrading wharf handling and pipeline capacity to speed-up discharge times together with enhanced monitoring of losses in systems during loading/unloading
- Upgrading of fire services, particularly in control and diagnostic systems, and the provision of diesel emergency backup systems for fire control
- Improved monitoring and surveillance for security.

3.4.4 Breakbulk

There are no significant innovations to report for breakbulk. However, there is a continuing focus on the upgrading of unitised loading processes (e.g. for aluminium) to increase unit load size and streamline ship loading.

3.5 Logistics and intermodal systems

3.5.1 Market developments

Logistics and intermodal systems are continuing to evolve on the back of outsourcing and industry-player consolidations opening the way to greater efficiencies. The future developments, drivers and current obstacles are succinctly sketched in the following vision statements recently made by Toll (September, 2006):

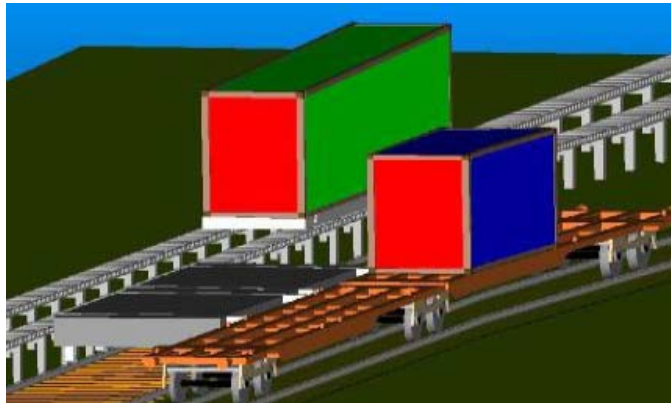
A fast and frequent service, with a worldwide reach, using smart technology, that follows the trend to direct purchasing these are what the global logistics industry strives for. In its way is the complexity of the task, and the ability to create a seamless wholly owned, door-to-door service that will surmount that challenge is what logistics customers now value the most. With changes in focus in the supply chain, organisations see inventory as a key cost and hence strive to reduce inventory levels while maintaining customer service. The logistics solution to the problem within the metropolitan markets is to increase frequency and reduce delivery size.

This vision of the future, which is applicable to both the global and domestic market-place, implies that impediments to increasing modal integration and speed/frequency are the priority issues requiring attention and resolution. Typical impediments concern the sub-optimal location of intermodal terminals, infrastructure access issues, operational constraints on rail, lack of standardisation of smart technologies, and increasing urban road congestion.

3.5.2 Intermodal systems technology

Intermodal systems technology is not standing still either with innovations to tackle one of the key challenges – how to further decrease transit times so as to be more competitive with all-road transportation. A design developed in Italy, “Metrocargo”, to be operational in the port of Savona Italy by 2008/9, involves increasing the transfer speed of containers and swapbodies to/from shuttle trains by using an automated system of rollers moving units forwards and sideways (see Figure 8). The normal 10-12 hour time taken to load/unload a shuttle train, including having to shunt to a terminal, can be done in only 20 minutes with the train remaining on the line which also reduces the need for space.

FIGURE 8: THE METROCARGO DESIGN – TRAIN LOADING AND UNLOADING



Source: Metrocargo

3.6 Conclusions

Changes in ownership in both liner shipping and container stevedoring has been moving at a rapid pace following the trend of increasing globalisation. Consolidation (horizontal integration) has been the name of the game with the top twenty liner companies now controlling almost 90% of world containership cellular tonnage – this was only 40% in 1990. A similar trend has occurred in the independent container stevedoring sector with the top three stevedoring companies now having a global footprint collectively operating over 100 terminals worldwide. The leading liner companies have also been expanding their global operation of container terminals as a way of securing dedicated port hubs with preferential operations. Vertical integration has also been occurring with liner companies increasingly offering door-to-door and secondary distribution services.

The expectation is that this consolidation in the container shipping market will continue. However, any future acquisitions of liner companies by the industry leader, Maersk Line, would most likely need to be monitored as their market share in a number of trades (including to/from Australia/NZ) is becoming increasingly dominant. This observation is also true for the independent container stevedoring market, particularly regarding any future mergers between the top three companies. The balance of power between carriers and ports has also been shifting towards the top tier of carriers as their container volumes, through consolidations, increasingly represent greater proportions of a port's total container trade. The implications of this trend are pressures on the ports' financial and strategic ability to provide or safeguard common-user facilities and open access policies.

Ownership in the international bulk shipping sector remains relatively diversified and, although further consolidation can be expected in the future, this trend is not yet considered to be a major issue for competition regulators.

Liner shipping operations and services continue to evolve to match increasing global container trade by a combination of more direct-calling services (particularly at Chinese and Black Sea ports) and the deployment of larger mainline vessels between hub ports with connecting feeder or relay vessels also increasing in size. The super post-Panamax era of 10-13,000 TEU containerships has arrived, newbuildings being deployed on the Europe – Far East trade. The planned completion of the widening and deepening of the Panama Canal in 2015 is likely to see a spurt in the 5-12,000 TEU containership size class which will mean larger vessels being used on many of the trades connecting the Americas to other areas of the world. This Panama Canal effect is also likely to happen for bulk shipping with the current maximum 70,000 dwt vessels used in many bulk trades increasing to the new Panama maximum of 170,000 dwt.

As far as the Australia end-to-end direct calling services are concerned, the maximum size of containerships is expected to increase from the current 4,100 TEU to around 6,000 TEU after completion of the planned Melbourne channel deepening in 2010. There may well be the opportunity for larger Trans-Pacific containerships to dip down (divert) to a single Australian hub port, such as Brisbane, using connecting feeder vessels along the Australian coast, but this will only happen in exceptional cases where carriers are able to obtain economic benefits by rationalising two or three existing vessel strings of chartered vessels – generally transshipment and feederage adds significantly to costs and fast transit times are a premium on the Trans-Pacific.

Dry bulk vessels are expected to increase in average ship size with Handy-size vessels increasingly being replaced with Panamax-size (70,000 dwt) and the increasing use of Cape-size vessels at the expense of current Panamax. Australian ports are aware of these trends and are preparing for them in as timely a manner as possible given increasingly difficult and complex development requirements.

Technologies for ships, ports and intermodal systems are continuing to be refined and introduced around the world. These technologies seek to solve environmental issues and increase transport system / infrastructure productivities. All of these technological advances could have a role in improving ports and shipping in the Australian context. Ultimately the market-place will decide the degree and location of the introduction of these advancing technologies in Australia but government can certainly play a role in their introduction by continuing to set and modify the policy framework on efficiency and environmental targets at national and state levels.

4. INTERNATIONAL CARGO TRADE FORECASTS, 2005-2020

4.1 Background

4.1.1 Changing structure of international trade

International trade continues to be driven by the desire of industry for lower costs of production with the result that supply-chains are getting longer and more reliant on efficient transport networks and infrastructure. The world's manufacturing hub of China continues its dominance with greater scale economies keeping costs low. Chinese economic growth has averaged 9% per year over the last two decades and in 2005 it accounted for 25% of world economic growth. By 2015, it is predicted that China's share of world trade will be around 16% (re. ABARE), up from 6% in 2004 and 1% in 1988. India is seen as the next major driver of international trade although traditionally it has seen many false starts. The general opinion is that the Indian economy and trade will expand at a fast pace in the next five to ten years.

As inputs for its domestic and export demand, China has become the key market for raw material consumption due to local supply being unable to meet the increasing production demand. It currently consumes 25% of the world's base metals and more than 30% of iron ore and coal supplies.

All these features can be found at work in Australia's international trade with manufactured goods being predominantly supplied from China, and base commodities (iron ore, coal, other minerals, waste paper etc.) being shipped to China as production inputs.

4.1.2 Forecasting methodology overview

The methodology used to develop forecasts of international seaborne trade in Australia is a mixed one reflecting the fact that there is not a single consistent approach which can adequately forecast international sea freight.

The lack of consistency is due to the myriad of different drivers of the demand for Australia's international traded goods and the internal and external competitive forces which affect the supply of Australia's international traded goods.

As an example, increased demand for Australian exports of coal and iron ore are driven by developments in other countries, principally Asian, whose industries are meeting demand for iron and steel which is being driven by the growth of Chinese industry. Exports of alumina are also being driven by the expanding Asian economies, however the price rises in alumina, at 17% compared to iron ore at 50% and coal at 100%, have not been sufficient to cause an immediate expansion of Australian alumina refining. In fact supply side cost pressures are likely to prevent the Australian alumina industry expanding in the short to medium term. Supply issues, which are mainly domestic in nature, are now affecting the expansion of a number of export industries in Australia.

4.1.3 Forecasting methodology approaches

In the main, there are three methods used in developing forecasts in this study:

- Sourced forecasts: Where we have used an externally developed forecast of future activity either at a local, state or national level to predict future cargo movements. In a number of cases, the original forecast has been adjusted to take account of more recent factors or industry developments which we believe will change the original forecast. Examples of sourced forecasts are coal, oil products and grain which all use national based estimates developed by third parties such as ABARE, and woodchips which use local port forecasts of future activity in the export of woodchips.
- Developed forecasts: Where we have used either industry or econometric factors which have an impact on the level of international trade to develop forecasts of future cargo volumes. This approach is only used where it can be demonstrated that the variables chosen to predict future trade activity are reliable in how they affect the level of trade and that the future value of the variable can be predicted with any level of certainty. Examples are forecasts of international container trade which are linked to global economic and trading factors, and the importation of motor vehicles which are linked to changes in population, and industry factors.
- Non-developed forecasts: Where we have not developed a unique forecast as we believe that the volume of trade is either too small and or the patterns of cargo movements are not consistent enough to develop a forecast of future throughput with any confidence. Cargo tasks that fall into this category are mainly in the breakbulk category as once movements of motor vehicles and iron and steel products are excluded from the breakbulk task, the remaining volumes of timber products (excluding woodchips) and other breakbulk cargoes are both small and fragmented across 35 of the 44 international trading ports. In these cases, we have provided a description of cargo types and movements which aim to inform the reader.

4.1.4 Level of forecasts

The level at which the forecast is developed, i.e. national, state or at port level, is a reflection of the availability of data and the confidence that we have in how the trade operates.

In a number of cases, we have made forecasts at a state level as we believe that there is sufficient interport competition in that state as to make the choice of export port uncertain - grain, mineral sands, woodchips and, to a lesser extent coal exports from Queensland, are examples of this.

Specific port forecasts for international containers, alumina and motor vehicles⁶ are possible as the infrastructure required for either supply or export is located in one place in each state and is unlikely to be replicated within that state.

4.1.5 International cargoes forecast

The following cargoes have been reviewed as part of international trade (import/export):

- Containers
- Dry bulk: iron ore, coal, grain, alumina, mineral sands, woodchips, sugar, and other (other ores, silica sands and salt)

⁶ There is a NSW Government plan for all motor vehicle imports in NSW to be relocated from Sydney to Port Kembla in 2010

- Breakbulk: motor vehicles, metal products (iron and steel, aluminium, etc.), forest products (logs, timber and pulp, excluding woodchips), and other specialised (livestock, reefer, etc.)
- Liquid bulk: crude oil, liquefied natural gas (LNG), petroleum products (incl. liquefied petroleum gases (LPG)), caustic soda, other chemicals, and other non-chemical (molasses, vegetable oils, and tallow).

The cruise sector (passengers/tourists) has been excluded from this study.

4.1.6 Implications for ports and shipping

The reader should note that the cargo trade forecasts presented in this chapter are used as input (demand-side) for the port capacity gap analysis presented in chapter five. The implications of the cargo trade forecasts for shipping demand are briefly discussed at the end of each cargo trade forecast section in chapter four.

4.1.7 Year methodology and trade statistics

The reader should note that the year statistics and forecasts use the financial year methodology with years shown in tables being “financial year ending”, i.e. 2005 in table = 2004/05 data.

4.2 Container imports and exports

4.2.1 Container forecasting methodology

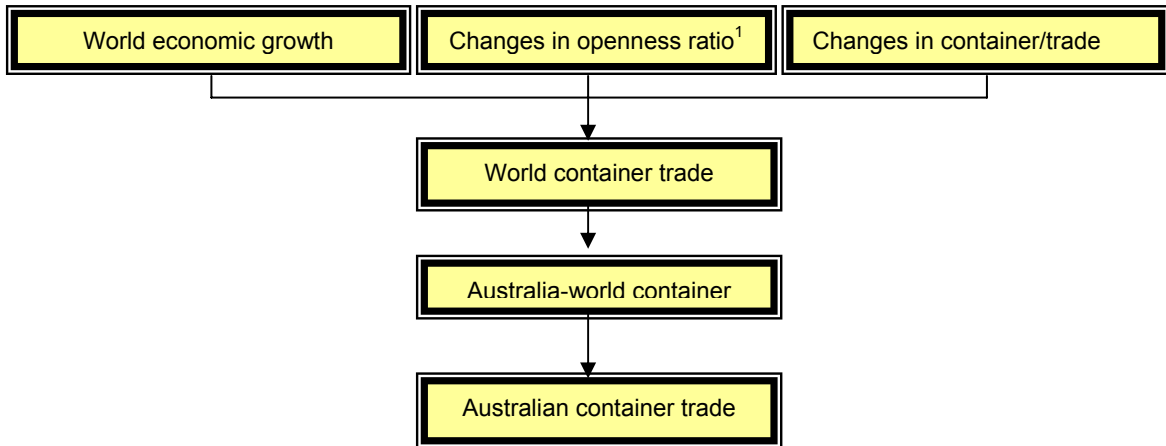
Estimates of the future Australian international container trade were produced using a ‘top down’ approach. This is in keeping with our usual approach and that used by many other forecasters for long-term projection of container trades.

This approach is adopted because the international container trade covers a very broad range of commodities, and

- reliable time series data for containerised exports and imports at a disaggregated level is often unavailable
- while it is sometimes possible to identify and model the effects of measurable factors (for example, exchange rates) on flows of specific commodities, it is virtually impossible to predict the values of these factors in the medium to long term
- over the long-term (more than ten years), the commodity composition of the container trade is itself very volatile, with the emergence of new commodities and the demise of older ones adding further complexity.

A ‘top down’ approach relies more openly on experienced judgment, and allows for the explicit and transparent presentation of key relationships. In some cases, these macro relationships are relatively stable over the long term. In others, reasonable arguments can be developed as to how these relationships might play out in the longer term, and the range within which they might change. On the basis of these relationships, a predicted level of global economic activity can be used as the basis for determining the number of containers to be handled, even if little is known about their specific contents. An overview of the top-down approach is given in Figure 9.

FIGURE 9: CONTAINER FORECAST METHODOLOGY



1. 'Openness ratio' is the ratio of the value of trade to the size of the world economy

Source: Meyrick and Associates

4.2.2 World economic growth

Medium term World Bank / International Monetary Fund (IMF) 2005 forecasts suggest that world economic growth will remain relatively buoyant over the next five years. Beyond that period, no authoritative predictions are available. We have assumed that the rate of growth from 2010 to 2020 will be slightly lower than the long-term growth rate experienced over the last thirty years.

4.2.3 Relationship of world trade growth to economic growth

The ratio of trade volumes growth to Gross Domestic Product (GDP) growth has been fairly volatile over the last decade. There was a very strong surge in this ratio in the early to mid-1990s, reflecting the effects of the trade liberalisation that took place at the time. This has fallen back to, or below, long-term historical levels as the stimulus given to global trade growth has tapered off.

See expected world merchandise trade volumes that will be generated by world economic growth (Table 2).

TABLE 2: WORLD MERCHANDISE TRADE

Forecast	World economic growth ⁷	Ratio of trade volumes growth to GDP growth ⁸	World trade volumes
2005-2010	3.75%	1.350	5.06%
2011-2020	3.25%	1.350	4.39%

Source: Meyrick and Associates, World Bank and IMF

4.2.4 World trade volumes and global container trade growth

For the last three decades, the growth in world container trades has been significantly higher — typically around 50% higher — than growth in world trade. There have been two main reasons for this:

- Growth in trade by manufacturers has outstripped growth in other (merchandise) trade sectors, and manufacturers comprise a large proportion of total containerised trade.
- There has been a progressive conversion of cargoes from non-containerised forms of transport to containers.

It is likely that the first of these two phenomena will persist into the indefinite future. However, this is not the case for the second — clearly, there will come a time when all that can be containerised has been containerised. We therefore assume that the ratio of containerised trade growth to total merchandise trade growth will decline over the coming decades, but will remain greater than one. The specific assumptions that we have made are shown in Table 3.

TABLE 3: RATIO OF CONTAINER TRADE TO TRADE VOLUMES

Forecast	World trade volumes	Ratio of container volume growth to trade growth	World container trade growth
2005-2010	5.06%	1.325	6.96%
2011-2020	4.39%	1.275	5.59%

Source: Meyrick and Associates

4.2.5 Australian international container trade growth

Prior to the 1990s, the Australian container trade grew at about 75% of the general level of world container growth. However, during the 1990s the rate of growth of Australia's container trades accelerated, and for the last decade or more, there has been very little difference between global and national growth rates.

⁷ Average world economic growth in the last 30 years was 3.42% p.a. Source: World Trade Organisation (WTO) Long term time series economic data.

⁸ 50 Year average = 1.6 Source: Meyrick and Associates analysis of historical period ratios based on IMF data; 50-year average based on WTO long term time series data.

With Australia now firmly committed to an open economy, and actively engaged in multilateral, regional and bilateral initiatives to further liberalise trade, our expectation is that Australian international container growth will continue, as in the 1990s, to grow at the same pace as world container volumes, resulting in the Australian international container forecast growth rates (Table 4).

TABLE 4: AUSTRALIAN CONTAINER GROWTH RATES FORECASTS

Period	Australian container trade growth
2005-2010	6.96%
2011-2020	5.59%

Source: Meyrick and Associates

4.2.6 Australian international container trade – market share

Australia has five ports that conduct significant international container trade with direct shipping calls to/from most major international markets. The five ports are Melbourne, Sydney, Brisbane, Fremantle and Adelaide.

The market share of Australian international container trade has been changing slightly over the last ten years with the ports of Melbourne and Sydney each having a decline of three percent in market share, Brisbane growing by four percent and Fremantle growing by one percent. Adelaide's market share remained static at four percent.

TABLE 5: AUSTRALIAN INTERNATIONAL CONTAINER MARKET SHARE, 1996 & 2005

Year	Melbourne	Sydney	Brisbane	Fremantle	Adelaide
1996	37%	35%	13%	11%	4%
2005	34%	32%	17%	12%	4%

Source: Meyrick and Associates

4.2.7 Forecast Australian international container trade with constant port market share

Applying the growth rates in Table 4 to the container volumes handled in 2004/05 by each container port, and assuming that each port's market share of the Australian international container trade remains constant, then the forecast of future international container volumes likely to be handled at each port is shown in Table 6.

TABLE 6: INTERNATIONAL CONTAINER VOLUMES (TEU), 2005 - 2020 (CONSTANT MARKET SHARE)

Year	Melbourne	Sydney	Brisbane	Fremantle	Adelaide	Total Australian International
2005	1,509,000	1,376,365	726,145	467,580	172,711	4,251,801
2010	2,112,498	1,926,818	1,016,554	654,580	241,784	5,952,233
2015	2,800,429	2,554,283	1,347,593	867,743	320,520	7,890,568
2020	3,675,687	3,352,609	1,768,775	1,138,951	420,697	10,356,719

Source: Meyrick and Associates

Assuming constant port market shares, the total Australian international container trade is forecast to rise from 4.3 million TEU in 2004/05 to 10.4 million in 2019/20, an increase of 6.1 million TEU relative to 2004/05 volumes or 2.4 times more.

4.2.8 Australian international container trade – port market share growth

The increased market share of Brisbane and Fremantle is due to their higher level of state growth compared to that of Melbourne and Sydney. The annual average growth in international container trade from 1996-2005 for each port is shown in Table 7.

TABLE 7: AUSTRALIAN PORTS INTERNATIONAL CONTAINER GROWTH RATE, 1996-2005

Year	Melbourne	Sydney	Brisbane	Fremantle	Adelaide
1996-2005	7.64%	7.81%	11.95%	10.32%	9.69%
Growth relative to Melbourne	1.00	1.022	1.563	1.351	1.269

Source: Meyrick and Associates

4.2.9 Forecast Australian international container trade with changing port market share

Melbourne is the largest Australian container port and is the port most likely to grow at the same rate as world container volumes (hence its setting as base). If the other four ports were to continue to grow between 2005-2020 at their current long term rate of growth compared to the expected growth in Melbourne then the likely international container volumes handled at each port are shown in Table 8.

TABLE 8: AUSTRALIAN INTERNATIONAL CONTAINER VOLUMES (TEU), 2005 - 2020 (INCREASING GROWTH RATE)

Year	Melbourne	Sydney	Brisbane	Fremantle	Adelaide	Total Australian International
2005	1,509,000	1,376,365	726,145	467,580	172,711	4,251,801
2010	2,112,498	2,026,028	1,458,507	761,265	308,724	6,615,309
2015	2,800,429	2,685,800	1,933,467	1,009,169	409,260	8,769,573
2020	3,675,687	3,525,231	2,537,761	1,324,579	537,171	11,510,453

Source: Meyrick and Associates

Given the higher growth rates of, in particular Brisbane and Fremantle to Melbourne, the total Australian international container trade is forecast to rise from 4.3 million TEU in 2004/05 to 11.5 million TEU in 2019/20, an increase of 7.2 million TEU relative to 2004/05 volumes or 2.7 times more.

In the main, there is little true interport competition for international container trade in Australia as each port is too remote from other container ports for landbridging of containers between ports to be competitive compared with direct shipping. The exception to this statement is Adelaide which has about 25% of its containers shipped through Melbourne rather than Port Adelaide. The reason for this capture of Adelaide cargo by Melbourne is that containers to and from North Asia and North America to Adelaide cannot be directly shipped as shipping services to these regions do not call at Adelaide, due to the thin volumes of trade, but at Melbourne which has several North Asia and North America direct calling services.

If Adelaide was to gain a direct shipping call to North Asia and North America then the volume of containers handled at Adelaide in 2019/20 would be expected rise by 30% from 537,171 to 699,603 TEU. It should be noted that Flinders Ports, which operates Port Adelaide, is using this “Melbourne re-capture” scenario as the basis for its long term planning.

We believe that the most-likely long term forecast is the one based on constant port market share growth (i.e. 10.4 million TEU by 2019/20); however, for port planning purposes, the increasing port’s market share growth scenario (i.e. 11.5 million TEU by 2019/20) should be used.

The implications for shipping are that container capacity on trade routes will need to be increased by almost three times by 2020. In practice, carriers do this by a combination of operational strategies – either by deploying larger vessels and/or increasing the number of weekly services. In terms of vessel economics, the deployment of larger vessels in a growing trade-lane is more cost effective than increasing the number of weekly services, but shippers value multiple calls in a week in terms of supply-chain control/flexibility and inventory level minimisation.

However, the provision of increased container shipping capacity is not the whole story in terms of adequately serving Australian exporters and importers. The provision of sufficient container equipment (the right type or size, 20ft dry for export versus 40ft dry from imports, and food-grade versus non food-grade, refrigerated containers for export) for Australian regional exports is a complex one driven by carrier global equipment management, relative yields (profitability) of trades for carriers, and inbound/outbound commodity and trade imbalances. This is effectively an issue for industry and the market-place to solve through the mechanism of rate-levels, supply and demand.

4.2.10 Comparison between Meyrick and BTRE container trade forecasts

A comparison between the Bureau of Transport and Regional Economics Working Paper 65 (June 2006) and this report shows that we have higher and different type of growth rates than that used by the BTRE but the 2020 forecast Australian international main-port container volumes are not that different (Meyrick 10-12 million TEU versus 10-11 million TEU as presented by the BTRE). Our higher container trade forecast for Australian ports is due to a combination of a difference methodology used and the effect of different types and levels of economic growth driving future container volumes. The key differences are summarised as follows:

- The Meyrick model uses a world economic growth of between 3.75% and 3.25% to drive its forecast of container volumes. The BTRE uses a combination of economic growth rates (OECD, Japanese, Australian) to drive a series of logarithmic forecast models
- Whilst comparisons cannot be made directly, as the models are very different, the differences in economic growth between the world and OECD are likely to cause the Meyrick model to produce higher container volumes than the BTRE
- The approach used in the Meyrick model is to treat Australia as a single entity, rather than a series of separate port based systems for container trade as we believe that there is no significant difference in the elasticity of demand for containerised goods between each state
- Meyrick and Associates uses a top down approach to modelling container forecasts as we believe the bottom up approach uses variables that are not causal in generating container trade. We have examined financial and economic data (conducted correlation analyses on historic data-sets) and have not found a strong link to the growth in Australian container trade and economic activity in Australia or the value of the Australian dollar – the correlation to growth in world trade is far more significant.

4.3 Iron ore exports

4.3.1 Global demand for iron ore

Since 2002, there has been strong growth in demand for exports of iron ore from Australia when the global production of steel began to grow at above 5% per annum after decades of stagnation. The key engine in the world's steel growth has been China which has increased its domestic steel production at above 20% each year since 2002. As a result global demand for iron ore has accelerated with demand rising by 4% per annum since 2002, with Chinese iron ore imports growing by between 20-40% per annum each year.

As a result of strong demand and higher prices, annual exports of iron ore from Australia have increased from 157 million tonnes in 2001 to above 300 million tonnes in 2006.

4.3.2 Future Australian iron ore exports

The future of iron ore exports from Australia is dependant on two interrelated factors:

- The first is the changes in the global demand for iron ore with the rapid development in China and other Asian countries fuelling significant price rises for iron ore, which also has the effect of further stimulating other iron ore exporters
- The second is the ability of Australian exporters to deliver iron ore at a price that is acceptable to the market and in sufficient quantities.

The strong global demand for iron ore has seen the international benchmark prices for iron ore double from US\$18 per tonne for iron ore fines, which was the base price between 1980-2002, to spot prices of up to US\$50 per tonne in 2005. The price of iron ore appears set to remain above US\$35 per tonne in the long run with growth in Chinese demand for imported iron ore continuing to remain above 10% per year until at least 2010⁹.

Planned increase in Australian iron ore mining

A review, as shown in Table 9, of the known expansion plans for iron ore production by the major iron ore companies, such as BHP Billiton and Rio Tinto, as well as some of the more ambitious plans by new mining companies, such as Fortescue Metals, indicate that the supply of iron ore from Australia could exceed 510 million tonnes per annum by 2020. Whilst this level of exports seems high, it actually represents an annual growth rate of just over 6% for the period 2006-2015.

TABLE 9: PROJECTED AUSTRALIAN IRON ORE EXPORTS (MT)¹⁰

Company	2006	2010	2015	2020
BHP Billiton	104	129	152	152
Rio Tinto	170	200	200	200
Fortescue Metals	0	40	60	60
Others	20	78	98	98
Total	294	447	510	510

It should be noted that due to the uncertainties around future project costs and investment decisions for iron ore projects, we believe that it is not possible to make reliable forecasts for iron ore exports beyond 2015 and, as a result, have left the export levels for 2020 at those of the 2015 estimates.

Constraints on expansion

There are, however, constraints beginning to appear on the ability of the planned iron ore mining expansions and new projects to be delivered. All mining companies have experienced both increases in production costs and difficulty in meeting delivery schedules due to the shortage of labour and mining supplies. As a check, with reference to industry analyses, we have reviewed the published costs of the major iron ore projects and reduced the projected output of a number projects by between 25% to 50% where either the project costs were already high or the ability to execute the project is complex and the projected output is unlikely to be achieved. The results of this analysis are shown in Table 10.

⁹ Annual growth in Chinese demand for iron ore has been predicted to remain at between 10% to 15% between 2007-2010 with projections beyond this time showing a steady slowdown to levels of 5% annual growth in demand to 2015 (sources include BHP Billiton, Morgan Stanley and ABARE). Growth estimates for iron ore exports are often contradictorily with a number of forecasters believing that China will not be able to afford the increased costs of raw materials and demand will slow as a result, other forecasters are more bullish and point out that increased prices of raw material are offset by China's lower cost of manufacturing. In addition the higher global prices of raw materials affect developed countries as well and will lead to greater numbers of manufacturers shifting to lower cost operations such as China and India in the future.

¹⁰ Source Company announcements various

TABLE 10: FORECAST AUSTRALIAN IRON ORE EXPORTS (Mt) – MOST LIKELY CASE

	2006	2010	2015	2020
Iron Ore Exports	272	390	441	441

Source: Meyrick and Associates

Consequently, given these adjustments, we forecast, as the most-likely case, total Australian iron ore exports to rise from around the 272 million tonnes level in 2006 to 441 million tonnes in the period 2015-2020, an increase of 169 million tonnes relative to 2006 volumes or 1.6 times more. In terms of the high case scenario, the 2020 volumes could be as high as 510 Mt.

The implications for bulk carrier shipping are that more vessels will need to be deployed on Australian iron ore export trades – most likely as additional (new) tonnage. It is also likely that vessels will be calling at an increasing number of iron ore ports as new reserves and infrastructure becomes operational. The size of the bulk carriers calling at Australian iron ore export ports is not likely to increase significantly, apart from the gradual shift towards the use of the upper size range of Capesize vessels (i.e. 185,000 dwt).

4.4 Coal exports

4.4.1 Overview of the global coal trade

The global coal industry has two main markets – thermal coal and metallurgical coal – which are distinguished according to the end use of the coal.

- Thermal coal has two major uses: heating and power generation (typically as the fuel source used to produce steam for a turbo generator)
- Metallurgical coal is used to make coke that in turn is fed into blast furnaces as part of the steel making process.

As metallurgical coal varies in quality, the amount of coal required per tonne of steel production varies. This in turn impacts on shipping costs, and can be an important element of comparative advantage. Australian metallurgical coal exports are generally of a high quality and are often preferred to local supplies due to their better thermal properties, which result in less ash residue.

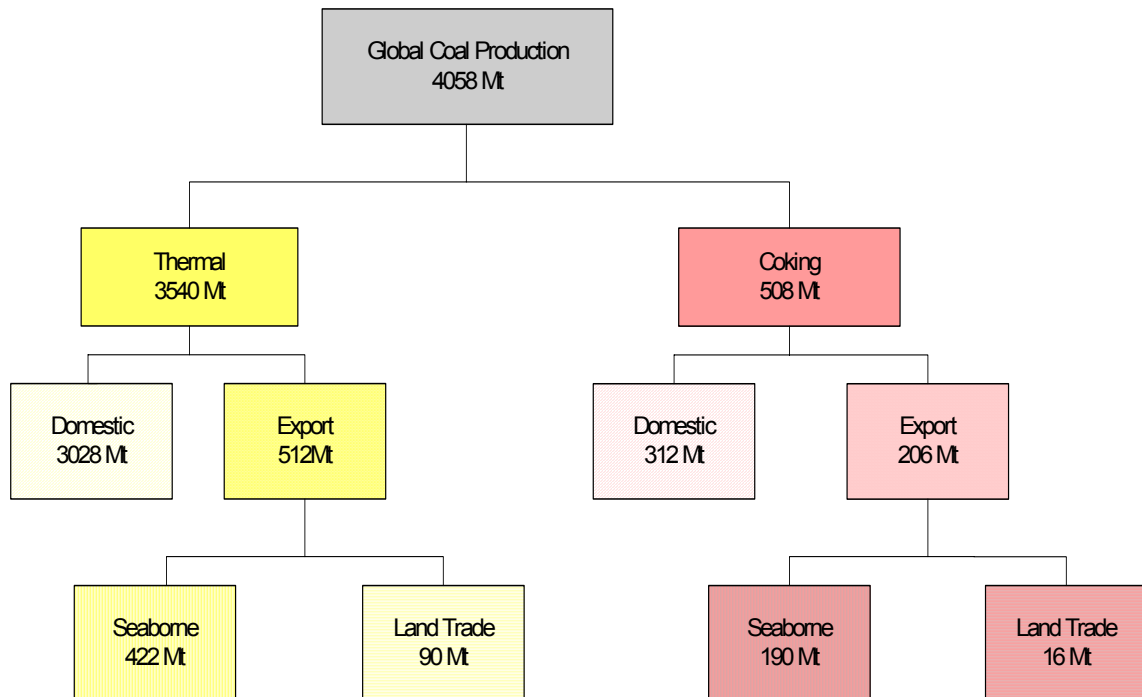
FIGURE 10: GLOBAL COAL INDUSTRY 2003¹¹


Figure 10 provides an overview of the disposition of global coal production in the year 2003. Of some importance to the current study is the relatively small proportion of total production that is traded internationally: well over 80% of total global coal production is consumed domestically.

The trade in seaborne coal exists for two main reasons:

- The importing country does not possess reserves of coal to meet its needs – the case of Japan, Taiwan, Korea
- The importing country is unable to meet the demand for coal (either the amount, cost or quality of the local coal is unacceptable) to local customers – the case of India, China, Europe.

Although, as shown above, seaborne coal meets a relatively small part of the overall consumption of coal, its major customers are heavily dependant on seaborne coal for their continued economic prosperity. Thus any interruption to supply or increase in demand has an immediate impact on the price of coal.

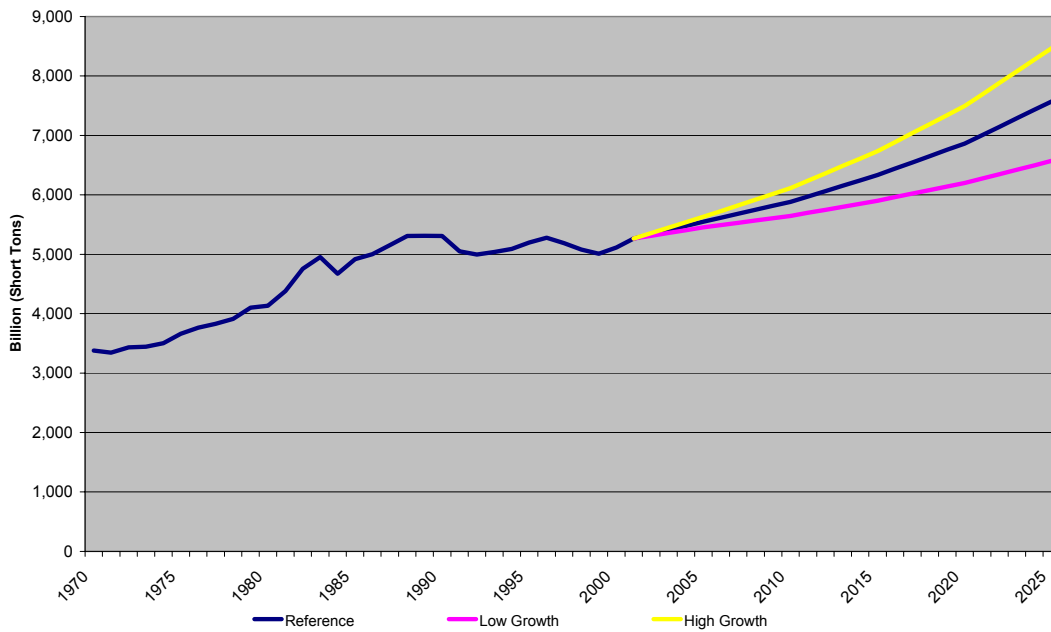
4.4.2 Global coal trade growth

Demand for coal was stagnant for much of the latter part of the 20th century, as shown in Figure 11. This stagnation was due to a combination of factors: the main ones being the development of alternative energy sources such as natural gas and nuclear power, tighter environmental controls on the use of coal, and the long economic downturn in Europe.

¹¹ Sources: International Energy Agency (IEA) and BHP Billiton (BHB)

The projected significant increase in coal demand from 2000-2025 is expected to largely arise from the increased economic activity in Asia and the consequent need to provide coal for electrical generation and steel production.

FIGURE 11: GLOBAL COAL DEMAND, 1970-2025¹²



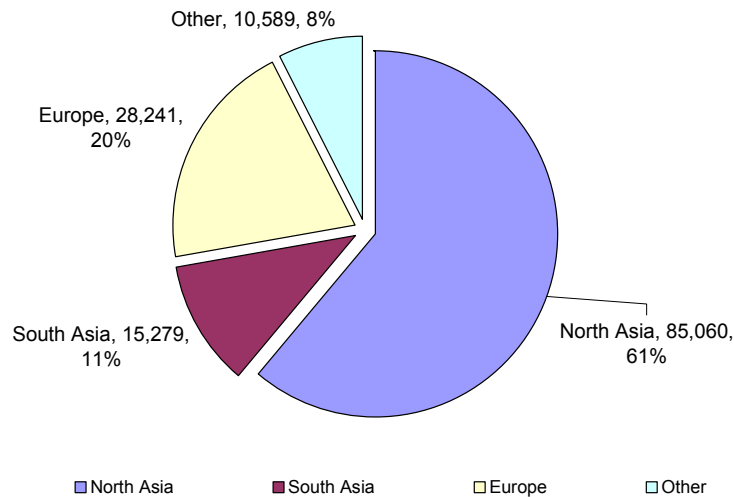
4.4.3 Current coal export destinations

Queensland coal exports and destinations

The North Asian countries (defined as Japan, Korea, China, Taiwan and Hong Kong) are the largest market for Queensland coal exports. While Europe is the second largest market it has limited future growth. It is likely that exports of metallurgical coal to South and Southeast Asia, in particular to India and Malaysia, will increase significantly.

¹² Source: International Energy Outlook 2004, released by the Energy Information Administration (EIA) of the U.S. Department of Energy (DOE).
<http://www.eia.doe.gov/oiaf/ieo/coal.html>

FIGURE 12: DESTINATION OF QUEENSLAND COAL EXPORTS, 2004



Source: Meyrick and Associations / various industry

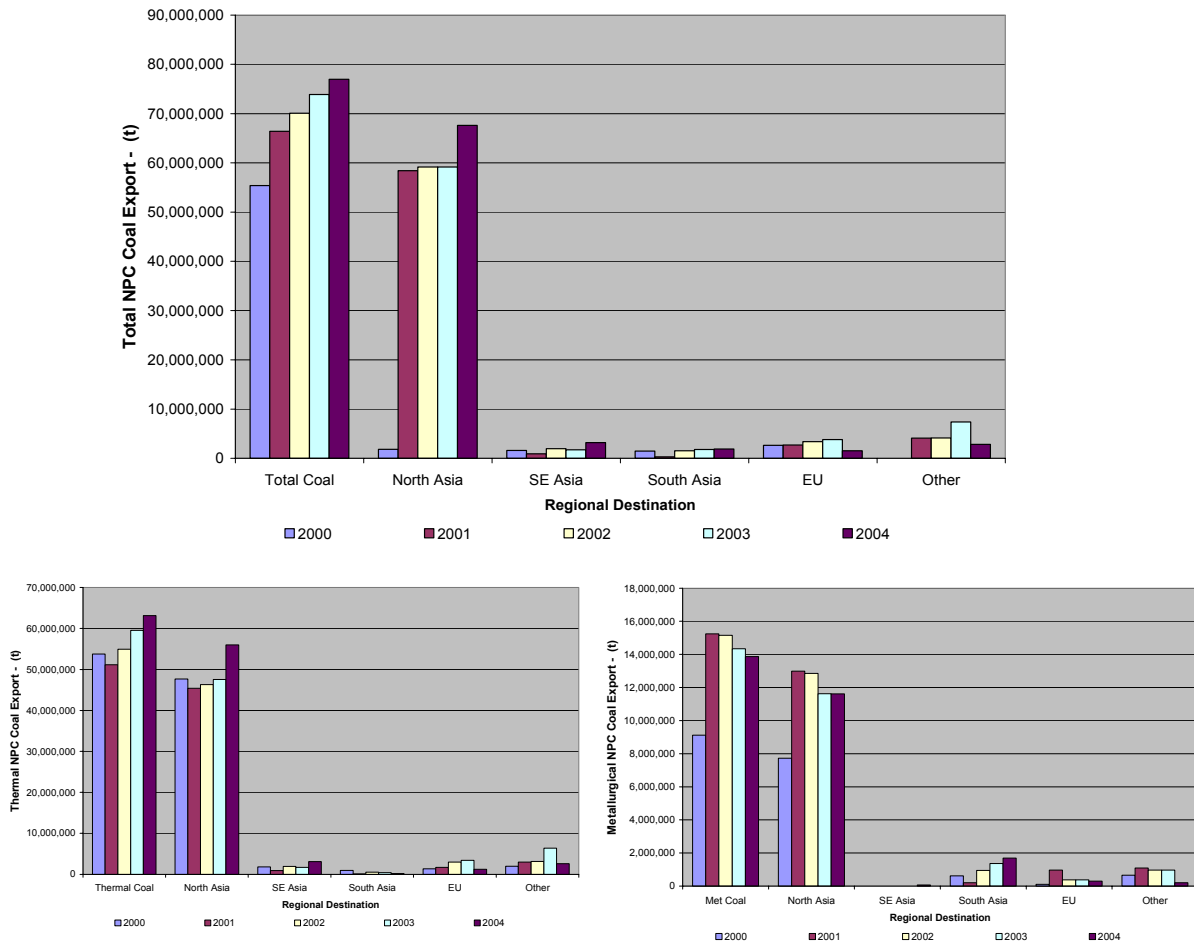
Other relevant features of current coal movements in Queensland are:

- Approximately 25% of all Queensland coal exports are comprised of thermal coal to North Asia. The remainder goes mainly to Europe, accounting for roughly 10% of Queensland thermal coal exports
- North Asia accounts for roughly 50% of Queensland's metallurgical coal exports. However, Europe remains a key market for metallurgical coal, accounting for 25% of all Queensland metallurgical exports
- South and Southeast Asia are not major destinations for Queensland coal at present, accounting for only around 10% of total coal exports – almost all of which is metallurgical coal. However, with Indian and Malaysian coal markets growing, this is expected to change.

New South Wales coal exports and destinations

Analysis of the New South Wales coal export data shows that export volumes are rising and that North Asia is the dominant market segment, as shown in Figure 13. The market segments that have not shown consistent growth between 2000-04 are those of the European Union and 'Other'. This is likely to be due in part to the general economic slowdown in Europe between 2000-2002. Another factor is the difficulty in competing in these more distant markets if large ships can not be used efficiently. The increase in freight rates for bulk shipping since 2003 has also tended to reinforce regionalisation of markets.

FIGURE 13: NEW SOUTH WALES COAL EXPORTS, 2000-04



Source: Meyrick and Associates / various industry

4.4.4 Future demand for Australian coal

Australia's exports of coal are already dominated by the Asian markets. As these markets are likely to be the most rapidly expanding coal markets in the world for the foreseeable future, it is likely that the share of Australian coal flowing to Asia will continue to increase. This is likely to be true for both thermal and metallurgical coal. Within Asia, there is likely to be greater diversification of markets. Japan will remain a very important partner for both metallurgical and thermal coal. However, Korea, Taiwan, India and Malaysia¹³ will gain in importance relative to Japan in the market for thermal coal. The market for metallurgical coal will also diversify, with India and China likely to grow in importance to rival Korea for the title of Australia's second most important market for metallurgical coal by the 2010, and to continue to grow strongly thereafter.

¹³ The Malaysian government is diversifying away from natural gas as the main domestic energy source. As the domestic supplies of coal are of low quality much of the thermal coal will have to be imported. This leads ABARE to forecast that thermal coal imports into Malaysia will reach 29 million tonnes in 2015, almost five times the level in 2004.

4.4.5 Global coal demand and supply forecasts – approach

We have based our projections on a review of established sources and analysis of other economic trends. There are not a large number of long term estimates of future coal trade growth, and there are substantial variations between the major sources of data on the coal trade. Even historical volumes for the same year quoted by different authoritative sources (we have drawn on ABARE, Morgan Stanley, Energy Information Agency (EIA) of the US Department of Energy, Barlow Jonker and SSY) vary by up to 10%-20%. The reason for these discrepancies is not clear: differences in the coverage of the data (such as the inclusion or exclusion of coke or brown coal) may be one cause.

That said, we have used what we believe to be the most up to date and authoritative reference material in compiling our forecasts. The surge in demand for coal had been predicted, but it was not until 2004 that it became evident and many of the estimates pre-2004 did not expect the rapid changes that occurred in Asian coal supply and demand: in particular the changes in Chinese coal demand and that of India.

There are two parts to our forecast for the future trade in seaborne coal:

- A short term forecast from 2005 – 2015

This is closely based on ABARE data¹⁴. Other short term estimates are available, and some of them differ quite significantly from those of ABARE (with regard to, for instance, the prospects for Chinese thermal coal exports). However, we have given preference to ABARE forecasts wherever their estimates were available for the relevant aspect

- A longer term forecast from 2015 – 2020

This forecast takes as its starting point ABARE's 2015 forecasts. Longer term estimates were then developed on the assumption that the structural trends evident in the short term would continue, and using estimates of global coal trade growth provided in a number of Japanese and US sources. However, as the projections in these forecasts are significantly more optimistic than those of ABARE, we have scaled back the expected global trade increase shown by these sources to a level consistent with the ABARE forecasts.

4.4.6 Forecast Australian coal exports

The forecast level of Australian coal exports is shown in Table 11.

TABLE 11: FORECAST AUSTRALIAN COAL EXPORTS (MT), 2005-2020

AUSTRALIA	2005	2010	2015	2020
Exports	243	304	341	390
as Thermal	120	144	160	182
as Metallurgical	123	160	181	208

Source: Meyrick and Associates

¹⁴ ABARE 2005, Infrastructure issues in the Hunter Valley coal supply chain, ABARE Report to the Australian Government Department of Industry, Tourism and Resources, Canberra, May 2005.

The level of exports from New South Wales and Queensland and the breakdown of thermal and metallurgical exports were analysed. Assuming that the share of each coal type exported from each State remains constant over time, we forecast a breakdown of total Australian coal exports by State as shown in Table 12.

TABLE 12: AUSTRALIAN COAL EXPORTS BY STATE AND TYPE (MT), 2005 – 2020

	Share	2005	2010	2015	2020
New South Wales		93	115	128	146
as Thermal	61.0%	73	88	98	111
as Metallurgical	16.7%	20	27	30	35
Queensland		150	189	213	244
as Thermal	39.0%	47	56	62	71
as Metallurgical	83.3%	103	133	151	173

Source: Meyrick and Associates

Note: Trade forecast for Australian coal exports are subject to coal producers being able to meet expected demand.

Total Australian coal exports are forecast to grow from 243 million tonnes in 2005 to 390 million tonnes in 2020, an increase of 147 million tonnes relative to 2005 volumes or 1.6 times more.

The implications for bulk carrier shipping can be considered to be the same as those discussed for iron ore exports at the end of section 4.3.2.

4.5 Grain exports

The grain forecasts used in this report are based on the estimated Australian exports published by the Grain Research and Development Corporation (GRDC)¹⁵, which has developed forecasts of exports to 2020 (GRDC 2004). These are presented in Table 13.

TABLE 13: AUSTRALIAN GRAIN EXPORTS AND GROWTH RATES ('000 TONNES)

	2005	2010	2015	2020
Total Australian Grain Exports	25,444	28,624	32,202	36,227
Growth (CAGR*)	-	2.38%	2.38%	2.38%

** Compound Annual Growth Rate.*

Source: Meyrick and Associates

As there is no clear evidence of a permanent structural shift in the shares of total national grain exports, we have assumed that these will remain constant through the forecast period with each state exporting according to its long term market share.

¹⁵ Grain Research and Development Corporation 2004, Grain industry demand and emergent uses: The foundation, GRDC, Canberra

TABLE 14: FORECAST GRAIN EXPORTS BY STATE ('000 TONNES)

State	Market Share ¹⁶	2005	2010	2015	2020
Victoria	12%	2,936	3,303	3,716	4,180
South Australia	14%	3,670	4,128	4,645	5,225
Western Australia	38%	9,542	10,734	12,076	13,585
Queensland	5%	1,223	1,376	1,548	1,742
New South Wales	32%	8,074	9,083	10,218	11,495

Source: Total market estimates as above, market shares from ABARE

In the short term, export grain volumes through individual Victorian and New South Wales grain ports¹⁷ are expected to continue to be extremely volatile¹⁸. Annual changes in grain throughput through these ports of over 50% have not been unusual, despite the overall growth in export grain volumes being only 2.5%.

The changes in the export port are the result of changes in how export grain is stored with on farm storage of grain now enabling farmers to control when their grain is made available for export. Changes in the charging and operating practices of rail operators such as Pacific National¹⁹ have impacted as well as differences in port efficiencies and vessel size access.

There does not appear to be the same volatility in the other states as the interport and interstate competition for grain exports is not as pronounced.

Over time, it is reasonable to expect that each state's market share will be driven by the underlying economics of the grain transportation and the needs of grain traders.

Given current (long term, non-drought) assumptions, total Australian grain exports are forecast to grow from 8.1 million tonnes in 2005 to around 11.5 million tonnes in 2020, an increase of 3.4 million tonnes relative to 2005 volumes or 1.4 times more. However, any realistic forecast of grain needs to factor in the extreme variability in harvests/droughts. Indeed the very latest short term ABARE predictions indicate a possible net import situation for Australia.

According to industry, an emerging trend is the increasing use of grain as a cattle feedstuff and raw material for the emerging/growing bio-fuels industry. This may add further uncertainty to the amount of grain available for export in the future.

¹⁶ Market Share based on 5 year average of grain export levels. Source: ABARE (2005)

¹⁷ The Victorian ports are Geelong, Portland and Melbourne and the New South Wales ports are Port Kembla and Newcastle

¹⁸ As an example grain exports in 2005/06 from the Victoria have dropped by one million tonnes, this is partially due to drought conditions in reducing yield in the Victorian crop. However an estimated 750,000 tonnes of grain which would have normally been exported through the Port of Melbourne is now moving through Port Kembla.

¹⁹ A major factor to change the export port in Victoria has resulted from alterations to the Victorian broad gauge rail network following the introduction of the new Regional Fast Rail network which has now advantaged Port Kembla and Geelong over Melbourne for grain exports

The implications for bulk carrier shipping can be considered not significant given the variability of Australian grain exports and its relatively small share of the global market. However, there is an expectation that the trend towards using more Panamax size vessels at the expense of Handy size vessels will continue or accelerate with a jump post-completion of the planned Melbourne port channel deepening.

4.6 Alumina exports

Alumina is produced by the chemical reduction of bauxite and is produced in both Western Australia and Northern Australia at a number of sites which are proximate to bauxite mines, although Gladstone is an exception with bauxite imported from Northern Australia. An increase in alumina exports will be driven by two main factors.

- The first is the planned expansions of alumina production in Western Australia and Northern Australia
- The second factor is the underlying incremental increase in alumina productivity that appears to be running at about 1% per annum²⁰.

4.6.1 Alumina refining overview

In Western Australia, there are two alumina producers, Alcoa at Pinjarra and Wagerup, and Worsley Alumina at Worsley and both have significant expansion plans in train (although two of the three expansions are at present on hold as there is uncertainty about the ability of the expansion projects to meet the delivery schedule and the planned cost²¹). In 2006, the Western Australian alumina producers have an estimated production capacity of 11.3Mt, which is based on 95% plant utilisation.

In Northern Australia there are three alumina refining operations:

- ALCAN operates a 2Mt alumina refinery at Gove.
- QAL operates a 3.5 Mt refinery at Gladstone
- COMALCO operates a 1.4 Mt refinery also at Gladstone.

4.6.2 Expansion of alumina refining

There are a number of planned expansions to alumina refining operations in Australia which will increase alumina exports between 2006-2020.

²⁰ This underlying increase in refining productivity is based on technology improvements to the Bayer process and improved energy efficiency. The Australian Mineral Industries Research Association is aiming for a 3% annual productivity increase we have been conservative and predicted 1% as an ongoing productivity factor.

²¹ This concern about increased operating cost and meeting delivery schedule is not restricted to Alumina as competition for skilled labour to develop new and existing mining developments and significant rises in the cost of mining are affecting iron ore, coal and mineral sands developments

2006-2010

There will be incremental upgrades at Alcoa's Pinjarra and Worsley Wagerup's refineries which will see capacity rise by 500Kt in 2008 and 800Kt in 2010 respectively. In Northern Australia, alumina refining capacity will increase from 5 Mt to 9.7 Mt by 2010 as expansions to ALCAN and COMALCO refining operations are undertaken increasing their capacities to 3.7Mt and 2.5Mt respectively.

2011 – 2015

Capacity at Alcoa's Wagerup refinery will be expanded to its planned capacity of 4.7Mt and Worsley's refinery to 4.4Mt between 2011 and 2015. This reflects our belief (based on consultation with the alumina producers and the reports of industry analysts) that the current expansion timetable will be delayed. In Northern Australia, we believe that a combination of incremental expansion of the three alumina refineries and an underlying increase in refinery productivity will increase capacity to 11.2Mt.

2016-2020

During this period, we have assumed an increase in the level of alumina exports of 3% per annum due to a combination of new alumina capacity being developed and productivity-driven production increases at existing alumina refineries. It should be noted that this growth rate is considered conservative as Australian alumina refining capacity is expected to increase at an annual average growth rate of 4.5% between 2003 and 2010.

4.6.3 Forecast Australian alumina exports

The forecast for alumina exports are based on alumina production with a 95% refinery utilisation.

TABLE 15: FORECAST AUSTRALIAN ALUMINA EXPORTS ('000T), 2005 – 2020

Year	Australian alumina exports	Northern Australia	Western Australia
2005	15,607	4,824	10,783
2010	21,328	9,229	12,098
2015	25,262	10,725	14,537
2020	29,286	12,433	16,853

Source: Meyrick and Associates / various industry

Total Australian alumina exports are forecast to grow from 15.6 million tonnes in 2005 to around 29.3 million tonnes in 2020, an increase of around 14 million tonnes relative to 2005 volumes or 1.9 times more.

It should be noted that there is also an export trade in bauxite which is secondary/incidental to the alumina export trade. Volumes of bauxite exports are covered in section 4.10 (other dry bulk cargoes).

The implications for bulk carrier shipping are that more vessels will need to be deployed on Australian alumina export trades with the likelihood of larger vessels being increasingly used instead of Handy and Panamax size vessels.

4.7 Mineral sands exports

4.7.1 Mineral sands overview

Mineral sands are old-beach sand deposits with high concentrations of heavy minerals. These heavy minerals, once extracted from the predominant constituent, quartz, have value in a wide range of commercial applications.

Most sand on the beach consists of grains of the quartz and contains low concentrations of mineral sands. Over time, the mineral sands, due to their density, are concentrated by wave and wind action into the valleys between strands, or long dune like formations. Mineral sands are defined as heavy minerals with a specific gravity greater than 2.9.

The major commercial mineral sands are:

- Zircon
- Rutile
- Ilmenite²²

Australia has the world's largest economic demonstrated resources (EDR) of mineral sands - about 29% of the world's ilmenite, 31% of rutile and 46% of zircon.

The majority of Australia's deposits are located in the South West of Western Australia, Eucla in South West South Australia, and in the Murray Basin Victoria, and with some mineral sand mining also occurring on North Stradbroke Island in Queensland.

The majority of mineral sands mined in Australia are exported. Almost all rutile and zircon production is sold to overseas markets, whilst 55% of ilmenite is exported. The remainder is upgraded to form synthetic rutile which is then either exported or upgraded to titanium dioxide pigment in one of two processing plants in Western Australia. In turn, this product is also exported.

A key feature of the mineral sands industry is the differences in life of the mining assets with a number of mines in Southern WA having a short life span of only a 3-5 years and other mines and deposits, such as those in Queensland and Victoria, having reserves which will support operations for 15-20 years.

4.7.2 Australian mineral sands industry

The mineral sands exports from Australia are controlled by three companies:

- Iluka Resources which has export operations of approximately 1Mt per annum exporting through Geraldton and Bunbury in Western Australia and is developing a new export operation, planned to commence in 2007 in Victoria at Hamilton with exports of 200-300Kt per annum of mineral sands through Portland between 2007- 2015. Iluka also has a controlling interest in Consolidated Rutile Ltd which operates on North Stradbroke Island and is estimated to produce 250-300 Kt per annum over the next 20 years.

²² Ilmenite may be processed into Synthetic Rutile

- Cable Sands which has export operations through Bunbury of approximately 250Kt per annum from local mineral sands mines and is now processing up to 300Kt of mineral sands per annum at its Bunbury mineral separation plant which are shipped from BEMAX²³ mineral sands operations in Victoria and NSW²⁴
- Ti West Joint Venture which operates mining and processing operations north²⁵ of Perth and a titanium dioxide pigment plant at Kwinana. Consultation with TI West indicate that they plan to export 200-250kt per annum through Western Australian ports and have recently shifted export operations from Fremantle to Bunbury.

4.7.3 Forecast mineral sands exports

The forecast of future mineral sands exports has a high degree of uncertainty, particularly regarding the future of those exports being sourced from the south of Western Australia.

In an industry characterised by long lead times in developing new mines and low growth in general, we do not believe it is appropriate to develop detailed forecasts of future mineral sands exports further than saying that overall export levels will be between 1.8-2.1 million tonnes per annum with three quarters being exported from Western Australia and the balance split between Victoria and Queensland.

Future exports of mineral sands from South Australia's Eucla region are considered to be "speculative" (not economically certain) at this time and therefore have been excluded. Australian Zircon has gained approval, in August 2006, to commence work on its Mindarie Project, 140km east of Adelaide which is principally a zircon mine which will also produce ilmenite, rutile and leucosene with an expected output of 100-200Kt per annum by 2010. At this time, any downstream processing and export tasks, whilst planned, are not yet confirmed and given the difficulty that Iluka and Bemax have in commissioning their mineral sands operations in Victoria and NSW, we are not prepared to include this development in this forecast.

TABLE 16: FORECAST AUSTRALIAN MINERAL SANDS EXPORTS ('000T), 2005 – 2020

Year	Australia Total Exports	Western Australia	Queensland	Victoria	South Australia
2005 -2020	1750 - 2050	1300 -1500	250 -300	200-250	Not included*

* Eucla region / Mindarie project.

Source: Meyrick and Associates / various industry

The implications for bulk carrier shipping can be considered not significant.

²³ BEMAX is the acquired Cable Sands in 2004

²⁴ BEMAX will produce 400-500Kt of mineral sands from its Pooncari mine which is 250 km south of Broken Hill. Mineral sands undergo some processing at Broken Hill and are then railed to Port Adelaide where they are loaded on to bulk ships, typically Handymax (40,000 DWT) and shipped to Bunbury where they are processed at the Cable Sands Mineral Separation Plant prior to being exported overseas. Source Discussions with Cable Sands

²⁵ Approximately 700Kt of heavy mineral concentrates is mined at Cooljarloo and then trucked to Chandala, where they are separated into ilmenite (420kt), rutile(25kt), leucosene(15kt) and zircon (70kt). The ilmenite is then refined to synthetic rutile (200kt) a portion of this is then used as feedstock for the titanium dioxide pigment plant at Kwinana. Source TI West

4.8 Woodchip exports

Exports of Australian woodchips, mainly in purpose-built high cubic bulk carriers, is the largest movement of timber products to and from Australia²⁶ (some 15x greater than logs and sawn timber) and takes place from five states with Tasmania accounting for the largest single share, although this is expected to change in the future. The Australian woodchip market has three major segments:

- The largest segment is 5 million tonnes of logs that are taken from native forests in Tasmania, mainly by the Gunns Ltd, chipped and then sold to Japanese paper companies
- The middle segment are logs taken from both native forests and from plantations by vertically integrated woodchip companies often owned by Japanese trading companies. The vertical integration extends from owning the right to harvest logs through the processing and shipping in dedicated woodchip vessels to Asian markets. Western Australian Plantation Resources (WAPRES) exports 800,000 tonnes through Bunbury and South East Fibre Exports Pty Ltd exports 850,000-900,000 tonnes of mainly Victorian woodchips through Eden in NSW are currently the two largest woodchip exporters of this type. In addition, around 250,000 tonnes of hardwood plantation woodchips are exported from the Port of Newcastle in NSW each year. This segment is expected to remain the second largest
- The smallest segment in the woodchip export market is managed by agribusiness investment companies which offer to lease land from farmers to grow plantations or purchase land for plantation development. The four main hardwood growers are Timbercorp, Great Southern Plantations, Integrated Tree Cropping and Pacific Forests. These companies have established new plantation operations in the South West of Victoria with plans to export through the port of Portland and in the South West of Western Australia and have begun to export woodchips through the port of Albany. This segment is expected to be the largest by 2020.

Exports of woodchips from Tasmania are expected to decline significantly in the short term if Gunns Ltd gains approval for a pulp mill in Northern Tasmania as the logs currently harvested for woodchip exports will be used for making value added woodpulp²⁷. Woodchip export volumes from Tasmania are expected to increase after 2015 as Gunns plans to develop plantations to make up for the native logs being used for woodpulp operations.

The forecast of future woodchip exports in Victoria and Western Australia has been taken from trade forecasts for the Ports of Bunbury, Albany, Geelong and Portland. The increase in woodchip exports from these two states is expected as the plantations outlined above begin harvesting operations²⁸.

²⁶ In 2005 exports of woodchips from Australia was over 10,000 Kt whilst the total import and export of timber products as either Roundwood or Sawnwood was 670 Kt. Timber products are discussed further in section 4.12 (other breakbulk cargo).

²⁷ Source Gunns Ltd "Tasmanian Pulp Mill Environmental Effects Statement" July 2006

²⁸ In 2005 Great Southern Plantations' made its first woodchip exports out of Albany shipping 350,000 tonnes to Japan's Daio Paper. Timbercorp and Integrated Tree Cropping, who jointly process and market their chips, have exported 420,000 tonnes from their chip export terminal at Albany since it opened in 2005 to Nippon Paper and Oji Paper

Overall exports of woodchips from New South Wales are, with some speculative volumes, expected to increase slightly. Speculative volumes out of the Port of Newcastle (some 526,000 – 600,000 tonnes/year of woodchips by 2020, including possible use for biomass fuel), if realised, will help offset an expected decline in exports out of Eden as the current high level of exports through Eden will fall as currently there is a significant supply of logs coming from state government forests in Gippsland, but this is damaged logs from the 2004/05 bushfire season and supplies will cease shortly.

The forecasts for Queensland woodchips has been retained at current levels as there is no indication from either the port of Brisbane or Gladstone that woodchip exports will change.

As far as South Australia is concerned, a “Green Triangle” plantation project in South East South Australia and extending into Victoria will yield increasing amounts of logs for woodchipping but export of the woodchips from the South East South Australia section will be through the Victorian port of Portland (chipper and loader operational in 2006).

TABLE 17: FORECAST AUSTRALIAN WOODCHIP EXPORTS ('000T), 2005 – 2020

State	2005	2010	2015	2020
Tasmania	5,000	1,000	2,000	2,000
Victoria	2,350	3,300	4,125	4,300
Western Australia	2,000	3,300	3,600	3,600
New South Wales	1,100	1,100	1,300	1,300
Queensland	270	270	270	270
Total	10,720	8,970	11,295	11,470

Source: Meyrick and Associates / various industry

Long term total Australian woodchip exports are forecast to increase to around 11.5 million tonnes, including some speculative volumes, with a short term dip of around 2 million tonnes (assuming approval of Gunn’s Tasmanian pulp mill project).

The implications for bulk carrier shipping can be considered not significant.

4.9 Sugar exports

4.9.1 Sugar industry

Queensland produces 90% of Australia’s sugar, with smaller volumes grown in New South Wales and Western Australia. The Queensland sugar industry is primarily export focused, with production in the other states largely destined for the domestic market. Until 2005, the export of Queensland sugar was regulated through single desk arrangements for both domestic and export market sales of bulk raw sugar as controlled by Queensland Sugar Limited (QSL). QSL is owned by the sugar growers and millers of Queensland and operates as a private company.

QSL has a dominant position in the sugar export chain as it manages the industry's seven bulk sugar terminals and handling facilities leased from the industry-owned company, Sugar Terminals Limited (STL)²⁹. Sugar exports are sold on the basis of cost and freight (CFR) or cost insurance freight (CIF) and with shipping arranged by QSL. The recent deregulation of the sugar market is not expected to alter QSL's position for a number of years as it has recently signed supply contracts with most of the major sugar mills and has reached an agreement with STL that it will continue to manage the sugar terminals until at least 2008.³⁰

4.9.2 Sugar exports

The major export markets for Australian sugar are Malaysia (1.03 million tonnes in 2004-05), the Republic of Korea (1 million tonnes), Japan (435,000 tonnes), Indonesia (362,000 tonnes) and Canada (333,000 tonnes)³¹.

It should be noted that molasses, exported from the same ports as sugar, is shipped as a bulk liquid and is covered under other liquid bulk cargoes (see section 4.15.2).

4.9.3 Forecast Australian sugar exports

Australian sugar production is forecast to be 5.2 million tonnes in 2006-07, and to reach 5.4 million tonnes in 2010-11.

Australian sugar exports are projected to increase to around 4.3 million tonnes in 2010-11.³² ABARE estimates show an underlying growth forecast of just over 1% in sugar production and just under 1% in sugar exports between 2004 and 2011.

Growth in sugar production is expected to derive from productivity measures rather than additional sugar cane acreage (expansion is being held back by lower prices and increased production cost though higher fertiliser and fuel charges as well as increased water costs).

In developing forecasts of sugar production and exports from 2010 to 2020, we have continued the 1% growth increase implicit in the ABARE forecasts.

Our forecasts assume that Queensland will remain the state where sugar exports take place but given the uncertainty about sugars supply chain and despite QSL having a dominant position in the short term, we believe that it is likely that new entrants will enter the sugar export market. A likely change is that one will see sugar move to being sold on a Free On Board (FOB) basis rather than Cost Freight (CFR) or Cost Insurance Freight (CIF) as is typical of deregulated dry bulk exports. As a result we are not confident that the current sugar volumes will continue to be shipped in the same shares through the current export ports.

²⁹ Sugar Terminals Ltd owns 7 major sugar terminals at Mackay, Lucinda, Bundaberg, Townsville, Mourilyan, Cairns and Brisbane and has a total storage capacity of over two million tonnes of raw sugar.

³⁰ STL announce on the 5th Sep 2006 that the QSL lease of the 7 sugar terminals would continue until at least 30 Jun 2008

³¹ Source ABARE 2005

³² Ibid

TABLE 18 : AUSTRALIAN SUGAR PRODUCTION AND EXPORTS ('000T), 2005- 2020

Year	Production	Exports
2005	5,196	4,271
2010	5,353	4,279
2015	5,578	4,458
2020	5,862	4,685

Source: Meyrick and Associates / various

Total Australian sugar exports are forecast to grow marginally from 4.3 million tonnes in 2005 to 4.7 million tonnes in 2020. As with grain exports, sugar exports, albeit to a lesser extent, will be dependent upon prevailing climatic conditions in the future.

The implications for bulk carrier shipping can be considered not significant.

4.10 Other dry bulk cargo imports and exports

Other dry bulk cargoes are not insignificant and cover:

- Nickel ores, around 3 to 4 million tonnes per year imported from New Caledonia/SE Asia into Townsville
- Zinc/copper/lead concentrates, around 1.5 million tonnes per year exported from Townsville to mainly Asia
- Bauxite, around 5 million tonnes per year exported from Weipa to Europe and Asia
- Silica sand, around 2.5 million tonnes per year exported from Queensland and Western Australia
- Salt, around 7.5 million tonnes per year exported from Western Australia
- Gypsum, around 1 million tonnes per year exported from Western Australia.

These other dry bulk cargoes have not been included in our long term forecasts but can be considered to represent an add-on total of around 17 million tonnes per year of trade.

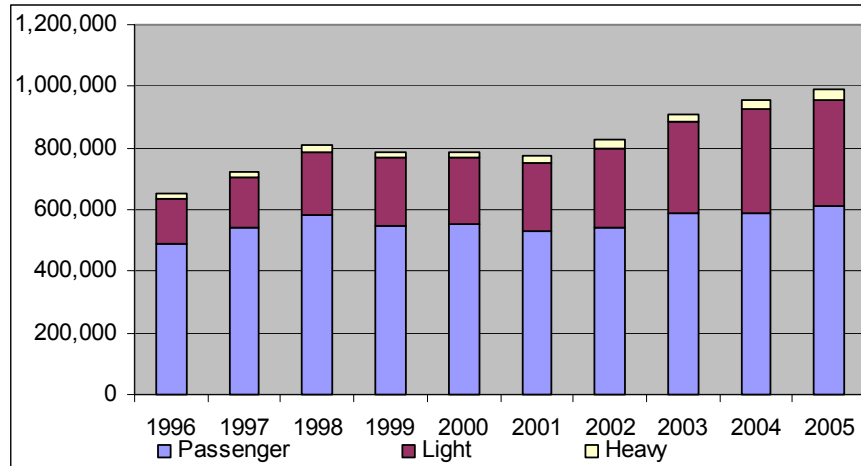
4.11 Motor vehicles imports and exports

4.11.1 Australian motor vehicle market

The Australian new vehicle market has been growing steadily (see Figure 14), with new vehicle sales in 2005 at 988,269 units³³. A key feature of this growth in sales is that the passenger segment has been largely static since 1998 with the growth in vehicle sales coming from new light vehicles, of which Sport Utility Vehicles (SUVs) are the most significant component.

³³ 2005 Annual motor vehicle sales Source Vfacts.

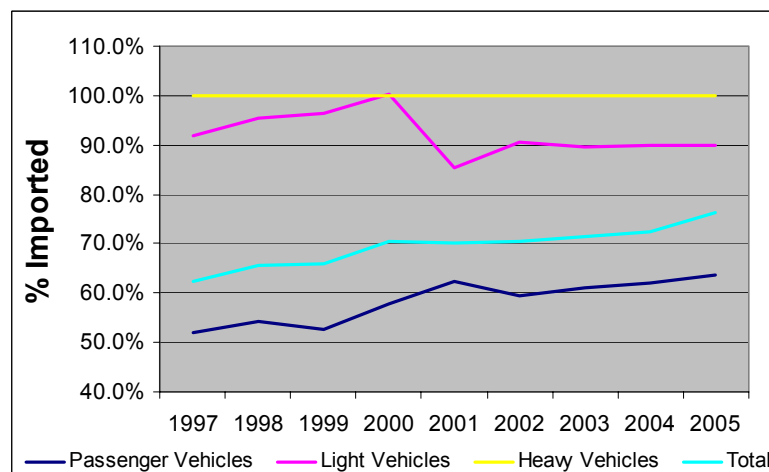
FIGURE 14: ANNUAL NEW CAR SALES (NUMBER OF VEHICLES), 1996 -2005



Source: Meyrick and Associates / various industry

The Australian automotive market is very open. Around 70 per cent of vehicles sold in Australia are produced overseas.

FIGURE 15: PERCENTAGE OF VEHICLES IMPORTED BY SEGMENT



Source: Meyrick and Associates / various industry

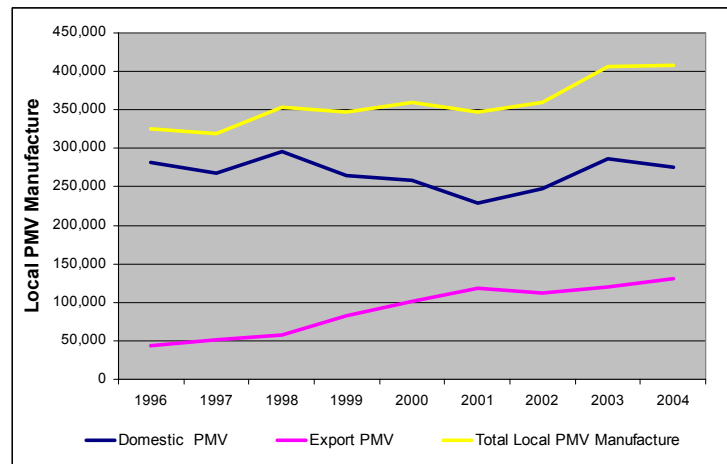
This import figure has been reasonably consistent since 2000 although the recent growth in SUV imports and the continuing trend to import passenger vehicles, may well see this rise further by 2020.

4.11.2 Australian domestic motor vehicle industry

Australia has a substantial motor vehicle industry which produced in 2004 just over 407,537 motor vehicles, including over 365,000 passenger motor vehicles.

Total production in Australia shows steady growth over the last ten years, with exports gaining share at the expense of domestic sales. However, domestic sales are also growing, with exports growing steadily as a component of total domestic sales - see Figure 16.

FIGURE 16: AUSTRALIAN DOMESTIC MANUFACTURE SEGMENTS (NUMBER OF VEHICLES)



Note: PMV = passenger motor vehicles

Source: Meyrick and Associates / various industry

4.11.3 Forecast for imported new motor vehicles

The forecast for imported new motor vehicles is based on four factors:

- The growth of the Australian passenger motor vehicle (PMV) market which has been low in recent times
- The growth of the Australian SUV market which has been very high, but is expected to slow
- The relevant percentage of each of the passenger and SUV segments that are imported - leading to the volume of new motor vehicle imported into Australia
- The growth rates of the Light Commercial Vehicles (LCV) and Heavy Commercial Vehicles (HCV) segments.

Growth of the Australian passenger vehicle market

The growth in the Australian passenger vehicle market which had slowed in 2004 to 0.3% rebounded in 2005 to the long term trend of 3.2% which is used in developing forward estimates.

Growth of the SUV segment

This forecast assumes the SUV segment will slow from its high level of 15 % growth in 2003-04 and converge with the passenger segment over time. The rationale is that the majority of 4 Wheel-Drive (4WD) and All Wheel-Drive (AWD) vehicles are being purchased by those who would normally purchase vehicles in the passenger segment.

Effectively the 4WD and AWD vehicles are assumed to be cannibalising sales in the passenger segment and the growth in this segment is expected to drop closer to that of the long term passenger market at around 5% by 2010 and to 4% by 2020.

Imports as a percentage of sales

As noted previously, the percentage of imports in the passenger segment is rising from 62% and is expected to reach 70% by 2020.

The percentage of domestic SUV's is expected to remain at 10% as Holden is expected to build a domestic SUV model to counter the very successful Ford Territory which is expected to sell 15,000 – 20,000 units each year.

The growth rates of the light and heavy commercial vehicles

The LCV and HCV segments are expected to differ in future growth as Australia's freight task is expected to double by 2020 from its base task in 2000³⁴. The urban freight task which is predominantly moved by LCV is expected to grow at 3.3% leading to strong growth in the LCV segment. The HCV segment although having the interstate freight task growing at 3% is only forecast to grow at 2.5% as new HCV's will have higher productivity and better utilisation so a long term growth rate of 2.5% has been used to 2020.

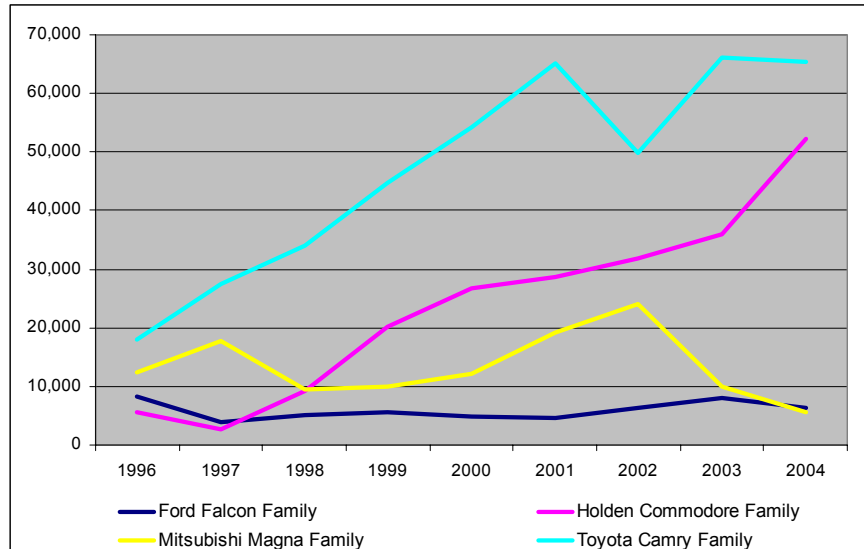
4.11.4 Australian automotive exports

In 2005, Australia exported around 140,000 vehicles or about 32 per cent of production. Important markets include the Middle East, the USA and New Zealand. Australia is a right hand drive market (vehicles drive on the left hand side of the road) but left hand drive vehicles are also produced for overseas markets.

Exports have had significant changes in the past three years with Mitsubishi's Magna variant, selling as the Diamante in the USA, and the Holden Monaro export programs to the USA being cancelled in 2004.

Exports from Victoria are mainly Toyota's to the Middle East, approximately 70% of the export trade, and Toyota's and Holden's to New Zealand, approximately 23% of the export trade. Exports from South Australia are mainly Holden's to Singapore and Thailand for onward shipment to Asia and the Middle East.

³⁴ Twice the Task - Feb 2006 SKM/Meyrick for National Transport Commission

FIGURE 17: MOTOR VEHICLE EXPORTS (NUMBER OF VEHICLES), 1996-2004


Source: Meyrick and Associates / various industry

In 2004, Holden commenced an export program of 30,000 cars to China as a part of a short term program which was put in place to supply the booming Chinese demand for cars. Given China's development of its domestic motor vehicle industry, Holden plans to restart exports in 2008 to the USA as rebadged Buicks with an estimated 30,000 vehicle per annum market³⁵.

The future of motor vehicle exports from Australia still remains unclear with Toyota continuing an export program of between 65,000 – 80,000 units although this is guaranteed only until 2010. Our approach to exports has been to assume that export of motor vehicles will continue at around 140,000 units nationally, although this is uncertain beyond 2010.

Exports of motor vehicles are expected to remain at 70% from Victoria and 30% from Adelaide.

4.11.5 State market share of new vehicle imports

Currently Victoria has approximately 34% of the total market for new vehicle imports (excluding imports for the Tasmanian market), NSW has 38%, and Queensland 19% with others sharing the remaining 9%³⁶. Major changes to state based market shares are not expected in view of a lack of cheaper landbridging solutions³⁷. However, industry structural change as discussed elsewhere will impact on exports and, less directly, on imports.

4.11.6 Forecast of motor vehicle imports and exports

The most likely forecast for imports and exports of new vehicles through the Australia and by state is shown in Table 19 and 20.

³⁵ Industry Sources

³⁶ Analysis of port Data and reports 2002-2005

³⁷ Patrick Corp was developing a landbridging model to move Holden Commodore's from Adelaide to Brisbane using purpose built rail wagons each capable of carrying three cars. The plan was to then backload imported cars that had been landed at Brisbane to Adelaide. It is not known if Toll Holdings will continue this plan.

TABLE 19: FORECAST NEW VEHICLE IMPORTS (NUMBER OF VEHICLES, '000)

	PMV Imports	SUV+LCV Imports	HCV Imports	Total Imports
2005	445	320	32	797
2010	553	428	36	1,018
2015	684	541	41	1,266
2020	835	659	46	1,540

Source: Meyrick and Associates / various industry

TABLE 20: NEW VEHICLE IMPORTS BY STATE (NUMBER OF VEHICLES, '000)

Year	Total Vehicle Imports	Victoria	NSW	QLD	Other
	Market Share:	27%	32%	24%	17%
2005	797	215	255	191	135
2010	1,018	275	326	244	173
2015	1,266	342	405	304	215
2020	1,540	416	493	370	262

Source: Meyrick and Associates / various industry

It should be noted in Table 20 that the import market share figures are based on State shares of national vehicle sales which comprise the total of passenger motor vehicles, SUVs and commercial vehicles (light and heavy). Port statistics are generally only showing imports of new passenger motor vehicles/SUVs with commercial vehicles classified separately and grouped under breakbulk cargoes. The following are 2004/05 number of (passenger) new vehicle imports for the main ports: Melbourne - 200,000; Sydney - 235,000; Brisbane - 180,000; Adelaide - 32,000; and Fremantle - 72,000 (basis 100,928 mass tonnes). The figures shown in Table 20 are estimates of the total of passenger, SUV, and commercial vehicles.

The expected forecast of motor vehicle exports is shown in Table 21.

TABLE 21 : FORECAST NEW MOTOR VEHICLE EXPORTS (NUMBER OF VEHICLES)

Year	New Vehicle Exports
2005	140,000 (70% Vic, 30% SA)
2010	140,000 (70% Vic, 30% SA)
2015	140,000 (70% Vic, 30% SA)
2020	140,000 (70% Vic, 30% SA)

Source: Meyrick and Associates / various industry

The total Australian motor vehicle import and export trade is forecast to grow from around 1 million units in 2005 to 1.7 million units in 2020.

The implications for vehicle carrier shipping can be considered not significant. Of greater significance to vehicle carrier operators will be the re-location of Port Jackson car import facilities to Port Kembla and other long-term plans to re-locate multi-purpose/conventional cargo operations to other outer harbours (notably – the potential to move vehicle operations away from Melbourne to regional ports such as Hastings or Geelong as Melbourne’s available land is progressively turned over to container handling).

4.12 Other breakbulk cargo imports and exports

Other breakbulk cargoes comprise metal products (iron & steel, and aluminium), forest products (timber, logs and wood-pulp, excluding woodchips), and specialised (livestock and reefer). In general, these are relatively small flows and dispersed over a number of Australian ports. Consequently, we have not conducted forecasts for these cargoes but only provided a short commentary as shown below.

Metal products, of which steel is the largest part, concern shipments to international markets from Port Kembla of around 2 million tonnes per year. Aluminium ingots are shipped overseas from the ports of Portland and Bell Bay (Tas).

In 2005, the total Australian trade (import and export) of timber (sawnwood) and logs (roundwood) was 670,000 tonnes. Given the approval of the Gunns Bell Bay pulp mill, this would see future exports of pulp to Asia (mainly China) of around 800 to 1,000 Kt per year. In NSW, it is expected that 200,000 tonnes of softwood logs will be exported through the port of Eden in 2006/07 rising to at least 250,000 tonnes by 2007/08. The recent approval of a timber mill at Bombala could increase exports through the port of Eden further (the mill has a capability to process 300,000 tonnes of softwood per year).

These developments could see the total long-term Australian trade in timber and logs increase to around 1 million tonnes per year with an additional 1 million tonnes per year of pulp exported from Tasmania (given approval of the Gunns pulp-mill project). It should be noted that the large woodchip export trade (some 11 million tonnes per year) has been reviewed separately in section 4.8. Woodchips are generally carried in purpose-built (high cubic design) bulk carriers as opposed to breakbulk or small bulk vessels for logs and sawn timber. Wood pulp is generally carried in bales by specialised open-hatch geared bulk carriers.

Livestock exports have declined significantly in the last five years (impacted by the drought / increased local slaughtering) and totalled around 417,000 tonnes in 2004/2005 (comprising 3.2 million live sheep and 550,000 live cattle). The main export ports are in Western Australia (Fremantle and Geraldton), Northern Territory (Darwin), Tasmania (Burnie) and Victoria (Portland) with significantly lower numbers through some Queensland ports. The expectation is that live sheep exports will bounce back to around 4.3 million head in 2006/2007 driven by Middle East imports (source – ABARE).

Reefer (non-containerised) exports of frozen meat in conventional refrigerated vessels have been declining as containers have taken an increasingly greater share of this trade. The Australian fruit export trade is almost exclusively containerised (which is not the case for neighbouring New Zealand exports). Globally, reefer trades (including containerised) have been increasing with Russian imports of fruit currently growing at 20% per year.

4.13 Crude oil and petroleum products imports and exports

4.13.1 Overview

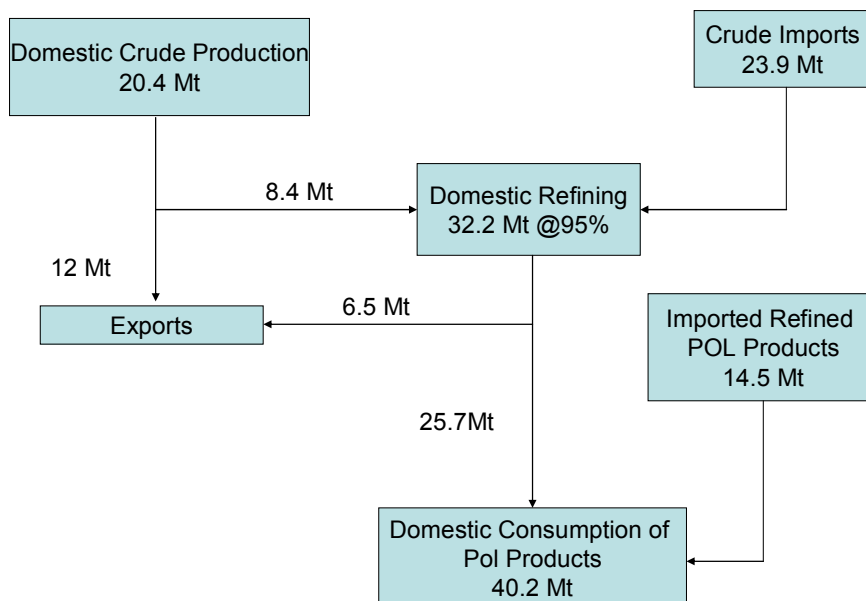
The liquid bulk sector in Australia is dominated by the maritime movement of petroleum products (POL) which are sourced both domestically and from overseas. The two main products that are shipped to and from Australian ports are crude oil and refined petroleum.

There are also substantial volumes of crude oil, condensate and LNG which are directly exported from their production facilities, typically in the North West Shelf Development area and the petroleum operations in the Timor Gap.

4.13.2 Petroleum production flows

The structure of flows in the Australian petroleum industry is shown in Figure 18 and is based on analysis of industry data from a range of sources. The volumes and flows of POL products in 2005/06 are taken from ABARE commodity reports.

FIGURE 18: AUSTRALIAN PETROLEUM PRODUCTION FLOWS, 2005-06



Source: Meyrick and Associates / various industry

4.13.3 Australia current petroleum demand

Based on the volume and type of POL products provided in ports statistics³⁸, it is possible to calculate the relative share of each state's consumption of the Australian demand for POL products. In 2005/06, Australia consumed over 40 million tonnes of POL products with Queensland, New South Wales and Victoria the largest consumers.

TABLE 22: AUSTRALIAN PETROLEUM DEMAND (TONNES), 2005/06

Australia / by state	Petroleum consumption	Market share
Total	40,261,552	-
VIC	9,662,772	24%
NSW	10,468,004	26%
WA	4,428,771	11%
SA	2,415,693	6%
TAS	1,610,462	4%
NT	1,207,847	3%
QLD	10,468,004	26%

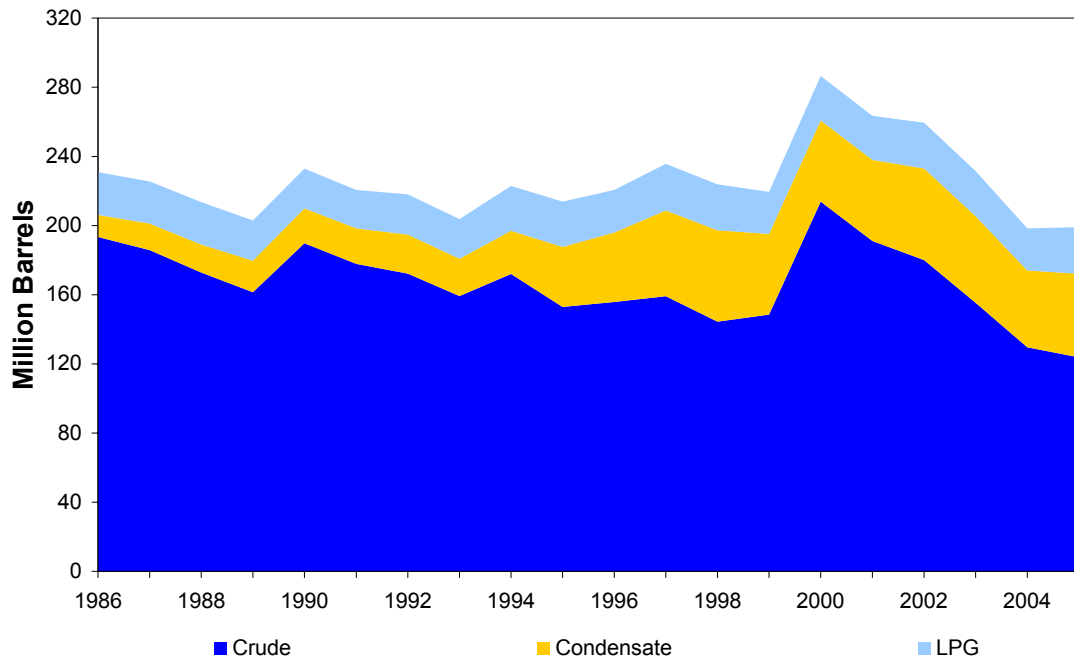
Source: Meyrick and Associates / various industry

It should also be noted that POL demand has seasonal variations with peaks for diesel fuel in certain regions due to agricultural use (i.e. during grain sowing and harvest). These seasonal peaks have to be catered for in terms of storage capacity and refining demand planning / imports.

4.13.4 Australia current petroleum supply

As shown below the volume of Australian domestic production of POL products has been declining since 2001. In 2006, Australian oil production was disrupted by cyclone activity with production dropping by 13% in the March quarter, although this is expected to be offset in part by new developments in the Enfield project which is expected to add just under 5 million tonnes in 2007.

³⁸ Port records various sources

FIGURE 19: AUSTRALIAN CRUDE, CONDENSATE & LPG PRODUCTION, 1986 – 2005³⁹


Australia produces crude oil and condensate at a number of locations and in 2005 produced over 20 million tonnes of oil, with Western Australia (North West Shelf) producing 70% of the Australian total.

 TABLE 23: AUSTRALIAN POL PRODUCTION (TONNES)⁴⁰, 2005

Location	Crude Oil Production (T)
VIC	3,658,512
WA	14,586,000
NT	858,000
QLD/SA	1,201,200
Total	20,377,500

4.13.5 Australia oil refining

Australia has four states with oil refineries in operation⁴¹, assuming that each refinery operates at 95% efficiency, the combined Australian refining capacity is just over 32 million tonnes of refined product. In our forecast, we assume that this capacity remains constant.

³⁹ Source APPEA

⁴⁰ Analysis of Australian Petroleum Statistics 2005 Data

⁴¹ Mobil's refinery at Port Stanvac in South Australia was mothballed in 2003 and is not expected to be recommissioned in the short term

TABLE 24: AUSTRALIAN POL REFINERY CAPACITY (TONNES)⁴²

State	Australian refining capacity
VIC	10,307,464
NSW	8,521,919
WA	5,600,118
QLD	7,832,050
Total refining capacity	32,261,552
@95% utilisation	

4.13.6 Australia's future demand for POL products

Australia's future demand for POL products is estimated to increase at between 1 to 2% per annum⁴³. We have developed our model of the Australian demand for POL products increasing at 1.5% per annum based on a 2005/06 base of 40.2 Mt. As a comparison, we have reviewed the estimates of future Australian demand for POL products by Geoscience Australia⁴⁴.

The consumption of liquid fuels as petroleum products is based on the forecast of consumption of liquid petroleum (other than LPG) in energy units published by the Australian Bureau of Agricultural and Resource Economics as at October 2005⁴⁵

The comparison shows the Meyrick analysis is slightly higher, although Geoscience does not include LPG, but the slope of the rise in demand is the same for both forecasts.

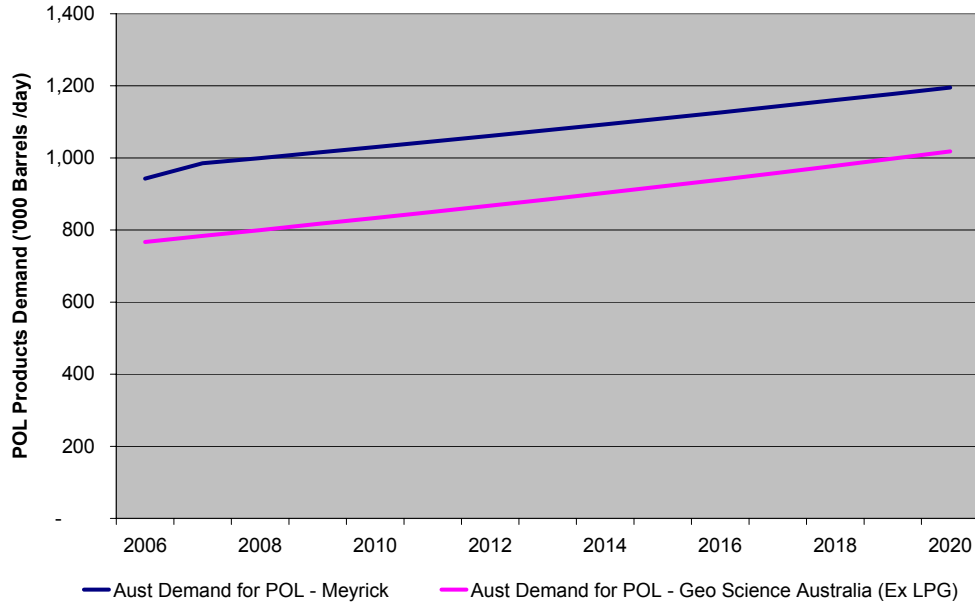
⁴² Industry Data

⁴³ Meyrick Analysis of port data and ABARE reports

⁴⁴ Submission by Geoscience Australia to the Senate Rural and Regional Affairs and transport Committee – Inquiry into Australia's Future Oil Supply and Alternative Transport Fuels dated Feb 2006

⁴⁵ Data from ABARE eReport 05.9: Australian energy: national and state projections to 2029-30. ABARE, Canberra.

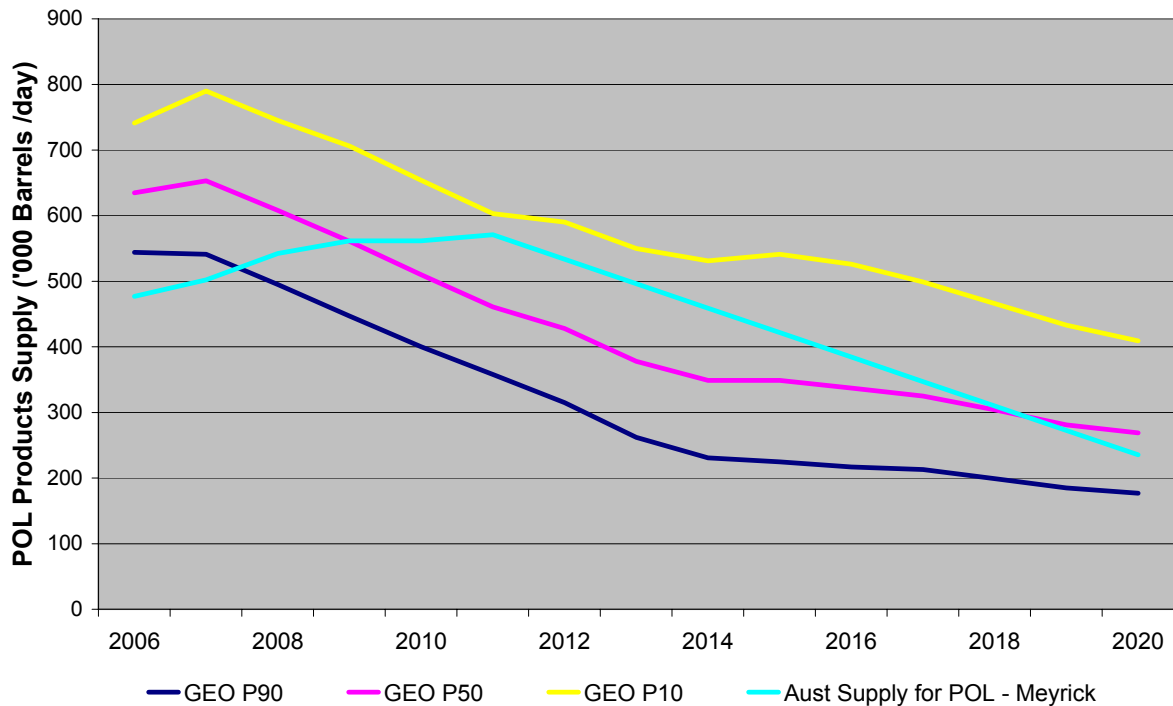
FIGURE 20: FORECAST AUSTRALIAN DOMESTIC POL DEMAND, 2006-2020



Source: Meyrick and Associates / Geoscience

4.13.7 Australia's future supply of POL products

Australia's domestic supply of POL products is expected to decline over time, even with the discovery of new oil prospects. This is clearly shown in both the Meyrick analysis and the Geoscience forecasts of future Australian crude and condensate production, as shown in Figure 21.

FIGURE 21: FORECAST AUSTRALIAN DOMESTIC POL SUPPLY 2006-2020


Source: Meyrick and Associates / Geoscience

The forecast of production by Geoscience Australia⁴⁶ is based on current estimates of production from identified and undiscovered resources. Geoscience Australia estimates are made at various probability levels to reflect the uncertainty surrounding the development of production estimates from discovered accumulations. To take account of this, three production estimates were prepared:

- (P90) means that there is a 90% chance of production being at least as high as the figure shown
- (P50) means that there is a 50% chance of production being at least as high as the figure shown.
- (P10) means that there is a 10% chance of production being at least as high as the figure shown.

The Meyrick forecasts are based on the actual 2005/06 POL production data as well as the increased output from the Enfield development as reported by ABARE to 2011, then declining to meet the 2020 estimate of the Geoscience P50 production estimate.

4.13.8 Forecasts of future POL needs

Based on the model of POL flows as shown in Figure 18, estimates of future POL flows have been developed.

Table 25 shows the future levels of Australian oil production and exports of unrefined POL products.

⁴⁶ Submission by Geoscience Australia to the Senate Rural and Regional Affairs and transport Committee – Inquiry into Australia’s Future Oil Supply and Alternative Transport Fuels dated Feb 2006

TABLE 25: AUSTRALIAN OIL PRODUCTION AND EXPORTS OF UNREFINED POL PRODUCTS (TONNES)

	Location	2006	2010	2015	2020
Domestic crude production	Australia	23,750,000	24,000,000	18,012,575	13,392,434
	VIC	4,264,000	2,400,000	1,500,000	500,000
	WA	17,000,000	18,600,000	14,512,575	10,892,434
	NT	1,000,000	1,500,000	1,000,000	1,000,000
	QLD	1,400,000	1,500,000	1,000,000	1,000,000
Export crude	Australia	15,101,333	16,554,747	10,904,822	6,659,681
	VIC	2,500,000	1,500,000	937,500	312,500
	WA	12,601,333	18,054,747	11,842,322	6,972,181

Source: Meyrick and Associates

Table 26 shows the volumes of Australian and imported crude oil used to supply Australian refineries, assuming that there is no change in refining capacity until 2020. The levels of domestic refined products remains constant, however there is expected to be a slight increase in the refined exports from the Brisbane refineries to meet the increased demand for refined products in far north Queensland over time.

TABLE 26: DOMESTIC REFINING POL FLOWS (TONNES)

	Location	2006	2010	2015	2020
Domestic crude used in domestic refining	Australia	8,648,667	7,445,253	7,107,753	6,732,753
Imported crude	Australia	26,376,180	27,579,594	27,917,094	28,292,094
	VIC	8,500,000	8,506,254	8,843,754	9,218,754
	NSW	9,408,180	9,936,069	9,936,069	9,936,069
	WA	0	0	0	0
	QLD	8,468,000	9,137,271	9,137,271	9,137,271
Domestic refining	Australia	35,024,847	35,024,847	35,024,847	35,024,847
	VIC	9,406,254	9,406,254	9,406,254	9,406,254
	NSW	9,936,069	9,936,069	9,936,069	9,936,069
	WA	6,545,253	6,545,253	6,545,253	6,545,253
	QLD	9,137,271	9,137,271	9,137,271	9,137,271
Export refined	Australia	6,500,000	6,564,864	6,790,185	7,038,958
	VIC	1,200,000	1,200,000	1,200,000	1,200,000
	NSW	600,000*	500,000	500,000	500,000
	WA	2,700,000	2,700,000	2,700,000	2,700,000
	QLD	2,000,000	2,164,864	2,390,185	2,638,958

(* based on Meyrick refining and supply model. Sydney Ports recorded 700,000 tonnes for 2006.

Source: Meyrick and Associates

The total domestic demand and the levels of domestic and imported supply of refined POL products are shown in Table 27.

TABLE 27: AUSTRALIAN DEMAND FOR POL PRODUCTS AND DOMESTIC AND IMPORTED COMPONENTS (TONNES)

	Location	2006	2010	2015	2020
Domestic demand	Australia	43,024,847	51,288,271	55,252,034	59,522,132
	VIC	11,597,520	12,309,185	13,260,488	14,285,312
	NSW	12,563,980	13,334,950	14,365,529	15,475,754
	WA	5,315,530	5,641,710	6,077,724	6,547,435
	SA	3,140,995	3,333,738	3,591,382	3,868,939
	TAS	1,932,920	2,051,531	2,210,081	2,380,885
	NT	1,208,075	1,282,207	1,381,301	1,488,053
	QLD	12,563,980	13,334,950	14,365,529	15,475,754
Domestic refined to domestic demand	Australia	28,524,847	28,459,983	28,234,662	27,985,889
Imported refined	Australia	14,500,000	22,828,288	27,017,372	31,536,243
	VIC	2,000,000	4,102,931	5,054,234	6,079,058
	NSW	2,200,000*	3,898,881	4,929,460	6,039,685
	WA	1,900,000	1,796,457	2,232,471	2,702,182
	SA	2,200,000	3,333,738	3,591,382	3,868,939
	TAS	900,000	1,282,207	1,381,301	1,488,053
	NT	1,300,000	2,051,531	2,210,081	2,380,885
	QLD	4,000,000	6,362,544	7,618,443	8,977,441

(*) of which 2 million tonnes through Sydney Ports.

Source: Meyrick and Associates

The total Australian trade in imported crude and imported/exported refined products is forecast to grow from 47.4 million tonnes in 2006 to 66.8 million tonnes in 2020, an increase of 19.4 million tonnes relative to 2006 volumes or 1.4 times more.

The implications for tanker shipping can be considered not significant.

4.14 Caustic soda imports

Caustic soda, as a liquid bulk chemical, is a critical input to the production of alumina from bauxite and imports of caustic soda are strongly correlated to alumina exports. Our forecast for the future level of caustic imports is based on the predicted level of alumina exports over time.

TABLE 28: AUSTRALIAN CAUSTIC SODA IMPORTS (T), 2005 – 2020

Year	Australian caustic soda imports	Northern Australia	Western Australia
2005	2,253,619	696,626	1,556,993
2010	3,079,691	1,332,704	1,746,987
2015	3,647,882	1,548,668	2,099,214
2020	4,228,895	1,795,331	2,433,564

Source: Meyrick and Associates / various industry

Total Australian caustic soda imports is forecast to grow from 2.3 million tonnes in 2005 to 4.2 million tonnes in 2020, an increase of 1.9 million tonnes relative to 2005 volumes or 1.9 times more.

The implications for chemical tanker shipping can be considered not significant as caustic soda shipments are often carried in “parcels” (i.e. not as full ship loads) meaning that increased volumes can be accommodated without significantly increasing the number of vessels.

4.15 Other liquid bulk cargo imports and exports

The forecasting of other liquid bulk products other than POL has not been undertaken. The main reason for the lack of a detailed forecast is the small volumes of other liquid bulk products that are moved in Australia and the lack of any systematic methodology for evaluating their future volumes.

However, what follows is a short commentary on the two main segments of the other liquid bulk trade, namely hazardous chemicals and other liquid bulk (non-chemical).

4.15.1 Hazardous chemicals (excluding caustic soda)

Hazardous chemicals are mainly imports into Australia, exports being almost insignificant. Imports comprise chemicals and chemical products, petro-chemicals, acids and bases. Total volumes have been somewhat volatile, affected by various factors mostly relating to industry structure, both on the supply and the demand side. The major change in the last five years has been the migration from dedicated vessels in this trade to the use of tank containers which reduce significantly the cost of shipping as well as reduce the size that is shipped. This change has seen a reduction in the volume of hazardous products shipped to/from dedicated terminals by chemical tankers.

4.15.2 Other liquid bulk (non-chemical)

The main movements of other liquid bulk (non-chemical) cargoes around and out of Australia are shipments of molasses (around 500,000 tonnes/year of Queensland exports), tallow (around 250,000 tonnes/year of Queensland exports), and vegetable oils. These are spread around a number of ports.

4.16 Conclusions

Forecasts for Australia’s international maritime cargo trade have been conducted for the period 2005 to 2020 (financial years ending) with export and import cargoes clustered into four main commodity groups – containers, dry bulks, breakbulks, and liquid bulks.

The Australian international container trade is forecast to almost triple its current (2005) level of 4.3 million TEU to almost 12 million TEU in 2020. This level of expected increase represents a significant challenge for the main container ports in terms of developing new port capacity (terminals) but in terms of liner shipping capacity can be relatively easily accommodated by the shipping lines.

The Australian iron ore export trade is forecast to almost double from 272 million tonnes in 2006 to an optimistic level of around 510 million tonnes in the period 2015-2020. However, more conservative forecasts, which take account of worsening mining project economics, predict levels of around 440 million tonnes in the period 2015-2020. Both the private and public port sector recognise the need for iron ore port expansion or new iron ore ports. The bulk shipping sector will need to plan for these developments in the form of newbuildings as not all bulk vessels are technically capable of carrying full or part loads of iron ore, i.e. the hulls need to be specially strengthened for dense minerals.

The Australian coal export trade is forecast to almost double from 243 million tonnes in 2005 to 390 million tonnes in 2020. Both the private and public port sector recognise the need for coal port expansion. The bulk shipping sector will need to plan for these developments in the form of newbuildings particularly at the top size range (i.e. Cape-size vessels). The Handy-size and Panamax-size vessels tend to carry a mixture of dry bulk cargoes so can more easily switch from one trade to another when demand dictates.

The Australian grain export trade is perhaps the most problematic and volatile one to forecast. A combination of climatic factors, possible diversion into other uses (i.e. for bio-fuels), changes in industry structure and economics make any annual forecast for grain exports uncertain. The general consensus is that the long-term expectation is that grain exports will increase, albeit slightly, from 8.1 million tonnes in 2005 to around 11.5 million tonnes in 2020. However, some analysts predict Australia could be a long-term net importer of grain particularly for certain types of grain. The implications for the port sector and connecting landside infrastructure are more how to cope with grain market volatility as opposed to focussing on the need for expansions. There are no significant impacts expected from these forecasts for bulk shipping except that more shipments are expected to be carried in Panamax-size vessels at the expense of Handy-size.

The Australian alumina export trade is forecast to almost double from around 16 million tonnes in 2005 to 29 million tonnes in 2020. The port and private industry recognise the need for capacity increases but in terms of the magnitude of the iron ore and coal trades the required level of future development is relatively small and manageable.

The other dry bulk export trades covering commodities such as mineral sands (1.75 million tonnes in 2005), woodchips (11 million tonnes in 2005), sugar (around 5 million tonnes in 2005), and other minerals / salt / gypsum (collectively around 17 million tonnes in 2005) are not expected to significantly increase in volume by 2020, indeed some of the commodities may stay flat, which suggests that the focus for ports and shipping should indeed be on servicing the major dry bulk commodities.

The only breakbulk commodity which is likely to significantly increase and have additional, specialised demands on port planning and development concerns the motor vehicles import/export trade. This is forecast to increase from around 1 million vehicle units in 2005 to 1.7 million vehicle units by 2020 with the challenge of re-locating from old (inner) harbour areas to more distant regional ports (e.g. from Port Jackson to Port Kembla, and longer-term the potential to move from Melbourne to regional ports such as Hastings or Geelong). This is not seen as being problematic for the specialised car carrier ship operators (there are sufficient vessels with sizes increasing) but more of an issue of inland logistics economics and available infrastructure for the motor vehicle importers and distributors.

The Australian international liquid bulk trades, primarily consisting of crude oil imports and petroleum products imports and exports (including gases), is not expected to significantly increase by 2020. Crude oil and petroleum products are forecast to increase from a total of almost 50 million tonnes in 2006 to almost 70 million tonnes in 2020. The one exception concerns imports of caustic soda which, as an input in the production of alumina, are forecast to double from 2 million tonnes in 2005 to 4 million tonnes in 2020. The expectation is that ports and shipping can easily accommodate these liquid bulk growth forecasts.

5. IMPLICATIONS OF CHANGES IN THE INTERNATIONAL SEAFREIGHT TASK

This chapter focuses at a high (macro) level on the implications for Australian ports of changes in the Australian international seafreight task. The first section (5.1) summarises existing, known plans for port capacity increases by major cargo group, whilst the second section (5.2) presents a gap analysis indicating any required changes in port capacity by major cargo group.

5.1 Existing plans for port capacity increases

5.1.1 Victoria

In the state of Victoria, the main commercial ports of Melbourne, Geelong, Portland and Hastings (Westernport) all have plans to expand and/or upgrade port facilities in one form or another. Table 29 summarises the major known plans.

TABLE 29: SUMMARY OF MAJOR KNOWN EXPANSION OR UPGRADE PLANS FOR PORTS IN VICTORIA

Port	Cargo	Plans	Timing
Melbourne	Containers	Channel deepening to 14m (also to benefit crude oil imports and grain exports)	2009/10
		Development of Webb Dock; Dynon area (road/rail interface); Victoria Dock as a multi-purpose terminal	2008-2017
Geelong	Dry bulk	Upgrading/expansion of storage and handling for woodchips	2006/7
	Breakbulk	Development of a specialised storage and handling facility (further details confidential at this stage)	2006/7
	Liquid bulk	Expansion of chemicals storage and handling in particular for expected bio-diesel production	2006/7
Portland	Dry bulk	Development of storage and handling for mineral sands	2006/7
Hastings	Containers &/or motor vehicles	Develop as the future long term overflow facility for Melbourne, possibly motor vehicles from 2015 (also possibility of Geelong as for Melbourne motor vehicles) and containers from 2035	2015+

Source: Meyrick and Associates / various port authorities

5.1.2 New South Wales

In New South Wales, the NSW Government has provided fundamental policy direction for the future roles and functions of NSW ports in a state-wide ports master-plan. The current investment decisions of the main commercial ports of Sydney (Port Botany), Newcastle, and Port Kembla are focussed on implementation of the state government’s “NSW Ports Growth Plan (October 2003)”.

The aim of the NSW Ports Growth Plan is to ensure that NSW ports have the capacity to meet the forecast trade task faced by the state and provide direction to industry and the community regarding future port developments in NSW. The major elements of the plan include:

- The expansion of the Port Botany container terminal
- Relocation of container, general cargo and car stevedoring from Port Jackson to Port Kembla
- Development of Newcastle as the state’s next major container facility after capacity at the expanded Port Botany is reached
- Sydney Harbour to remain a working port
- Increasing the proportion of containers moved by rail to and from ports to intermodal terminals in the Sydney metropolitan area and regional NSW.

Table 30 provides more detail of the major known plans for the individual ports in NSW.

TABLE 30: SUMMARY OF MAJOR KNOWN EXPANSION OR UPGRADE PLANS FOR PORTS IN NEW SOUTH WALES

Port	Cargo	Plans	Timing
Sydney (Port Botany)	Containers	5 new berths taking total annual capacity to 3.2 million TEU	2011
	Liquid bulk	Expansion of storage and handling for liquid bulk cargoes	2006/7
Newcastle	Dry bulk - coal	Proposed channel extension and deepening to 16-17m and new terminal with up to 3 new berths), taking total annual capacity to 120-154 million tonnes	2007-10
		New berth for breakbulk and general cargo at Mayfield	2007-09
	Breakbulk, general cargo & liquids	Expansion of storage import facilities for handling liquid bulk cargoes at Walsh Point and Dyke Point	2008-10

Port	Cargo	Plans	Timing
Port Kembla	Containers, other breakbulk & vehicles	<ul style="list-style-type: none"> - Development of two multipurpose berths, in addition to the already completed extension of one existing berth in 2005. These developments will facilitate the relocation of containers (30,000 TEU/year), other breakbulk and car imports from Port Jackson (Sydney); - Development of storage and handling facilities for vehicles once they are transferred from Glebe Island (Port Jackson) in 2008 	2007-08

Source: Meyrick and Associates / various port authorities / NSW Government

5.1.3 Queensland

In the state of Queensland, the main commercial ports of Brisbane, Gladstone, Hay Point/Dalrymple Bay, and Abbot Point all have plans to expand and/or upgrade port facilities in one form or another. Other Queensland ports, such as Mourilyan, Townsville and Weipa, also have plans. Table 31 summarises the major known plans.

TABLE 31: SUMMARY OF MAJOR KNOWN EXPANSION OR UPGRADE PLANS FOR PORTS IN QUEENSLAND

Port	Cargo	Plans	Timing
Brisbane	Containers	15m access (achieved 2006), 1 berth under construction plus 2 new berths to increase capacity by 25% making total 9 berths	2008-13
	Dry bulk - coal	Expansion of terminal from 5 to 7 million tonnes per year	2007
	Liquid bulk	Expansion of storage and handling for chemicals	2006/7
Abbot Point	Dry bulk - coal	Expansion underway taking long term total annual capacity to potentially 50 million tonnes per year	2006/7
Gladstone	Dry bulk - coal	Expansion of two terminals plus one new taking total annual capacity to 95 million tonnes with long term plan of 145 million tonnes	2010
Hay Point / Dalrymple Bay	Dry bulk - coal	Phased expansion of two terminals taking total annual capacity to 112 million tonnes in 2007 and 141 million tonnes by 2008 (the long term plan)	2007/8
Mourilyan	Breakbulk - livestock	New export / handling facility	2006/7

Port	Cargo	Plans	Timing
Townsville	Various	Expansion / reservation of land; upgrading of channels	2007
Weipa	Dry bulk - bauxite	Widening and deepening of channel to allow larger, post-panamax vessels, re. planned increase in bauxite shipments (extra 20 million tonnes per year) to expanded Gladstone alumina refinery.	2006/7

Source: Meyrick and Associates / various port authorities

5.1.4 Western Australia

In the state of Western Australia, a large number of the ports have plans to expand and/or upgrade port facilities in one form or another. This particularly reflects the dominant position of the minerals export sector in Western Australia.

TABLE 32: SUMMARY OF MAJOR KNOWN EXPANSION OR UPGRADE PLANS FOR PORTS IN WESTERN AUSTRALIA

Port	Cargo	Plans	Timing
Fremantle	Containers	Major expansion – new Outer Harbour at Kwinana to increase capacity from 1.2 million TEU per year (Inner Harbour) to total of 3.2 million TEU per year	2015
Albany	Dry bulk – iron ore	Deepen channels for 175,000 dwt vessels for new berth with exports of 7 million tonnes per year (new iron ore mine)	2008
Bunbury	Various	Expand from 8 to 14 berths, doubling port capacity to 13 million tonnes per year (including new coal exports)	2007-15
Cape Preston	Dry bulk – iron ore	Private-sector reviving plans to build a port at Cape Preston to handle iron ore exports (Balmoral deposits). The port is also part of WA government plans to handle iron ore exports when the ports of Dampier and Port Hedland reach capacity	2010
Dampier	Dry bulk – iron ore	Upgrading to increase capacity to 140 million tonnes per year	2007
Esperance	Containers	New handling facilities for BHP Billiton's Ravensthorpe Nickel project (10,000 containers/year to Townsville and 2,000 containers/year from Qld.)	2007
	Dry bulk	New facilities for importing 500,000 tonnes per year of sulphur for BHP Billiton's Ravensthorpe Nickel project; new facilities for woodchip exports (100,000-300,000 tonnes/year, starting 2008)	2007/8

Port	Cargo	Plans	Timing
Geraldton	Dry bulk – iron ore	Expansion / upgrading of berth facilities and handling systems	2007
Oakajee	Dry bulk – iron ore	New iron ore port (20km North of Geraldton) as flow-over for Geraldton which has max port capacity of 20 million tonnes/year. Planned new capacity for Oakajee of 60 million tonnes per year	-
Port Hedland	Dry bulk – iron ore	Under expansion (upgrading + two new berths) to meet exports of 150 million tonnes/year by 2008 and 200 million tonnes/year by 2010	2008-10

Source: Meyrick and Associates / various port authorities

5.1.5 South Australia

In the state of South Australia, only the ports of Adelaide and Whyalla have or are implementing plans to expand and/or upgrade port facilities in one form or another. Table 33 summarises the major known plans.

TABLE 33: SUMMARY OF MAJOR KNOWN EXPANSION OR UPGRADE PLANS FOR PORTS IN SOUTH AUSTRALIA

Port	Cargo	Plans	Timing
Adelaide	Containers	Upgrading in progress with channel deepening to 14.2m completed (Aug. 2006) plus 125m berth extension to give 635m of quayline	2007
	Dry bulk - grain	New deepsea grain terminal (Outer Harbor)	2007
Whyalla	Dry bulk – iron ore	New offshore floating transshipment facility for loading Capesize & Panamax vessels, part of expansion from 1 to 4 million tonnes/year	2008

Source: Meyrick and Associates / various port authorities

Port Pirie may see some increases in exports with possible needs to upgrade/expand given new mining projects becoming operational in the hinterland (the exact impacts and timings unclear at this stage),

5.1.6 Tasmania

In the state of Tasmania, only the ports of Bell Bay (Launceston), Burnie and Hobart have or are implementing plans to expand and/or upgrade port facilities in one form or another. In terms of mainland port projects, the size of the Tasmanian projects can be considered small. Table 34 below summarises the major known plans.

TABLE 34: SUMMARY OF MAJOR KNOWN EXPANSION OR UPGRADE PLANS FOR PORTS IN TASMANIA

Port	Cargo	Plans	Timing
Bell Bay	Breakbulk - woodpulp	New wharf as part of Gunns Pulp mill project involving import of raw materials and export of around 1 million tonnes/year of woodpulp	2007/8
Burnie	Dry bulk - minerals	Dredging program in progress to maintain 10-11.5m for expected increase in mineral exports (nickel in 2007, plus zinc & other)	2006
Hobart	Various	Remedial work to a number of berths	2007

Source: Meyrick and Associates / various port authorities

5.1.7 Northern Territory

In the Northern Territory, only the port of Darwin has a number of projects in progress. The ports of Gove (alumina/bauxite exports) and Milner Bay-Groote Eylandt (manganese ore exports) have no plans for expansions in the foreseeable future.

The port of Darwin has plans to redevelop the City Wharf area over a period of the next 15 years as the East Arm Wharf becomes the main commercial port area. In terms of future works, the East Arm Wharf has a green-field site ready for industrial developments and stage two of the master-plan would involve further reclamation and berth extensions, a bulk solids stockpile area, and marine industry support facilities – to give a total of 1.5km of berth face (currently 700m).

5.2 Gaps and required changes in port capacity

The accuracy of identifying gaps and assessing port capacity requirements reduces significantly beyond forecasting and planning time horizons of five years. Indeed many of the known (published) port expansion plans do not go beyond 2008-2010 which makes it difficult to say whether there are “as-yet-to-be” recognised gaps or known requirements. In general, the five main ports concerned with the international container trade have recognised the need to plan long term (in the case of Melbourne a 2006-2035 port development plan has been produced and published for consultation).

Another feature which needs to be recognised in the planning process is that a number of the key bulk ports (particularly for minerals) are operated by private companies who are shipping their own cargoes through the facilities. These private (shipper) operators are able to react more quickly and precisely to matching production demands with port capacities and facilities than publicly-owned ports with a multitude of customers and different cargo-handling operations.

Based on our analyses, table 35 summarises the current (2005) and forecast (2020) demand, planned port capacities and possible gaps for the key cargo sectors – namely containers, coal and iron ore.

TABLE 35: SUMMARY OF PORT DEMAND, SUPPLY AND POSSIBLE CAPACITY GAPS

Cargo	Ports	Demand, 2005	Demand, 2020	Planned port capacity (where known)/year	Capacity gaps to 2020
Containers	Brisbane	0.7 M TEU	2.7 M TEU	Plus 25% (3 berths)	Not expected
	Sydney	1.4 M TEU	3.5 M TEU*	3.2 M TEU	Not expected
	Melbourne	1.5 M TEU	3.5 M TEU	Increases 2015+	Not expected
	Adelaide	0.2 M TEU	0.6 M TEU	Increases planned for	Not expected
	Fremantle	0.5 M TEU	1.7 M TEU	3.2 M TEU	Not expected
Coal	NSW	93 Mt	146 Mt	136-170 Mt **	Not expected
	Queensland	150 Mt	244 Mt	343 Mt	Not expected
Iron ore	WA	272 Mt	441 Mt	407 Mt	Likely not problematic

Note: Mt = million tonnes, M TEU = million TEU of containers.

Source: Meyrick and Associates, various ports and government agencies

(*) Container demand forecasts for 2020 for the five ports have been made using Meyrick & Associates' model as described in section 4.2. However, other forecasts (NSW Government moderate growth scenario as used for the Port Botany expansion) estimate container demand for Sydney at 3.4 million TEU by 2025 which is less than the Meyrick & Associates' forecast of 3.5 million TEU by 2020.

(**) The planned port capacity for coal in NSW of 136 Mt/year comprises 120 Mt/year at Newcastle and 16Mt/year at Port Kembla. The additional capacity to 170 Mt/year is dependent on a number of pending investment decisions at the Port of Newcastle, i.e. the plans currently proposed are awaiting approval.

Given the 'macro-level' of this scan, the port demand/supply analysis shows that, in all likelihood, there are no problematic gaps expected in total planned port capacity up to 2020 for containers, coal and iron ore.

In terms of the other cargo sectors over the period 2005-2020, the following can be concluded:

- Other dry bulk cargoes should be adequately catered for
- Motor vehicles should be adequately catered for
- Other breakbulk may be more problematic as many city port master plans are squeezing out conventional breakbulk cargo handling operations which are located close to markets
- Liquid bulk cargoes should be adequately catered for.

It should be noted that ports typically carry out a far more detailed 'micro-level' of analysis which can reveal specific local issues not picked-up in the macro approach undertaken in the study.

5.3 Other issues impacting on effective port infrastructure planning

At first sight, it would appear at the ‘macro-level’ that there are sufficient initiatives and plans to bring on-stream extra port capacity and increased channel depths to meet the forecast increases in Australia’s international maritime freight task.

However, it is becoming increasingly apparent that the ability of ports and industry to fast-track new or upgraded port infrastructure (i.e. channels, new terminals, ports and connecting rail/road) is rapidly diminishing as project lead-times increase due to the need to deal with more stringent and time-consuming regulatory, community and environmental requirements. This issue is recognised by government as evidenced by the need for studies such as the DOTARS “National Intermodal Terminals Study (NITS)”, the NTC study “Twice the Task”, the various recent Auslink corridor studies in combination with port initiatives, and the current proceedings of the Neville Commission parliamentary inquiry on national port infrastructure.

This situation is further complicated by the commercial competition for land-use in the coastal city areas and the lack of integrated, long-term land-use planning between the various federal and state governmental agencies particularly regarding land adjacent or close to existing port facilities. The overall effect has been to increase the start-to-finish time for new port infrastructure projects by one or more years (Melbourne’s channel deepening project is a clear example of this).

The implications of this trend is that for governments, ports and industry to be effective, they need to commence new port infrastructure projects much sooner than was the case in the past. This means that more funds and resources need to be committed and earlier. It is clear that demand forecasts will need to be re-visited/reviewed more frequently than before to make sure that expansion and access upgrade projects do not lag behind increases in trade.

There is also emerging another, somewhat hidden, driver of the ability of ports and governments to effectively tackle the planning of port infrastructure capacity at Australian bulk export ports. It is becoming increasingly apparent that the traditional ‘Free-On-Board (FOB)’ sales trade terms of Australian exporters mean that they, and the ports, are unable to control the inefficiencies of vessel planning by overseas buyers (i.e. a lack of coordination) which is often a significant cause of the growing congestion found at bulk export ports (particularly coal). The switching of sales trade terms to ‘Cost Insurance and Freight (CIF)’, which is an increasing strategic focus of industry, provides exporters, and ports, with the added benefit of a greater control over port capacity planning both daily and in the long-term.

6. INCREASING SHIPPING'S SHARE OF THE DOMESTIC FREIGHT TASK

6.1 Overview of the domestic freight task

6.1.1 Domestic freight markets

Domestic freight markets are differentiated on the basis of commodity types, corridor characteristics, transport distances, domestic consumption and transport to international exports through Australia's international ports. The largest segment of the domestic freight market (by tonnage) is local distribution to the major capital cities and towns along the seaboard, which represents around three times the size of the inter-regional freight task⁴⁷. The total inter regional freight task is estimated to be around 2 billion tonnes per annum.

The domestic inter-regional freight market is dominated by road transport with a total mode share of 74% across all commodity types (Table 36). The greatest single commodity by tonnage moved by road transport is non-metallic minerals, this represents 42% of the total tonnage of freight moved within Australia. Manufactured products represent 16% of all freight moved in Australia and is predominantly moved by road transport (91% by tonnage). Rail transport dominates in the mining industry with 89% of coke and coal and 85% of metallic minerals.

TABLE 36: DOMESTIC FREIGHT TASK BY COMMODITY AND MODE IN 1999 (MILLION TONNES)⁴⁸

Commodity:	Road	Rail	Sea	Total*
Manufactured products	267	18.1	6.8	291.9
Livestock, Agriculture & Forestry	196	57.3	2	255.3
Coal and coke	16.7	139.4		156.1
Metallic minerals	14.1	190	18.9	223
Non-metallic minerals	753.1	7.2		760.3
Oil, gas and petroleum products	51.2	2.4	13.1	66.7
Other bulk	20.2	6.4	10.4	37
Total	1,318.3	420.8	51.2	1,790.3
Mode Share	73.6%	23.5%	2.9%	

* excluding Air.

The vast majority of Australia's domestic freight task is made up of inland movements to ports, coastal towns and cities. Inter-capital movements, parallel to the coast, represent a small proportion of the total inter-regional freight movement (3% by mass).

Freight movements between Melbourne and Sydney, and Sydney and Wollongong constitute 38% of freight being moved through the Auslink corridors (Table 37). Other significant flows include Sydney–Brisbane (9%), Melbourne–Brisbane (6%), Melbourne–Geelong (8%), Melbourne–Adelaide (11%), Melbourne–Perth (5%), and Perth–Bunbury (4%).

⁴⁷ Source: BTRE Working Paper 66, Demand Projections for Auslink Non-Urban Corridors

⁴⁸ Source: BTRE Information Paper 53 Australian Sea Freight 2002-03 and BTRE Working Paper 66

TABLE 37: FREIGHT MOVEMENTS BY AUSLINK CORRIDOR AND TRANSPORT MODE 1999 ('000 TONNES)⁴⁹

Corridor	Road	Rail	Coastal	Air	All Modes
Sydney–Melbourne	7,310.7	1,462.1	2,727	96	11,595.8
Sydney–Canberra	1,848	168	0	7	2,023
Sydney–Brisbane	4,275.2	860	159.3	53	5,347.5
Sydney–Adelaide	1,527.8	251	169	17	1,964.8
Melbourne–Adelaide	3,361.5	2,570	782.1	17	6,730.6
Melbourne–Brisbane	2,129.9	629.2	845.5	19	3,623.6
Brisbane–Darwin	35.9	0	10.8	4	50.7
Adelaide–Perth	213	633.5	149.3	6	1,001.8
Adelaide–Darwin*	32.5	0	0	4	36.5
Perth–Darwin	4.5	0	335	0	339.5
Brisbane–Cairns	317.5	277	252.3	7	853.8
Hobart–Burnie	294.8	174	295	0	763.8
Sydney–Wollongong	10,615.1	1,183.2	8.8	0	11,807.1
Melbourne–Geelong	4,361.4	333.8	271.9	0	4,967.1
Townsville–Mt Isa	32.6	2,125.9	0	0	2,158.5
Sydney–Dubbo	671.6	147	0	0	818.6
Perth–Bunbury	1,482.2	1,565	19.2	0	3,066.4
Melbourne–Mildura	215.8	253.1	0	0	468.9
Melbourne–Sale	1,020.6	49	0	0	1,069.6
Melbourne–Perth	641.6	1,630.4	221.9	21	2,514.9
Sydney–Perth	659.3	236	31.9	23	950.2
All corridors	41,051.5	14,548.2	6,279	274	62,152.7

**Does not include Adelaide to Darwin Freight Link*

6.1.2 Growth in the domestic freight market

The domestic freight task is forecast to double by 2025, from 62 million tonnes in 1999 to 132 million tonnes in 2025. The fastest growth (in absolute and percentage terms) is forecast to occur on the shorter routes, such as Sydney to Wollongong and Perth to Bunbury (Table 38). The inter capital east coast routes are also forecast to grow strongly with the largest increases in tonnages expected on the Sydney to Melbourne, and Sydney to Brisbane routes. Growth on the longer routes, Melbourne to Brisbane and eastern states to Perth is at the lower end of the forecasted freight growth when compared to the other corridors described above.

⁴⁹ ⁴⁹ Source: BTRE Working Paper 66, Demand Projections for Auslink Non-Urban Corridors

TABLE 38: FORECAST GROWTH ON THE INTER-REGIONAL FREIGHT CORRIDORS⁵⁰

Corridor	1999	2025	Growth	% Growth
Sydney–Melbourne	11,595.8	22,722.9	11,127	96%
Sydney–Canberra	2,023.0	4,299.0	2,276	113%
Sydney–Brisbane	5,347.5	13,644.9	8,297	155%
Sydney–Adelaide	1,964.8	3,785.0	1,820	93%
Melbourne–Adelaide	6,730.6	12,999.0	6,268	93%
Melbourne–Brisbane	3,623.6	7,197.9	3,574	99%
Brisbane–Darwin	50.7	114.0	63	125%
Adelaide–Perth	1,001.8	1,925.5	924	92%
Adelaide–Darwin	36.5	67.6	31	85%
Perth–Darwin	339.5	600.1	261	77%
Brisbane–Cairns	853.8	1,800.7	947	111%
Hobart–Burnie	763.8	1,075.5	312	41%
Sydney–Wollongong	11,807.1	27,778.1	15,971	135%
Melbourne–Geelong	4,967.1	11,545.7	6,579	132%
Townsville–Mt Isa	2,158.5	-	-	-
Sydney–Dubbo	818.6	1,317.0	498	61%
Perth–Bunbury	3,066.4	10,388.8	7,322	239%
Melbourne–Mildura	468.9	917.9	449	96%
Melbourne–Sale	1,069.6	2,559.2	1,490	139%
Melbourne–Perth	2,514.9	5,050.2	2,535	101%
Sydney–Perth	950.2	2,116.2	1,166	123%
Total	62,152.7	131,905.2	69,752.5	123%

6.1.3 Domestic freight routes

The major domestic freight routes that are served by all four transport modes run in parallel to the Australian coast line and run between the major capital cities as well as some regional centres. The three main corridors are North-South along the east coast of Australia, the East-West (from the eastern capitals to Perth), and Adelaide to Darwin. The three major corridors can be further broken down into origin and destination pairs for the capital cities in each state (Table 39).

⁵⁰ Source: BTRE Report 112

TABLE 39: CHARACTERISTICS OF THE MAIN DOMESTIC FREIGHT CORRIDORS

Route:	Distance (km)	Transit Time (hrs)			
		Air	Road	Rail	Sea*
Brisbane – Sydney	1,000	1.2	15	21	26
Sydney – Melbourne	930	1.2	11	13.5	29
Melbourne- Brisbane	1,850	2	33	36	55
Melbourne– Adelaide	740	1	9	13	26
Sydney - Adelaide	1,550	1.5	20	27	50
Adelaide – Perth	2,700	2	34	45	67
Melbourne – Perth	3,400	3	43	58	84
Sydney – Perth	3,400	3	55	72	106
Brisbane – Perth	4,400	4	70	93	132

* assumes a constant vessel speed of 20 knots. Perth = Fremantle.

Source: Meyrick and Associates / various published distance tables

6.1.4 Historical modal shares

On most corridors, there has been a steady transition from rail to road with the introduction of higher capacity trucks and a decline in performance and reliability of rail services. Coastal shipping has been steady on most routes over the period from 1970's to present. Non-bulk sea freight declined on most corridors up until the 1990s, but has since made somewhat of a come back on the Eastern Capitals to Perth route (at the expense of road)⁵¹. Air cargo has catered for a very specific target market and only represents a small proportion (by weight) of inter-capital freight flows.

The following is a brief description of the main characteristics and attributes of each of the corridors:

- **Melbourne–Sydney.** This route (length 930 kilometres) has parallel routes for rail and road from Melbourne to Wodonga. North of Wodonga the rail line takes a more inland route though Wagga Wagga before meeting the Hume Highway just west of Goulburn. This corridor has the largest freight flow in tonnage terms and non-bulk sea traffic is minimal. Rail has not shared in the growth, and is thus steadily carrying a smaller proportion of the total intercity task.

⁵¹ Source BTRE information sheet 22

- **Sydney–Brisbane.** This corridor (length 1,000 kilometres) is served by two alternative road routes, the Pacific Highway and the Newell Highway and the coastal railway line. The Pacific Highway has been significantly upgraded over the past 10 years and there are proposed upgrades along the rail line to significantly reduce transit time. This corridor exhibits a freight mode share pattern similar to the Melbourne–Sydney market. After gaining share in the early 1970s, due to the decline in coastal shipping, rail’s mode share has been declining.
- **Melbourne–Brisbane.** On this corridor (length 1,850 kilometres), the Newell Highway is the most direct and quickest road route. The rail corridor runs via Sydney. The decline in rail’s share on this corridor was reversed in the late 1990s with the introduction of non-stop trains and other improvements to the service. Further improvements to this corridor are forecast to result in an increase in a doubling of rail mode share from 21% to 40%⁵². Coastal freight dropped dramatically from 1970 to 1980 on this corridor and only represents a minor share of the freight traffic today (less than 5%).
- **Sydney – Adelaide.** Rail has two alternatives for this corridor, via Broken Hill or via Melbourne. The inland route includes the slow pass over the Blue Mountains whereas the route via Melbourne offers flexibility to pick up and drop off cargo midway along the route. Rail gained some rail-specific traffic in the late 1980s. However, this temporary boost in its mode share has since given way to a trend decline in share.
- **Melbourne – Adelaide.** The recent opening of the freeway through the Adelaide Hills benefits road freight by reducing transit times on this relatively short route. Road freight has increased due to the progressive introduction of B-doubles. This has turned this route into a short route where road is favoured.
- **Eastern Capitals–Perth.** This route (average length 3,400 kilometres) is the most favourable of the seven corridors for rail. Pick-up and delivery costs are a smaller proportion of total rail freight costs than on other, shorter, routes. Rail and road gained from the sharp drop in coastal shipping that followed the sealing of the Eyre Highway in 1976. But since then, rail’s share has drifted downwards from around 70 per cent to close to 50 per cent. Since 1997, there has been a large increase in coastal shipping under the Single and Continuous Voyage Permit Program for foreign vessel with mode share increasing to 20% by 2000. This increase in shipping share has come mainly at the expense of road. Rail has maintained its share in the face of the new competition from sea (and grown its tonnages very rapidly) by means of several mechanisms. In recent years, there has been a well-planned centralisation of investment under the aegis of the Australian Rail Track Corporation (ARTC). Standardisation of the gauge in Victoria was completed in 1995. Earlier concrete sleepers were extended during the 1990s and early 2000s. The adoption of National Rail class locomotives was completed by the lengthening of passing loops—allowing larger train lengths. In-cab signalling and points control meant trains no longer had to stop. By these means rail has been able to maintain its share on the corridor in the face of growing sea traffic.

⁵² Source: Booz Allen Hamilton analysis for ARTC corridor studies

Rail is most competitive on the eastern capitals to Perth corridors with a rail mode share of 60%. The Melbourne to Brisbane corridor has an estimated 20% rail market share and is the second most competitive corridor for rail. The longer the distance, the more effectively rail can compete with road freight with lower impacts of pick up and delivery costs at either end. On the other corridors, market shares are estimated to be 9% between Melbourne and Sydney (mostly Tasmanian freight), and around 11% between Sydney and Brisbane.

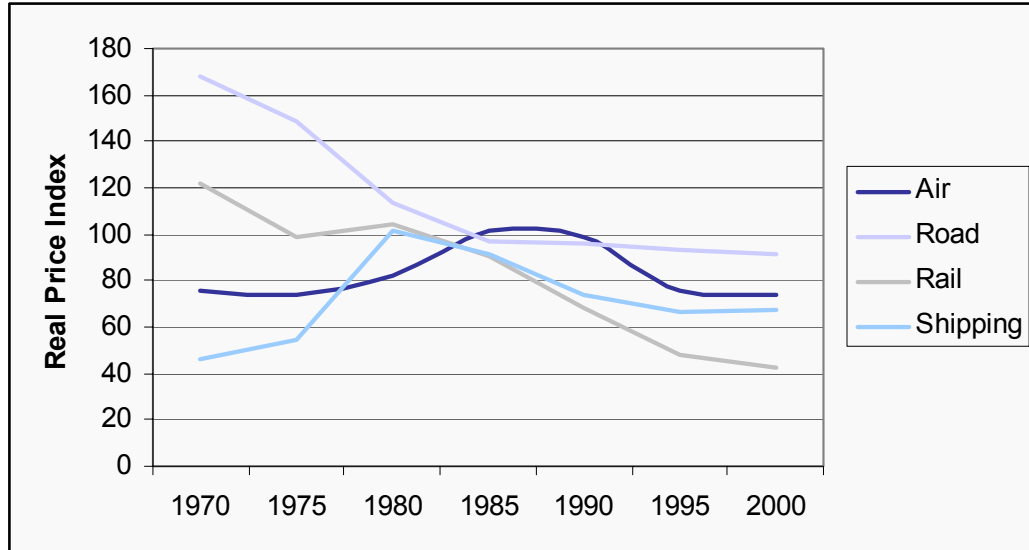
6.1.5 Mode choice factors

Changes in the operating characteristics of the three modes has resulted in a major shift away from rail and towards road and coastal shipping. The key factors that have contributed to this change in mode, and are likely to influence the mode choice into the future, include:

- Price (total costs of line haul, pick up and delivery charges at either end, handling and infrastructure access charges)
- Reliability of service (at key points in the transport chain)
- Availability (frequency) and flexibility of service
- Transportation time (including inland pre- and on- carriage, cargo cut-off and availability at port and any waiting at modal interchange points)
- Suitability of mode for product (e.g. packaging, size and weight of load compared to restrictions by mode)
- Pick up and delivering times falling within preferred windows of time for transport customers

Road and rail freight prices have steadily decreased in real terms from 1970 to 2000 (Figure 22). Road and rail prices have fallen by 45% and 65% over 30 years, respectively. Over the same period, coastal shipping prices increased by 45% (based on Tasmanian shipping fees, re BTRE report 112) and air transport prices remained similar in real terms. However, Tasmanian (Bass Strait) shipping fees, as used by the BTRE, are not reflective of permit shipping fees which are generally at marginal cost for containers and would have fallen in real terms over the same period. Permit shipping fees for bulk cargoes are likely to be a mixture of marginal cost and market full cost reflecting operational factors and world market trends. The reductions in road freight prices accompanied by improvements in reliability, reductions in road travel times and increases in vehicle carrying capacity⁵³ have lead to road being the dominant mode on shorter distance hauls. However, on the east-west coastal shipping route real freight prices have fallen by 20% since 1990.

⁵³ Truck capacities have increased from 72m³ to 185m³ since the 1970's (source: communications with trucking professional)

FIGURE 22: REAL PRICE INDEX FOR FREIGHT TRANSPORT PRICES IN AUSTRALIA⁵⁴


Road has the competitive advantage over rail on shorter length hauls because it is cheaper, more reliable, more flexible and more available. Rail has a competitive advantage over road on the east-west route because it is 40 per cent cheaper than road (Table 40).

TABLE 40: MODAL CHARACTERISTICS IMPACTING ON MODE CHOICE

From	To	Mode	Avg AS/T Charge	Transit Time, hrs	On-time Reliability	Service Availability	Mode Share
Per	Syd	Road	192	55	95%	99%	18%
		Rail	122	72	70%	83%	58%
		Sea*	<rail	106	n.a.	n.a.	-
Per	Mel	Road	186	43	95%	99%	18%
		Rail	113	58	66%	80%	58%
		Sea*	60	84	n.a.	n.a.	-
Adl	Mel	Road	34	9	95%	99%	85%
		Rail	45	13	74%	70%	13%
		Sea*	<rail	26	n.a.	n.a.	-
Mel	Syd	Road	44	11	95%	99%	89%
		Rail	48	13.5	55%	50%	11%
		Sea*	<rail	29	n.a.	n.a.	-
Mel	Bris	Road	84	33	95%	99%	68%
		Rail	83	36	45%	60%	30%
		Sea*	<rail	55	n.a.	n.a.	-
Syd	Bris	Road	54	15	95%	99%	85%
		Rail	53	21	50%	25%	15%
		Sea*	<rail	26	n.a.	n.a.	-

Sources: Booz Allen analysis for ARTC (Reliability=arrivals; Service Availability=up-time), *Meyrick/industry.

⁵⁴ Source: BTRE Report 112

Coastal shipping is most competitive on the east-west routes because rates are almost half that of rail, and delivery times are within the requirements of the customers. Coastal shipping has some other advantages, such as reduction in damage to goods. More fragile products are better transported in containers by sea rather than by rail where they can be damaged by rough riding of wagons on tracks.⁵⁵ Real freight rates have been reducing and the cost of transport is representing a smaller percentage of the total cost of producing and delivering goods to the market. In which case, damage to products can become more costly than the difference in freight rates across the modes (Source Booz Allen Hamilton consultation with freight transport customers).

6.1.6 Contestable markets

Coastal shipping is most competitive with rail transport. Due to its high value and requirements for fast and reliable transport, air cargo is not contestable by sea. Road transport on shorter hauls has a significant competitive advantage over sea freight because of its much quicker transit times, flexibility of service and high level of reliability (>95%). In summary:

- Road is, in general, more attractive than rail or coastal shipping for **non-bulk** freight transport for distances up to 1,500km;
- Rail transport is, in general, more attractive than road or coastal shipping for **non-bulk** freight movements over distances over 1,500km;
- Coastal shipping is, in general, more attractive than road for **non-bulk** freight movements over distances above 2,200km.

It should be noted that distance is not the exclusive factor in deciding the attractiveness or competitiveness of different modes of transport for non-bulk freight, but it is, in general, a significant factor.

The most contestable routes for coastal shipping are the east coast to west long-haul coast routes (Adelaide, Melbourne, Sydney, Brisbane – Perth).

Long-haul inter-capital non-bulk flows are the most contestable across the three modes (road, rail and sea):

- Container loads can be carried easily by any one of the three modes
- Ports and rail terminals are located close to each other providing equal accessibility to either mode (i.e. transport cost and time to rail terminal and wharf is very similar from end customer sites)

6.1.7 The PAN shipping experience – rise and fall

The PAN shipping service provided a good example where they were able to enter the market with a more reliable service concept than single voyage permits on international carriers at a much cheaper price than rail. A lot of traction was made in the market in the early days and then lost when PAN was unable to deliver on its timetable due to one of its two ships not being seaworthy (Source: Commentary on PAN shipping services and consultation with freight customers).

⁵⁵ Consultation with customers of rail and sea freight transport services from Melbourne to Perth.

There is a definite niche for coastal shipping if the service is regular and reliable. Foreign vessels sailing under permit are unable to fulfil this need consistently because their operation is focussed on overseas movements.

The PAN experience showed that local shippers are prepared to support a local service because of this consideration, notwithstanding that it will always be more expensive because of the foreign lines ability to marginally cost their coastal operation. PAN pitched their rates about midway between foreign permit vessels and the rail alternative. At the commencement of the service, when schedule integrity was being maintained, this pricing strategy appeared about right. Some major shippers left both of the alternatives to support PAN (albeit via the forwarders Toll, Patricks, etc). This situation changed considerably when the service was unable to stick to schedule for specific (unfortunate) operational reasons. Some shippers went back to foreign lines, who by then had re-entered the market, or to rail.

In conclusion, various operational and commercial factors impacted negatively on PAN (they were also handicapped by deciding not to offer equipment or a door-to-door service, i.e. only wholesaling port-to-port slots), but it was the inability to offer a reliable service that was the key consideration. Ironically, if schedule integrity had been maintained, in all probability no coastal permits would have been issued to foreign lines as the third vessel planned to be introduced would have made the 21-day port rotation a weekly fixed-day frequency. The downfall of PAN has done no favours to the cause of a domestically-operated coastal shipping service having left a negative experience for many parties involved in the east-west domestic trade.

6.2 Existing structure of domestic shipping trades

Existing domestic shipping trades and services can be segmented into four broad categories, these are:

- Bass Strait domestic trade – cargoes (container, rolling and breakbulk) shipped between Victoria and Tasmania by Australian domestically-operated ships
- Mainland inter-state containers – east west (Brisbane/Sydney/Melbourne/Adelaide – Perth) and north south routes (Melbourne/Sydney – Brisbane) using international container ships with permits or, when available (which is no-longer the case after the fall of PAN), Australian domestically-operated container ships
- Remote-area and other domestic non-bulk trades – supporting remote communities and mining projects in Western Australia, Northern Territory, Northern Queensland, and the Furneaux Group of islands in the Bass Strait; and a link across the Spencer Gulf in South Australia
- Domestic bulk and breakbulk trades – cement (Cement Australia, Adelaide Brighton), gypsum (CSR, Rio Tinto⁵⁶), bauxite (Queensland Alumina), alumina (Alcoa), iron ore (BlueScope Steel), sugar (Sugar Australia), petroleum products (various oil majors), and iron and steel products (BlueScope Steel).

⁵⁶ Rio Tinto supply gypsum under the brand of "Dampier Salt" from Cape Cuvier in Western Australia using Handymax shipping in lots of 40,000T on a CFR basis to Kwinana. After being unloaded it is placed into bulk storage on at the port from a steady supply is drawn to supply the local producers. They are seeking to expand their operations to the East Coast for users of gypsum who are not able to be supplied by CSR

6.3 Bass Strait domestic shipping trade

The Bass Strait domestic shipping trade concerns domestic vessels sailing between Melbourne in Victoria and Tasmanian ports. However, it is interesting to note that other Tasmanian domestic shipping trades did previously exist with a service between Adelaide and Tasmania, and the recent attempt by TT Line to establish a passenger/wheeled service between Tasmania and Sydney which proved uneconomic and folded in 2006.

The Bass Strait domestic shipping trades are characterised by complex relationships between different trading ports in Northern Tasmania and by an oversupply of both shipping capacity and port infrastructure. What is undeniable is that growth in trade in both directions has grown significantly over a sustained period. This has occurred despite the sluggish performance of the Tasmanian economy compared to that of Australia as a whole over the same period⁵⁷.

The general sea freight task across Bass Strait has grown steadily at above 7% per year since 1990 and is expected to grow at 5% per year in the long run.

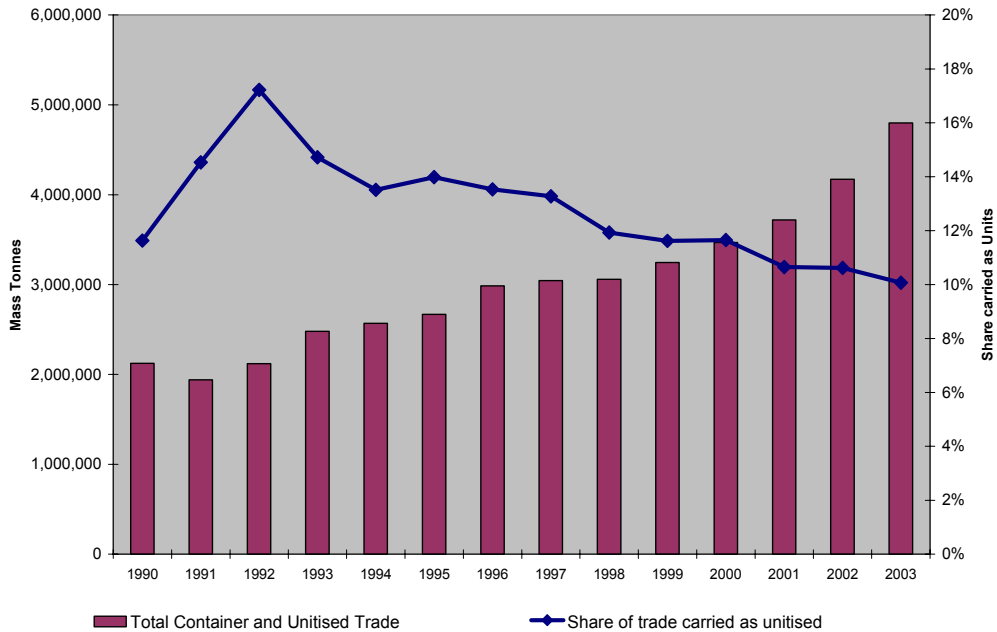
The freight task that is handled currently by Bass Strait shipping is approximately 5 million tonnes per annum and is generally divided into three main categories⁵⁸.

- Containerised – 87% by weight and increasing (approximately 320,000 TEU)
- Wheeled unitised – 10% by weight and declining slowly (approximately 35,000 units)
- Breakbulk which is mainly timber products and motor vehicles (non tourism) – 3% by weight

⁵⁷ After the nationwide recession of the early 1990s, the Tasmanian economy fell behind the national average in nearly all measures of economic performance. According to the Tasmanian Government this gap increased in the period between 1996–97 and 1999–00, as illustrated by the following statistics the national economy grew by 15.2%, whereas the Tasmanian economy expanded by only 6.6%; real private sector business investment in the national economy averaged \$4,194 per capita per annum, whereas investment in the Tasmanian economy averaged \$1,997 per capita per annum; and the national population grew by 3.4% while Tasmania's population contracted by 0.7%: Source Tasmanian Govt.

⁵⁸ Dry and liquid Bulk products, mainly cement and refined petroleum, although large are handled by specialist coastal vessels as part of a dedicated supply chain.

FIGURE 23: BASS STRAIT FREIGHT TASK OVER TIME



Source: Meyrick and Associates / various industry

6.3.1 Bass Strait containerised trade

The introduction of new players and services and the consequent downward pressure on freight rates appears to have served as a stimulus to recent trade growth which has continued to grow at almost 7% since 1990. Shipping in the Strait is currently extremely competitive, with supply of cargo capacity significantly exceeding current demand, and more capacity is expected to be added despite the above conditions.

There are four shipping lines that handle containerised freight across Bass Strait and of the 320,000 TEU⁵⁹ that currently pass across Bass Strait, the TT Line handles 65,000 TEU, ANL Shipping (ANL) 45,000 TEU, and Toll with Patrick Shipping handles 65,000 TEU and Toll Shipping 145,000 TEU⁶⁰.

For approximately 90% of this containerised cargo, the origin or destination is within Australia. The remaining 10% consists of international containers that are transhipped in Melbourne. Tasmanian exports of zinc and paper are the largest component of this transhipped cargo.

Toll has been the most active in reshaping the industry by increasing the capacity of its ships the *Tasmanian Achiever* and *Victorian Reliance* from 422 to 524 TEU. This has only improved Toll's position which had already seen the group shift its trans-Bass Strait cargo onto its own ships, thus integrating its land and sea operations⁶¹. This will put pressure on the remaining carriers, as Toll is a significant source of trans-Bass Strait cargoes.

⁵⁹ Source: Meyrick and Associates data, based on port records

⁶⁰ Patrick Shipping is in the process of being sold as part of the requirements of the purchase of Patrick Corporation by Toll. The sale is expected to be completed in the first part of 2007

⁶¹ It now transports about 80% of the group's trans-Bass volumes on its own ships – Lloyds DCN Article 6 Mar 03

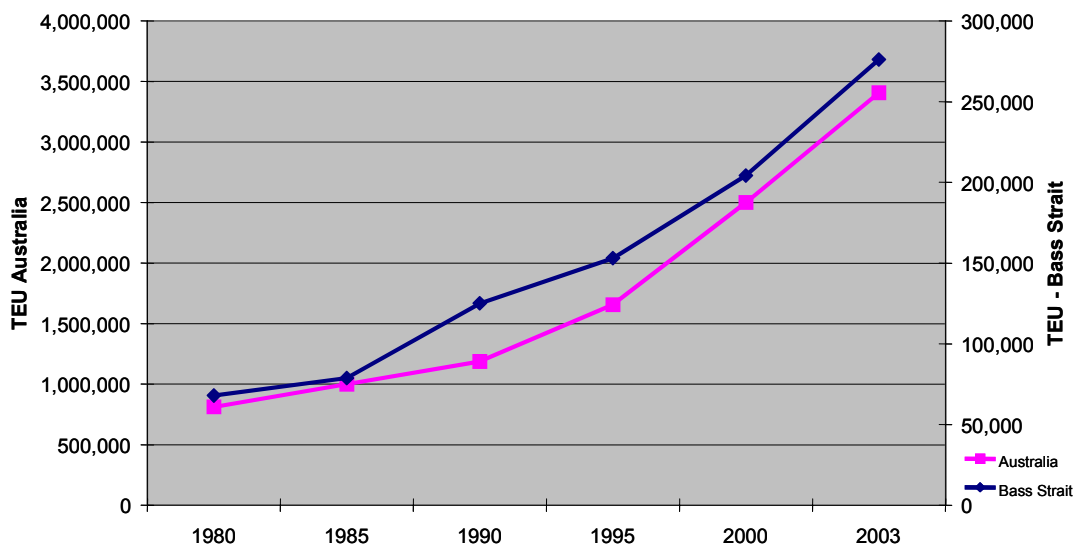
Competition for containerised cargoes has intensified with the decision by McDonalds Australia in May 2005 to shift 50% of its supply of potatoes from Simplot Australia, Toll Shipping's largest customer, to New Zealand suppliers. This has reduced shipments on Toll's vessels and consequently seen Toll move to attract replacement cargo. The TT Line indicated that, as a result of this, volumes of containers shipped on its vessels have dropped from 135 containers per sailing to 100⁶².

ANL Shipping has reinvigorated its Bass Strait operations and appears intent on competing over the long term.

The Bass Strait Container trade is characterised by:

- A broad range of containerised commodities making it difficult to identify a single or a number of major drivers
- Medium term growth in both containers and wheeled units (< 5 years) but having a high degree of annual volatility.

FIGURE 24: RELATIONSHIP BETWEEN INTERNATIONAL AND BASS STRAIT TEU GROWTH



Source: Meyrick and Associates / various industry

Trade growth appears to be relatively stable over the long term and appears to parallel Australian growth see Figure 24.

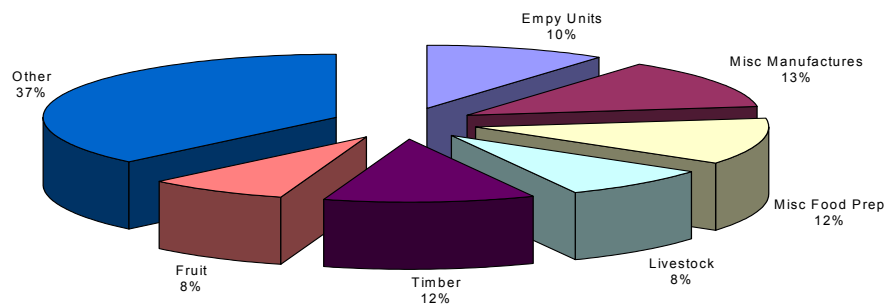
6.3.2 Bass Strait wheeled unitised trade

The trade is defined by pack type, and in practice, as in Northern Europe, there is considerable scope for substitution between wheeled unitised cargoes and containers in the trade (wheeled unitised cargoes are those carried on dedicated trailers, i.e. not in a shipping container).

⁶² Discussions MA and TT Line

The major products carried as wheeled unitised cargo are miscellaneous manufactures and food preparations which are the largest categories in both directions, although the number of empty wheeled units being imported, at 10% of the trade, indicates that the northbound cargo is not always available (see Figure 25).

FIGURE 25: PRODUCT GROUPS SHIPPED IN WHEELED UNITISED FORM



Source: Meyrick and Associates / various industry

All Bass Strait lines are major players in the wheeled unitised trade, with the exception of ANL who do not operate Ro-Ro vessels across the Bass Strait.

The single most important industry change in the past five years has been the introduction of the Spirit of Tasmania I and II, as their rapid transit time and frequency of service make them ideal for moving goods across Bass Strait on a 'Just in Time' basis. TT Line offers the latest closing time for freight to be loaded onto the vessel and the quickest vessel passage, both of which are important for food products and explains why the TT Line now dominates this market segment.

TT Line handles 60% of the wheeled unitised cargo segment, a position which it established when the Spirit of Tasmania I and II commenced operations.⁶³

Patrick and Toll Shipping share the remaining 40% of this segment. Toll increasing of the size of its ships, the *Tasmanian Achiever* and *Victorian Reliance* in 2004, included additional wheeled unitised capacity.

6.3.3 Bass Strait breakbulk trade

Timber products and motor vehicles are the two largest components of this segment. Patrick and Toll carry timber exports from Tasmania, although this trade appears to be declining with the slowing of the Victorian building boom and the increase in timber from Victorian pine plantations.

⁶³ The major components of the Wheeled Unitised trade are miscellaneous manufactures and food preparation which are the largest categories in both directions

TT Line now carries 40 unaccompanied motor vehicles on each of its voyages to Tasmania; these vehicles are under contract from Linfox and Patrick Autocare. This volume represents 50% of the movement in unaccompanied motor vehicles across Bass Strait.

ANL does not carry breakbulk cargoes (only containerized).

6.3.4 Bass Strait trade forecasts

The Port of Melbourne⁶⁴ has recently released its trade forecasts for the Bass Strait cargo trades between 2006 and 2035. The relevant trade forecasts are shown in Table 41.

TABLE 41: BASS STRAIT CARGO TRADE FORECASTS TO 2020

Bass Strait Cargo Trade				
Year	Containerised (TEU)	Wheeled Unitised (Units)	Breakbulk (‘000T)	Total Tonnage (‘000T)
2010	416,000	40,000	144	5616
2015	534,000	46,000	167	7127
2020	658,000	51,000	197	8705

Source: Port of Melbourne Corporation

6.4 Mainland inter-state container shipping trades

The mainland inter-state container shipping trade through across Australia has been the fastest growing trade in Australia over the last five years⁶⁵.

The mainland container shipping trade has three major segments: the North/South (Brisbane – Sydney/Melbourne), the East/West (Perth – Adelaide/Melbourne/Sydney), and transshipment of international cargoes (including empty containers) across Australian ports.

The growth in mainland containers does not appear linked to growth in other sectors or trade growth in general. Initial evaluation against economic drivers produced nonsensical estimates of future mainland container volumes.

The growth in the mainland container shipping trade appears to be due mainly to a rapid increase in the market share with containers moving from road and rail, rather than to growth of the market itself, and therefore this will clearly not be sustained indefinitely.

However, there are two important factors that are likely to place a ceiling on this growth well before it is constrained by the overall size of the market:

⁶⁴ Port Development Plan 2006 -2035 Port of Melbourne Corporation Note Analysis and Forecast development undertaken by Meyrick and Associates 2005/06

⁶⁵ The Mainland trade from Melbourne grew at 261% from 2000-2005, whereas the Bass Strait trade grew at 154% and international container trade through Australia grew at 139%. Source MA Data on Australian Domestic and International Trade

- Domestic containers (as opposed to transshipment containers ultimately bound for overseas destinations) are carried on spare slots on international vessels and hence low priority if capacity is tight
- Rail operators: The growth in coastal container volumes has placed extreme pressure on the rail companies that have traditionally carried a large share of this market.

6.4.1 Domestic container shipping services

Australia had a thriving coastal shipping service in the early 1970s. However, the cost of its operation and service issues made it uncompetitive against road and rail. Today, the lack of shipping's competitiveness arises from a combination of service-related factors (slower transits, lack of frequency) and cost-levels, whereby the cost advantages are insufficient to offset the service issues.

Unless dedicated coastal shipping services are again re-introduced (post PAN), the volume of mainland containers will be limited to the volume of surplus capacity on international container shipping services. This is not always available and in 2004 spare slots decreased on the South Asian services and as a result mainland container shipping volumes decreased and rail volumes surged.

6.4.2 International container shipping lines

Long-haul mainland containerised cargo in Australia is carried either on rail or by sea. The low cost of rail and the high cost of Australian domestic shipping under the Cabotage system⁶⁶, combined with the service-related factors discussed above, led to the collapse of the Australian domestic container shipping industry in the early 1990's.

International Shipping Lines through the use of single and continuous voyage permit systems⁶⁷ are able to carry domestic cargo at effectively the marginal cost of production. This gives them an enormous price premium⁶⁸ over both road and rail and any dedicated domestic coastal shipping operator.

However, this price advantage is, in practice, for a somewhat "erratic" service since international containers will take precedence over domestic ones when space is in short supply. This particularly occurs during the peak shipping season (October through December). Furthermore, this price advantage can be eroded when carriers force shippers to use international sea containers for domestic loads (i.e. less volume per shipment and double-handling if inland legs in domestic equipment).

⁶⁶ Cabotage, the limiting of access to a country's coastal trade to national ship operators or national flag vessels with national crews, is a key issue. Cabotage in Australia operates through Part VI of the Navigation Act 1912 (the Navigation Act). This Act provides that ships licensed to operate on the coastal trade must, among other things, pay applicable Australian wages. The Act also provides for non-licensed ships to operate when no licensed ship is available or the service that the licensed ship provides is inadequate.

⁶⁷ **Single voyage permit:** a permit that the Department of Transport and Regional Services issues for a single voyage between designated ports for the carriage of a specified cargo or passengers, as an authorised exception to the cabotage policy.

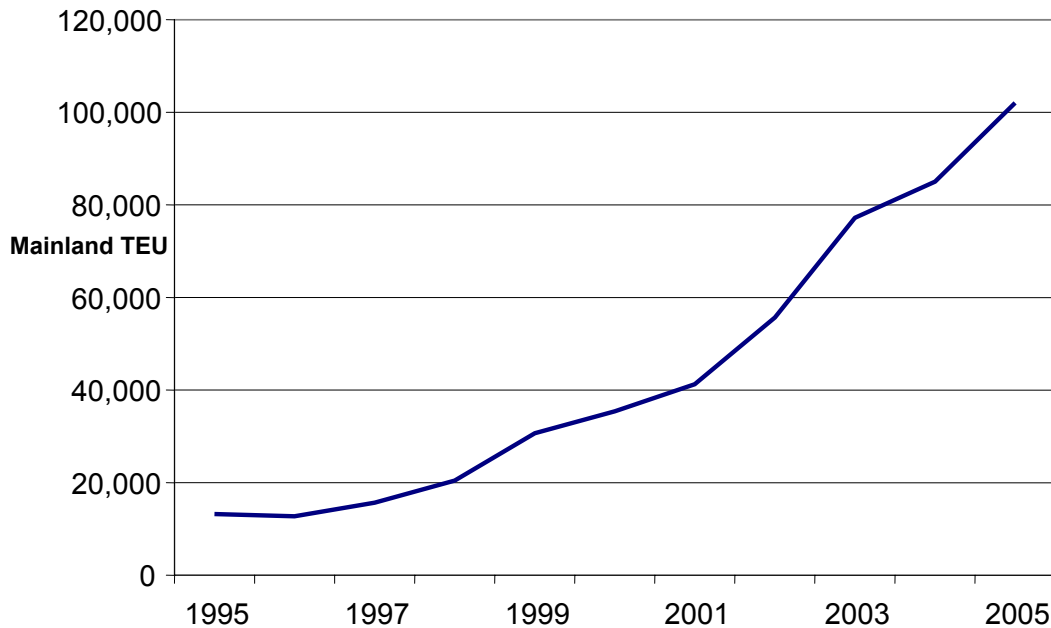
Continuing voyage permit: a permit that the Department of Transport and Regional Services issues allowing a vessel to carry specified cargo between specified ports usually for six months, as an authorised exception to the cabotage policy.

⁶⁸ A container shipped on rail from Melbourne to Fremantle takes 3 days at a cost of \$2000. The same container could be shipped for as little as \$500 in six days on an AAX vessel offering a fixed day call service between Melbourne to Fremantle.

6.4.3 Recent history in the mainland containerised shipping trade

Growth has been spectacular, with growth above 21% per annum since 1995 (see Figure 26), however the markets for freight services on both the North/South and East/West are fairly mature and limited annual growth in market size is expected in a “business as usual” situation.

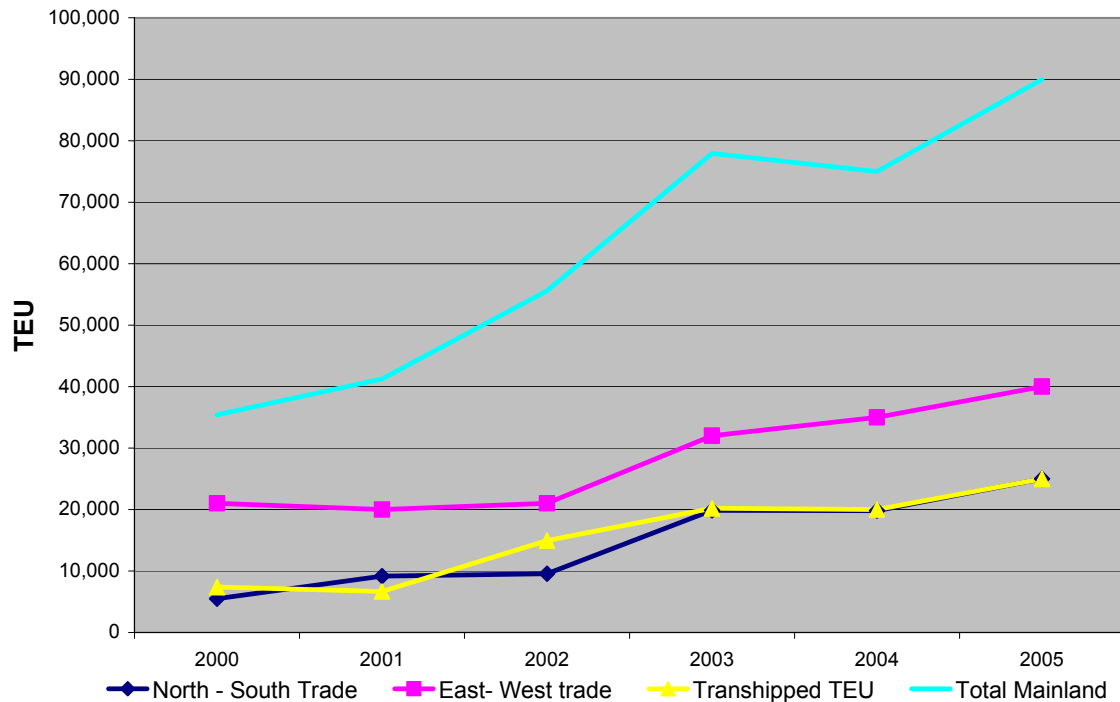
FIGURE 26: MAINLAND CONTAINER SHIPPING TRADE 1995-2005



Source: Meyrick and Associates / various industry

The major segments in the mainland container shipping trade are the shipping legs from Melbourne to Brisbane and from Melbourne to Fremantle, the volumes on the return leg from Fremantle to Melbourne are small and almost nothing on the Brisbane to Melbourne leg. The volumes include international transhipped containers consisting mainly of empties.

As shown in Figure 26, the growth in mainland trade had been sudden, indicating that industry actions are responsible for the growth in mainland volumes.

FIGURE 27: NORTH-SOUTH AND EAST-WEST CONTAINER SHIPPING TRADE & TRANSHIPMENT, 2000-2005


Note: Transhipped TEU includes empty containers.

Source: Meyrick and Associates / various industry

East-West

In 2005, there were over 40,000 TEUs shipped between the Eastern states and Fremantle, the majority of which were on Single Voyage Permits. The majority of these are export from the eastern states to Western Australia with trade volumes increasing.

North-South

The North-South trade (Brisbane – Sydney/Melbourne/Adelaide) has increased by 100% in the last four years and its growth appears to be stabilised at above 25,000 TEU. The trade is likely to face increased competition with rail as the improved rail infrastructure and the expected increase in competition between the major rail operators intensifies.⁶⁹

Transhipment

International transhipment (mainly empty repositioning) is extremely volatile and dependent on the international port calling patterns of deepsea carriers. Although traditionally a potential cargo for domestic shipping, we consider it to be outside the scope of this study which is more focussed on domestic inter-state possibilities.

⁶⁹ The competition between Pacific National and Queensland Rail in the North-South non bulk freight market is going to intensify as both organisations have made it clear that they will be entering the other's core markets in the next two years. QR has entered NSW and Victoria and is seeking access to the Dynon freight terminals.

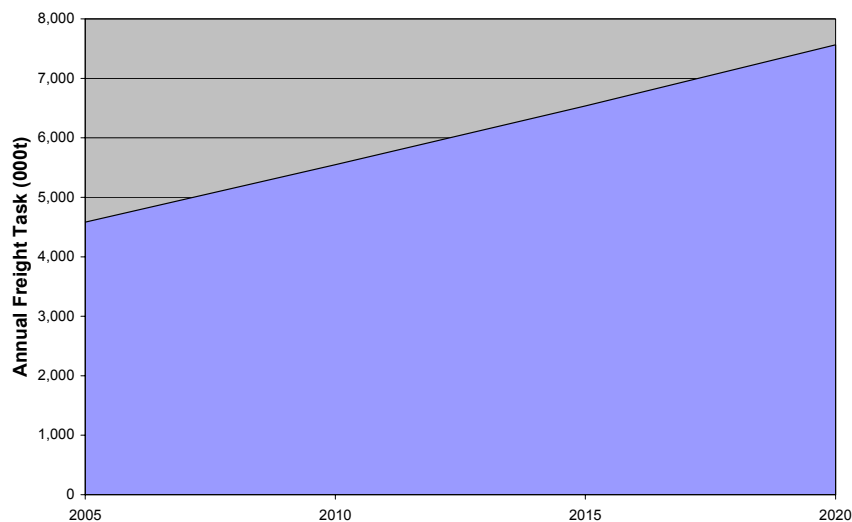
6.4.4 Mainland container shipping trade forecasts for ‘business-as-usual’

The market for non-bulk freight on the East-West and North-South trade lanes is mature and the expected growth is limited in the “business-as-usual” situation. What is exciting is that movement by sea is currently a small part of the overall freight task and even small changes in mode share could lead to significant additional volumes of mainland containers, i.e. there is a large contestable market when critical success factors are achieved for coastal shipping (see section 6.9.2 for a discussion on the critical success factors).

The most recent study of trade volumes on the North-South and East-West trade lanes was published in 2006 by the Bureau of Transport and regional Economics and entitled “Freight measurement and modelling in Australia”.⁷⁰

The report provides estimates of the future freight task between the major capital cities to 2020. These estimates are shown in Figures 28 and 29.

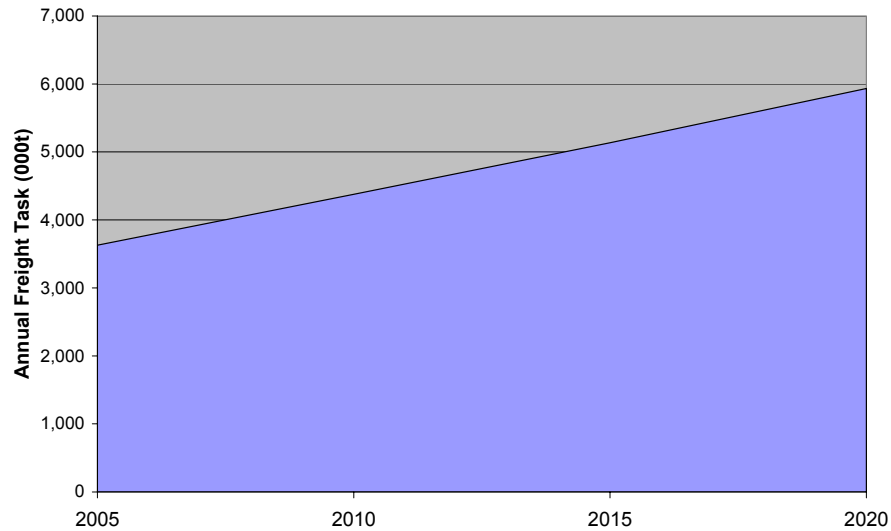
FIGURE 28: PREDICTED EAST–WEST FREIGHT TASK



Source: Meyrick and Associates / various industry

⁷⁰ “Freight Measurement and Modelling in Australia” BTRE Report 112

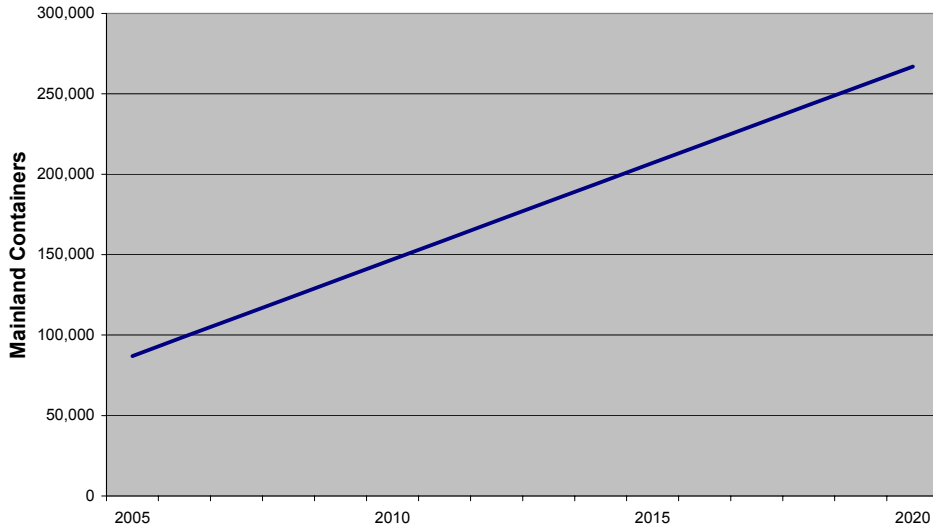
FIGURE 29: PREDICTED NORTH-SOUTH FREIGHT TASK



Source: Meyrick and Associates / various industry

In both of the mainland major segments, the current percentage carried at sea of the freight task is approximately 10% (this is after converting the non-bulk freight into the estimated number of containers using 15 tonnes per TEU). This is in accordance with a separate study recently completed by Meyrick and Associates on trade flows to and from Western Australia and the number of containers moving North-South.

In the business-as-usual situation with sea continuing to hold a 10% market share, we forecast mainland container shipping demand (total of the North-South and East-West routes) for 2005-2020 as shown in Figure 33. However, these should be adjusted by excluding deepsea transshipment containers which represent around 25,000 containers per year.

FIGURE 30: PREDICTED MAINLAND CONTAINER SHIPPING, 2005-2020


Source: Meyrick and Associates / various industry

6.4.5 Planned new mainland container trade to/from Esperance (WA)

BHP Billiton’s Ravensthorpe Nickel project in Western Australia requires that around 10,000 purpose-built containers per year (likely to be 20ft tank containers) are shipped to Townsville with a further 2,000 containers per year coming from Queensland with raw materials. The project is planned to start in 2007 and the port of Esperance has already commissioned the delivery of a container gantry crane which can also handle bulk raw material imports. This new trade, although specialised, could form an important base load for an East-West domestic multi-purpose shipping service connecting Western Australia with Queensland. In all likelihood, the service would probably extend to Fremantle with an Esperance call and proceed no further than Brisbane with containers railed to/from Townsville or alternatively transhipped along the East coast onto an international multipurpose service calling Townsville. It was reported in the shipping press that PAN Shipping was at one stage interested in capturing this new cargo on its weekly, three vessel Fremantle-Adelaide-(Tas)-Sydney-Brisbane “Boomerang” service.

6.5 Remote-area and other domestic non-bulk trades

6.5.1 Northern Territory and Northern Queensland

Coastal shipping services in the Northern Territory (NT) and Northern Queensland are often the only means of serving remote communities and mining operations. This requires the use of small multi-purpose (geared), ro-ro or landing-craft vessels to carry a mixture of cargoes – project building materials, fuel, general consumerables (in general containers), and perishables (in reefer containers). Perkins Shipping, based in Darwin, is the main shipping operator providing a NT communities service, NT coastal service (connecting Darwin, Gove and Groote Eylandt), and a Gulf freight service (Brisbane, Cairns to Karumba, Weipa and islands). Perkins Shipping also has a road fleet to offer door-to-door services.

6.5.2 Western Australia

The Western Australian government provides a contract to operate a Western Australia coastal service. This contract was recently won by Sea Corporation (based in Perth) from Patricks. Sea Corporation operates a 17 day service using a single 320 TEU multi-purpose geared vessel (the SCS Anne) calling Fremantle, Dampier, Port Hedland, Broome, Wyndham and Darwin. Cargoes are typically building materials, general supplies and mining industry equipment (previously Patricks also carried cement as a base load but this is now carried by road). Sea Corporation also have a connecting carrier agreement with the deepsea container carrier MSC for relaying deepsea cargoes along the WA coast, as well as operating trucks to provide a door-to-door service. Interestingly Sea Corporation state that ships can be almost as fast as road with a ship taking 8 days from Fremantle to Darwin compared with 7 days by road.

6.5.3 Furneaux Group Islands, Tasmania

The Furneaux Group of islands in the Bass Strait (Flinders Island, and King Island) are connected to Tasmania and the mainland (Victoria) by passenger/freight ro-ro shipping services operated by Southern Shipping based in Bridport and Patricks (currently being sold by Toll as part of its takeover of the Patrick group). The Flinders Island service operates with two vessels under a Tasmanian government contract. As from January 2007, the King Island service may be served differently depending upon the new owners of the Patricks Bass Strait service. The Furneaux Group island services allow for dairy products to be distributed to the mainland as wells as exports of marine products and meat to overseas markets. The services are also important for supplying fuel for the communities.

6.5.4 South Australia – Spencer Gulf

In December 2006, a new ferry service for passengers, cars and trucks commenced operations across the Spencer Gulf between Wallaroo (north of Adelaide) and Lucky Bay. The two-hour service, operated by Sea SA, involves two 18 knot ships each with a capacity for ten trucks, 50 cars and 350 passengers, and saves 350km in distance thus providing a short-cut between Adelaide and Port Lincoln, Whyalla and other Western destinations. The rationale behind the service is to encourage trade between the Eyre and York peninsulas and remove traffic from roads also reducing accidents. It has been calculated that if the new ferry service was not operational the same vehicles driving around the top of the Spencer Gulf would produce 34 times more CO2 emissions than when transported by the ships.

6.5.5 Other islands

There are other island services which are primarily passenger ferry with some capability to carry local wheeled-freight or vehicles. Examples are the Kangaroo Island ferry service operated by Sealink in South Australia, and the Magnetic Island ferry service in Queensland. The more distant Norfolk Island and Lord Howe Island are served by a dedicated cargo ship sailing to/from the port of Yamba in NSW with additional calls at New Zealand ports.

6.6 Domestic bulk shipping case study – the cement trade

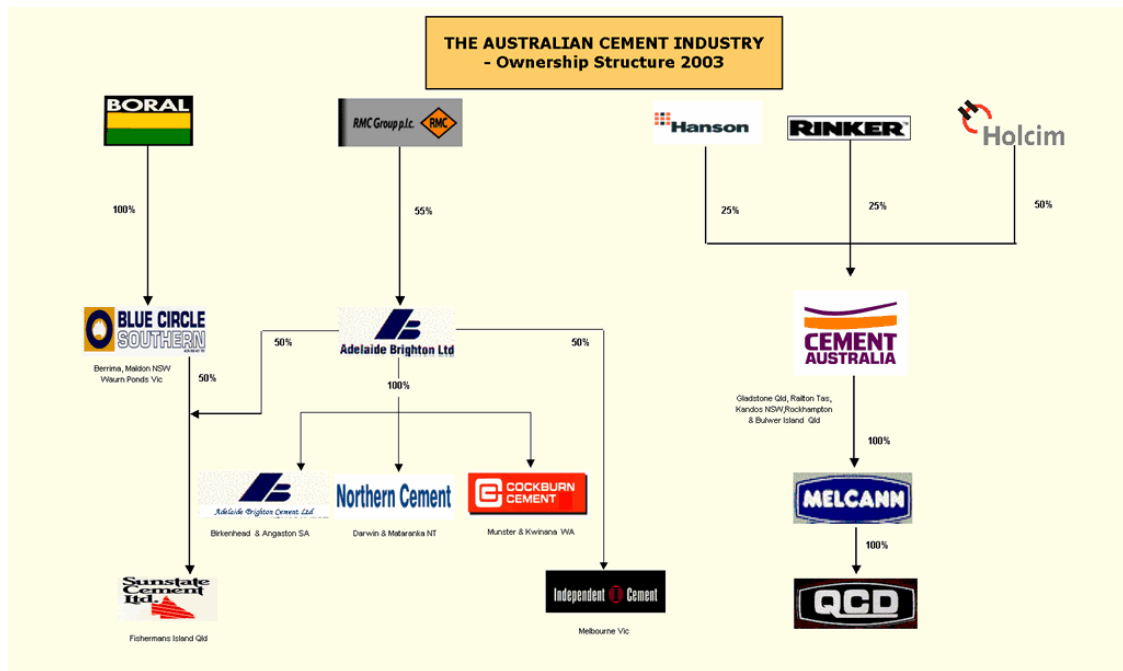
The aim is to demonstrate how the industry is structured, what the drivers of demand are, how the supply chain requires maritime transport and what arrangements are in place and what the future trade levels are predicted to be. Cement has been selected as an example because it has operations in each state which use domestic bulk shipping.

The major influences on Australian cement market growth are economic – growth in housing and major construction projects, however the movement of cement through Australian ports is influenced largely by industry issues and structure.

6.6.1 Cement industry overview

Domestic cement manufacturing, like the grain industry, is oligopolistic, with major cement companies vertically integrated into all phases of production and distribution.

FIGURE 31: AUSTRALIAN CEMENT INDUSTRY STRUCTURE



Source: Meyrick and Associates / various industry

The Australian cement industry comprises the three major Australian cement producers – Adelaide Brighton Ltd⁷¹, Blue Circle Southern Cement Ltd, 100% owned by Boral, Cement Australia which has been formed from the merger of Australian Cement Holdings Pty Ltd and Queensland Cement Ltd. (see Figure 31).

These companies account for 100 percent of integrated cement supplies in Australia, having production facilities with a clinker capacity of over 8Mt per annum.

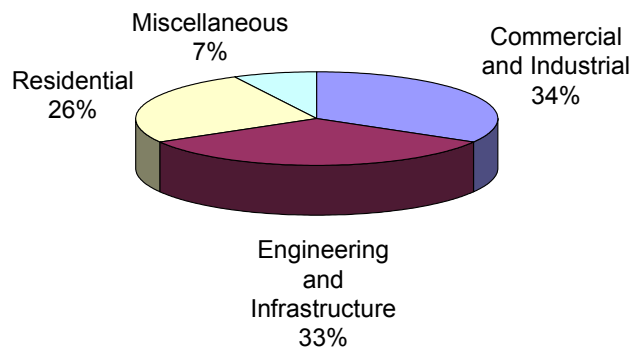
There are a number of smaller suppliers, of which Buckridge is one in Western Australia which imports clinker for production into cement and has 30% of the WA cement market (equivalent to 3% of the national market).

⁷¹ Adelaide Brighton produces cement in South Australia and Western Australia and lime in Western Australia. Independent Cement and Lime, 50% owned by Adelaide Brighton, purchases cement from Adelaide Brighton and is a major distributor of cement in Victoria and to a lesser extent, NSW. Adelaide Brighton owns 50% of Sunstate Cement, the Queensland clinker grinder and cement distributor. Adelaide Brighton also has downstream concrete operations with relatively small market shares in Victoria, NSW and Queensland and concrete masonry operations in Victoria, NSW and South Australia through C&M Brick.

6.6.2 Cement consumption

The major uses of cement are shown in Figure 32. These show a diverse range of industries each with different, non-linked growth cycles. Building and construction work follow different cycles of activity. Residential construction goes through a sequence of relatively short but regular cycles, with departures from the trend level of activity around plus or minus 10 per cent. Non-residential construction is on a longer cycle. The construction booms of the late 1980s and late 1990s are particularly pronounced. Engineering projects, such as infrastructure (major roads and airports), generally provide a stable base for building and construction activity. Miscellaneous use of cement covers the repair and home maintenance segments.

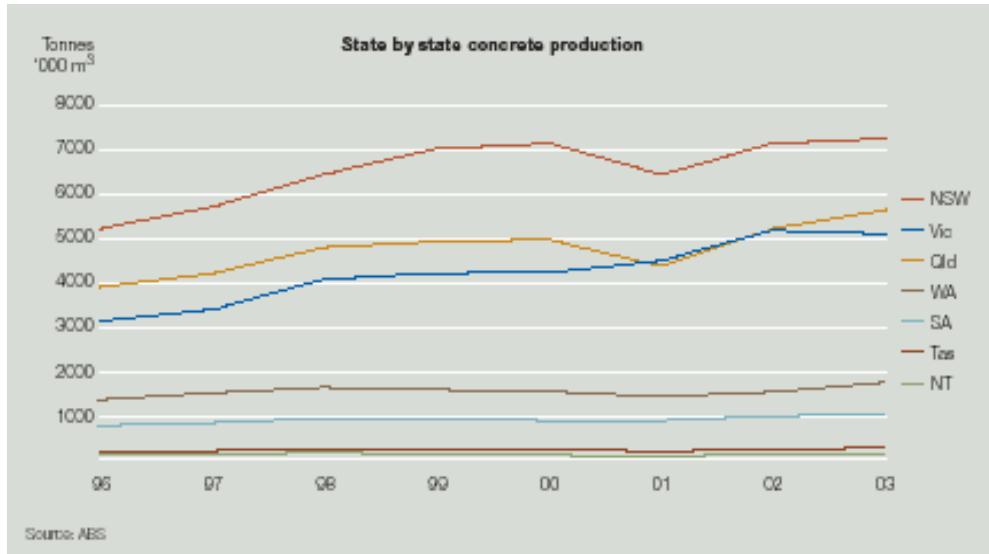
FIGURE 32: MAJOR USES OF CEMENT IN AUSTRALIA



Source: Meyrick and Associates / various industry

The major use of cement is in the production of concrete with the largest consumers being NSW, Queensland and Victoria as shown in Figure 33.

FIGURE 33: CONCRETE PRODUCTION IN AUSTRALIA, 1996- 2003

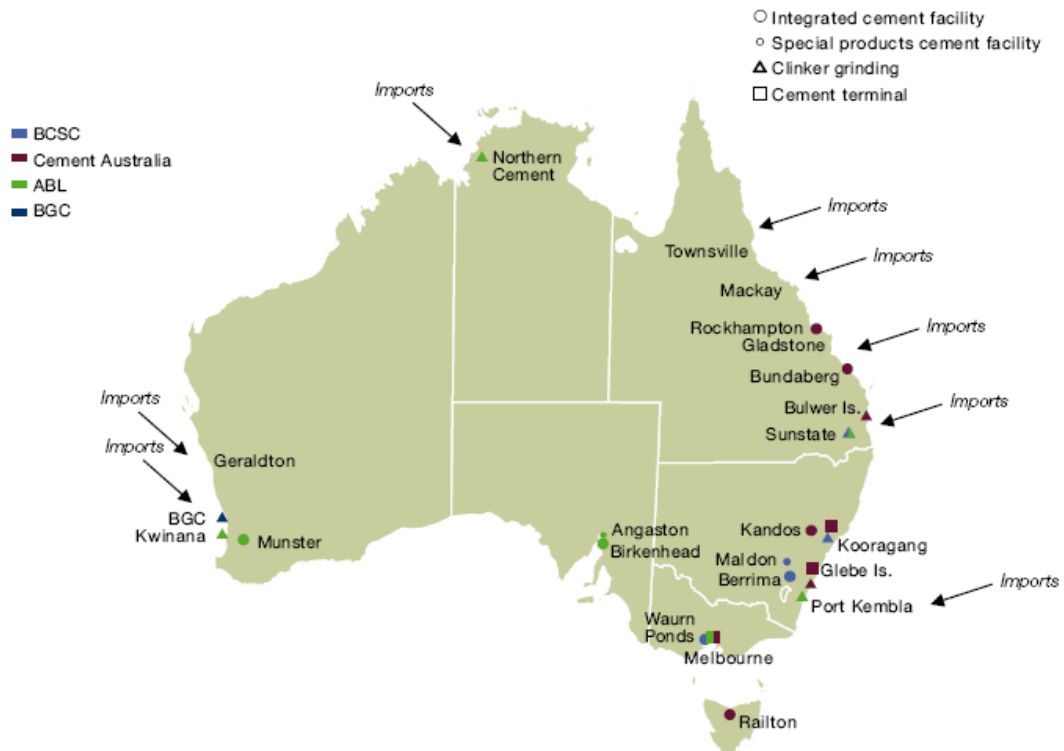


Source: ABS

6.6.3 Cement production and import balance

Cement production in Australia comes from a variety of sources.

FIGURE 34: CEMENT PRODUCTION AND DISTRIBUTION IN AUSTRALIA



Source: Meyrick and Associates / various industry

The cement market is currently in balance with supply being met largely by domestic supplies (90-95%) and imports (5-10%) from Asia and mainly into the Queensland market which has a net 600,000 tonne shortfall between domestic supply from Cement Australia at Gladstone and overall state imports of cement⁷². This percentage was much higher, however the actions of domestic suppliers in cutting their prices has reduced overseas imports particularly into Victoria and NSW since 2000.

TABLE 42: CEMENT PRODUCTION VOLUMES BY MAJOR SUPPLIER

Blue Circle Southern Cross	2,400
Cement Australia	3,290
Adelaide Brighton	2,120
Total ('000 tonnes):	7,810

Source: Meyrick and Associates / various industry

TABLE 43: CEMENT PRODUCTION AND DISTRIBUTION BY STATE

Location	Company	Production ('000T)	Use	Moved by
NSW				
Berrima	BCSC	1,300	Local NSW market	Road/Rail
Maldon	BCSC	300	Local NSW market	Road/Rail
Kandos	CAPL	450	Local NSW market	Road/Rail
Victoria				
Waurm Ponds	BCSC	800	Local VIC market	Road/Rail
Queensland				
Gladstone	CAPL	1,600	QLD Market	Shipped (1,400)
Rockhampton	CAPL	140	Local market	
South Australia				
Birkenhead	ABL	1,300	Eastern Australia	Shipped
Angaston	ABL	250	Eastern Australia	Shipped
WA				
Canningvale	BGC	(Imported Clinker) 300	WA Market	Rail/Road
Kwinana	ABL	300	WA Market	Rail/Road
Munster	ABL	570	WA Market	Rail/Road
Tasmania				
Railton	CAPL	1,100	Eastern Australia	Shipped 2/3 VIC, 1/3 NSW

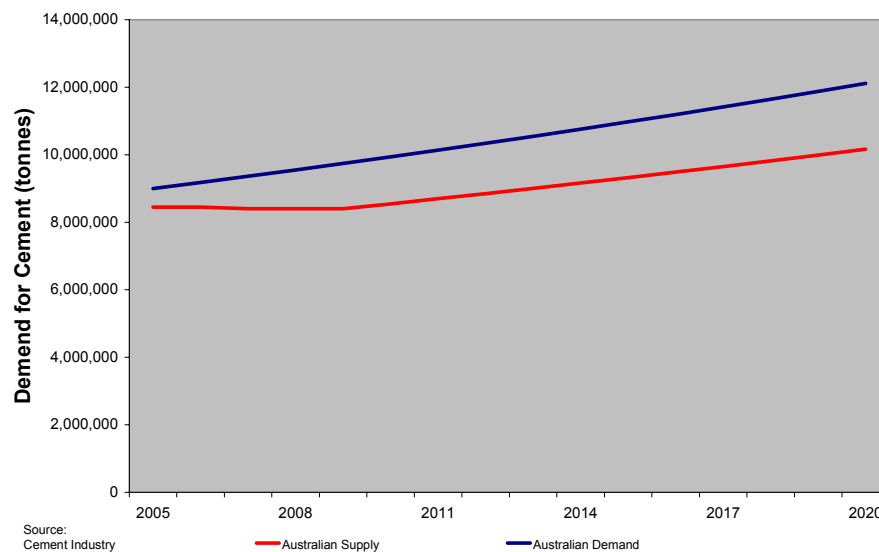
Source: Meyrick and Associates / various industry

⁷² Analysis of Queensland port statistics 2000 - 2005

6.6.4 Demand for cement

The underlying demand of Australian cement is running at about 1.7% per annum and domestic supply has peaked in the near term with expansion plans under development, according to the Cement Industry⁷³, and is likely to decline in the medium term following a series of planned upgrades and major maintenance shutdowns before regaining volume in 2010 and onwards.

FIGURE 35: CEMENT DEMAND AND SUPPLY IN AUSTRALIA, 2005-2020



Source: Meyrick and Associates / various industry

6.6.5 Maritime trade in cement

The dominant maritime cement suppliers in Eastern Australia are:

- Cement Australia which ships its output from the Tasmania operations at Railton on a 70/30 split to Melbourne and NSW using the dedicated vessel MV Goliath
- Adelaide Brighton which exports to the eastern states from South Australia through its joint venture company Independent Cement and Lime using vessels under Continuing Voyage permits such as the MV Stadacona and the CSL Pacific.
- Cement Australia which ships cement from its facility at Gladstone to supply the Queensland and NSW market using the MV Cementco.

Future volumes of cement from domestic cement suppliers are expected to be close to present levels with only small annual increases. The increase in Australian Cement demand is expected to be met by increasing imports from Asia.

⁷³ ABR briefing to ASX Nov 2005

6.7 Lessons from the cement trade case study

The main lesson from the cement trade case study is that the bulk trades are often very much part of integrated port-based manufacturing systems and supply-chains whereby the market-place has already sorted out and implemented a coastal bulk shipping system given the constraints of existing land infrastructure and transport. This sector of domestic shipping is far more industry-driven and probably less sensitive to government transport policy initiatives than the non-bulk domestic shipping sector.

6.8 Other domestic bulk and breakbulk trades

Other domestic bulk and breakbulk trades follow similar shipping patterns to those of cement with a mix of Australian-operated and foreign permit vessels used for coastal distribution. Major flows are bauxite from Weipa to Gladstone (alumina refining), iron ore from WA to Port Kembla, sugar from Queensland to other states, gypsum from Thevenard and Cape Cuvier to cement production centres, refined petroleum products from refineries to outlying regions, and steel products (slab) from Port Kembla to Hastings (Westernport). The cargoes and shipping movements are generally part of a manufacturing supply chain involving raw materials supply and distribution of intermediate products or final products from production centres to regional storage facilities.

6.9 Australian coastal fleet and shipping capacity

The Australian coastal fleet is comprised of all vessels licensed to partake in Australia's coastal trade — under the *Navigation Act* (1912), vessels may be licensed to participate in Australia's coastal trade regardless of its flag and crew nationality. Licenses are issued on three main conditions: the vessel's crew are paid Australian equivalent wages while it trades on the Australian coast; the vessel was not in receipt of foreign government subsidies or bonuses; and, the vessel's crew have access to the vessel's library facilities (DOTARS website <http://www.dotars.gov.au>).

As at September 2006, the Australian coastal trading fleet (with coastal licences) comprises 45 vessels: 36 of these are Australian registered with a combined capacity of 1.13 million DWT; and 9 are overseas registered with a total capacity of 636,000 DWT. The major trading fleet, defined as vessels with a DWT of greater than 2,000 tonnes, comprises 39 vessels of which 31 Australian registered and eight overseas registered.

Table 44 shows a breakdown of the Australian coastal trading fleet into the major and other trading fleets, as well as the number of Australian and overseas registered vessels.

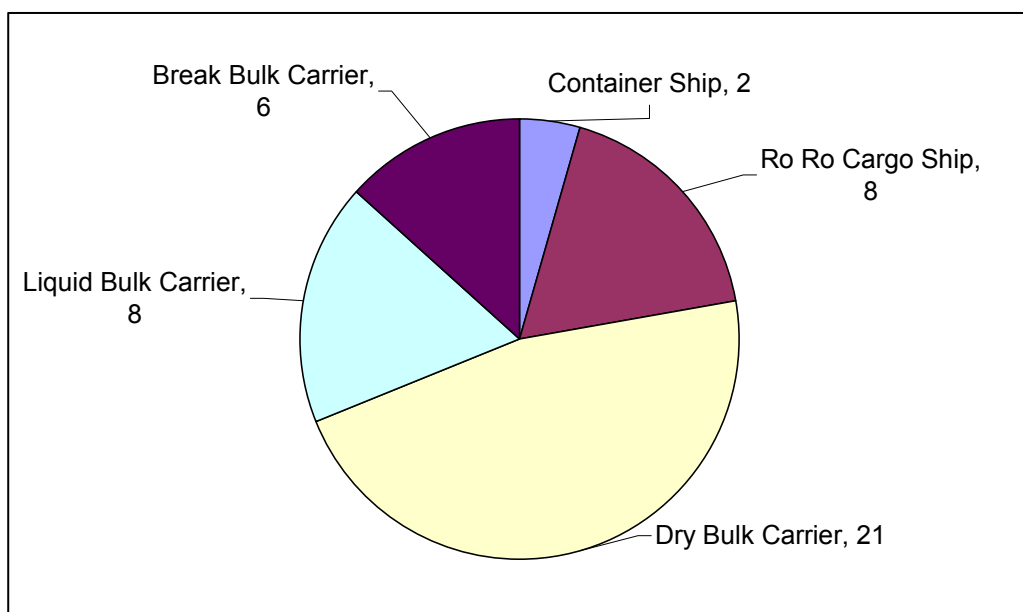
TABLE 44: SUMMARY OF THE AUSTRALIAN COASTAL TRADING FLEET, AS AT SEPT. 2006

	No. of Vessels	Deadweight (tonnes)
Major Trading Fleet (>2,000 DWT)		
Australian registered	31	1,134,466
Overseas registered	8	634,718
<i>Total coastal</i>	39	1,136,026
Other Trading Fleet (<2,000 DWT)		
Australian registered	5	1,560
Overseas registered	1	1,446
<i>Total other trading ships</i>	6	3,006
<i>Total Australian registered</i>	36	1,136,026
<i>Total Overseas registered</i>	9	636,164
Total Australian trading fleet	45	1,772,190

**Note: This list does not include supply vessels or Australian registered vessels that do not operate on coastal routes
 Source: BTRE 2006b, Lloyd's List, Sea-Web*

6.9.1 Composition of the Australian coastal fleet

The most common type of vessels operating within the Australian coastal fleet are dry-bulk carriers with a total of 21 vessels. Ro-Ro cargo ships (8 vessels), liquid-bulk carriers (8 vessels), Breakbulk carriers (6 vessels) and container ships (2 vessels) make up the remainder of the coastal fleet. This can be seen in Figure 36.

FIGURE 36: NUMBER OF AUSTRALIAN COASTAL SHIPS BY TYPE, AS AT SEPT. 2006


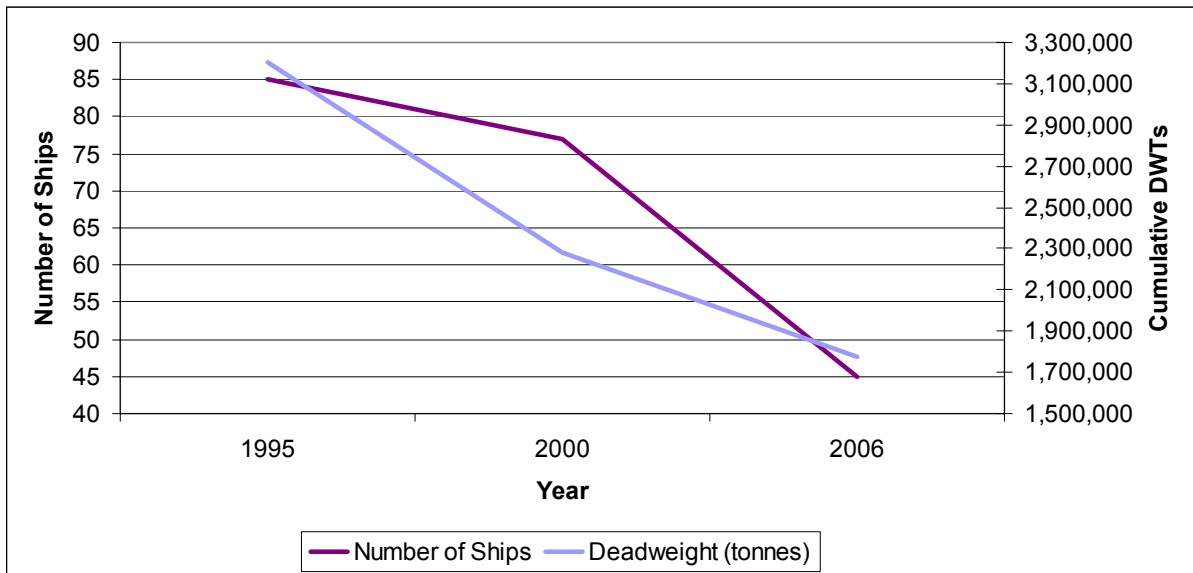
Source: Meyrick and Associates analysis

Appendix 7 provides a detailed list of the Australian coastal fleet including the vessel name, DWT, GRT, port flag, vessel type, owner/operator, routes deployed and the main cargo carried.

6.9.2 Australian coastal fleet in decline

Both the number of vessels and the cumulative DWT of the Australian coastal fleet have declined over the past decade. Figure 37 illustrates that in 1995, there were 85 vessels in the Australian coastal fleet; this number fell to 45 vessels in 2006. The graph also shows that the cumulative DWT of the Australian coastal fleet was 3.5 million DWT; this has fallen to approximately 1.77 million DWT in 2006.

FIGURE 37: THE AUSTRALIAN COASTAL FLEET - NUMBER OF VESSELS AND TOTAL DWT, 1995-2006



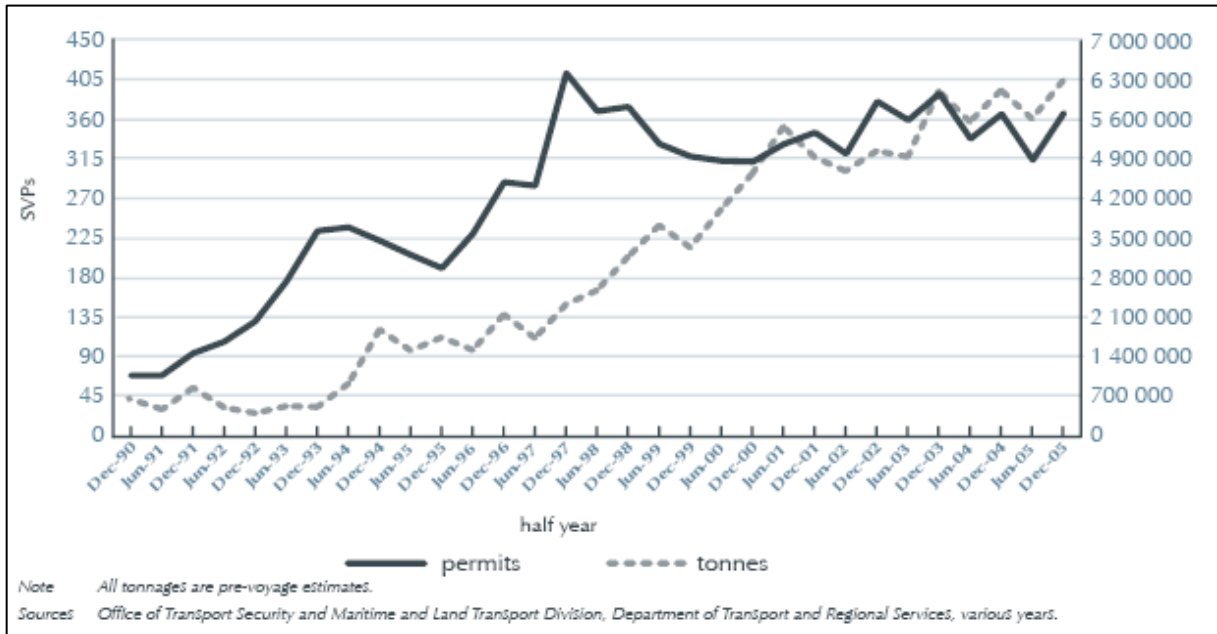
Source: BTRE 2006a, and Meyrick and Associates estimates

6.9.3 Single voyage permits and continuing voyage permits on the increase

The decline of the Australian coastal fleet in the 1990’s, due to competitive reasons discussed earlier, has meant that there has been insufficient or inadequate tonnage available to service the demand triggering the increased issuing of single voyage permits (SVPs) and continuous voyage permits (CVPs). This is particularly the case for CVPs.

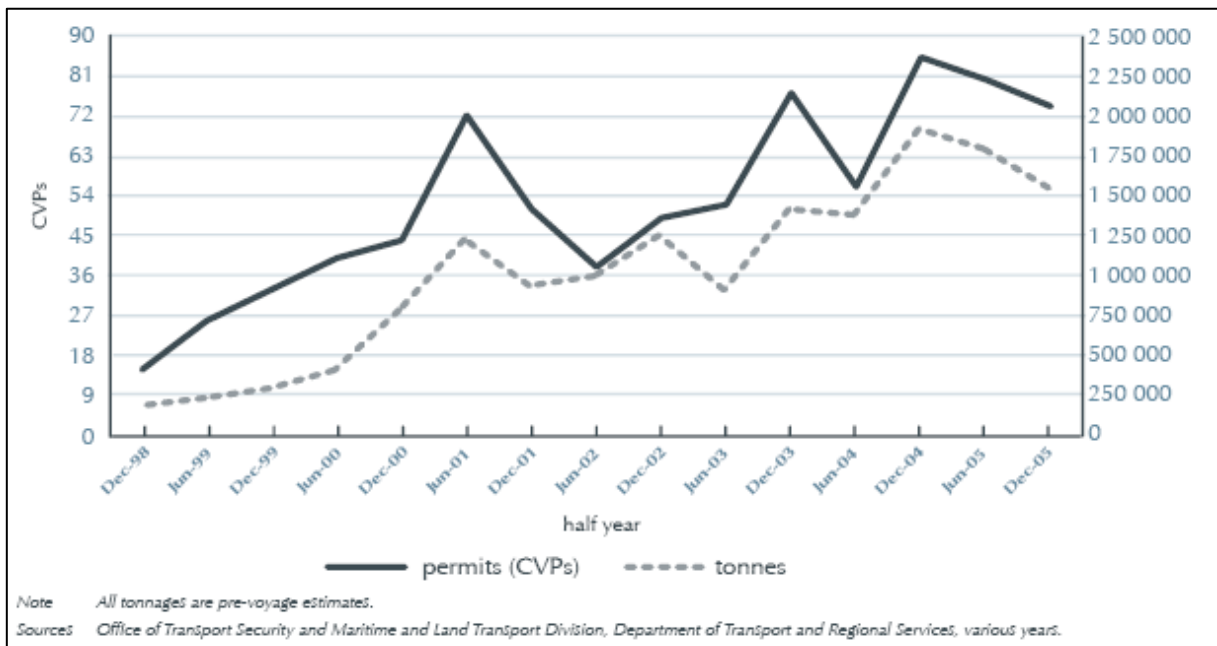
In 2005, 670 SVPs were issued; a decrease of 3.4 per cent from 2004 —when 702 permits were issued. However, the volume of cargo carried by vessels holding SVPs increased by 1.9 per cent from 11.7 million tonnes to 11.9 tonnes (BTRE 2006a, p16). Prior to 1998, CVPs were rarely issued; since then however, both the volume of tonnes carried and the number of CVPs issued has fluctuated considerably. In 2005, a total of 3.4 million tonnes of cargo was moved by vessels holding CVPs and 154 CVPs were issued — compared to 141 in 2004 (BTRE 2006a, p16). Figure 38 and Figure 39 show the number and respective tonnes carried by vessels carrying permits from 1990-2005 for SVPs and 1998-2005 for CVPs.

FIGURE 38: NUMBER OF SVP'S ISSUED AND TONNES CARRIED BY VESSELS HOLDING SVP'S, 1990-2005



Source: BTRE 2006a, p17

FIGURE 39: NUMBER OF CVP'S ISSUED AND TONNES CARRIED BY VESSELS HOLDING CVP'S, 1998-2005



Source: BTRE 2006a, p17

The majority of SVPs are used to carry dry bulk and petroleum products. Between July-December 2005, the BTRE estimated that the movement of dry bulk cargo comprised 62 per cent of the total volume of freight moved by vessels operating under a SVP. And petroleum products comprised 28 per cent of this total (BTRE 2006a p40).

TABLE 45: SUMMARY OF SINGLE VOYAGE PERMITS ISSUED BY CARGO CATEGORY, JULY–DECEMBER 2005

Cargo Category:	# SVPs	Cargo Tonnes	Cargo %
<i>Bulk Cargo:</i>			
Petroleum Products	63	1,788,379	28%
Liquefied Gas	12	143,360	2%
Other Bulk Liquids	11	87,753	1%
Dry Bulk	118	3,906,800	62%
<i>General Cargo:</i>	162	364,253	6%
Total	366	6,290,545	100%

** Note: These figures are based on pre-voyage estimates*

Source: BTRE 2006a, p40

6.9.4 Proportion of cargo carried by vessels with permits increasing

The total coastal shipping freight task for the period of 1990-2005 has varied between 45 million tonnes and 55 million tonnes per annum. During this time, the proportion of cargo carried by vessels operating under a coastal voyage permit has steadily increased: in 1990, approximately 7 per cent of the total volume of coastal trade was carried by vessels with coastal permits; this increased to approximately 27 per cent in 2005.

Figure 40 shows the increasing volume of trade carried by vessels operating under a permit as a proportion of the total Australian coastal shipping trade from 1990-2005.

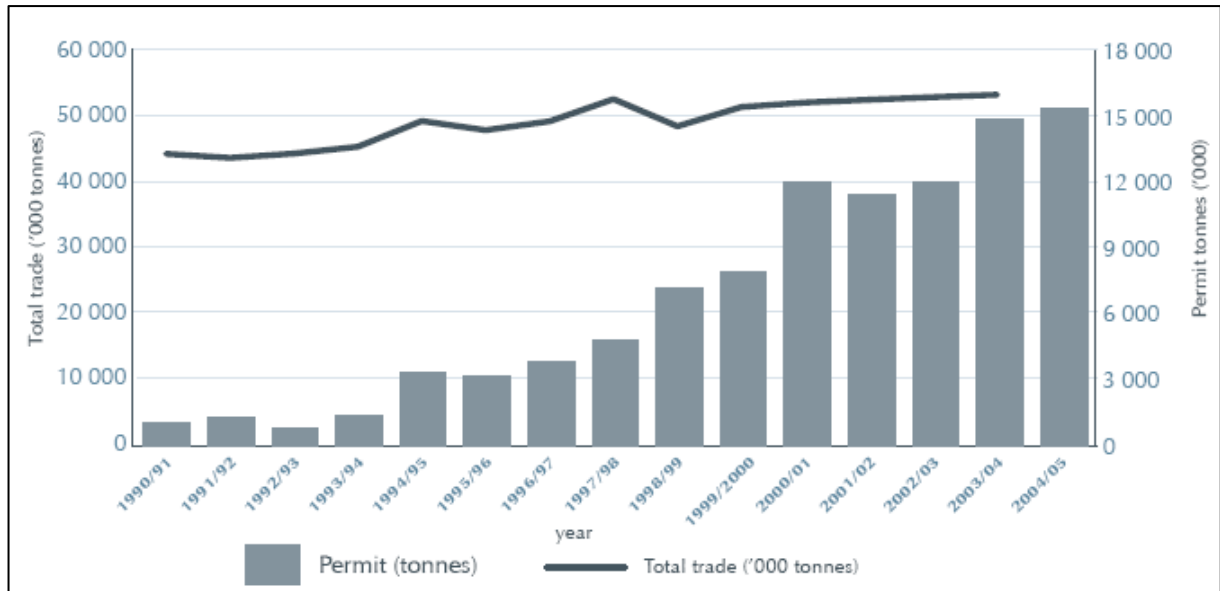


FIGURE 40: TONNES CARRIED BY PERMIT AND TOTAL AUSTRALIAN COASTAL SHIPPING TRADE, 1990-2005

Source: BTRE

6.10 Potential non-bulk coastal shipping market

6.10.1 Contestable market size

Coastal shipping is most competitive on the longer distance inter-capital routes between the east coast capitals and Perth and between Melbourne and Brisbane. Within these corridors coastal shipping competes most strongly with rail. Over the longer distance routes, customers are paying a premium to use road over rail indicating that their choice is being influenced more by reliability, transit time and service availability than price.

The existence of a large number of road operators within the shorter distance corridors (i.e. Sydney-Melbourne, Adelaide-Melbourne, Sydney-Brisbane) have compounded competitive pressures to force the critical elasticity factors of transit time, reliability, availability and price to levels which make it difficult for rail and sea to compete under the current operating environment. Rail and sea freight modes are not likely to gain significant mode share in these shorter corridors. These critical factors are significant in customer decision making within longer corridors as seen by customers' choice to pay a premium for road over rail. This market trend is indicative of the high importance placed by customers on transit time, availability and reliability over price.

The competitive advantage of rail and sea is more prominent within longer corridors (i.e. Melbourne-Brisbane, Adelaide-Perth, Melbourne-Perth and Sydney-Perth), with particular focus between East Coast capital cities and Perth. The rail market share is most susceptible to shipping if the critical mode choice factors mentioned previously improve for shipping or regress for rail. Based on the non-bulk freight flows on rail, the total potential contestable market between these modes, without taking into account the type of cargo, is 2.4 million tonnes per annum.

TABLE 46: NON-BULK FREIGHT MOVEMENTS BY AUSLINK CORRIDOR AND MODE, 1999 ('000T)⁷⁴

Corridor:	Road	Rail	Coastal	Air	All Modes
Melbourne-Brisbane	1,803.9	421.8	0.8	19.0	2,245.5
Adelaide-Perth	129.2	617.5	2.8	6.0	755.5
Melbourne-Perth	461.9	1,117.9	16.4	21.0	1,617.2
Sydney-Perth	450.4	226.0	-	23.0	699.4
Contestable corridors / All corridors	2,845.4	2,383.2	20.0	69.0	5,317.6

However, the type of cargo, its value, use in a supply-chain, door-to-door logistics and other characteristics are additional factors in determining the real size of the contestable market between rail and shipping. As such, these additional factors warrant a level of research outside the scope of this 'high-level' study. In general terms, based on industry observations, it can be concluded that:

- Low-value commodities are more contestable for shipping as the cost of transport is a significant part of the 'product-to-market' cost (examples: building products, timber/paper, base chemicals, and certain agricultural products)
- Heavy-weight and hazardous (dangerous) cargoes are attractive for shipping in terms of infrastructure investment/maintenance and safety (example: metals and chemicals/gases)
- Commodities which are not time sensitive and move between points close to ports are attractive for shipping (raw material supplies close to ports connected to manufacturing or regional storage facilities also close to ports)

Shipping finds it harder to compete for the following types of commodities:

- Commodities which are key components in manufacturing processes requiring seamless 'just-in-time' logistics (example: automotive components)
- Refrigerated foodstuffs which have low tolerance for service failures (example: supermarket supply-chains)
- Manufactured goods moving from distant inland origins to distant inland destinations.

⁷⁴ ⁷⁴ Source: btre Working Paper 66, Demand Projections for Auslink Non-Urban Corridors

6.10.2 Conditions for successful operations (the optimal situation)

Coastal shipping can become a viable option for significant annual freight volumes if the critical mode choice factors of price, reliability, availability and transit times are pushed towards market competitive levels relative to rail. As a starting point, there needs to be close to peak reliability for sea to have any grounds for mode share. Reliability upwards of 90% is likely to be required in order for shipping to be trusted as a market alternative. There is very little statistical data available, but anecdotal industry information of instances of international vessels being late, on-carrying domestic cargoes to overseas ports, or closing out domestic cargoes in favour of international cargoes suggests that reliability is below the 90% level. An added issue cited by industry is that domestic cargoes have to be carried in international sea containers which can mean re-loadings and problems of availability

The transit times of shipping between the corridors in question are significantly longer than rail as shown in Table 39. Through natural advancement in shipping technologies, the transit times are likely to be reduced and mode share is highly correlated with transit times which is seen as a significant point of current differentiation between rail and sea. Shipping can realise substantial mode share through minor streamlining in transit times of 10 to 20%. This means in practice deploying vessels with service speeds of around 21 to 25 knots instead of the more standard 18 to 20 knots. Ideally, high-speed catamaran-type cargo vessels of 30 knots plus would secure business, but the harsh sea conditions of the Great Australian Bight would limit their use.

Another critical success factor, which is reported to have been problematic for PAN Shipping in Sydney Botany Bay, is the securing of a fixed, ideal day berthing window at the main Australian international ports. Without this, it is very hard to provide the level of quality of service required and be attractive for shippers. The solution, albeit costly, is to ultimately construct dedicated berthing facilities and connecting infrastructure in the main ports for domestic container shipping services.

Availability of shipping services is a mode choice factor directly within the control of operators for immediate returns in mode share. The number of services between cities needs to be increased to compensate for the lag in transit times. Deployment of two loads within the same week provides the needed flexibility for customers and creates a substitution effect for longer travel time.

Coastal operators need to complement improvements in critical mode choice factors with significant investment in integrated infrastructure and domestic-sized equipment (as can be evidenced by successful coastal operators in Europe which have moved away from the limitations of international sea containers to the use of containers matching road trailers – there are vessels with cell guides specially designed for large trailer size containers). To provide door-to-door service for customers, the operator needs to ensure that ports are equipped with loading and unloading machinery for domestic-sized equipment. These facilities need to be integrated with road freight docks to transfer cargo to trucks efficiently and securely. Furthermore, the ports will need to increase their customs controlling areas and docking berths to account for increased coastal shipping traffic. Investment in infrastructure must support the decision to compete with rail for mode share in order to be able to provide a reliable service when volumes increase.

Improvements in reliability, availability and transit time would need to be made whilst maintaining a suitable price differential to attract customers away from rail. Coastal shipping is currently undertaken at marginal cost and can therefore offer domestic rates at a discount to rail of up to 50% between Melbourne and Perth, and Melbourne and Brisbane. The improvements required to gain confidence from the market would require a dedicated fleet of vessels, use of domestic-sized equipment and additional infrastructure at the ports. These requirements for service improvements would limit the ability for coastal shipping services to offer discounted freight rates above their operating costs.

The methodology utilised to derive estimates of the potential market share for coastal shipping were based on the assumption that long haul corridors are the most contestable due to the dominance of road freight on shorter routes and the realistic and pragmatic view that such advantages would not be readily sufficiently eroded. The longer corridors represent markets where the position of road freight is weaker and where rail is in some cases clearly the dominant player.

Market intelligence indicates that customers are paying premiums for road freight across longer corridors where they place greater emphasis on reliability, availability and transit times. This suggests that the current rail market is the most contestable for sea in terms of realisable gains in market share. Therefore, the rail market across the four significant long haul corridors Melbourne-Brisbane, Adelaide-Perth, Melbourne-Perth, and Sydney-Perth emerge as those most contestable for coastal shipping.

6.10.3 Potential coastal shipping non-bulk market share under optimal conditions

In order to estimate the potential coastal shipping market share under optimum conditions, the following changes in service characteristics were assumed over the current situation:

- 100 percent increase in service availability;
- 25 percent increase in reliability; and
- 10 percent reduction in transit times.

A simple choice model was built to estimate the change in market share when the above changes in service characteristics were assumed. The model was based on the derived measures of demand responsiveness for service attributes of sea and rail transport shown in Table 47⁷⁵. The choice model used current market shares as a base and the elasticity effects shown in Table 47 were applied for the changes in service attributes listed above. The elasticity effects were derived from direct and cross elasticities based on rail market evidence and BTRE data on sea price elasticities⁷⁶. The elasticities used implicitly take account that containerised cargo is not homogenous but rather a mix of differing inland origins/destinations, commodity types with differing characteristics which make some containers more or less contestable for shipping as service attributes are changed in a positive or negative way.

⁷⁵ Mode choice parameters used for this analysis have been based on high level analysis to indicate potential shift to sea from rail

⁷⁶Source: Freight Flows in Australian Transport Corridors, Occasional Paper 98, Bureau of Transport and Communications Economics (1990), ARTC Interstate Rail Audit, Booz Allen Hamilton (2001), North-South Rail Corridor Study, Earnst & Young (2006), L. Garcia Menendez, I. Martinez-Zarzoso, D. Pinero De Miguel, "Determinants of Mode Choice between Road and Shipping for Freight Transport", Journal of Transport and Policy Economics (2004).

TABLE 47: MODAL SHARE ELASTICITIES

Service Characteristic	Change	Elasticity 'effect'	Source
Price	1 % ↓ SEA	0.23%	Based on reversing the BTCE's reported increase in rail demand (0.23%)
	1 % ↑ RAIL	1.9%	Based on average of long and short haul elasticities in BTCE (1990)
Transit	1 % ↓ SEA	0.01%	Derived from ARTC Audit figures for rail.
Availability	1 % ↓ RAIL	0.72%	Derived from E&Y (2006) rail elasticities.
	1 % ↑ SEA	0.20%	Derived from E&Y (2006) figures for rail.
Reliability	1 % ↓ RAIL	0.11%	Derived from E&Y (2006) rail elasticities.
	1 % ↑ SEA	0.03%	Derived from E&Y (2006) rail elasticities.

The resulting change in market share when all of the above changes in service characteristics were applied based on the derived measures of demand responsiveness is 4.9 million tonnes per annum across all corridors shifting to coastal shipping. The change in market size under optimum operating conditions for coastal shipping is shown in Table 48.

TABLE 48: CHANGE IN ANNUAL TONNAGE BY SEA UNDER OPTIMUM SERVICE LEVELS FOR SEA

Service Characteristic	Current Tonnes by Sea '000 tonnes per annum	Potential Tonnes by Sea (Optimum Conditions) '000 tonnes per annum
Melbourne – Brisbane	0.8	1.0
Adelaide – Perth	2.8	3.4
Melbourne – Perth	16.4	19.8
Sydney- Perth	0.0	0.7
Total :	20.0	24.9

The mode share impact estimation process used in the high level analysis for mode change from rail to road are likely to understate the increase in mode share for coastal shipping due to the small market share coastal shipping currently has. The model is more suitable for incremental changes in service characteristics rather than significant changes in services. A doubling in service availability represents a major change in coastal shipping service availability and may result in a step change in mode share as a fundamental (as opposed to marginal / incremental) change in service offering / product is involved.

The market share for coastal shipping will be limited even with a doubling of tonnage. As an upper limit, should doubling the number of services result in a doubling of the mode share for coastal shipping, the total market share for coastal shipping would be 40 million tonnes or two percent share of the contestable market.

6.11 Opportunities for supply-lead innovative coastal shipping operations

The main contestable routes are considered to be non-bulk (containerised) East-West (East Coast to WA) and North-South (East Coast). These have been evaluated in section 6.9.

However, this is not the whole story.

Given the nature and direction of Australia's coastal cargo-flows, there exists the opportunity for an innovative operator (entrepreneur) to create a market by combining domestic containerised flows (using domestic-sized equipment) with bulk and/or breakbulk cargoes using "combi/multi-purpose" vessels. Examples where this could be investigated in more detail are service routes such as:

- Hastings (steel plus Melbourne sourced domestics containers) – Tasmania (domestic containers and breakbulk) – Port Kembla (steel, breakbulk and domestic containers to/from the Sydney market) or alternatively Newcastle (bulk, breakbulk and domestic containers to/from the Sydney market) on a twice weekly basis
- Fremantle – Esperance - Adelaide – Melbourne – Sydney (or regional ports of Port Kembla or Newcastle) - Brisbane service combining domestic containers with bulk and breakbulk (ro-ro) or possibly liquid bulk cargoes all on the same ship on a weekly basis
- Two Australian coast counter-rotating container/ro-ro/bulk (multi-purpose, geared) services, both weekly with calls to reflect the direction of one-way movements of different commodities.

The containers could also include international export/import cargoes relayed (feedered) by a coastal vessel between regional ports and mainports, i.e. a 'way-port' call(s) at Western Australia regional ports, such as Albany or Bunbury, on route to/from Fremantle. In addition, there exists the potential for a cost-effective container service to be operated by combining domestic container flows with international container relay to/from a hub container port such as Brisbane (given favourable vessel economics) – see the end of section 3.3.1 for further discussion.

6.12 Ability of Australian and international vessels to service increased domestic freight

6.12.1 Availability of appropriate vessels

The nature of Australian coastal trades (type of commodities, volumes, available infrastructure at ports, shipper supply-chain requirements, etc.) is such that there are no universal or standard vessels which can serve all routes. By definition, all vessels will be “niche” in character falling into a number of categories:

- Small, fast, geared containerships
- Multi-purpose (container/breakbulk or container/ro-ro), geared ships
- High-speed ferry type container/ro-ro ships
- Handy size (geared/gearless) to Cape size bulk carriers
- Handy size to large tankers for crude and petroleum products
- Handy size to Panamax size chemical parcel tankers (chemicals/molasses/vegetable oils)
- Specialised small to Panamax size gas tankers.

The more specialised tonnage (ferries, gas tankers, etc.) will tend to be purpose-built (newbuildings), whilst the remainder can be generally found on the international charter or purchase (secondhand) markets. The current permit system for using foreign-flagged vessels in Australian coastal trades is such that there are increased risks for the shipowner regarding vessel availability and port-pair usage if the shipper requires the provision of long-term, flexible shipping capacity (i.e. greater than three months – the maximum allowed for a continuous voyage permit). Risks can currently only be reduced if a coastal licensed vessel is used but this has the financial penalty of higher operating costs.

6.12.2 Cost position of Australian-flag vessels

Historically, there has been much analysis and review of the high-cost position of Australian-crewed vessels compared with internationally (ITF)-crewed vessels with the conclusion that Australian licensed and all-crewed vessels operating in the coastal trades are unable to compete with foreign-flagged and crewed vessels operating under coastal voyage permits.

Analysis of the report prepared exclusively for the AMG by Thomson Clarke – Coastal Shipping Case Studies (June 2002) shows that the cost penalty of an Australian crew versus a Foreign (ITF) crew:

- for small coastal vessels (5,500-8,700 DWT) on the studied Australian coastal routes is an additional 10-15% of the total voyage cost
- for a handy size bulker (28,000 DWT), an additional 5-6%.

Indicative cost comparisons provided by the Australian Shipowners Association (ASA) from a recent study conducted for the ASA shows the following indicative cost position for a 1,000 TEU containership Panama-flagged/foreign-crewed using permits versus Australian-flagged/crewed (licensed for the coasting trade):

- The annual manning cost index for a fully Australian-manned licensed vessel compared to a fully foreign-manned vessel of the same crew number (although the foreign crew structure is different) is 4.67 versus 1.00

- The manning cost for the Australian-manned licensed vessel represents around 38% of its total daily operating cost (excluding fuel) versus 13% of the total cost for the foreign-manned vessel
- Other cost areas where the Australian licensed vessel has a cost disadvantage concerns vessel victualling (18% more), dry-docking / stores / lubes (all 7% more), and capital (11% more, i.e. loan interest, etc.) – these all effectively aspects of fiscal policy.

However, it appears that from discussions with industry that there is a perception that the “black-and-white” situation that existed historically is now less applicable as current regulations regarding DOTARS licensed vessels and foreigners with long-term business visas (as administered by Immigration) allow for Officers to be foreign and Ratings to be Australian residents/nationals – a lower cost position than all-Australian crews. Furthermore, some shipowners with foreign-flag vessels are known to be making the occasional international voyage or diversion to a foreign port, fulfilling the current regulations, thus allowing them to operate in coastal trades on a semi-permanent basis without incurring the higher cost of all-Australian crews.

In practice, the market has access to low-cost shipping through the permit system for foreign vessels carrying domestic cargoes with international container shipping lines being able to offer marginal cost pricing set well below rail rates. This would most likely continue to be the case if the permit system did not exist.

6.13 Overseas development of short-sea/coastal shipping policies

The development of short-sea or coastal shipping policies in other major maritime countries is very much a mixed affair with some regions attempting to introduce real initiatives to stimulate the business (the European Union), whilst others are doing no more than expounding the benefits of short-sea / coastal shipping through cooperative discussion groups (the United States).

Prior to discussing the European and US initiatives, it should be noted that there are differences between Australia and the Europe/US regions. Coastal shipping in Europe involves international borders which is not the case in Australia. Furthermore, the geography of Australia is such that population centres are mostly along the coast with outlying areas often exclusively served by shipping – in Europe and the US transport chains often extend deep inland. These differences make Australia’s coastal shipping situation somewhat unique but there are common issues relating to alleviating road congestion, reducing pollution, and optimising infrastructure investments in an integrated manner, which are also the subject of European and US policy initiatives.

European transport policy

Over the last five years, the European Commission (EC) has produced several white paper and green papers on transport policy, including a 2005 mid-term review of its 2001 to 2010 policy paper. As a backdrop, the EC is projecting, with the right policies in place, that the amount of freight transported by short-sea shipping within the European Union (EU) will be 59% higher in 2010 than in 2000 with shortsea’s modal market share increasing slightly from 39% in 2000 to 41% in 2010. The various policy papers envisage the concept of “motorways of the sea”. The EC also recognises two major challenges for short-sea shipping:

- As yet, there is no seamless internal shipping market with voyages between EU-member states still classified as international which prevents coastal shipping being fully integrated
- Ports are at full capacity and will need extra investment to absorb growth as well as cater for increased coastal shipping – this will demand increased cooperation and specialisation between European ports.

The plan is to develop an integrated maritime transport strategy around a “common European maritime space” which will facilitate short-sea shipping. The EC, in its European Transport Policy paper, emphasises that:

The current volume of short-sea traffic in Europe is well below potential capacity. Sea transport is not just a means of carrying goods from one continent to another; it is a real competitive alternative to land transport. For this reason, certain shipping links, particularly those providing a way around the bottlenecks in the Alps and Pyrenees, should be made part of the trans-European network, just like motorways and railways.....They will have to be ‘sign-posted’ notably by granting European funds to encourage start-ups and give them an attractive commercial dimension.

Two examples cited by the EC clearly demonstrate both the conventional and innovative sides of the coin:

- 75% of the timber exported by Finland to Italy crosses Germany and the Alps although it could be carried by sea
- A fast ferry service from Genoa in Italy to Barcelona in Spain allowing whole lorries (trailer/container plus tractor) to transit in just 12 hours which means haulage companies can avoid some of the busiest motorways in Europe at a competitive cost.

The Australian situation is somewhat different (i.e. coastal shipping within one nation state) but there are lessons to be learnt from the European experience to date.

Short sea shipping in the United States of America

There is renewed focus in the United States of America on the role that coastal and inland waterway systems can play in the solution to America’s highway and rail congestion problems and ultimate development of the economy (World Water Forum website: <http://www.iwtnetwork.jp>). The Short Sea Shipping initiative, implemented in 2004, provides a framework to create awareness of the importance waterborne domestic inland, inter-coastal and intra-coastal, and nearby international services (Yongey and Hennesy 2005 p1). Through the program, The United States Maritime Administration (MARAD) must share information, resources, and technologies with US and/or foreign-based businesses involved in transportation to promote short sea shipping.

The Short Sea Shipping initiative has the following goals within the United States:

Revitalise Short-sea shipping: *Assure an intermodal sealift capacity to support domestic commerce and support vital national security interests.*

Intermodalism: *Improve the Nation's intermodal transportation system performance by applying advanced technology and innovation to short-sea shipping operations.*

Trade: *Increase the U.S. Maritime Industry's participation in cargo and passenger movement in the domestic trades.*

Reduce congestion: *Reduce congestion by supplementing existing rail and highway transportation with short-sea shipping capabilities.*

Reduce Emissions: *Reduce emissions along our Nation's major traffic corridors by offering short-sea shipping as an alternative to supplement existing forms of transportation.*

Create Jobs: *Introduce new employment opportunities by encouraging the development of infrastructure supporting short-sea shipping operations.*

Shipbuilding: *Create a new market for U.S. shipyards.*

Source: MARAD website <http://www.marad.gov>

It should also be noted that a Memorandum of Cooperation between the U.S., Canada and Mexico for advancing short-sea shipping is currently being negotiated.

Short Sea Shipping Cooperative (SCOOP)

As part of its Short Sea Initiative Program, MARAD formed a Short Sea Shipping Cooperative Program (SCOOP) — it consists of short-sea shipping stakeholders from government organisations and the maritime industry. The Short Sea Shipping Cooperative Program (SCOOP) was established October 15, 2003 in Washington DC. Some of its goals include:

- *To improve transportation mobility*
- *To promote international coastal trades*
- *To welcome movement of domestic international cargo*
- *To develop new freight transportation alternatives and public policies*

The Short Sea Shipping Cooperative Program was formulated in response to the recommendations of the First Annual Short Sea Shipping Conference held in November 2002 (MARAD website: <http://www.marad.gov>).

The initiative is not based upon competition with other modes of transportation, but rather works complementary to them: it encourages the integration of water transport into the supply chain and hence alleviates some congestion off highways (MARAD website: <http://www.marad.gov>)

Support by the GOMSA for advancing short sea shipping.

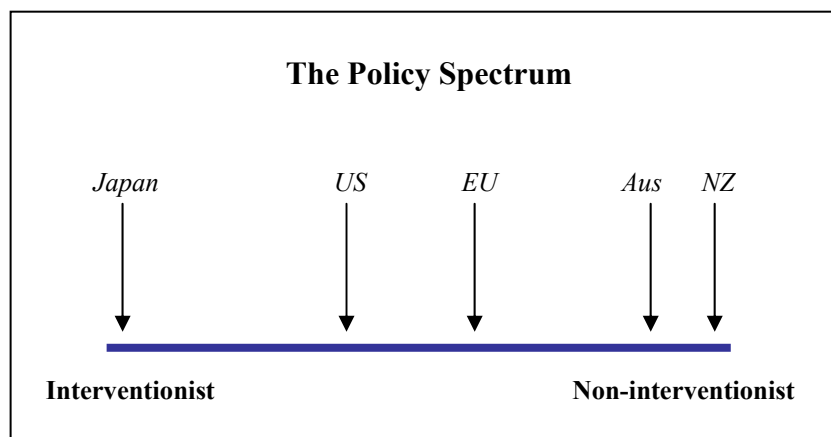
The Gulf of Mexico States Accord (GOMSA) is a regional organisation of the Mexican and U.S. States that border the Gulf of Mexico. This group studies and develops general concepts for short sea shipping operations, port facility designs to support short sea shipping operations, and environmental assessments for short sea shipping, for the purposes of encouraging cross Gulf trade.

A key interest of GOMSA and the partnership is to facilitate more shipping among the ports on the Gulf; the two groups have signed an agreement with the Maritime Administration of the United States (MARAD) that would “recognise and enhance the communications and working relationship among MARAD, GOMSA, and the partnership in order to address the common goals of advancing short sea shipping in the Gulf of Mexico and ensure that it is safe, secure, efficient, and environmentally sound.” Business interest seems to exist.⁷⁷

6.14 Industry and government opportunities to support viability

The wider picture of how coastal shipping operates globally, with some overseas examples sketched in the previous section, sees a government policy spectrum ranging from fully interventionist (Japan) to non-interventionist (New Zealand). Administrations such as the US and European Union sit somewhere in between. Australia has positioned itself towards the non-interventionist end of the spectrum.

FIGURE 41: GOVERNMENTAL POLICY SPECTRUM FOR COASTAL SHIPPING

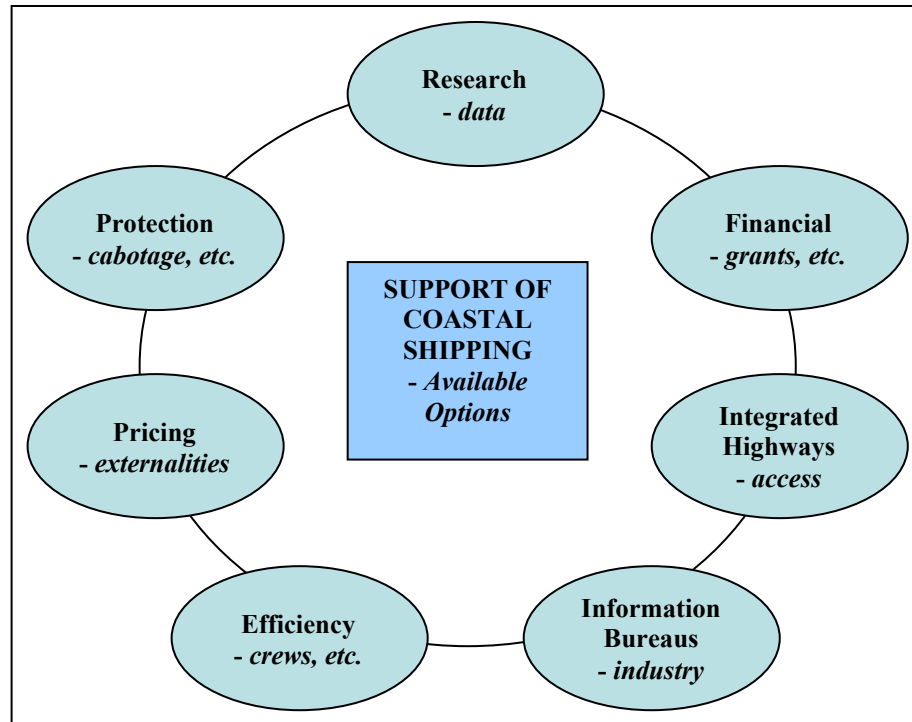


Source: Meyrick and Associates

The more interventionist governments are using a range of policy measures to ensure that coastal shipping has a role to play in national freight transportation. These available options are shown in Figure 42. As such all these options are applicable to the Australian situation.

⁷⁷ Lubin School of Business Faculty Working Papers Pace University Year 2006 North American Trade Corridors: An Initial Exploration Stephen Blank Pace University, page15

FIGURE 42: AVAILABLE OPTIONS TO SUPPORT COASTAL SHIPPING



Source: Meyrick and Associates

6.14.1 Protection

Protection, in the form of national flag reservation or ‘cabotage’, is a method used to ensure that any coastal shipping is purely the domain of local (national flag) carriers. This is the case in the US (with cabotage embodied in the Jones Act) and also Japan. In the case of Australia, the Navigation Act of 1912 gives preference to Australian licensed ships in the coasting trade. However, the price for this ‘strategic’ approach is often a market of high-operating costs which is unable to drive-out inefficiencies. Financial measures are then often required to make coastal shipping profitable and/or competitive with land transport modes.

6.14.2 Pricing

Pricing of government-owned infrastructure to fully reflect externalities (environmental pollution, congestion, accidents etc.) is an area which can significantly support the case for coastal shipping. Increasingly governments in Europe (the UK, Scandinavia countries) and the European Commission, as a response to the now accepted economic impact of global warming, are factoring-in externalities into economic and transport decision-making with future carbon-trading likely to make this a practical reality for industry as well. National infrastructure priced with full externalities would make more freight contestable for coastal shipping.

6.14.3 Efficiency

Efficiency measures which can benefit coastal shipping relate to the following areas:

- Lower manning levels permitted with increased (innovative) vessel automation, specific training, and special operational situations (as occurs in Europe with a number of flag-states)
- Opening-up access of port and connecting intermodal infrastructure to new domestic shipping operators such that dedicated terminals and associated facilities do not have to be constructed where capacity is available at existing international terminals.

6.14.4 Financial

Financial measures can take a number of forms, either focussed on stimulating services or alleviating penalties/barriers:

- Construction or operational subsidies to help alleviate a cost penalty imposed by a particular aspect of government policy - this occurs in the US for Jones Act trades and in Japan
- Start-up grants for coastal shipping services on designated routes – this is actively employed by the European Commission to kick start coastal / short sea shipping
- Waiving or reduction of port access charges for coastal shipping (i.e. reduced port dues for high frequency of calls and exemption of pilotage in a number of European government-owned ports)
- Financial support of coastal / short sea promotional bureaus (often in partnership with industry – examples in Europe and the US)

6.14.5 Integrated highways

The concept of integrated highways, which include so-called ‘maritime highways’, are a specific initiative (often regionally driven) to focus efficiency measures, access policies, and infrastructure investment on designated freight paths or routings. This is being successfully applied in Europe by the European Commission for coastal / shortsea shipping and also in the ASEAN region. A similar model could be applied to the Australian situation taking account of local specifics.

6.14.6 Research

A common theme in high-level transport planning is that comprehensive national transport data is often lacking or insufficient/inadequate to allow governments, in partnership with industry, to make informed decisions regarding appropriate policies to support coastal shipping. We are of the opinion that the establishment of a system which collects and makes public data on transport demand by route, sectors and transport mode is a definite positive driver.

6.14.7 Information bureaus

This involves the establishment and running of information bureaus actively promoting the availability and benefits of coastal shipping to shippers, forwarders and the general public. This is an area which industry (shippers and carriers) are willing to support and be part of. In general, industry will only support a commercially viable coastal shipping sector as defined by the market-place (shippers and competing transport modes). Governments can try what they will, but if a coastal shipping operation is not commercially viable versus other land transport modes, it has no long-term future.

6.15 Conclusions

Shipping's share of the inter-capital non-bulk freight task (movements parallel to the coast) is currently small, just 3% in terms of mass. Indeed, domestic containers along the coast between Perth and the Eastern States, and between Brisbane and the southern eastern seaboard ports totalled around 65,000 TEU (or around one million tonnes of freight) in 2005. Virtually all of these were carried on international vessels.

There is a desire by governments, and Australian shipping, to seek opportunities and methods to increase this share with the benefits of an increased coastal shipping industry and possible (indirect) reductions in road congestion, the movement of hazardous goods by road, and CO2 emissions. Another important reason why shipping is a focus is because of the other impacts of land (road) transport such as road toll, injuries, noise and investment required in road maintenance. Although Australia has a different geography to other parts of the world, it is encouraging to see that other countries (New Zealand, UK, etc.) and regions (European Union) are increasingly recognising the important role that domestic shipping can play in alleviating land transport bottlenecks, infrastructure constraints, safety and environmental impacts. Australia is therefore not alone in this respect.

There are already examples of established domestic shipping trades which service island or remote areas (the largest being Bass Strait) and the bulk trades such as fuel, minerals, cement and steel products. Moreover, the rise and subsequent fall of PAN Shipping's coastal container shipping service in 2006, while it has undoubtedly not helped the cause of dedicated domestic container shipping, particularly amongst the shippers and forwarders, also demonstrates a resurgence of commercial interest in the use of sea transport for the carriage of domestic containers.

In our assessment, the reasons for the failure of PAN Shipping were largely specific to its operations, and do not reflect a fundamental failure of the dedicated coastal container shipping concept. Although further more detailed and focussed work would be necessary to reach a definitive conclusion on this point, in our judgment the information and analysis of this study indicates that the balance can be tipped in favour of a role for dedicated coastal shipping services in the transportation of inter-capital non-bulk freight. This could be achieved through a combination of:

- significantly improved service offerings than have yet been offered in the market, which provide a service quality similar to rail at a lower price
- the lead being taken by, or in partnership with, an existing door-to-door transportation company with the financial capability to invest in ships, domestic equipment and possibly co-invest in dedicated port infrastructure, and
- a supportive policy framework from governments which stimulates innovation in and promotes the use of non-bulk coastal shipping in a manner that facilitates efficient choices between the various modes of transport.

We also believe that the current domestic container shipping operations offered by international permit vessels is inherently volatile and unable to offer the level of service or space to contest additional cargoes currently carried by land transport modes. International cargoes will always take priority over domestic ones and the marginal-cost pricing used by shipping lines for domestic freight will never prove sufficient to switch priorities or re-design operations and equipment to better meet the needs of domestic shippers. This has been proven the case in the past in other parts of the world (in particular Europe and Asia) where decisions to move in and out of the carriage of intra regional cargoes on mainline international services have been regularly made by carriers prior to the introduction of dedicated intra regional vessel services.

Withdrawal of capacity by international operators would also have implications for land transport. The instability of the capacity offered by international services, who now carry a significant share of East-West container cargo, therefore implies that we must either accept the a risk of a sudden and significant deterioration of land transport capacity, or provide excess ‘buffer’ capacity in the system. Indeed brief consultation with rail industry confirms this point (i.e. they would be unable to cope in the short-term with the demand surge caused by international vessels dropping the carriage of domestic containers).

Next to this, government transport policy on road and rail certainly has the capability to impact upon the future modal share of domestic shipping. Regulations on road limits (size and weight), driver fatigue, fuel emissions, carriage of hazardous cargoes, etc. and decisions whether to invest in new rail infrastructure, all can help to tip the balance in favour of an expansion in domestic shipping.

These considerations suggest that a gap or role does exist for dedicated domestic container shipping and increased coastal bulk shipping.

The start-up of a twice weekly domestic container shipping service covering Perth – Adelaide/Melbourne/Sydney, and Melbourne – Brisbane using 500 TEU, high-speed containerships would have the two-way potential to carry a maximum of over 200,000 TEU per year or around three million tonnes of freight per year. This would represent capturing a significant part of both land transport’s existing non-bulk freight carryings on these routes, but less in terms of the growing market in the future (an expected doubling by 2020).

In addition, some potential may exist for regional niche operations which combine containerised freight flows with break-bulk or bulk cargoes – however, the long-term trend is for the deployment of dedicated (fully-cellular) containerships once trade volumes reach sufficient levels.

It should also not be forgotten that there are associated landside industries which support and benefit from an expansion of domestic shipping (ship-building, insurance companies, ship servicing companies, etc.) – in other words the benefits to the national economy are not exclusively maritime.

APPENDIX 1 – GLOSSARY (LIST OF ABBREVIATIONS)

Abbreviation	Description	Abbreviation	Description
4WD	Four wheel drive	GRDC	Grain Research and Development Corporation
ABARE	Australian Bureau of Agricultural and Resource Economics	HCV	Heavy commercial vehicle
ABS	Australian Bureau of Statistics	HECTS	High efficiency container transporters
ACCC	Australian Competition and Consumer Commission	IAPH	International Association of Ports and Harbours
ACS	Australian Customs Service	IEA	International Energy Authority
AFFA	Australian Department of Agriculture, Fisheries & Forestry	IMF	International Monetary Fund
AMG	Australian Maritime Group	IMO	UN International Maritime Organisation
AMIS	Australian maritime identification system	ISPS	IMO International Ship and Port-facility Security code
AMP	Alternative marine power (or 'cold-ironing')	ISSC	International ships security certificate
AMSA	Australian Maritime Safety Authority	ITV	Inter terminal vehicle
AQIS	Australian Quarantine and Inspection Service	Kt	Thousand tonnes
ARTC	Australian Rail Track Corporation	LCV	Light commercial vehicle
AWD	All wheel drive	LNG	Liquefied natural gas
BTRE	Bureau of Transport and Regional Economics, DOTARS	LPG	Liquefied petroleum gas
BWM	Ballast water management	LRIT	Long range identification tracking
CAGR	Compound annual growth rate	MARAD	US Maritime Administration
CBP-CSI	US Customs and Border Protection Container Security Initiative	MEPC	IMO Marine Environmental Protection Committee
CCTV	Closed circuit television	MOUs	Memorandum of understandings
CFR	Cost Freight INCO trade term	MSIC	Maritime security identification card
CIF	Cost Insurance Freight INCO trade term	Mt	Million tonnes
CO2	Carbon dioxide gas	OSRA	US Ocean Shipping Reform Act of 1998
COAG	Council Of Australian Governements	PMV	Passenger motor vehicle
C-TPAT	US Customs Trade Partnership against Terrorism	POL	Petroleum products
CVP	Continuous voyage permit	PSC	Port State Control

Abbreviation	Description	Abbreviation	Description
DOTARS	Australian Department of Transport and Regional Services	RMG	Rail mounted gantry
DTEI	Department for Transport, Energy & Infrastructure of South Australian Government	SCOOP	Short sea shipping cooperation
DUKC	Dynamic under keel clearance	SOLAS	IMO Safety of Life at Sea convention
DWT	Deadweight tonnage of a vessel (ship)	SUV	Sports utility vehicle
EC	European Commission	SVP	Single voyage permit
EDR	Economic demonstrated resources	T	Tonnes
EIA	Energy Information Agency of US Department of Energy	TEU	Twenty-foot equivalent unit measure of container
ESPO	European Sea Ports Organisation	ULCC	Ultra large crude carrier
EU	European Union	UNCTAD	United Nations Conference on Trade and Development
FAO	UN Food and Agriculture Organisation	UV	Ultra violet
FMC	US Federal Maritime Commission	VLCC	Very large crude carrier
FOB	Free On Board INCO trade term	WCO	World Customs Organisation
GDP	Gross domestic product	WTO	World Trade Organisation
GOMSA	Gulf of Mexico States Accord	NMERA	National Maritime Emergency Response Arrangements

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APPENDIX 3 – OVERVIEW OF AUSTRALIAN MARITIME PORTS

PORT	State	Cargo Tonnes (2005/2006)	Main cargoes	Port access (m)	Comments	Reviewed in study
Abbot Point	QLD	12,023,931	Coal	17.2	15-20 MT/year, expansion underway. Long-term potential 50 MT/year.	Yes
Adelaide	SA	9,968,759	Containers, Liquid & Dry bulk, Breakbulk	14.0	-	Yes
Albany	WA	2,659,961	Dry Bulk (grain & woodchips)	12.2	-	Yes
Brisbane	QLD	26,736,179	Containers, Liquid & Dry Bulk, Breakbulk	14.0	Planned 15m access. Expansion of Fisherman Islands Coal Terminal from 5MT/year to 7MT/year.	Yes
Broome	WA	162,380	-	-	-	No
Bunbury	WA	12,205,031	Dry (alumina) & Liquid (caustic) Bulk, Breakbulk (timber)	12.2	-	Yes
Bundaberg	QLD	414,609	-	-	-	No
Burnie	TAS	4,150,723	General Cargo	11.5	-	Yes
Cairns	QLD	1,132,712	Liquid (mainly petroleum products) & Dry (mainly sugar) Bulk.	8.3	New master plan being released. No significant change to trade is planned.	Yes
Cape Flattery	QLD	1,395,666	-	-	-	No
Dampier	WA	110,069,146	Dry (iron ore) & Liquid (LNG) Bulk	-	90MT/year of iron ore exports. Port owned by Hamersley Iron & operated by Pilbara Iron.	Yes
Darwin	NT	1,077,108	Containers & General Cargo	12.0/14.0	Access is 12m inner harbour & 14m East arm.	Yes
Eden	NSW	1,047,037	Woodchips	12.5	-	Yes
Esperance	WA	8,309,163	Dry Bulk (iron ore & grain)	13.2	-	Yes
Fremantle & Kwinana	WA	25,044,193	Containers, Dry Bulk & Breakbulk	13.1	Expansion planned – Outer Harbour (Kwinana).	Yes
Geelong	VIC	11,155,813	Liquid (mainly crude oil) & Dry (mainly grain) Bulk	11.6	-	Yes

Geraldton	WA	5,502,529	Dry Bulk (iron ore, grain & mineral sands)	13.4	-	Yes
Gladstone	QLD	67,233,791	Coal & other Dry Bulk	16.0/18.0	Expansion planned. RG Tanna Coal Terminal from 45MT/year to 68MT/year; Barney Point Coal Terminal from 5MT/year to 7MT/year; Wiggins Island a possible 20MT/year.	Yes
Hastings (Westernport)	VIC	3,082,869	Liquid (mainly crude oil) Bulk & Breakbulk (mainly steel)	14.0	-	Yes
Hay Point & Dalrymple Bay	QLD	81,621,197	Coal	-	Expansion planned. Hay Point Services Coal Terminal from 35MT/year to 44MT/year (long-term plan for 55-57MT/year); Dalrymple Bay Coal Terminal (DBCT) from 54.5MT/year to 68MT/year (long-term plan for 85MT/year). Dalrymple Bay operated by Babcock & Brown	Yes
Hobart	TAS	2,580,302	Bass Strait – Containers & General Cargo	14.0	-	Yes
Karumba	QLD	1,269,724	-	-	-	No
Klein Point	SA	1,866,091	-	-	-	No
Launceston & Bell Bay	TAS	5,041,491	Bass Strait - Containers & General Cargo, Dry Bulk	12.0	Some international containers.	Yes
Lucinda	QLD	678,493	-	-	-	No
Mackay	QLD	2,348,387	-	-	-	No
Melbourne	VIC	27,760,881	Containers, Liquid & Dry Bulk, Breakbulk.	11.6	12.2m tidal channel deepening under review.	Yes
Mourilyan	QLD	806,616	-	-	-	No
Newcastle	NSW	85,572,887	Dry Bulk (coal, grain, alumina), Bulk Liquids, & Breakbulk/General Cargo.	15.2	Proposed to increase depth to 16-17m. New coal terminal & expansion, to increase coal exports from 85 MT/year to 120 MT/year.	Yes
Port Giles	SA	647,583	-	-	-	No
Port Hedland	WA	110,624,083	Dry (iron ore) & Liquid (petroleum products) Bulk, Breakbulk	19.0	Access is 14m channel plus 4-6m tide (19m at berth)	Yes
Port Kembla	NSW	25,909,249	Dry Bulk (iron ore, coal, grain), Breakbulk (steel)	15-16	Breakbulk expansion soon with car imports switched from Sydney.	Yes
Port Lincoln	SA	1,776,589	Dry (grain, fertiliser) & Liquid (petroleum products)	15.2	Natural deepwater. Large grain carriers top-up from shallower ports in SA and VIC.	Yes

			Bulk			
Port Pirie	SA	767,462	Dry Bulk (zinc concentrates, grain etc.)	8.2	Location of Zinifex zinc smelter (one of largest in world).	Yes
Portland	VIC	3,483,577	Dry Bulk (woodchips, grain etc.)	12.5	-	Yes
Quintell Beach	QLD	1,707	-	-	-	No
Rockhampton	QLD	138,433	-	-	-	No
Skardon River	QLD	0	-	-	-	No
Sydney & Botany Bay	NSW	25,904,755	Containers, Breakbulk, Liquid Bulk	14.0	Major expansion of container terminal planned.	Yes
Thevenard	SA	1,937,726	Dry Bulk (gypsum, grain etc.)	9.8	-	Yes
Thursday Island	QLD	80,251	-	-	Island.	No
Townsville	QLD	9,930,445	Dry Bulk	12.0	Major expansion planned for both land and channels	Yes
Wallaroo	SA	462,579	Dry Bulk (grain & fertilisers)	9.5	-	Yes
Yamba	NSW	14,355	-	-	-	No
Total NSW*	NSW	138,448,283	-	-	-	-
Total NT*	NT	1,077,108	-	-	-	-
Total QLD*	QLD	205,812,141	-	-	-	-
Total SA*	SA	17,426,789	-	-	-	-
Total TAS*	TAS	11,772,516	-	-	-	-
Total VIC*	VIC	45,483,140	-	-	-	-
Total WA*	WA	274,576,486	-	-	-	-

Total AUS*	-	694,596,463	-	-	-	-
+ Ardrossan	SA	-	Dry Bulk (grain)	12.5	Estimate 0.5 million tonnes/year. Ausbulk is operator	No
+ Cape Cuvier	WA	-	Dry Bulk (gypsum and salt)	-	Estimate at 2.5 million tonnes/year	Yes
+ Derby	WA	-	-	-	Estimate 100,000 tonnes/year	No
+ Devonport	TAS	-	Bass Strait – Containers & General Cargo	11.5	Estimate 3 million tonnes/year	Yes
+ Gove	NT	-	Dry Bulk (bauxite and alumina)	13.5	Estimate 5 million tonnes/year	Yes
+ Milner Bay	NT	-	Dry Bulk (manganese ore)	12.5	Estimate up to 0.5 million tonnes/year. Handling Handymax vessels (Groote Eylandt mine/port lease extended to 2031)	No
+ Port Bonython	SA	-	-	-	Estimate 1 million tonnes/year	No
+ Port Latta & Stanley	TAS	-	-	-	Estimate Port Latta 2 million tonnes/year & Stanley 0.5 million tonnes/year	No
+ Port Walcott (Cape Lambert)	WA	-	Dry Bulk (iron ore)	19.8	Estimate at 55 million tonnes/year. Berth owned by Robe River Iron Assoc & operated by Pilbara Iron	Yes
+ Useless Loop	WA	-	Dry Bulk (salt)	-	Estimate 1 million tonnes/year. Shark Bay.	No
+ Weipa	QLD	-	Dry Bulk (bauxite)	-	Estimate 16 million tonnes/year. Comalco operated port with bauxite shipped to Gladstone	Yes
+ Whyalla	SA	-	Dry Bulk (iron ore, coal) & Breakbulk (steel)	10.7	Estimate 3 million tonnes/year. OneSteel have commissioned a floating transshipment platform 7-8km offshore in the Spencer Gulf to allow loading of Cape & Panamax size ships. Iron ore expansion (to be completed 2008) from 1 to 4 million tonnes/year.	Yes

(*) for AAPMA reporting ports only. A number of privately/industry-operated ports are excluded from AAPMA statistical reporting – these exclusions have been added to the bottom of the table. There are also in addition a number of offshore marine oil & gas loading terminals whose throughputs are (generally) not included in the AAPMA port throughput statistics (examples being – Airlie Island Terminal, Barrow Island Terminal, Saladin Terminal & Thevenard Island Terminal, and Varanus Island Terminal).

Sources: AAPMA for cargo tonnage and port authorities/BTRE/industry for other data (incl. non-AAPMA reporting ports).

APPENDIX 4 – MAP OF AUSTRALIAN MARITIME PORTS (SOURCE-AAPMA)



APPENDIX 5 – DETAILS OF CURRENT IRON ORE PROJECTS

Project	Company	Location	Status	Start-up	New capacity Mt	\$US Capital Expenditure	\$/t of production
Koolan Island	Aztec Resources	Koolan Island, WA	New project,	late 2006	4	\$ 76	19
Tom Price/Marandoo/ Nammuldi expansion	Rio Tinto	Pilbara, WA	Expansion,	late 2006	15	\$ 290	19
Argyle	Resource Mining	124 km S of Wyndham, WA	New project,	late 2006	1.5	\$ 35	23
Jack Hills project (Stage 1)	Murchison	380 km NE Geraldton, WA	New project,	mid-2006	1.2	\$ 29	24
Pilbara Iron Ore project	Fortescue Metals Group	Pilbara, WA	New project,	late 2007	45	\$ 1,344	30
Hamersley Iron Yandicoogina mines expansion project	Rio Tinto	Pilbara, WA	Expansion,	late 2007	16	\$ 530	33
Project Magnet	OneSteel	Whyalla, SA	Expansion,	2007	6.5	\$ 228	35
Weld Range	Midwest	370 km N of Geraldton WA	New project,	2010	15	\$ 560	37
Hope Downs	Hancock	Pilbara,	New project,	early 2008	22	\$ 980	45
Jack Hills project (Stage 2)	Murchison	380 km NE of Geraldton WA	Expansion,	2010	23	\$ 1,309	57
Western Australian Iron ore Rapid Growth Project 2 (RGP2)	BHP Billiton	Pilbara, WA	Expansion, under construction	late 2006	8	\$ 575	72
Western Australian iron ore rapid growth Project 4 RPG 4	BHP Billiton	Pilbara, WA	Expansion,	2010	23	\$ 1,700	74
Western Australian iron ore rapid growth project 3 (RGP3)	BHP Billiton	Pilbara, WA	Expansion,	late 2007	20	\$ 1,530	77
Southdown Magnetite iron ore project	Grange Resources	90 km NE of Albany	New project,	2010	6.6	\$ 550	83
Karara magnetite mine and pellet plant	Gindalbie	45 km E of Koolanooka WA	New project,	2007	7	\$ 700	100
Koolanooka pellet project	Midwest	55 km N of Mullewa WA	New project,	2010-2012	4.5	\$ 700	156
Cape Preston mine and pellet plant	Mineralogy	Fortescue, WA	New project,	2007-08	5	\$ 1,370	274

APPENDIX 6 – NON-US PORTS UTILISING THE CONTAINER SECURITY INITIATIVE (CSI)

Region	Port / Date joined CSI / Country
Americas	Halifax, Montreal, and Vancouver, Canada (03/2002)
Americas	Santos, Brazil (09/22/2005)
Americas	Buenos Aires, Argentina (11/17/2005)
Americas	Puerto Cortes, Honduras (03/25/2006)
Americas	Caucedo, Dominican Republic
Americas	Kingston, Jamaica
Americas	Freeport, Bahamas
Europe	Rotterdam, The Netherlands (09/2002)
Europe	Le Havre (12/2002) and Marseilles (01/2005), France
Europe	Bremerhaven & Hamburg, Germany (02/2003)
Europe	Antwerp and Zeebrugge, Belgium (10/2004)
Europe	Gothenburg, Sweden (05/2003)
Europe	Felixstowe (05/2003), Liverpool, Thamesport, Tilbury, and Southampton, U.K. (11/2004)
Europe	Genoa (06/2003), La Spezia (06/2003, Livorno (12/2004), Naples (09/2004) and Gioia Tauro (10/2004), Italy
Europe	Algeciras, Barcelona and Valencia, Spain (07/2004)
Europe	Piraeus, Greece (07/2004)
Europe	Lisbon, Portugal (12/2005)
Asia	Yokohama (03/2003) and Tokyo (05/2004), Japan
Asia	Hong Kong, China (05/2003)
Asia	Pusan, Korea (08/2003)
Asia	Port Klang (03/2004) and Tanjung Pelepas (08/2004), Malaysia
Asia	Singapore (03/2004)
Asia	Nagoya and Kobe, Japan (08/2004)
Asia	Laem Chabang, Thailand (08/2004)
Asia	Shanghai (04/2005) and Shenzhen (06/2005), China
Asia	Kaohsiung and Keelung, Republic of China (Taiwan) (07/2005)
Asia	Colombo, Sri Lanka (09/2005)
Africa	Durban, South Africa (12//2003)

Middle East	Dubai, United Arab Emirates (UAE) (03/2005)
Middle East	Port Salalah, Oman (03/2006)

United States Customs and Border Protection's CSI initiative commenced in January 2002 with 26 customs administrations committed to joining CSI. CSI is now operational at ports around the world. The US goal is to have 50 operational CSI ports by the end of fiscal year 2006.

Source: US CBP (2006)

APPENDIX 7 – DETAILED ANALYSIS OF THE AUSTRALIAN COASTAL FLEET, 2006

The following table covers commercial cargo vessels trading along the Australian coast issued with a DOTARS Coasting Licence.

Vessel	Year Built	DWT	GRT	Port Flag	VesselType	Company Name	Routes Deployed	Cargo Carried
ACCOLADE II	1982	8,140	6,310	Australia	Dry Bulk Carrier	Inco Ships	Klein Point / Adelaide / Klein Point	Limestone
ALCEM CALACA	1979	11,600	8,839	Australia	Dry Bulk Carrier	Cementco Shipping	Gladstone / Townsville / Gladstone; Gladstone / Newcastle / Melbourne / Gladstone	Cement
ALLTRANS	1987	35,218	27,997	Australia	Dry Bulk Carrier	ASP Ship Management	Gladstone / Launceston / Gladstone; Gladstone / Newcastle / Gladstone; Gladstone / Bluff (NZ) / Gladstone	Alumina
ANL BASS TRADER	1996	9,965	7,260	Australia	Container Ship	Inco Ships	Melbourne / Launceston / Melbourne	Containers
BARRINGTON	1989	33,289	21,718	Australia	Liquid Bulk Carrier	Teekay Shipping (Australia) Pty Ltd	Botany Bay / Townsville (or Mackay or Cairns) / Botany Bay	Oil Products
BASKER SPIRIT	1992	97,068	56,020	Bahamas	Liquid Bulk Carrier	Teekay Shipping (Australia) Pty Ltd	Route unknown	Crude Oil
BIQUELE BAY	1995	1,446	1,064	Republic of Singapore	Dry Bulk Carrier	Perkins Shipping Pty Ltd	Likely NT and/or Northern QLD	Dry Bulk
BOOMERANG I	2005	23,579	18,327	Cyprus	Container Ship	ASP Ship Management	Fremantle / Melbourne / Sydney / Fremantle	Containers
British Fidelity	2004	46,803	29,335	Isle of Man	Liquid Bulk Carrier	BP Australia	Route unknown	Oil Products
CALEDON BAY	1985	174	197	Australia	Break Bulk Carrier	Perkins Shipping Pty Ltd	Likely NT and/or Northern QLD	General Cargo
Cementco	1978	16,510	12,076	Australia	Dry Bulk Carrier	Cementco Shipping	Tasmania / Melbourne / Sydney	Dry Bulk
CORAL BAY	1992	406	380	Australia	Break Bulk Carrier	Perkins Shipping Pty Ltd	Likely NT and/or Northern QLD	General Cargo
ENDEAVOUR RIVER	1983	75,105	50,144	Australia	Dry Bulk Carrier	ASP Ship Management	Gladstone / Weipa / Gladstone; Gladstone / Newcastle / Gladstone	Dry Bulk
ENTERPRISE	1985	8,709	6,389	Antigua & Barbuda	Dry Bulk Carrier	Jebsens	New South Wales, South Australia, Tasmania and Victorian ports	Dry Bulk
FITZROY RIVER	1982	75,105	51,035	Australia	Dry Bulk Carrier	ASP Ship Management	Gladstone / Weipa / Gladstone	Bauxite
FOURCROY	1998	380	486	Australia	Break Bulk	Perkins Shipping	Likely NT and/or Northern QLD	General Cargo

					Carrier	Pty Ltd		
FRANCES BAY	1981	2,100	1,627	Australia	Break Bulk Carrier	Perkins Shipping Pty Ltd	Darwin, previously Cairns	General Cargo
GOLIATH	1993	15,539	11,754	Australia	Dry Bulk Carrier	Cementco Shipping	Devonport / Melbourne / Devonport; Devonport / Sydney / Devonport	Cement
HELIX	1997	99,950	72,609	Australia	Liquid Bulk Carrier	Barwil	Geelong / TAS ports / Geelong; Geelong / Sydney / Geelong	Oil Products
IRON CHIEFTAIN	1993	50,587	34,422	Australia	Dry Bulk Carrier	Inco Ships	Port Kembla / Whyalla / Port Kembla	Iron Ore
IRON MONARCH	1973	14,885	10,577	Australia	Break Bulk Carrier	Teekay Shipping (Australia) Pty Ltd	Port Kembla / Hastings / Port Kembla	Break Bulk
IRON YANDI	1996	169,963	82,306	Australia	Dry Bulk Carrier	Teekay Shipping (Australia) Pty Ltd	Port Hedland / Port Kembla; Newcastle / ASIA & Other Overseas	Dry Bulk (Iron Ore)
KOWULKA	1984	23,500	17,796	Australia	Dry Bulk Carrier	CSR LIMITED	Thevenard / Sydney / Thevenard; Thevenard / Melbourne or Brisbane / Thevenard	Gypsum
Lindesay Clark	1985	29,500	0	Australia	Dry Bulk Carrier	Inco Ships	Geelong / Fremantle / Geelong; Geelong / Whyalla or Ardrossan / Geelong	Fertiliser
Lowlands Prosperity	2001	168,800	56,565	Belgium	Dry Bulk Carrier	BHP Billiton Freight	Newcastle	Iron Ore
MATTHEW FLINDERS III	1995	300	247	Australia	Ro Ro Cargo Ship	Southern Shipping	Vic / Tas / Furneaux Islands	General Cargo and Passengers
NIVOSA	1984	124,754	72,609	Australia	Liquid Bulk Carrier	Barwil	SE ASIA / Sydney / Geelong	Oil Products
ORMISTON	1979	16,602	13,909	Australia	Dry Bulk Carrier	CSR LIMITED	Thevenard / Melbourne / Thevenard; Thevenard / Whyalla or Ardrossan or QLD / Thevenard	Gypsum
PACIFIC TRIANGLE	2000	184,744	100,330	Liberia	Dry Bulk Carrier	Teekay Shipping (Australia) Pty Ltd	Pt Hedland to Pt Kembla (iron ore); Pt Kembla and Newcastle to Japan	Iron Ore
PALMERSTON	1990	42,954	26,162	Australia	Liquid Bulk Carrier	Teekay Shipping (Australia) Pty Ltd	Gladstone / Mackay / Gladstone; Gladstone / Townsville or Botany Bay	Oil Products
PIONEER	1996	22,140	17,094	Australia	Dry Bulk Carrier	Teekay Shipping (Australia) Pty Ltd	Mackay / Sydney / Mackay; Mackay / Melbourne / Mackay	Sugar (bulk and bagged)
PORTLAND	1988	36,634	36,634	Australia	Dry Bulk Carrier	Inco Ships	Portland / Fremantle / Portland; Portland / Bunbury / Portland	Dry Bulk (Alumina)
RIVER BOYNE	1983	75,516	51,035	Australia	Dry Bulk Carrier	ASP Ship Management	Weipa / Gladstone / Weipa	Bauxite
RIVER EMBLEY	1983	76,292	27,662	Australia	Dry Bulk Carrier	ASP Ship Management	Weipa / Gladstone / Weipa	Bauxite

SAMAR SPIRIT	1992	98,640	57,448	Bahamas	Liquid Bulk Carrier	Teekay Shipping (Australia) Pty Ltd	Pt Bonython, Hastings, Philippines, PNG, Singapore, and Indonesia to Botany Bay, Brisbane, Melbourne and Sydney	Crude Oil
SCS ANNE	1998	6,375	4,559	Antigua & Barbuda	Break Bulk Carrier	SEACORP COASTAL SHIPPING	WA / NT	General Cargo and Break Bulk
SEAKAP	1982	8,161	5,323	Australia	Liquid Bulk Carrier	Teekay Shipping (Australia) Pty Ltd	Newcastle / Port Kembla / Newcastle; Newcastle / Gladstone or Whyalla; Newcastle / TAIWAN	Asphalt and Bitumen
SEAROAD MERSEY	1990	4,824	6,574	Australia	Ro Ro Cargo Ship	Patrick Shipping Pty Ltd (Melbourne)	Melbourne / Devonport / Melbourne	Containers and Break bulk
SEAROAD TAMAR	1991	7,000	7,928	Australia	Ro Ro Cargo Ship	Patrick Shipping Pty Ltd (Melbourne)	Melbourne / Devonport / Melbourne	Containers and Break bulk
SOUTHERN CONDOR II	2002	300	247	Australia	Ro Ro Cargo Ship	Southern Shipping	Vic / Tas / Furneaux Islands	General Cargo and Passengers
SPIRIT OF TASMANIA I	1998	5,651	29,067	Australia	Ro Ro Cargo Ship	TT Line (Spirit of Tasmania)	Melbourne / Devonport / Melbourne	Containers, Break Bulk and Passengers
SPIRIT OF TASMANIA II	1998	5,651	29,067	Australia	Ro Ro Cargo Ship	TT Line (Spirit of Tasmania)	Melbourne / Devonport / Melbourne	Containers, Break Bulk and Passengers
TASMANIAN ACHIEVER	1999	7,619	20,342	Australia	Ro Ro Cargo Ship	Toll Shipping	Melbourne / Burnie / Melbourne	Containers, Break Bulk
VICTORIAN RELIANCE	1999	7,619	20,342	Australia	Ro Ro Cargo Ship	Toll Shipping	Melbourne / Burnie / Melbourne	Containers and Break bulk
VIGSNES	1979	22,093	14,785	Australia	Dry Bulk Carrier	ASP Ship Management	Route unknown	Dry Bulk
WARRENDER	1995	1,150	946	Australia	Container Ship	Perkins Shipping Pty Ltd	Not recently tracked (previously Weipa / Karumba / Weipa)	Containers / General Cargo

APPENDIX 8 – NON-CONFIDENTIAL STAKEHOLDER INTERVIEWS

During the study a number of non-confidential interviews were held with industry stakeholders, notably:

- Australian Association of Ports (AAPMA)
- Australian Shipowners Association (ASA)
- Maritime Union of Australia (MUA)
- Shipping Australia Limited (SAL).

Non-confidential information provided by these parties for the study is available, if required, from Meyrick and Associates upon written request.

Other interviews/consultations with industry were conducted, and sourced from other confidential studies, but the parties concerned wish to remain in confidence.