

**Strategic design + Development**

**Air Freight Export Council of NSW**

## **The Sydney Airport Land Freight Interface**

**Final Report**

**June 2005**

---

**Strategic design + Development Pty Limited**  
ABN 51 103 363 257

Suite 104, 51 Rawson Street Epping NSW 2121  
PO Box 1075 Epping NSW 1710  
Australia  
Telephone +61 2 9868 2590  
[www.strategicdesign.com.au](http://www.strategicdesign.com.au)

**CONTENTS**

**1 EXECUTIVE SUMMARY ..... 3**

**2 INTRODUCTION ..... 5**

2.1 Background .....5

2.2 Purpose of this Paper .....5

**3 THE CTO LAND INTERFACE TASK..... 7**

3.1 Overview.....7

a) *What is the CTO Land Interface?* .....7

b) *Key Participants in CTO Land Interface*.....7

c) *Measuring the CTO Land Interface Task*.....9

3.2 The KSA Freight Task .....9

3.3 The CTO Transport Task ..... 10

3.4 Measuring Variations in Demand ..... 11

3.5 Measuring Performance at the CTO Land Interface..... 11

a) *Road Transport Performance*..... 11

b) *CTO Performance* ..... 12

3.6 What Influences the CTO Land Interface Task? ..... 14

a) *The Demand for Road Transport Services* ..... 14

b) *The Supply of Road Transport Services*..... 16

**4 TRENDS IN THE AIR FREIGHT SUPPLY CHAIN ..... 17**

4.1 Air-side Operations ..... 17

a) *Belly-hold Capacity*..... 17

b) *Freighter Aircraft* ..... 19

c) *Regulatory Restrictions*.....20

4.2 CTO Operations..... 21

a) *Overview*..... 21

b) *Key CTO Operational Issues*..... 21

c) *The Role of Cargo Agents in Improving the Management of the CTO Interface*..... 23

4.3 Issues Relating to Truck Operations ..... 24

**5 CONCLUSIONS ..... 25**

**6 REFERENCES ..... 28**

**FIGURES**

Figure 1 - The Air Freight Land-Side Chain.....8

Figure 2 - Influences on the CTO Land Interface Task ..... 13

Figure 3 - Comparison of the Boeing 747 and Airbus A380..... 18

**TABLES**

Table 1 - HACTL Performance Measures..... 13

Table 2 - Introducing the A380; the Impact on Freight Capacity ..... 19

# 1 EXECUTIVE SUMMARY

Sydney Airport (KSA) handles between 55 and 60 per cent of Australia's international and domestic air freight<sup>1</sup> by tonnes; KSA is Australia's premier air freight gateway and the operational performance of the air freight chain through the airport is critical to the NSW and national economic performance and wealth generation.

Some resource and operating constraints are currently affecting the performance of the air-land interface at KSA and there is an urgent need to develop strategic responses to these issues; at an annual growth rate of 6 per cent, Sydney's air freight task can be expected to double within 12 years. At the same time, the passenger task is expected to double to 50 million passengers each year.

This study initiated discussion among stakeholders on the factors influencing the capability of the KSA air-land interface to adequately meet the future needs of the airport. Further work is required to forecast KSA's future freight flows by analysing the drivers of the freight task and by applying vehicle utilisation metrics to determine the consequential number of expected vehicle movements.

The key conclusion of this study is that the performance of the KSA land interface will not improve without the development of short and long term strategies that have the support of all stakeholders along the air freight supply chain.

Two critical and symbiotic challenges are facing the KSA air freight chain:

- Providing clarity in understanding the precise character of the existing chain, particularly with respect to the translation of air freight flows to road transport services at the Cargo Terminal Operator (CTO) facilities, including the management of freight within the CTOs; and
- Instilling within the highest levels of Sydney Airport management and other key stakeholders such as airline executives and government officials, the importance of the air freight chain to the sustainability of passenger services and as a consequence, its importance to the commercial performance of airlines, the airport and the Australian tourism sector. Overcoming this challenge is critical to ensuring that airline and airport decisions take into account the needs of the air freight chain, particularly with respect to the allocation of on-airport land and the management of off-airport road network.

Without agreement on how to address these challenges individual stakeholders will continue to make commercial decisions in isolation and not with respect to the best interests of the air freight chain. This has the potential of reducing rather than enhancing the performance of the land interface. Consequently, it is recommended that a short term strategy be developed immediately to:

- Clearly articulate the important role KSA's air freight chain plays in underpinning the sustainability of passenger services and by implication of the revenue streams they generate, articulate the importance of air freight to SACL's own commercial performance;
- Establish the likely impact of the A380 on the short term passenger task and SACL's intended strategy to managing short term conflicts between the air and land-side resources required to manage the passenger and freight tasks;
- Establish and improve the collection and maintenance of total and major commodity freight flow data, aircraft movement data and vehicle visitation data, that

---

<sup>1</sup> The BTRE estimates that the total air freight task, excluding dedicated freighters, was approximately 780 million tonnes in 2002-03 (BTRE 2004, p. 15)

stakeholders agree is at a level required to make medium to long term investment decisions.

It is also recommended the short term strategy establishes the process for the regular monitoring and reporting of CTO land interface performance based on indicators of freight dwell times and truck turnaround metrics. Only with this information, allied with an agreed appreciation of future freight flows, can realistic assessments be made of the challenge to improving the performance of the land interface. Without this information it would be premature to adopt demand management strategies such locating loose freight handling off-airport and/or establishing a charging regime for truck queuing and parking.

The KSA freight community must also reach agreement on the most likely scenarios that may affect air freight chain in the long term; particularly with respect to the volume and value of the freight, including the implications for changes in the mix of belly-hold and freight services, and changes in the mix of by-pass and loose freight cargoes. Based on this appreciation, agreed long term strategies can then be developed to provide greater certainty with respect to the required CTO infrastructure and road transport services needed to service the expected freight flows. In particular, agreement is required on the key long term issues of:

- The availability and utilisation of on- and off-airport land for CTO services;
- The availability of truck parking and waiting areas; and
- Improving the road network links between the CTOs and freight forwarder premises.

Only with these issues addressed can the right business models be developed for providing the required infrastructure and for the effective management of the road freight task. In this respect, Sd+D recommends that there is an urgent need to establish an agreed long term and on-going strategic approach to:

- Developing appropriate pricing signals to influence the utilisation of non-peak CTO capacity and reduce cargo dwell time. These charges should be sufficient to influence commercial behaviours and clearly supported by operational benefits identified in the performance monitoring program;
- Investigating options for on- and off-airport CTO facilities that maintain competitive pressures rather than attempting to provide equal competitive circumstances for all CTOs. For example, SACL could consider leveraging the benefits of economies of scale by reducing the number of CTOs at Link Road to Qantas and one other CTO, and limiting the northern lands development to two CTO facilities.

Our conclusions are not intended to be alarmist rather they are intended to emphasise that circumstances exist whereby serious capacity constraints at KSA may become significant much faster than is generally accepted. Therefore, Sd+D concludes that the successful management of the CTO land interface task is at a crossroad. Stakeholders can continue to operate based on established commercial behaviours, exacerbating the demand for scarce and in some instances unavailable land resources.

Sd+D also recommends that SACL considers its role as a supply chain leader in improving the performance of the airfreight chain, particularly with respect to what leverage SACL may impart through the forthcoming renewal of terminal leases and the management of access to airport facilities.

Sd+D's suggested way forward requires the support of all stakeholders in acknowledging that in the near future capacity constraints will force change on all stakeholders; simply, there is a lack of available land to meet future needs. Consequently, the time for action is now and the focus should be on actions that can be taken immediately to delay major and potentially unnecessary structural change; reducing the cost of disruption and expensive infrastructure investment on all operators within the airfreight supply chain.

## 2 INTRODUCTION

### 2.1 Background

Stakeholders in freight operations at Sydney Airport (KSA) have expressed to the Air Freight Export Council of NSW (AFEC) concerns regarding the interface between the Cargo Terminal Operators (CTOs) and the land transport system. These concerns include delays in receiving and delivering freight, intermittent access to CTO facilities and over-parking by road vehicles on the adjacent road network, particularly Link Road.

AFEC believes that the majority of operational issues are well managed by the Sydney Airports Corporation (SACL). However, AFEC and SACL believe it prudent to assess the performance of the land interface with respect to its capability to handle trade growth and to identify possible improvements in supply chain processes. Consequently, Strategic design + Development (Sd+D) has been commissioned by AFEC and SACL to:

- Define and assess the land transport processes that interface with CTO operations at KSA; and
- Inform industry and government agencies of key policy and related enabling strategies to underpin growth and benefits for stakeholders.

Government and industry understanding of the importance and performance of the air freight supply chain has been overshadowed by the focus on passenger transport and sea-borne freight (ALIS 2002, p. 22). However, this is not unique to Australia. Tretheway (2003) argues that airport operators “often overlook the strategic importance of air cargo ... The sad facts are that most airports see air cargo as an auxiliary activity, not as a strategic element of their mission. This is a tragedy because not only is air cargo critical to the success of a large portion of passenger traffic, but it may also present the best business opportunity for airport companies”.

Current Australian transport policy is focused on the implementation of the Commonwealth’s new AusLink infrastructure plan. While a key objective of the AusLink plan is to improve the land interface with Australia’s major sea and air gateways, it is likely that in practice AusLink will be biased towards volume rather than value freight flows<sup>2</sup>.

The importance of air freight supply chains to the generation of national wealth will continue to be overlooked unless a proactive approach is adopted by air freight stakeholders. As KSA is Australia’s premier air freight gateway, this study provides an excellent opportunity to develop an improved understanding of the air freight sector’s future needs and opportunities with respect to its interface with the local, regional and national land transport networks.

### 2.2 Purpose of this Paper

This paper is about understanding the management of current and future demand at the CTO land interface; where demand is expressed in terms of the number of vehicles accessing the CTO facilities. This paper is designed to provide stakeholders with a clearer understanding of the influences on the demand at the CTO land interface and how demand might be measured and managed.

It is not an objective of this study to assess or compare the internal performance of the CTOs. Nor is the purpose of this study to assess air-side processes. Nevertheless, certain

---

<sup>2</sup> For example, the Department of Transport and Regional Services recently called for the provision of consultancy services for a national study of intermodal terminals (RFT No. L2005/0116; March 2005). Major intermodal terminals were defined as road-rail intermodal facilities (including port connections) with a throughput greater than 10,000 TEUs.

aspects of CTO and air-side operations will influence the character of vehicle movements at the land interface and these aspects will be discussed as appropriate.

Also as part of this study, an important objective of AFEC and SAFL is to develop among private and public stakeholders an agreed understanding of the current land interface processes. This common knowledge will be used as the basis for improving dialogue with regard to assessing the types of changes required to address current and future land interface capabilities.

## 3 THE CTO LAND INTERFACE TASK

### 3.1 Overview

#### a) What is the CTO Land Interface?

In its simplest form the CTO land interface is the transfer of air freight between agents acting on behalf of cargo owners and the Cargo Terminal Operators (CTOs) acting on behalf of the airlines. This process involves the transfer of:

- Freight between road and air assets through the CTO premises<sup>3</sup>; and
- Documentation relating to the ownership and/or carriage of the freight.

While the focus of this study is on the management of the physical interface between the road and CTO operations, the air freight sector's reliance on paper documentation and the consequential use of "document runners" results in increased demand on the functionality of the landside interface and the road network in the airport precinct.

The landside freight interface is also influenced by passenger traffic factors such as the size of aircraft, frequency of passenger services and direct competition for scarce land within the airport. Road freight vehicles also compete for space on the local road network with private and commercial vehicles associated with the passenger task, and with local traffic including road freight vehicles servicing the Botany Bay port facilities.

#### b) Key Participants in CTO Land Interface

Key participants in the CTO land interface and their primary motivations are:

- **The Airport Operator** – Airports are land intensive and are often located in areas where the land has become scarce and thus very valuable. Also, they often have regulatory restrictions on the hours and/or type of air operation further constraining capacity. Most airports derive the majority of their revenues directly from regular passenger services.
- **The Airlines** – The revenue focus of airlines is the passenger task, however, as Tretheway (2003) argues, most airlines need to carry freight in the belly-hold to augment the financial viability of the passenger service. Fuel plays a significant role in airline operations, not only in terms of costs, but also in terms of the freight carrying capacity of the aircraft. The greater the fuel load the less freight capacity.
- **The Cargo Terminal Operators** – Since the majority of air freight utilises belly-hold capacity and the CTOs primary contractual service obligations are to the airlines, the CTOs primary focus is to satisfy the airlines' needs to keep capital intensive assets moving; and in so doing meet the passengers' expectations of reliable services. Conversely, CTOs have no contractual obligations with road transport service providers or freight forwarders. As CTOs occupy valuable airport land, CTO operations are most efficient when the storage of freight is minimised.
- **Cargo Agents** are freight forwarders and/or customs brokers acting on behalf the cargo owners (shippers) to deliver or receive freight at the CTO facilities, and to acquire space on the aircraft if required under the shipper's terms of trade. To reduce costs, cargo agents can gain commercial leverage with the airlines by generating greater freight volumes. However, the cargo agent sector is competitive and contestable therefore the agents' primary focus is to meet the needs of the shipper in terms of price and service. Cargo agents have no contractual obligations with CTOs

---

<sup>3</sup> As such, the CTO facilities, like stevedoring facilities in the maritime sector, can be regarded as inter-modal terminals.



### c) Measuring the CTO Land Interface Task

The CTO land interface task can be measured in terms of:

- Freight task (throughput of freight measured in tonnes and volume (cubic metres));
- Transport task (measured in terms of vehicle visits);
- Variations in demand (frequency); and
- Performance.

These measures are discussed below.

### 3.2 The KSA Freight Task

While in tonnage terms Australia's international air freight task represents less than one per cent of total Australian international trade, by value it represents approximately 26 per cent of Australia's total international trade (BTRE 2004, p. 7). This is because air freight is significantly more valuable on a per kilo basis. In 2001-02, the average value of Australian air freight exports was \$63 per kg compared with \$0.20 per kg for sea freight exports. "Of the top ten export food groups in 1998, 'vegetables and fruit' had the lowest average value at approximately \$2.40 per kilogram, while 'fish, crustaceans & molluscs' had the highest value at \$19.30. By contrast, office machines and automatic data processing (ADP) equipment had an average value of around \$140 per kilogram." (ACCC 2004, p. 8)

KSA handles between 55 and 60 per cent of Australia's international and domestic air freight<sup>4</sup> by tonnes. The KSA freight task was 475,000 tonnes in 2004, an increase of 5.1 per cent on the previous year (SCAC 2004, p. 7). While there were 266,746 total aircraft movements in 2004, less than 3 per cent (7,476) were freight aircraft movements.

Based on a total freight throughput of 441,000 tonnes in 2001/02, KSA was ranked in the mid-thirties amongst the world's largest freight airports published in the *Air Cargo Yearbook 2004* (p. 22). However, KSA's freight task is more significant in the global picture when measured on a tonne-kilometre basis. Although tonne-kilometre data is not available for the airport, the significance of this aspect of the task can be demonstrated using Qantas freight data; Qantas does not rank in the top 50 of airlines in terms of uplifted freight but was ranked 19<sup>th</sup> on a tonne-kilometre basis in 2001 (*Air Cargo Yearbook 2004*, p. 23).

It was the intention of this study to provide estimates of future freight flows through KSA based on an analysis of the drivers of demand for the major commodity groups currently being traded through the airport. Data required to conduct such an analysis is not readily available, particularly with respect to import flows. To collect such data would require resources beyond that allocated to this study. Nevertheless, some comments can be made on currently available estimates of air freight forecasts.

Domestic and international freight, including mail, is "forecast to grow from 430,000 tonnes in 2000/01 to 1,297,000 tonnes in 2023/24. This represents an [compound] average annual growth of 4.9 per cent" (SACL 2004, p. 50). The vast majority of this growth is expected to be in the international freight task, with growth expected to be approximately 4.6 per cent per annum to 994,000 tonnes in 2024 (SACL 2004, p. 70).

The expected long term-growth in international freight through KSA is significantly lower than IATA forecasts of short-term growth in total international freight (tonnes uplifted): an average annual rate of 6 per cent for the period 2004 to 2008 (IATA 2004).

---

<sup>4</sup> The BTRE estimates that the total air freight task, excluding dedicated freighters, was approximately 780 million tonnes in 2002-03 (BTRE 2004, p. 15)

The Sydney Airport Master Plan does not provide estimates of import and export growth. However, it is important to note the ratio of imports to exports is currently two to one and that a significant proportion of exports are highly price sensitive<sup>5</sup>. It is also believed that with continued off-shore production there will be an increase in imports relative to export flows. Consequently, it is reasonable to assume that future growth in the international freight task through KSA will be driven by import flows.

Growth is expected to vary widely, depending on the routes involved. In particular, routes related to the Chinese market are expected to grow rapidly<sup>6</sup>. It is also important to take into account that the majority of air freight through KSA will continue to utilise passenger aircraft capacity (belly-hold capacity). Consequently, estimates of future freight throughput through KSA must be undertaken by considering the drivers of demand on a sector specific<sup>7</sup> basis, particularly taking into account the likely influence of greater than average growth in imports from China.

Regardless of the range of forecasts for future freight flows that might be developed for the Sydney Airport, the real issue is that current operating procedures and infrastructure investment in and around the CTO land interface will not be capable of handling future freight flows indefinitely. Even with low rates of growth, urgency is needed to develop a better understanding of the drivers of KSA freight flows and how this will impact on the land interface.

As a first step to improving stakeholder understanding of the KSA freight task, it is recommended that AFEC negotiate with SACL and the CTOs for an appropriate system of collecting and maintaining time-series data on the major commodities traded through KSA, and that this data be used as the basis for analysing current and future freight flows. It is possible that the burden of collecting this data could be reduced through the use of Customs documentation systems.

### 3.3 The CTO Transport Task

While the basic measure of throughput through the CTO facilities is the freight task, the basic measure of demand at the CTO land interface is “vehicle visits”.

The number of vehicle visits will be a function of the freight task and the volume of freight carried by each vehicle. For example, if the freight task was 100 tonnes and each vehicle on average carried 1 tonne inwards and 1 tonne outwards, then the transport task would be 50 vehicle visits.

In general terms, the volume of freight carried per vehicle will be a function of the size of the vehicle and the utilisation of the vehicle in terms of its carrying capacity.

While demand can be measured on an individual CTO basis, vehicles can visit more than one CTO per trip to the airport. Consequently, from the perspective of SACL and AFEC, it may be more appropriate to measure vehicle visits on an airport precinct basis and incorporate a partial measure of the number of movements between CTOs.

<sup>5</sup> The NSW Airfreight Export Council estimates that approximately 40 per cent of exports are sourced from the Sydney Metropolitan region, 25 per cent from regional NSW and 35 per cent from inter-state. For Qantas, 60 per cent of the exports from KSA are perishable products (ACCC 2004, p. 8) and all stakeholders interviewed believe that the proportion of perishable exports to total exports has been declining.

<sup>6</sup> Boeing predicts that Chinese freight growth will be more than 10 per cent per annum through to the year 2021 (BTL 2003).

<sup>7</sup> Sector refers to an airport to airport (or city pairs) route.

Stakeholder consultations have indicated that data on the number of vehicle visits is not readily available. Obtaining data on the number of vehicle visits is critical to determining the relationship between demand at the CTO land interface and the current and future air freight task through Sydney.

### 3.4 Measuring Variations in Demand

Knowing the total number of vehicle visits is only a partial indicator of the CTO land interface task. Equally important is developing an understanding of the frequency of vehicle visits (or variations in demand) as system processes and infrastructure are a typically a function of peak demand rather than total demand. Total infrastructure investment is reduced the more vehicle visits can be evenly spread using demand management techniques.

Typically, demand is measured on a temporal scale (eg. on a daily, weekly and monthly basis); seasonality is an expression of variations in demand over a yearly basis.

Quantitative data on the frequency of vehicle visits is important but not critical to achieving the objective of improving stakeholder understanding of the ability of the landside infrastructure to handle expected freight flows. Qualitative assessments of the differences between peak and non-peak periods can be obtained from stakeholders and used to apportion the relevant throughput during the peak period. For example, the peak periods for exports are known to be the evening and Friday evening on a daily and weekly basis respectively. For imports, the peak periods are morning and Monday morning.

### 3.5 Measuring Performance at the CTO Land Interface

There are two aspects to measuring the performance of the CTO land interface task:

- The performance of the road transport fleet in delivering and receiving freight; and
- The performance of the CTO in processing vehicles.

#### a) Road Transport Performance

Ideally, the road transport fleet is performing at its best when the minimum number of trucks visit the CTO for a given volume of freight; a headline indicator of road transport fleet performance that might be used is the number of truck visits per 1000 tonnes.

Overall performance of the road transport fleet will be affected by:

- **Visit utilisation:** Although a truck makes one visit, it could perform two functions: drop off and pick up. Visit utilisation measures how often vehicles achieve this ideal. For example, a vehicle arriving and departing with freight has a visit utilisation of 100 per cent; a vehicle arriving with freight and departing empty has a visit utilisation of 50 per cent. One difficulty with this measure is how to accommodate vehicles visiting more than 1 CTO per visit to the airport precinct. For example, a vehicle arriving with freight at one CTO and receiving freight at another CTO would be measured twice as having a visit utilisation of 50 per cent on a CTO basis but measured once at 100 per cent on a precinct basis.
- **Vehicle utilisation** refers to the capacity of the vehicles servicing the CTO land interface and how that capacity is used. This requires data on the types of vehicles being used and volume of freight carried. There is significant variation in the types of vehicles servicing the CTO land interface – from B-doubles to utes. In comparison with the sea freight land interface task, this variety provides a unique challenge in the operation and management of the CTO land interface task.

When measuring the performance of the road transport fleet, it is important to understand that there is a difference between efficiency and effectiveness outcomes. The above indicators measure efficiency. From a demand management viewpoint achieving maximum efficiency might be ideal but doing so is likely to result in less than effective outcomes for the customer and/or system through reduced flexibility and increased costs as result of consolidating freight on to larger vehicles.

### b) CTO Performance

The demand at the CTO land interface will also be affected by how quickly the CTOs process vehicles; the faster the rate the greater the capacity of the interface. Typically CTO performance can be measured by:

- **Queue Time:** the time a vehicle waits at the CTO gate for entry to the CTO's premises. As the availability and use of land is an important issue with respect to managing the CTO land interface, queue length should also be measured. This is because queue time in itself does not provide a true indication of the impact of waiting vehicles on the road network outside the CTO's premises. A simple measure of queue length would be the maximum number of vehicles in the queue during the day.
- **Turnaround Time:** the time a vehicle spends on the CTO's premises.

A key measure of the operational performance of the CTO land interface is the average time it takes to service a vehicle, and can be measured from presentation of documents to departure from the terminal. However, one of the difficulties unique to the air freight chain is the variety in the volume of freight transferred to and from the vehicle. This may explain the significant variation in views with respect to the current average turnaround of vehicles (ranging from 20 minutes to 3 hours).

An alternative measure suggested by one CTO was that servicing vehicles should be measured from presentation of documents to allocation of a forklift to service the vehicle; a task that on average should take no more than 15 minutes. This would be a very good partial indicator and should demonstrate performance improvements directly as a result of greater use of electronic documents.

However, total turnaround time should still be measured to provide a complete picture of the time taken to service vehicles. This measure is used by the Hong Kong Air Cargo Terminals Limited (HACTL). HACTL's published performance measure and targets are presented in Table 1.

It is important to understand that CTOs do not have total control over improving truck queuing and turnaround times<sup>8</sup>. For example, a vehicle may arrive unnecessarily early or many vehicles may arrive just prior to the receipt cut-off time for export. However, queue and turnaround times do provide an indication of the overall performance of the CTO land interface and are useful indicators for measuring improvements in the operation and management of the interface.

The following section discusses the various influencing factors that may increase or reduce the demand at the CTO land interface.

---

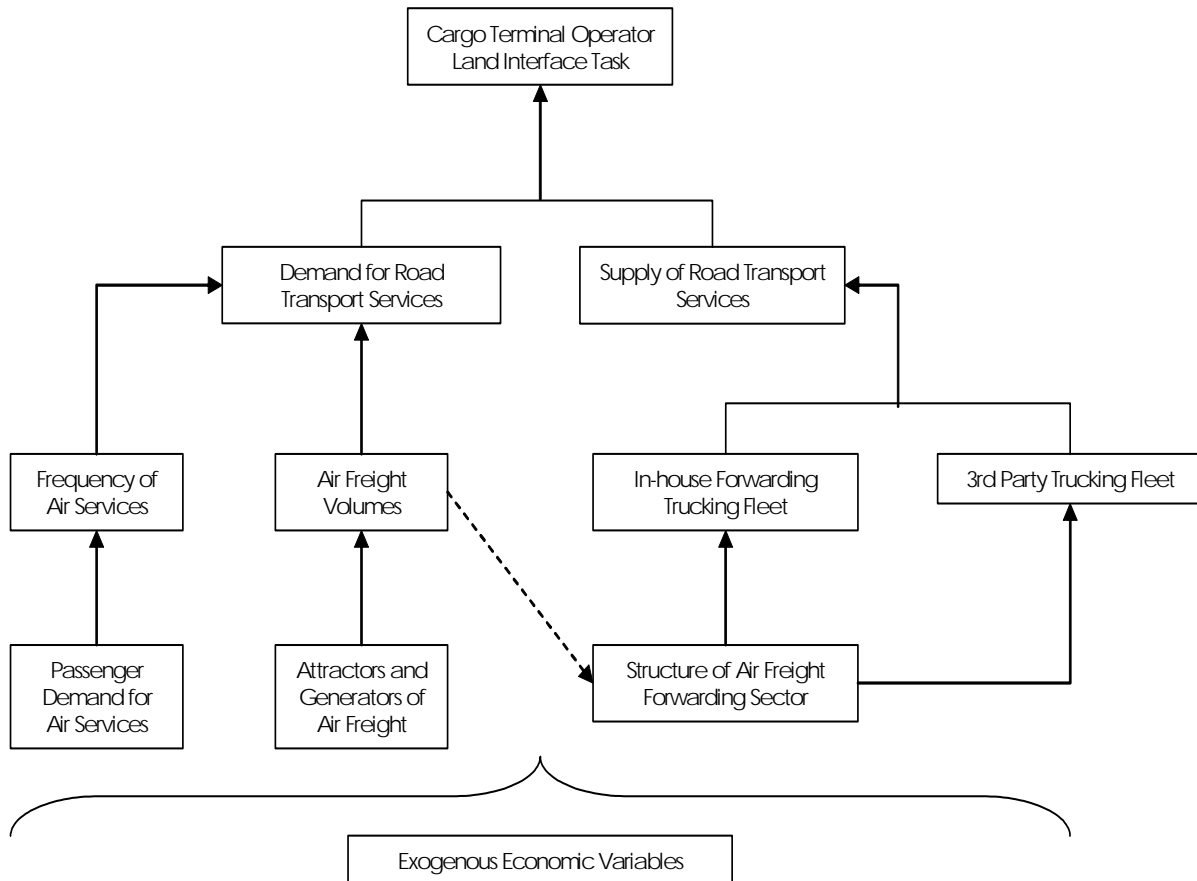
<sup>8</sup> The active intervention by the CTOs can influence the performance of the land interface. For example, in the sea freight sector the equivalent of the CTOs (the stevedores) use vehicle booking systems (VBS) to manage the arrival of vehicles. However, it has been suggested that with greater diversity in the type of trucks serving the air freight chain, a VBS system would not work at CTOs. Nevertheless with vehicles currently arriving randomly at the CTO gate, at the very least a gate supervisor can assist in managing the truck queue by prioritising the entry of vehicles. Only Menzies currently has a truck interface supervisor and a proprietary system for managing truck interface; a call forward system with a screen in the office to tell them where which door to go to. While this system is already in operation for exports, it is currently being introduced for imports and will be connected to the Customs CMR system.

**Table 1 - HACTL Performance Measures**

Metric	Measure	Performance Targets (%)
<b>Landside Services</b>		
Truck Waiting Time	Within 30 minutes	95%
Cargo Acceptance	Within 15 minutes	95%
Cargo Release	Within 30 minutes	95%
Empty Unit Release	Within 60 minutes	95%
<b>Import Cargo Breakdown</b>		
< 10 tonnes	Within 2 hours	95%
10-50 tonnes	Within 5 hours	95%
> 50 tonnes	Within 9 hours	95%
Perishable Cargo	Within 1 hour	95%
Express Cargo	Within 1 hour	95%
<b>Airside Services</b>		
Last Unit Arrival	Within 70 mins	95%
First Mail Unit Arrival	Within 60 mins	95%

Source: Hong Kong Air Cargo Terminals Limited [www.hactl.com](http://www.hactl.com)

**Figure 2 - Influences on the CTO Land Interface Task**



### 3.6 What Influences the CTO Land Interface Task?

It is important to understand the fundamental principle that road transport is a derived demand. That is, the number and frequency of vehicle visits is a function of outcomes of other economic activities. In the case of the CTO land interface, the road transport task will be influenced by:

- The frequency of air services;
- Volume and direction of freight (freight flows); and
- The structure of the freight forwarding sector, including the degree of outsourcing of road transport activity; and
- The structure of the road transport sector.

The factors influencing the CTO land interface task are shown in Figure 2. Additional factors to consider are the location of freight forwarders and/or shippers, and congestion with respect to variations in travel times and the number of trips that can be made in a day. The following section considers the factors influencing demand and supply of road transport services at the CTO land interface.

#### a) The Demand for Road Transport Services

The demand for road transport services for delivery and receipt of freight at the CTOs is a function of the volume of air freight (*the what*) and the frequency of air services (*the when*).

Air freight volumes are a function of the characteristics of points of generation and attraction of freight. In a general sense generators and attractors of freight can be viewed as exporters and importers (shippers). Ideally, in order to more accurately forecast future freight volumes, the determinants of generation and consumption of the various commodities need to be analysed. For example, export volumes are a function of global demand. The volume of imports used as inputs into local production will be a function of local industrial activity, while the volume of imports consumed by households will be a function of household income and expenditure.

The location and size of shippers has a significant impact on the CTO land interface task:

- Small volume shippers located close to KSA are likely to use small vehicles, increasing the number of vehicle visits per tonne of freight;
- KSA has a very large hinterland with exports (for example) being sourced from as far as South Australia and North Queensland. The further a vehicle has to travel, the more likely the road transport operator will allow time for unforeseen contingencies. Consequently, when delays do not occur the vehicle arrives well before time, with many of these vehicles currently waiting and queuing within the Airport precinct (if not Link Road itself), adding to congestion<sup>9</sup>.

Shippers and freight volumes also influence the structure of the air freight forwarding sector, which in turn influences the supply of road transport to service the CTO land interface task.

As most of Australia's air freight is served via the belly-hold of passenger aircraft, the frequency of air services is determined primarily by the demand for passenger services. Consequently, scheduled frequency is reasonably fixed and predictable, providing a degree of certainty in the air freight chain. This predictability allows for a reduction in the system's margin of error, with freight forwarders having greater confidence in the time required to dispatch vehicles to deliver or receive freight at the CTOs.

<sup>9</sup> Note that in some instances, airlines will arrange for the carriage of freight by road transport between Sydney Airport CTOs and other Australian airport CTOs, typically Melbourne. This is a form of land-bridging.

Consultations have indicated that freight-only air services are significantly less reliable and yet the proportion of freight-only air services by freighters is likely to increase relative to passenger services<sup>10</sup>. Consequently, it could be expected that there will be pressures on the reliability of the land interface.

Frequency of demand can also be influenced by documentation processes and disconnects in the operation of the air freight chain.

- Australian Quarantine and Inspection Service (AQIS) phytosanitation certificates have been raised as the only government impediment to the smooth operation of the CTO land interface. Currently the AQIS service is closed over the weekend and consequently there is a rush to clear exports for flights on the weekend prior to 1600 hours (4 PM) on Fridays. This can increase the demand for road services at this time and also increase the required capacity within the CTO facilities.
- Consultations indicate that there are separate peak demands for exports (Friday evening) and imports (Monday morning). While the peak in exports can be explained to some extent by the AQIS phytosanitation issue (see above), there is also the commercial incentive for exports to leave Australia at the end of the working week to travel over the weekend, reaching the northern hemisphere markets in time for sale on the Monday of the following week. It is also likely that the more restricted operating hours of exporters and importers compared to the air transport system also plays its part<sup>11</sup>. This 'mismatch of hours' is also a significant and on-going issue for the sea freight chain. Importantly, a strong argument can be made that it is the exporters and importers who are the customers of the chain and the services providers should adapt to the requirements of their customers.
- The Sydney CTO land interface may also be affected by the airport curfew, however the above comments on shipper hours of business suggests this is not a significant factor in the operation of the CTO land interface.
- The air freight chain is still heavily based on paper documentation systems, particularly for B2B transactions<sup>12</sup>, although this will change gradually as the new Customs initiatives are fully operational. Currently "document runners" are used to move paperwork between participants in the chain. Not only do these document runners add to the demand on the road transport network in the airport precinct, their use adds to the complexity of coordinating the physical movement of freight and the CTO land interface task.

The demand for road transport services will also be influenced by the type of freight and the perceived<sup>13</sup> performance of the CTO and its facilities. For example, if there is a perception that the CTO is not capable of maintaining the cool chain, deliveries of perishable exports will arrive as close as possible to the receipt cut-off time; this results in increased congestion at the interface (higher peaks in demand) and a greater potential for actual breakdowns in the cool chain.

---

<sup>10</sup> The ACCC reports (2004, p. 11) that as at October 2003, Australia-wide there were 7 dedicated freight only operators (Asian Express, Cargolux, Federal Express, Lufthansa Cargo, Martinair, Polar Air Cargo and United Parcel Service) and 5 airlines which operated dedicated freight operations in addition to their regular passenger services (Cathay Pacific, Korean Air, Malaysia Airlines, Qantas and Singapore Airlines). "Freight carried on dedicated freighters accounted for 27.3 per cent of inbound freight to Australia and 14.7 per cent of outbound freight from Australia in August 2003."

<sup>11</sup> For example, during the Sydney Olympics the CTO operating hours were extended beyond the normal 5am to 10pm (7 days a week) window but the extended period of operation was not utilised.

<sup>12</sup> With the exception of AQIS phytosanitation, government systems were praised for their use of electronic applications.

<sup>13</sup> Experience with waterfront reform suggests that the performance of the land interface can be affected by the perception of road transport operators, freight forwarders and shippers regarding the performance of other agents within the chain. These perceptions can be based on hearsay, anecdotal evidence and/or influenced by once off events, and be no reflection of actual performance.

## b) The Supply of Road Transport Services

The supply of road transport to service the CTO land interface task is managed by the air freight forwarders, customs brokers and CTO's, utilising either in-house vehicles or 3<sup>rd</sup> party services.

The structure of the air freight forwarding industry will influence the number and type of vehicles used in the CTO land interface task. For example, a highly concentrated forwarding sector is likely to promote greater use of larger, fewer vehicles due to the ability of large forwarders to consolidate greater volumes of freight. Where the sector consists of many, equally competing forwarders, consolidation is diluted resulting in less efficient use of road transport assets.

- Consultations suggest that the air freight forwarding industry is polarised between a few very large forwarders (with DHL/DANZAS the largest) and a mix of medium to smaller forwarders (see also ACCC data presented in Section 3.2(c)).
- Unlike the shipping sector, Government regulations (eg. the Australian Government Regulated Aviation Security Program for Cargo Agents) tend to limit the number of air freight forwarders.
- The structure of the freight forwarding and customs broker sector is expected to change with the introduction of the Customs CMR reforms. Under air cargo automation the freight forwarder must also have Section 77g clearance for the release of imports from Customs. Under CMR, a freight forwarder can put a House Bill directly to Customs to achieve a release. Consequently, the number of freight forwarders capable of handling imports directly in Sydney is expected to increase from the current 70 (approximately) Section 77g freight forwarders.

Recent years have seen the development of integrated logistics service providers in Australia. For example, Qantas (through its partnership with Australia Post) and Patrick Corporation have developed integrated services that incorporate freight forwarding, CTO and road transport services. It is a reasonable expectation that integrated service providers are able to improve the coordination of the road transport task at the CTO land interface. However, there is little evidence that this is happening even in the maritime sector where there is a longer history of vertical integration. This is partly because the individual parts of the organisation are yet to be fully transformed into a truly integrated service.

- Qantas' integrated services are diluted in a sense that Australian Air Express operates a separate CTO facility and forwarding services to its parent company.
- Menzies Aviation Group's business proposition is based on providing a suite of specific aviation services rather than adopting the integrated logistics provider model.

The effect of the use of 3<sup>rd</sup> party operators on the character of road transport services to the CTO land interface will depend on how the freight forwarders are outsourcing their transport requirements.

- In Australia, the local and regional road transport sectors are highly competitive with very low barriers to entry.
- If the freight forwarders are offering their transport tasks on an open, first-in basis, road transport services at the CTO land interface will be highly fragmented.
- If forwarders offer their requirements to just a few road transport operators on a fixed contract basis, the road transport operators would have an incentive and opportunity to coordinate their operations and improve the efficiency of their road transport assets.

## 4 TRENDS IN THE AIR FREIGHT SUPPLY CHAIN

This Chapter discusses existing operational practices at KSA and trends in the air freight supply chain that may influence the CTO land interface task.

### 4.1 Air-side Operations

#### a) Belly-hold Capacity

In principle, the demand for air freight transportation is a derived demand based on freight flowing from points of production to points of consumption. However, the historic commercial reality is that the majority of air freight is transported in the available up-lift capacity of commercial passenger aircraft (belly-hold capacity) and therefore the supply of air freight services has been strongly linked and influenced by the market for air passenger services.

In 2001/02 the proportion of belly-hold freight moved relative to total freight moved through KSA was 85 per cent for international freight and 80 per cent for domestic freight (SACL pers comms).

In the past belly hold capacity has grown sufficiently to satisfy air freight demand; although at certain times on certain routes shortages in capacity exist. Tretheway (2003, p. 32) cites figures demonstrating that compared to the growth in Gross Domestic Product of OECD countries from 1970 to 1998, the number of passengers carried by airlines increased by roughly 2.5 times but air freight grew almost 4.5 times the rate of growth of the developed world economy.

Typically the relationship between growth in GDP and growth in freight is used as a proxy for determining estimates of freight flows. However, Tretheway's analysis indicates that this may result in misleading air freight forecasts; is air freight growth of 4.5 times the growth in GDP sustainable over the medium to longer term?

Nevertheless, the rapid growth in air freight volumes does provide one important insight. During the period observed by Tretheway there was a dramatic growth in the long-haul passenger market, fuelled by the introduction of the Boeing 747 aircraft. Consequently, there was a rapid growth in the supply of belly-hold air freight capacity, stimulating an increase in air freight volumes in response to airlines desperate to fill the additional capacity; the philosophy being "it is better to carry cargo at any price than let the space go empty" (Rowe 2004).

Tretheway emphasises the importance of freight to airline sustainability:

"Globally, air cargo and mail account for roughly 12% of airline industry revenues. While this may seem small, consider that airline operating margins globally average under 3%. Take away air cargo revenues and many passenger airlines would not be economically viable<sup>14</sup>" (Tretheway 2003, p. 33).

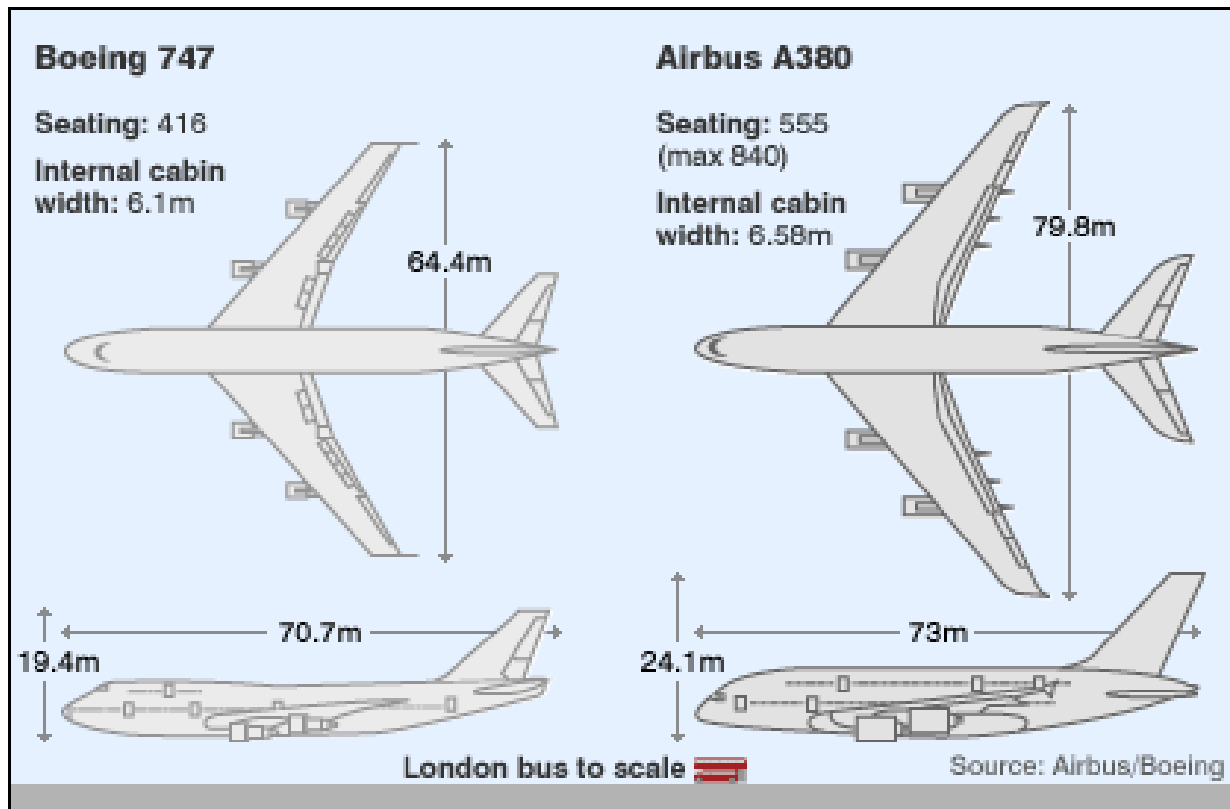
Therefore, a key question is: will the introduction of the next generation of long distance aircraft (the A380) lead to another supply driven market?

---

<sup>14</sup> Tretheway suggests that roughly 20 per cent of passenger flights would be uneconomical without air cargo (p. 34). To put that another way, without air freight, airports could lose at least 20 per cent of their passenger revenues.

One of the difficulties in answering this question immediately is that there is uncertainty regarding the impact the A380 will have on available freight capacity. Although the A380 has 49 per cent more floor space and 35 per cent more seats than the 747-400 ([www.airbus.com](http://www.airbus.com)) it only has approximately 8 per cent more freight carrying volume<sup>15</sup>.

**Figure 3 - Comparison of the Boeing 747 and Airbus A380**



Source: <http://news.bbc.co.uk/2/hi/business/4174729.stm>

The final freight capacity of the A380 will be determined by the seat configuration and the inclusion of new passenger facilities such as business centres and lounges, as well as the fuel requirements for the sectors on which the aircraft is deployed.

As the anchor airline for KSA, Qantas' intention regarding the A380 is a significant influencing factor with respect to available air freight capacity at Sydney Airport. Qantas has ordered 12 A380s with options for 10 more and will deploy its first aircraft on the Melbourne-Los Angeles sector in October 2006 (Qantas 2005). The airline has stated that it would operate the A380 with a seat configuration for 501 passengers, although online aviation publication [airliners.net](http://airliners.net) suggests that Qantas plans to fit its aircraft with 523 seats. This difference in passenger capacity is likely to have less impact on the final freight capacity when compared to the operating conditions of the sectors Qantas' A380s will be deployed on.

It was the general view of KSA stakeholders that the longer sectors to and from Sydney are likely to significantly reduce the up-lift capacity for freight due to the additional fuel load requirements. It was also suggested that flying against the jet stream (e.g. on the Los Angeles to Sydney sector) may reduce freight capacity to less than 20 tonnes.

Nevertheless, the deployment of A380 will reduce over all freight capacity on a per passenger basis. A simple comparison of the A380 and B747 aircraft indicates that due to

<sup>15</sup> The A380 freight volume is 171 cubic metres ([www.airbus.com](http://www.airbus.com)) while the freight volume of a 747-400ER ranges from 137 to 159 cubic metres ([www.airliners.net](http://www.airliners.net)).

the larger passenger capacity of the A380 fewer flights will be needed to service existing passenger demand. Using baseline estimates of 400 and 500 passengers per flight for the B747 and A380 respectively, there would be a reduction of 20 per cent in total freight capacity (see Table 2).

**Table 2 - Introducing the A380; the Impact on Freight Capacity**

Aircraft	Freight per Flight (tonnes)	Pax per Flight	Flights per 10000 Pax	Total Freight (tonnes)
B747	20	400	25	500
A380	20	500	20	400
Reduction in freight capacity				20%

The introduction of the A380 is also causing concern among KSA’s freight stakeholders in terms of the additional space required to support the much larger A380 and how the additional passenger task will be handled at the airport, particularly with respect to the implications for air and land side usage of the scarce airport land.

The A380 aircraft will have a significant impact on the air freight market, but its introduction is most likely to be felt with respect to the dedicated freighter segment of the market; as the following section will illustrate.

**b) Freighter Aircraft**

The A380 freighter (A380F) will carry significantly greater volumes of freight than the B747F (150 tonnes compared to 100 tonnes). However, the earliest the A380F will be deployed in the market is August 2008 when FedEx takes delivery of 10 A380-800F aircraft.<sup>16</sup> FedEx will operate the aircraft on the major east-west routes between North America, Asia and Europe.

Although it is unlikely that an A380F will be deployed on sectors involving KSA in the short to medium term, the impact of the A380F on the major global freight sectors (Europe-North America-Asia), combined with other industry developments, could have a significant flow on effect for the KSA CTO land interface task.

The recent SARS crisis and the IRAQ war resulted in the loss of belly-hold capacity. However, freighters were used as a substitute for the lost freight capacity as they were less restricted in their movements. Consequently, “while passenger traffic dived by as much as 45% at the height of the [SARS] crisis, cargo actually continued to manage faltering growth” (Conway 2004a, p. 20). In addition, the USA West Coast Longshoreman’s dispute resulted in increased demand for air freight capacity that was more flexibly met by air freighters.

Conway argues that as a consequence of the versatility of freighter aircraft, there has been a mind-shift in airline thinking, with airlines recognising the commercial benefits of developing a balanced portfolio of passenger and freight services. This is likely to result in an increase in freighter investment and therefore greater freighter capacity and a return to a supply lead market. This pressure will increase with new market entrants such as Russia’s Volga-Dnepr<sup>17</sup> and the return of United Airlines to the freighter market (Rowe 2004).

<sup>16</sup> <http://www.fedex.com/us/about/today/companies/express/a380.html>

<sup>17</sup> It was recently announced that Volga-Dnepr and other Russian and Ukrainian interests have signed a business plan to modernise the AN124-100 fleet and the production of a new AN124, equipped with new avionic systems, modern power engines, larger tonnage capacity and longer flying ability (eyefortransport.com 4/4/2005).

Support for greater investment in freighter capacity will come from:

- The availability of surplus, aging 747 passenger aircraft displaced by the introduction of the A380. These aircraft are suitable for conversion to dedicated freighters and will provide a cheap source of additional freighter capacity;
- The development of closer relationships with large forwarders and preferred carriers, “seeking fixed prices set over six to 12 months ... In return, they are prepared to commit to pay for the space they book whether they use it or not” (Conway 2004, p. 12). This is a similar development to the rise of Non Vessel Operating Carriers in the shipping sector, which also stimulated investment in new shipping capacity; and
- Increasing pressure from the aviation industry for government reforms such as the introduction of worldwide open skies for freighters (Kay 2004).

While additional freight capacity will be deployed on the high volume freight routes in the first instance, under conditions of a supply driven market it is likely that these markets will become saturated with excess capacity and airlines will seek new markets such as those involving Australia. This may result in acceleration in the growth of dedicated freight services to and from Australia, particularly Sydney in the first instance.

If the supply driven market scenario becomes a reality, it will have a multiplying effect on the operation of the land interface. Firstly, as Tretheway's analysis suggests, it would be a reasonable expectation that the growth in freight volumes will accelerate, taking advantage of depressed freight rates and new services.

Secondly, and more significantly, increased use in dedicated freighters will result in greater surges of throughput. That is, while a passenger aircraft typically discharges 3-4 pallets of by-pass freight, freighters can discharge up to 20 pallets<sup>18</sup>. Consequently, the supporting land infrastructure will not only need to cope with an overall increase in freight volumes, it will also need to cope with an increase in peak demand.

Since dedicated freighters are more flexible than passenger aircraft with respect to city pairs, failure to provide adequate landside infrastructure at KSA will result in freighters diverting to other Australian cities such as Melbourne, increasing costs to NSW businesses and consumers. Sd+D was advised that fly-overs are could occur due to the lack of aircraft parking facilities at Sydney.

### **c) Regulatory Restrictions**

Although Australia has an open skies regulatory regime for air freight services, access to air freight capacity through KSA is indirectly regulated via aircraft movement restrictions:

- Section 6(1) of the *Sydney Airport Demand Management Act 1997* restricts aircraft movements during the non-curfew period to a total of 80 movements per hour.
- Section 6 of the *Sydney Airport Curfew Act 1995* restricts aircraft movements between 11pm and 6pm, every day.

While the latter Act does allow for some aircraft movements during the curfew period, importantly Section 15 of the Act specifically excludes aircraft greater than 34,000kgs take-off weight, regardless whether or not the aircraft complies with the 90-95 noise rule; effectively excluding the use of dedicated jet air freighters from operating during the curfew. Changes to Section 15 would require an amendment to the Act; an unlikely event given the political sensitivities relating to aircraft noise at KSA.

---

<sup>18</sup> Typically a 747 passenger aircraft carries 20 tonnes of freight while a 747 freighter carries 100 tonnes.

## 4.2 CTO Operations

### a) Overview

At KSA there are four CTOs:

- Qantas: the largest CTO with approximately 60 per cent of total capacity<sup>19</sup>;
- Patrick: approximately 18 per cent of total capacity;
- AAE: Half owned by Qantas and Australia Post, with approximately 14 per cent of total capacity; and
- Menzies: with less than 10 per cent of total capacity.

With the exception of Menzies, the CTOs are located adjacently to each other in Link Road, near the international passenger terminal. Menzies is located in Sixth Street, near the domestic passenger terminal. The Menzies location means that good planning in the movement of freight between the CTO and aircraft is crucial, particularly for exports. The trip across the airport can take up to 25 minutes though 10 minutes is achievable.

KSA has provided for a common user by-pass facility at the Patrick terminal. However, the facility is operated by Menzies not Patrick. There is only one significant user; Universal.

CTOs lease their facilities from SACL; Qantas has a lease to 2016 while the other CTOs have leases to about 2009.

Typically CTOs have 3 year contracts with airlines, with poor service termination clauses within the contracts. The service contracts can be differentiated on station by station and product by product basis: worldwide "airlines are pursu[ing] a variety of procurement strategies. While some buy strategically across a network, others are opportunistic and work more on a station-by-station basis. For every airline that buys cargo handling services separately, there are others that centralise purchasing and bundle contracts together with ramp and passenger handling requirements. As such, handlers have to fathom whether it is best to offer all service lines in every location, or just to offer specialised services in one or two strategic locations" (Rowe 2004b, p. 14).

CTOs are responsible for load planning of aircraft and are required to re-weigh all outbound freight. Airline security requires export freight to be x-rayed.

### b) Key CTO Operational Issues

There are 3 key CTO operational issues:

- The handling of loose freight
- The use of the CTO facilities for storage of freight
- The hours of operation of CTO facilities.

The issue that raised most concern among freight forwarders and customs brokers interviewed was the handling of mixed pallets (loose freight), particularly for imports. Loose freight involves a binning process where cartons are unpacked from the aircraft, placed in various bins corresponding with the cargo agent. For exports, loose freight is consolidated into unit loads by the CTO.

Historically loose freight represented about half of the import and export task. One CTO suggested that currently loose freight represents about 70% of imports and exports.

---

<sup>19</sup> Capacity is based on the 'production' metric of tonnes per square metre. It is estimated that the current average production rate for the Sydney Airport CTOs is 9 tonnes per sqm. A range between 10 to 15 tonnes is considered normal (ASC 2004).

Data provided by another CTO indicates that half of the export task and over 2 thirds of the import task is loose.

For imports, the proportion of loose freight depends on the point of origin. It is a particular issue for imports from Asia and to a lesser extent Europe; the latter probably the result of insufficient volumes to make a full pallet. One CTO suggested that the preponderance of loose freight from China is due to Chinese Customs requiring acquittal at piece level. Qantas is currently negotiating with overseas suppliers in an attempt to move loose freight as by-pass freight.

Loose freight must go to the CTO for breakdown as there is a commercial risk for the CTO if there is any loose freight missing from a consignment. Perceptions of the turnaround of trucks picking up loose freight were particularly mixed; many suggested that the pick-up process can take up to 2 hours, while one freight forwarder stated that it can take up to 4 to 6 hours (average 3 hours) to access loose freight at the Qantas terminal<sup>20</sup>. Qantas states that its average truck turnaround time is 20 minutes.

It was suggested by a number of stakeholders that demand pressures at the CTO interface could be relieved if the loose freight task was moved off-airport to less valuable and more suitable land. However, all CTOs expressed resistance to this suggestion, particularly on the grounds that the handling of loose freight is a key element of the CTOs business proposition and operational requirements in serving the airlines. While there is no doubt that moving loose freight off-airport will result in the release of significant capacity at the on-airport facilities, more thought regarding the type of business model that would support such a strategy is required. In the meantime, measures can be put in place to assist in providing the required information needed to formulate such a strategy.

From the CTOs' perspective, the tendency of shippers to use CTO facilities for storage and the concentration of deliveries and pickups has a significant impact on CTO operations.

CTO facilities occupy valuable land. The more freight is stored within the facility, either in terms of volume or dwell time, the greater the infrastructure required to service the freight task. Consequently, the primary function of the CTO must be on the efficient transfer of freight between road and air transport assets. Ideally, CTO operations should flow smoothly such that the freight remains within the CTO premises for as short a time as possible. Qantas indicated that freight dwells within its facility for 15 to 18 hours on average per consignment. Unreasonable dwell times generally relate more to imports than exports.

While minimising dwell time is an ideal goal of the CTOs, there will come a point where increased efficiency in this respect will impact on the effectiveness of the interface. This is because the effective handling of the road freight task requires a degree of smoothness in the servicing of the vehicles to reduce the equipment and infrastructure requirements. Consequently, a degree of dwell time must exist to allow freight to be temporarily stored for early arrivals and later pick-ups. Nevertheless, the CTOs should be regarded as a transfer facility rather than a de-facto storage site.

Although CTO operating hours are generally 0500-2300hr, 7 days a week and there are no restrictions on operating longer hours if required, the operational behaviours of importers and exporters result in significant peak flows during much smaller operational windows.

---

<sup>20</sup> In addition to the delays involved in accessing loose freight, cargo agents were highly critical of the CTO charges for handling loose freight that cargo agents are forced to pay. The central element to this argument is that the cargo agents do not have a commercial service agreement with the CTOs. By-pass freight does not normally attract a CTO charge, although storage can be charged.

As explained previously, shippers seek to reduce the opportunity cost of goods in transit by sending freight overnight and over the weekend. Furthermore, exporters in particular tend to dispatch their freight to arrive as close as possible to the cut-off time for receivals. CTOs must provide final load notice to the airline at 1 hour prior to take-off and this is the cut-off time for outbound freight to be received and weighed by the CTO.

For exports of perishable products, the bunching of delivery at the CTOs can be partly explained by the perception of a lack of infrastructure to maintain temperature integrity. For example, a number of freight forwarders indicated that there was an urgent need for shaded areas at the CTO facilities to reduce the effect of radiant heat from the tarmac. Nevertheless, one CTO explained that they had advised shippers that if perishable exports arrived early they would be put into a cool room however most continue to arrive at the last minute.

The kind of operational behaviours of shippers described above is not unique to the air freight supply chain. The impact of shipper demands on the efficiency and effectiveness of sea freight supply chain service providers has been well documented for over a decade. More recently, a study by Meyrick and Associates for the Sea Freight Council of NSW provides important insights and a warning on how the 'disconnect' between the varying chain operating requirements is likely to remain if action is not taken (Meyrick 2004):

- Regardless that stevedores operate on a 24/7 basis, 95 per cent of container volumes move through the stevedores between 7am and 3:30pm;
- Only 34 per cent of chain participants have adopted alternative operating arrangements to improve the coordination of the landside task even though 60 per cent said misalignment was significant barrier to the effective coordination of the chain;
- 89 per cent of chain participants said that they would not have been stopped from adopting more flexible working arrangements if they had intended to do so.

Perhaps the most significant finding of the Meyrick study is that most respondents said that they would not change their operating behaviours until the performance of the off-peak truck interface improved at the stevedores. This suggests that any attempt to improve the management of CTO land interface task must involve clear communication of the operational performance and benefits of off-peak use of the CTOs.

### **c) The Role of Cargo Agents in Improving the Management of the CTO Interface**

"AFIF estimates that only 2-3 per cent of cargo carried by air out of Australia is by direct contract [between shippers and airlines]" (ACCC 2004, p. 12) so an argument could be made that cargo agents have a commercial interest in taking a leadership role in improving the coordination of the CTO land interface task. However, the ACCC also reports that there are approximately 250 freight forwarders operating in the international air freight sector in Australia. "Of those, over 170 are registered IATA cargo agents (thereby being able to deal directly with airlines for exports)<sup>21</sup>. Total sales (freight revenue earned) by IATA registered cargo agents through CASS in Australia amounted to \$770 million in 2001, on a total of 397,126 air way bills. Around 46 per cent of registered IATA cargo agents had a turnover through CASS of over \$1 million in 2001" (ACCC 2004, p. 12).

---

<sup>21</sup> IATA creditation allows a freight forwarder to issue master and house (forwarders) airway bills for exports. CTOs will not accept shipments from non-IATA registered freight forwarders as the CTOs are acting on behalf of the airlines and airlines will not carry such freight. In cases such as this the CTO accepts the freight at full rates and moves it on behalf of the particular airline carrying the freight.

This suggests that the cargo agent sector is competitive in Australia, and a number of freight forwarders suggested that changes in the regulatory requirements governing the industry are likely to see an increase in the number of cargo agents in the industry.

Consultations also indicate that while shippers articulate service as a key factor in selecting their cargo agent, the reality is that the market remains price driven with the key service requirement being delivery or dispatch of the freight when it suits the shipper. Consequently, the operational behaviours of the shippers are not easily influenced by the cargo agent, resulting in the continuing existence of greater than necessary peaks in the demand for CTO services.

### 4.3 Issues Relating to Truck Operations

Most freight forwarders have outsourced their road transport operations, though many require the road transport operator to have their cab painted in the freight forwarder's livery.

Trucks park in Link Road and within the Qantas yard. It was suggested in the consultation process that truck facilities were already inadequate during peak times. Qantas is spending \$3 million on a project to improve car and truck parking operations, the servicing of trucks and security.

In the view of one CTO manager, the outsourcing of road transport services by the cargo agents has seen a drop in the quality of road transport services, particularly with respect to the standard of driver. This may also be the result of the prevailing driver shortages.

While there is strong motivation for road transport operators to maximise the utilisation of their vehicles<sup>22</sup>, picking up multiple loads (particularly from different CTOs) can have significant disadvantages in terms of total dwell time (on a terminal and precinct basis), resulting in a reduction in service and an increase in costs. Consequently, there is trade-off between waiting to maximise utilisation of the vehicle and maximising the number of paying trips per day.

Typically, road transport operators will start the day picking up import by-pass freight so that the cargo agent can unload the imports in the morning while the road operator returns to pick up loose freight. Ideally the latter will occur in time to deliver and then pick up export freight in the afternoon in time for evening departures.

---

<sup>22</sup> This would be difficult to do if, as suggested by one CTO, it is that case that most drivers are unaware of their pick-up load until they receive the paperwork on arrival at the CTO.

## 5 CONCLUSIONS

The purpose of this study was to initiate discussion on the factors influencing the capability of KSA CTO land infrastructure to adequately meet the future needs of the airport. It was also an objective to forecast future demand at the CTO interface by analysing the drivers of the freight task and by applying vehicle utilisation metrics to determine the consequential number of expected vehicle movements.

While the first objective has been achieved, the latter objective could not be fulfilled, given the resources allocated for this project, due to the lack of suitable and readily available freight flow and vehicle movement data, and the uncertainty regarding immediate factors such as the impact of the introduction of the A380 and rising fuel prices.

Nevertheless, a number of conclusions, observations or likely scenarios can be drawn to further the debate.

The key conclusion is that the performance of the CTO land interface at KSA will not improve without the development of short and long term strategies supported by all stakeholders along the air freight chain. There is an urgent need to develop such strategic responses; at an annual growth rate of 6 per cent, Sydney's air freight task can be expected to double within 12 years. At the same time, the passenger task is expected to double to 50 million passengers each year.

There are two key and symbiotic challenges facing the Sydney air freight chain;

- Providing clarity in understanding the precise character of the existing chain, particularly with respect to the translation of air freight flows to road transport services at the CTO premises, including the management of freight within the CTOs; and
- Communicating the importance of the air freight chain to the sustainability of passenger services and as a consequence, its importance to the commercial performance of airlines, the airport and the Australian tourism sector. Overcoming this challenge is critical to ensuring that airline and airport decisions take into account the needs of the air freight chain, particularly with respect to the allocation of on-airport land and the management of off-airport road network.

Without agreement on how to address these challenges individual stakeholders will continue to make commercial decisions in isolation to the best interests of the air freight chain, potentially reducing rather than enhancing the performance of the land interface. Consequently, it is recommended that a short term strategy be developed immediately to:

- Clearly articulate the important role Sydney's air freight chain plays in underpinning the sustainability of passenger services and by implication, promote the importance of air freight in underpinning the commercial performance of SACL;
- Establish the likely impact of the A380 on the short term passenger task and SACL's intended strategy to managing short term conflicts between the air and land-side resources required to manage the passenger and freight tasks;
- Establish and improve the collection and maintenance of total and major commodity freight flow data, aircraft movement data and vehicle visitation data, that stakeholders agree is at a level required to make medium to long term investment decisions.

It is also recommended that the short term strategy establishes the process for the regular monitoring and reporting of CTO land interface performance based on indicators of freight dwell times and truck turnaround metrics. Only with this information, allied with an agreed appreciation of future freight flows, can realistic assessments be made of

the challenges to improving the performance of the land interface. Without this information it would be premature to adopt demand management strategies such as locating loose freight handling off-airport and/or charging truck operators for access to the airport precinct.

The KSA freight community must also reach agreement on the most likely scenarios that may affect the air freight chain in the long term; particularly with respect to the volume and value of freight, including the implications for changes in the mix of belly-hold and freight services, and changes in the mix of by-pass and loose freight cargoes. Based on this appreciation, agreed long term strategies can then be developed to provide greater certainty with respect to the required CTO infrastructure and road transport services needed to service the expected freight flows. In particular, agreement is required on the key long term issues of:

- The availability and utilisation of on- and off-airport land for CTO services;
- The availability of truck parking and waiting areas; and
- Improving the road network links between the CTOs and freight forwarder premises.

Not until these issues are addressed can the right business models be developed for providing the required infrastructure and for the effective management of the road freight task. In this respect, Sd+D recommends that there is an urgent need to establish an agreed long term strategic approach to:

- Developing appropriate pricing signals to influence the utilisation of non-peak CTO capacity and reduce cargo dwell time. These charges should be sufficient to influence commercial behaviours and clearly supported by the operational benefits identified in the performance monitoring program;
- Investigating options for on- and off-airport CTO facilities that maintain competitive pressures rather than attempting to provide equal competitive circumstances for all CTOs. For example, SACL could consider reducing the number of CTOs at Link Road to Qantas and one other CTO with the latter developing a new facility capable of providing capacity sufficiently greater than would be possible with two CTOs spread over the same area. This option would also improve the potential to provide greater capacity in the northern lands development.

In developing the short and long term strategic frameworks the following key messages need to be taken into account:

- Belly-hold capacity will continue to be the most significant source of available air freight capacity to and from KSA. However, it is possible that the rate of growth in freighter capacity will be faster than overall freight growth resulting in greater surging in freight throughput.
- Underpinning the potential growth in freighter capacity is the possibility that the airline industry is entering into a new phase in the industry's development, where air freighters (and the management of freight more generally) will become increasingly significant in medium to long term airline business strategies. A key indicator of the realisation of this scenario will be the level of investment in new freighter capacity on the major freight routes and on-going supply led market.
- Import flows will continue to dominate the air freight trade through KSA; flows that are more suited to the use of dedicated freighters operating triangular services where low utilisation of the ex-Australia leg is compensated by repositioning to more lucrative sources of export in Asia.
- Not only will the CTO facilities need to manage overall freight growth in excess of 6 per cent per annum, growth in freighter services will impact on the character or frequency of volume through the terminals. If freighter services cannot be used to

smooth current throughput volumes (i.e. arrive/depart off-peak), the impact of the additional and significant surges of freight volumes during peak times will require substantial operational and infrastructure adjustments to provide the capacity required to meet the new peak throughput levels.

- On the demand side, shippers can be expected to continue with their normal behaviours (as they continue to do in the containerised shipping market); i.e. exporters will continue to send their freight to the CTOs on Fridays, and importers will continue to demand their freight at the beginning of the week. Consequently, growth in total freight volumes will continue to be concentrated during the current peak periods.
- It is also possible that any increase in CTO capacity will result in a shift in shipper demand from off-peak and shoulder periods to shoulder and peak periods, negating or at least reducing the effectiveness of the capacity investment to meet future demand, exacerbating the pressures on truck working, waiting and parking areas, and is likely to result in increased truck queues, and truck waiting and turnaround times.
- If the existing operating practices are maintained, it can be expected that there will be an increase in the average cargo dwell time within the CTOs premises. Consequently, the CTOs will need more storage space on a per unit throughput basis.

Under the above conditions, forecasts of future freight growth can be misleading as freight throughput will not be evenly distributed on a daily or weekly basis. Instead, any future work must focus on estimating what the peak flows on the airside and landside are likely to be and what operating and behavioural changes are required to manage the task.

Our conclusions are not intended to be alarmist, but they are intended to emphasise that circumstances exist whereby serious capacity constraints at KSA may become significant faster than generally accepted. Sd+D concludes that the successful management of the CTO land interface task is at a crossroad. Stakeholders can continue to operate based on established commercial behaviours, exacerbating the demand for scarce and in some instances unavailable land resources.

Sd+D also recommends that SACL considers its role as a supply chain leader in improving the performance of the airfreight chain, particularly with respect to what leverage SACL may impart through the forthcoming renewal of terminal leases and the management of access to airport facilities.

Sd+D's suggested way forward requires the support of all stakeholders in acknowledging that in the near future capacity constraints will force change on all stakeholders; there is simply a lack of available land to meet future needs. Consequently, the time for action is now and the focus should be on what actions can be taken immediately to delay major structural change and consequently reduce the cost of disruption and expensive infrastructure investment within the air freight supply chain.

## 6 REFERENCES

ACCC 2004, *International Air Transport Association, Cargo Tariff Resolution 502: Discussion Paper*, Australian Competition and Consumer Commission, Australian Government.

Air Cargo Yearbook 2004.

ALIS 2002, *Freight Logistics in Australia: an Agenda for Action*, prepared for the freight logistics industry by the Industry Steering Committee of the Freight Transport Logistics Industry Action Agenda and released by the Australian Government as the Australian Logistics Industry Strategy, Commonwealth of Australia, Canberra.

ASC 2004, *Sydney Airport Freight Capacity Study: Key Findings*, Airport Strategic Consultants Pty Ltd.

BTL 2003, *August 2003 Newsletter*, Bell Total Logistics Pty Ltd, [www.btl.com.au](http://www.btl.com.au).

BTRE 2004, *Australian Transport Statistics, May 2004*, Bureau of Transport and Regional Economics, Canberra.

Conway, Peter 2004, 'An outbreak of sanity', *Air Cargo Yearbook 2004*, p. 12.

IATA 2004, IATA international cargo and passenger forecasts 2004-2008, [www.iata.org](http://www.iata.org).

Kay, Dora 2003, 'Barriers to cargo growth', *Air Cargo Yearbook 2004*, p. 4.

Meyrick 2004, *Freight Supply Chain – Coordination of Working Arrangements (Mismatch of Hours)*, report by Meyrick and Associates for the Sea Freight Council of NSW Inc.

Qantas 2005, *A380 Revealed to Qantas and the World*, Qantas press release, 18 January 2005, [www.qantas.com.au](http://www.qantas.com.au).

Rowe, Richard 2004, 'Cargo proves its worth', *Air Cargo Yearbook 2004*, p. 3.

Rowe, Richard 2004a, 'Cargo comes in from the cold', *Air Cargo Yearbook 2004*, p. 8.

Rowe, Richard 2004b, 'Reality bites for handlers', *Air Cargo Yearbook 2004*, p. 14.

SACL 2005, *Freight Airlines*, [www.sydneyairport.com.au](http://www.sydneyairport.com.au).

SCAC 2004, *Annual Report*, Southern Cross Airports Corporation Holdings Limited, Sydney.

Tretheway, Mike 2003, 'Fighting cargo's corner', *Airline Cargo Management*, December, pp. 32-6.