



Brisbane West Wellcamp Airport
Perishable Goods Facility
Preliminary Feasibility Study

Report Authors and Collaborators



Australian Centre for Sustainable Business and Development

This report was prepared by members of the Australian Centre for Sustainable Business and Development (ACSBD), a research centre of the University of Southern Queensland (USQ). The ACSBD delivers independent research based on data and expert analysis. It supports an applied research program dedicated to promoting sustainable development through innovations in business and community sustainability.



Queensland Government

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Wiley & Co

This research was undertaken in collaboration with Wiley & Co. Wiley provided specifications for the facility design, developed the facility concept drawings, and provided CAPEX and OPEX estimates for the cost analysis. Wiley is a multidisciplinary technical service company offering a complete suite of services in advice, design, engineering, construction and project Delivery.



Toowoomba and Surat Basin Enterprise

Toowoomba and Surat Basin Enterprise (TSBE) collaborated on this project and provided input to the direction for the research. TSBE is an independent, business driven organisation. They are the go-to organisation that links business with opportunity to achieve sustainable growth and diversity for the region.

Acknowledgements

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Cover: Brisbane West Wellcamp Airport has the potential to become a major airfreight hub.

Executive Summary

This report comprises a preliminary feasibility study for the establishment of a perishable freight facility at Brisbane West Wellcamp Airport (BWWA). Scoping research undertaken by the University of Southern Queensland in late 2014 identified the establishment of a perishables facility as part of the BWWA development as a vital 'missing piece' if export opportunities were to be realized. A cold storage and distribution facility is essential to ensure the integrity of the fresh produce cool chain.

Air Freight Export Hub

BWWA is Australia's first privately-funded public airport and the first public airport to be built in 50 years. The 300ha airport, featuring a 2.87km runway capable of landing a Boeing 747 aircraft, is the anchor tenant of the 800ha Wellcamp Business Park situated 8.4 nautical miles west from the CBD of Toowoomba, Queensland, Australia.

Toowoomba is the second most productive agriculture region in Australia and is connected to the nearby Western Downs and Lockyer Valley agricultural zones. Consequently, the region is a natural food bowl which is expected to play an important role in supplying the growing demand from Asia for safe, fresh produce. An exceptional combination of intermodal transport and logistics infrastructure, rich agricultural soils and safe food production capacity provides Toowoomba with the potential to become a major air freight export hub with the potential to service the east coast of Australia.

Cold Storage and Distribution Facility

This project provides a design brief for a state of the art cold storage and distribution facility on the airport and develops concept plans based on this brief. The financial feasibility of the proposed facility is analysed and potential ownership and operating models are canvassed.

In an attempt to identify potential destinations for air freight services from BWWA, historical import and export data were analysed. Two-way, single destination air freight services offer the greatest potential for lower freight charges and it was therefore important to consider where imports are coming from as well as where exports are going to.

The likely demand for air freight services at BWWA was canvassed through interviews with a sample of seven major horticultural production/processing firms, four meat processors, two horticultural exporters and a leading freight forwarding company. BWWA's competitive advantage was assessed to complement the data gathered through these interviews.

Key Feasibility Study Findings

Cost Analysis

The preliminary cost analysis conducted over a range of operational scenarios indicates that the construction and operation of a CTO perishable goods facility at BWWA is financially feasible.

Based on an assumption of reaching full capacity of ten flights per week and 100% volume for both imports and exports by the fourth year of operation, the internal rate of return over a 20 year project life was 22.5% with a payback period of 7 years. All scenarios considered resulted in internal rates of return of at least 13% and payback periods of between 5 and 9 years.

Ownership and Operating Models

An owner/operator model is preferred over a lessee operated model from a governance perspective due to the strategic and operational flexibility it offers.

This model is applicable to both the CTO facility and the integrated CTO-Freight Forwarder facility. The preferred operational model for the integrated CTO-Freight Forwarder facility is a sole user facility because of the inherent complications of a multi-user operation.

Export Destinations

It would appear to be possible, based on present volumes, to capture over time sufficient in-bound and out-bound freight to underpin a dedicated freight service out of BWWA with target destinations of Singapore, Hong Kong and mainland China.

It is important to note that as the nature and quantity of high value perishable product demanded by Asia changes, so too will requirements at a logistics level.

Potential Demand for Air Freight Services at BWWA

There is support for BWWA and its potential perishable handling facility, and confidence amongst producers, processors and exporters in its evolution as an export hub. BWWA has a number of comparative advantages over Brisbane and Sydney airports.

All respondent stressed the importance of maintaining the cold chain through the system. Other key factors driving utilisation are potential destination options, the frequency of flights and the costs relative to existing options out of Brisbane and Sydney.

Discussions with the airport operators indicate that they are working closely with exporters and the logistics industry to identify and understand challenges, ensure a world class facility design and competitive use charges, and understand emerging trends in overseas demand for fresh Australian agricultural product.



Facility Design

The facility is designed to function initially as a cargo terminal operation for export ready consignments.

However, the CTO facility's modular design allows for additional storage and consolidation space to be added on the landside of the staging area if and when required.

- Facility capacity - designed to handle 100 tonnes + of perishable freight per day (initial operation);
- Design facilitates flow of goods through facility whilst maintaining strict temperature control;
- Two landside load docks receive perishable goods;
- Three temperature controlled rooms load to airside; each has individual temperature control to ensure integrity of the cool chain required for range of perishable products;
- In-bound cargo handling capacity;
- Border protection and customs facilities.

Concept Plans

Wiley & Co developed two concept plans based on the facility's key design elements:

- **Option 1:** a Cargo Terminal Operator (CTO) facility designed to receive export ready consignments of perishable goods either directly from a processor/exporter or via a freight forwarder. This design has a flight storage area capable of handling 190 tonnes of freight across three individually controlled temperature zones.
- **Option 2:** an integrated CTO-Freight Forwarding facility that has additional storage areas to allow consignment consolidation and export-build.

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Introduction

The Brisbane West Wellcamp Airport (BWWA) commenced commercial operations in November 2014 and has the potential to become a major Australian air freight hub especially for agricultural products. An essential infrastructure component of such a freight hub is a state of the art cold storage and distribution facility within the airport precinct that is capable of efficiently handling both refrigerated and dry cargo.

This study presents the findings of a preliminary evaluation of the feasibility of establishing such a facility. The objectives of the evaluation were:

- To generate a preliminary design and costing for a state of the art cross-docking facility at BWWA;
- To conduct a feasibility analysis of such a facility under a range of operational scenarios.

Methodology

Preliminary Design and Costing

University of Southern Queensland (USQ) staff engaged with representatives of Wiley & Co to develop a preliminary design and costing model for a cross-docking facility at Wellcamp airport.

Feasibility Analysis

USQ staff undertook a series of related activities that fed into the overall feasibility analysis:

1. An analysis of air freighted goods currently coming into Australia to identify potential back-loading opportunities. This analysis involved desktop research and relied heavily on relevant customs data from various sources including MariTrade and Bureau of Infrastructure, Transport and Regional Economics (BITRE).
2. Focused semi-structured interviews with major horticultural producers and meat processors in the region of the broad airport catchment.
3. An assessment of Brisbane West Wellcamp's comparative advantage
4. A preliminary financial analysis for the facility under a range of throughput scenarios.
5. A review of alternative ownership and operating options for the proposed facility at BWWA.

Bottom: Brisbane West Wellcamp Airport.



Air Freight Service Destinations

In an attempt to identify potential destinations for air freight services from BWWA, historical import and export data were analysed. Two-way, single destination air freight services offer the greatest potential for lower freight charges and it was therefore important to consider where imports are coming from as well as where exports are going to. Air freight exports out of Australia are essentially 'backloads' for air freight importers.

The preliminary review of air freight statistics examined annual import and export data from the three major Australian east coast airports – Brisbane, Sydney and Melbourne. The objectives of this review were:

1. To identify and quantify the major imports by commodity groups and country of origin.
2. To identify and quantify the major export destinations for fresh produce and meat

Examination of historical data regarding air cargo is limited in its ability to predict future demand in what is currently highly dynamic environment. Never the less, historical data is the only hard data available.

Imports

Import data for the past three years (2012-2014) indicated that four countries – USA, China, New Zealand and Hong Kong, accounted for 70% of air freighted imports through eastern Australian ports (Figure 1).

Of the 525,000 tonnes of air freighted goods imported into Australia in 2013, 55% (282,000t) entered through Sydney airport, 25% (129,000t) through Melbourne and 10% (55,000) through Brisbane. One potential reason for the relatively low volume of goods arriving through Brisbane airport is that it does not offer dedicated air freight services; all freight services into and out of Brisbane are 'under passenger'.

These data indicate that China and Hong Kong would be the most likely sources of back-loading consignments for cargo flights operating out of the BWWA.

Further analysis of the data from China and Hong Kong indicate that the major commodity groups imported were engines/machines, motors/appliances and clothing (Figures 2 & 3).

Bottom: Engines, motors, appliance and clothing are the key products arriving into Australia by air.



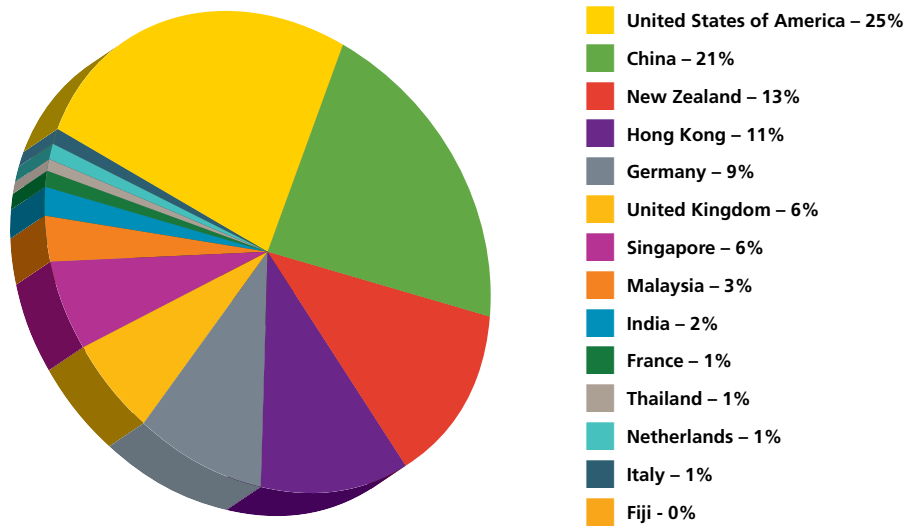


Figure 1: Air Freight Imports by Country of Origin (2013)
(Source: MariTrade)

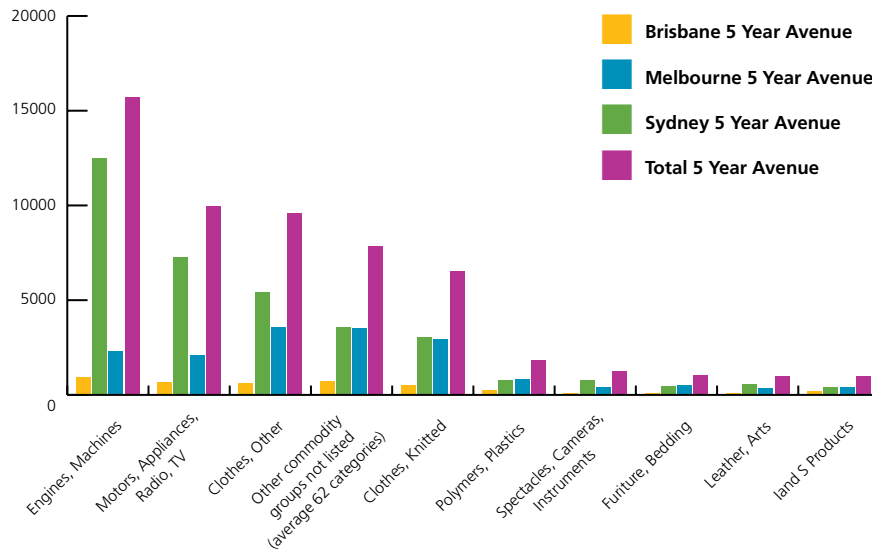


Figure 2: Top 10 Air Freight Imports from China by Commodity Groups (tonnes)
(Source: MariTrade)

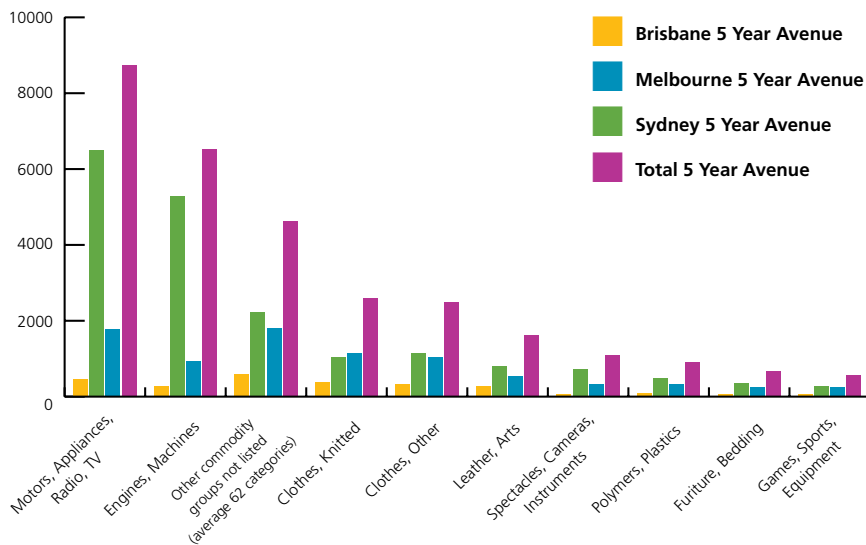


Figure 3: Top 10 Air Freight Imports from Hong Kong by Commodity Groups (tonnes)
(Source: MariTrade)

Exports

The examination of export statistics focused on data pertaining to fresh produce (fruit & vegetables) and meat products as these commodity groups had been identified as the priority products from the catchment area of BWVA (Figures 4 & 5).

These data clearly show that Singapore is the major export market for horticulture and meat products out of Brisbane airport. Export data from Sydney and Melbourne airports confirm Singapore as the major export destination for horticultural products along with Hong Kong. However Middle East destinations (UAE, Bahrain & Qatar) dominate meat and meat preparation exports from Sydney and Melbourne airports.

Bottom: Potential international inbound and outbound routes for BWVA air freight services.



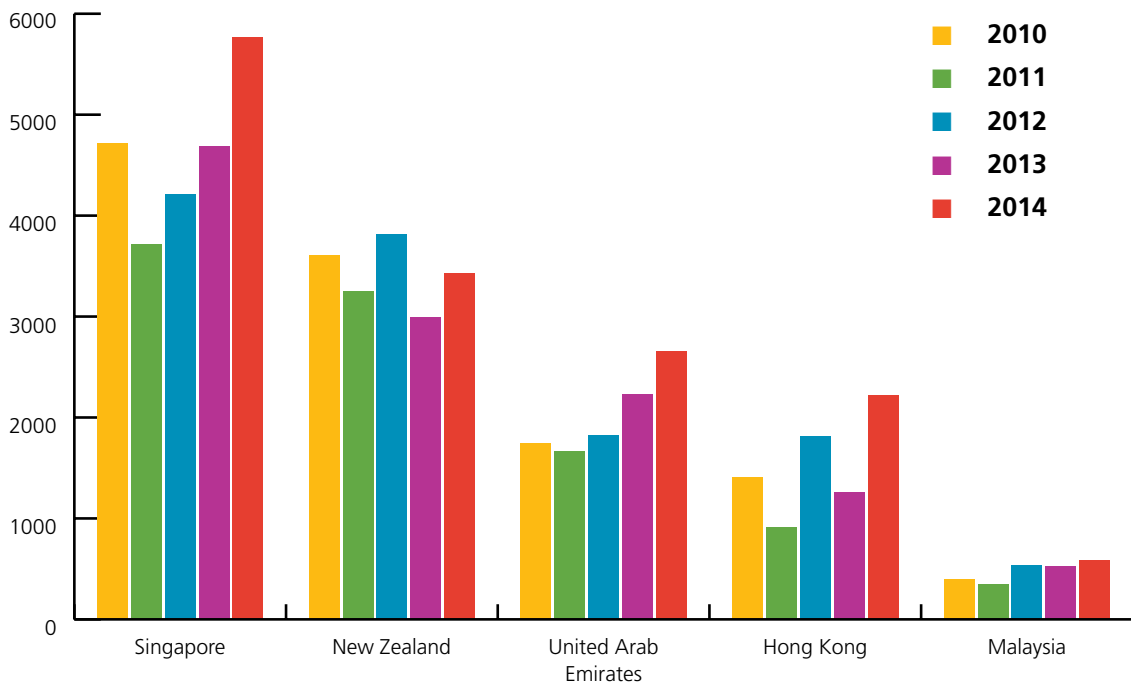


Figure 4: Fruit & Vegetable Exports (ex Brisbane) by Top 5 Destinations (tonnes)
(Source: MariTrade)

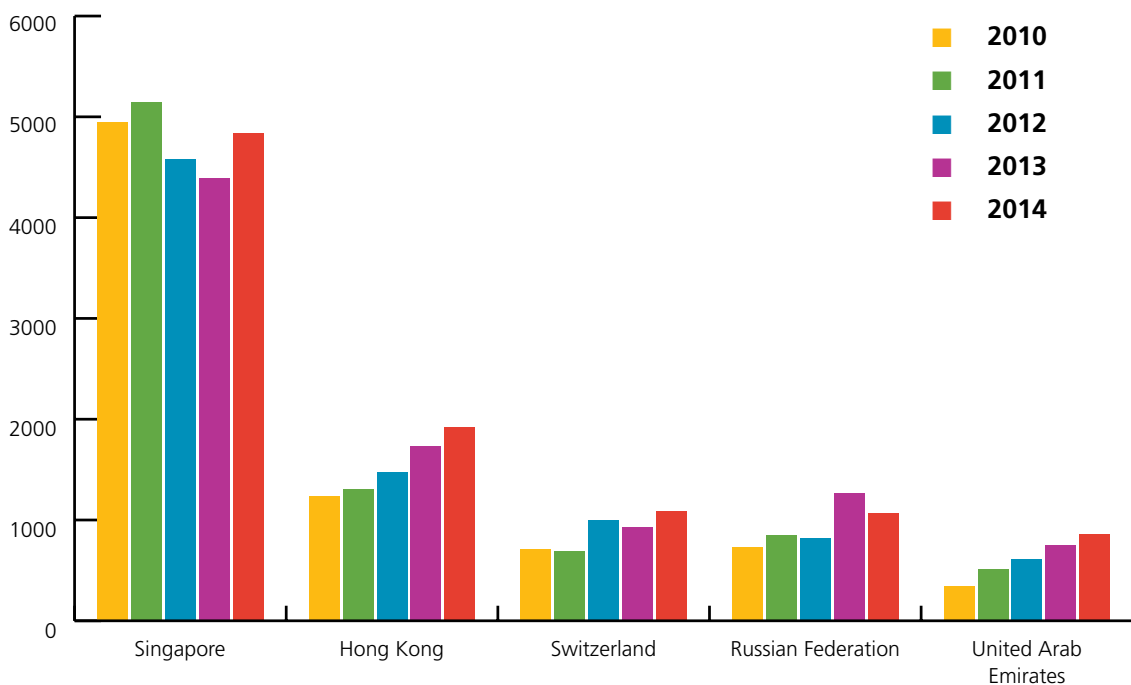


Figure 5: Meat & Meat Preparation Exports (ex Brisbane) by Top 5 Destinations (tonnes)
(Source: MariTrade)

Air Freight Services

A review of export and import statistics for the major east coast airports indicate;

1. China and Hong Kong offer the best back-loading opportunities for cargo to Asian destinations
2. Engines, motors, appliances and clothing are the major categories of products imported by air from these destinations Australia wide
3. Singapore and Hong Kong offer the best markets for air freighted horticultural products
4. The Middle East is currently the major destination for air freighted meat products
5. Approximately 7,000 tonnes of meat products are exported annually to Singapore and Hong Kong via Brisbane

Conclusion

Based on present volumes, over time, it would appear to be possible to capture sufficient in-bound and out-bound freight to underpin a dedicated freight service out of BWWA to target destinations, Singapore, Hong Kong and mainland China.



Pictured: China, Hong Kong and Singapore are seen as key destinations for southern Queensland's agricultural produce.

Demand for Air Freight Services

The likely demand for air freight services at BWWA was canvassed through interviews with a sample of major horticultural production/processing firms, meat processors, horticultural exporters and a leading freight forwarding company and an assessment of its comparative advantage.

Although it is expected that the range of perishable products that would potentially utilize the facility would be extensive, this study concentrated on its use by exporters of horticultural and beef products.

WHAT WE DID

WE INTERVIEWED HORTICULTURAL AND BEEF PRODUCERS, PROCESSORS AND EXPORTERS TO DETERMINE THEIR REQUIREMENTS FOR A PERISHABLE GOODS FACILITY.

WE UNDERTOOK AN EVALUATION OF BRISBANE WEST WELLCAMP AIRPORT'S COMPARATIVE ADVANTAGE.

Left: Asia is a growing market for Australian chilled beef in Asia. Right: There is strong demand for safe, quality fresh produce in Asia.



Horticultural Producers

Representative from seven horticultural production/processing businesses, a major freight forwarder and two leading exporters operating out of the Brisbane wholesale markets were canvassed for their views on BWWA as an export hub for horticultural products and the nature of facility required to service their needs. The purpose of these interviews was twofold – to determine their present involvement/interest in export and to ascertain what commercial conditions and facility features would encourage them to utilize BWWA as an export gateway.

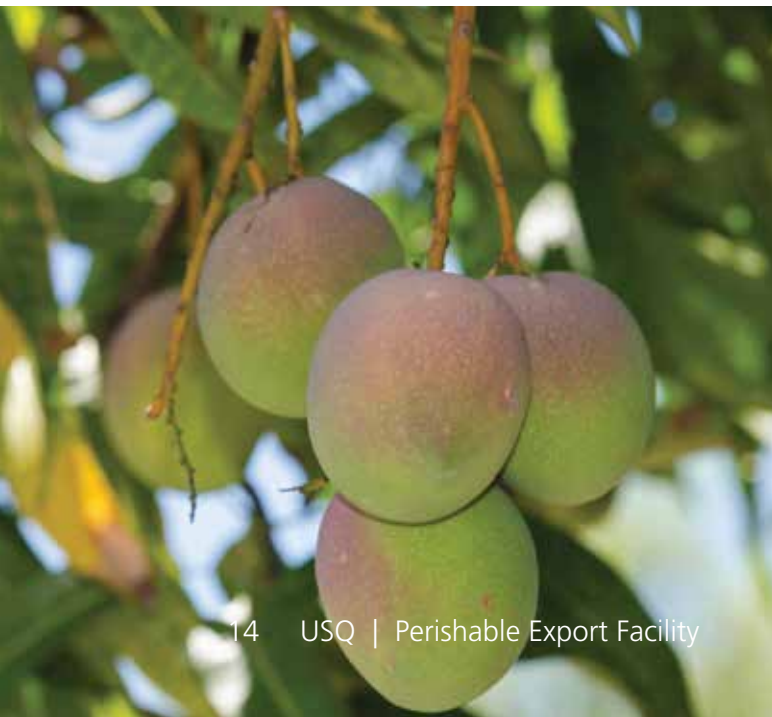
Brisbane West Wellcamp Airport as an Export Hub

In general the horticulture producers/processors and exporters were supportive of the BWWA development and expressed confidence in its evolution as an export hub for horticultural products both fresh and minimally processed.

The major points raised were:

- There is a strong demand for safe, quality fresh produce in Asia;
- Major Asian export destinations were Singapore and Hong Kong;
- Outside of these markets, export regulations and phytosanitary protocols made export of fresh produce more difficult;
- The existing services out of Brisbane were meeting their needs in terms of frequency of flights, destination options and available space;
- Major vegetables exported were broccoli, celery, carrots and bagged salads
- Major fruits exported were mangoes, melons, berries and some citrus;
- Preference was to ship product on air pallets;
- All utilized the services of a freight forwarder; CT Freight dominates the market out of Brisbane;
- Freight costs ranged between \$0.40 & \$0.60/kg for vegetables and \$1/kg for fruit;
- Freighter rates of \$1.50-\$2.00/kg were considered to be too high for them to be competitive;
- Given a regular dedicated freighter service, there was interest in exploring market opportunities associated with the destination ports;
- There are no protocols that allow the majority of fresh vegetables, including bagged products, to be exported from Australia to China;
- There are strict phytosanitary protocols governing the entry of Australian fruit to the Chinese market.

Left: Mangoes are a major Australian horticultural export. Right: Broccoli, celery, carrots and bagged salads are major Australian vegetable exports.



The freight forwarder contacted was of the opinion that an export freight hub out of BWWA would be difficult to establish and sustain without the development of passenger services. Several reasons were given for this opinion:

- The high freight rates associated with freighters;
- The competition from established carriers operating out of east coast airports;
- The higher cost (capital and operational) of freight service providers who don't have economies of scale;
- The lack of a high value manufacturer in the catchment area that could complement perishable product exports and raw material/component imports;
- Difficulty in recruiting staff with the skills required to operate such a facility efficiently.

It should be noted that the freight forwarder may have perceived international cargo operations at Brisbane West Wellcamp Airport as being in direct competition to their own business.

The freight forwarder acknowledged that the operators of BWWA did have an opportunity to offer potential clients incentives in terms of landing fees, container terminal operator fees and potentially quicker clearance times for both passengers and freight.

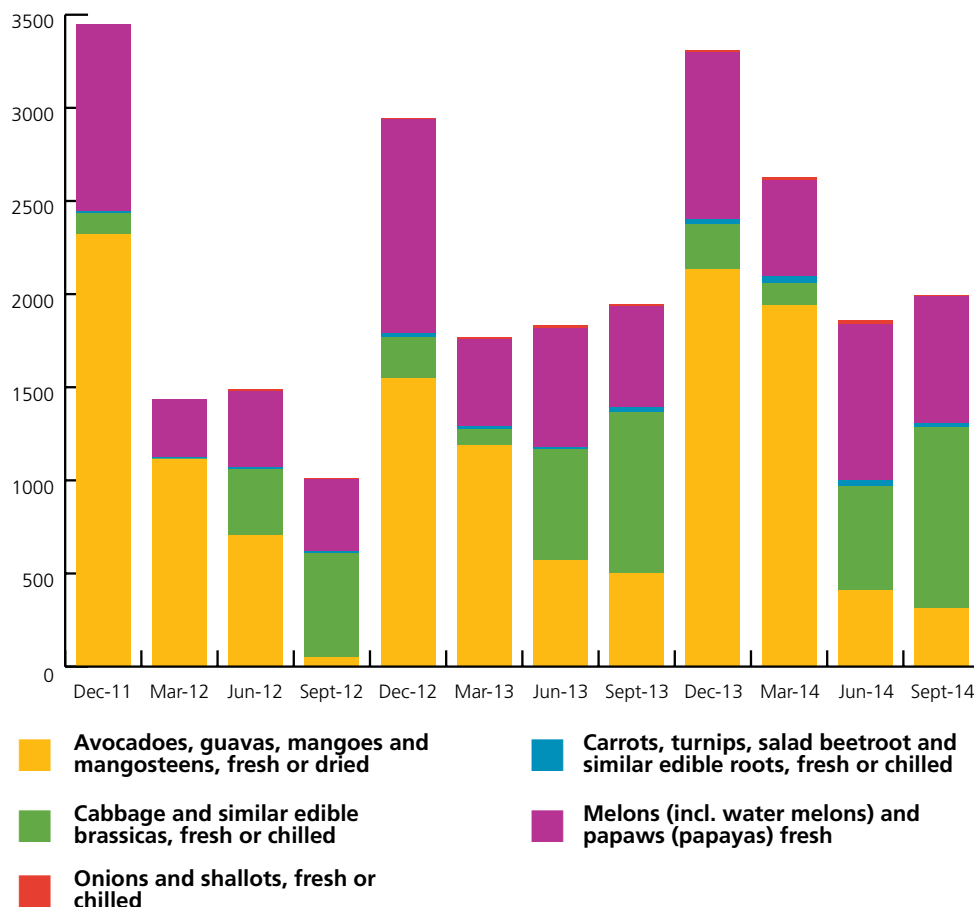


Figure 6: Quarterly Horticulture Exports, ex Brisbane (tonnes)
 (Source: Bureau of Infrastructure, Transport and Regional Economics)

Meat Processors

Representatives from five meat processing businesses in the region were interviewed. The purpose was to determine what commercial conditions would encourage them to utilize BWWA as an export gateway over existing airports and to gauge their preferences for export destinations.

Brisbane West Wellcamp Airport as an Export Hub

The meat processors agreed with their fresh produce counterparts that the BWWA facility was an important regional infrastructure development that could offer future export opportunities for their firms.

The major points made by the meat processors were:

- There was a growing market for Australian beef in both Asia and the Middle East;
- Currently the majority of product being exported was frozen or chilled product which was transported by sea;
- Small volumes of chilled beef are being airfreighted usually to meet urgent shortfalls or customer contract conditions, or to test new markets;
- They were satisfied with the existing air freight services out of Brisbane in terms of availability of space, frequency of flights and range of destinations;
- The differential in freight rates for sea and air transport could inhibit the expansion of air freight;
- High value cuts or shelf-ready packaged products could carry the additional air freight costs but there are issues associated with the availability of supply and the sale of less valuable cuts. To build volumes of high value cuts there would have to be a degree of cooperation between processors and third party coordination of load consolidation;
- There may be potential opportunities for portion controlled retail shelf ready products. Two beef processing plants were in the process of expanding their plants to be able to provide this value added product line;
- Given a regular dedicated freighter service, there was interest in exploring market opportunities associated with the destination ports;
- Australian meat processors must be licensed by the Chinese government to export fresh, chilled or frozen beef to China.

Left: Beef processing plants are diversifying into portion control chilled beef (image courtesy Wiley). Right: Currently most beef exports are transported by sea.



Export Horticulture: Nature of the Perishable Facility

The major points identified in the interviews centred round the extent of service required and the costs associated with providing the service. The overwhelming priority was the maintenance of the cool chain.

The minimal requirements for the facility were:

- A roll-on, roll-off cross docking system;
- Two temperature and humidity controlled rooms – one set at 0-4°C and the other at 10-14°C.

If loads were to be consolidated in the facility then this space should be air-conditioned and provision made for border agency inspection facilities.

Export Beef: Nature of the Perishable Facility

To accommodate frozen and chilled beef products there would have to be two temperature controlled areas set at -20°C and $\leq 40^{\circ}\text{C}$ respectively.

Given the likely need to accumulate consignments from different processors and to provide a buffer for unexpected delays or errors, these temperature controlled areas would need to be large enough to hold substantially more than a single plane load.

Provision also needs to be made for border protection and Customs inspection facilities.

Left: Two temperature controlled areas set at -20°C and $\geq 4^{\circ}\text{C}$. Right: Temperature controlled areas need to hold more than 100 tonnes at any one time.



Brisbane West Wellcamp Airport (BWWA) Comparative Advantage

There are a number of comparative advantages that BWWA has over Brisbane and Sydney airports and these are:

Dedicated air cargo services

BWWA intends to offer dedicated air freight services to a range of export destinations. Brisbane airport does not currently offer dedicated air cargo services. All freight services into and out of Brisbane are 'under passenger'. This limits the amount of fresh produce that can be exported on each flight.

Airspace availability

There is little demand on airspace at BWWA and aircraft can get in and out easily. Australia's other international airports are generally located within capital cities and some are restricted by curfews. Ability to handle additional flights as demand grows is impacted by airspace capacity.

Greenfield site

As a "greenfield" site, Wellcamp has been designed and built for the future. The site has incorporated an industrial park as well as being located near to other industrial parks that are currently under development and also an intermodal rail and road hub that is being developed within 12 km of the airport. The airport is not hampered by being built in a residential or potential residential area, but has been built in an industrial and agricultural area where population expansion will not place pressure on future development.

Capacity to expand

Capacity of both Brisbane and Sydney airports are reaching or near capacity. Brisbane airport is building a second runway for completion sometime around 2025 and it is being driven by tourism growth into Queensland. A second airport is slated for Sydney at Badgerys Creek, this location already has encroaching residential areas and is still within the restrictive Sydney basin that has limited land for expansion. BWWA does not have the limitation of a geographic basin and has been built for the future and the anticipated capacity that will be required.

Bottom: BWWA intends to offer dedicated air freight services to a range of export destinations.



Location

The geographic location of BWWA has been built with a focus on industry efficiency and development. With the current energy resource development and growth in Queensland and particularly in the Surat Basin, BWWA will allow more efficient access to air freight services for maintenance supplies, spare parts and specialised equipment coming in from overseas. The location of the airport at Wellcamp will lower the cycle time for time critical parts as the transport leg does not have to move through metropolitan Sydney or Brisbane in the first instance. The Wellcamp location has the ability to access major road transport infrastructure so freight can move north, east, west or south with relative ease. This will have the additional advantage of removing freight off some of the more congested highways such as the Bruce, Pacific and Hume highways.

Infrastructure

Current and future planned infrastructure development around the Toowoomba Region will be enhanced by the BWWA facilities, these include the second Toowoomba Range crossing, second rail corridor from Toowoomba to Brisbane and the inland rail corridor. These infrastructure developments and BWWA will have a number of synergies that will help move the current freight task off currently congested highway systems. Sydney and Brisbane via their geographic location are not able to facilitate the reduction of freight transport on the Bruce, Newell or Hume highways; indeed as they expand they will only increase the level of usage and congestion.

Enterprise hub

BWVA forms part of the Toowoomba Enterprise Hub, a significant transport, logistics and business hub with major stakeholders including Witmack Industry Park, Interlink SQ and Wellcamp Business Park. It provides a strategic location for the development of co-dependant and new businesses in the Toowoomba Region. There is comparatively cheaper land available for businesses to develop new facilities, a large local population (Toowoomba city having +160000 people) for labour, developing freight corridors and an international airport for export and import activities.

Left: BWVA forms part of the Toowoomba Enterprise Hub, strategically located in southern Qld. Right: Located 15 minutes from Toowoomba, one of Australia's hotspots for investment and industry.



Demand for Air Freight Services

The likely demand for air freight services at BWWA and facility requirements were canvassed through interviews with potential users of a perishables facility.

All interviewees stressed the importance of maintaining the cold chain through the system. Given the diverse product range passing through the facility there would need to be at least three independently temperature controlled rooms in addition to the necessary customs and quarantine facilities.

Other key factors driving utilisation are potential freight routes and destinations, frequency of flights and costs relative to existing options out of Brisbane and Sydney.

Discussions with BWWA operators indicate that they are working closely with exporters and the logistics industry to identify and understand challenges, ensure a world class facility design and competitive use charges, and understand emerging trends in overseas demand for fresh Australian agricultural product.

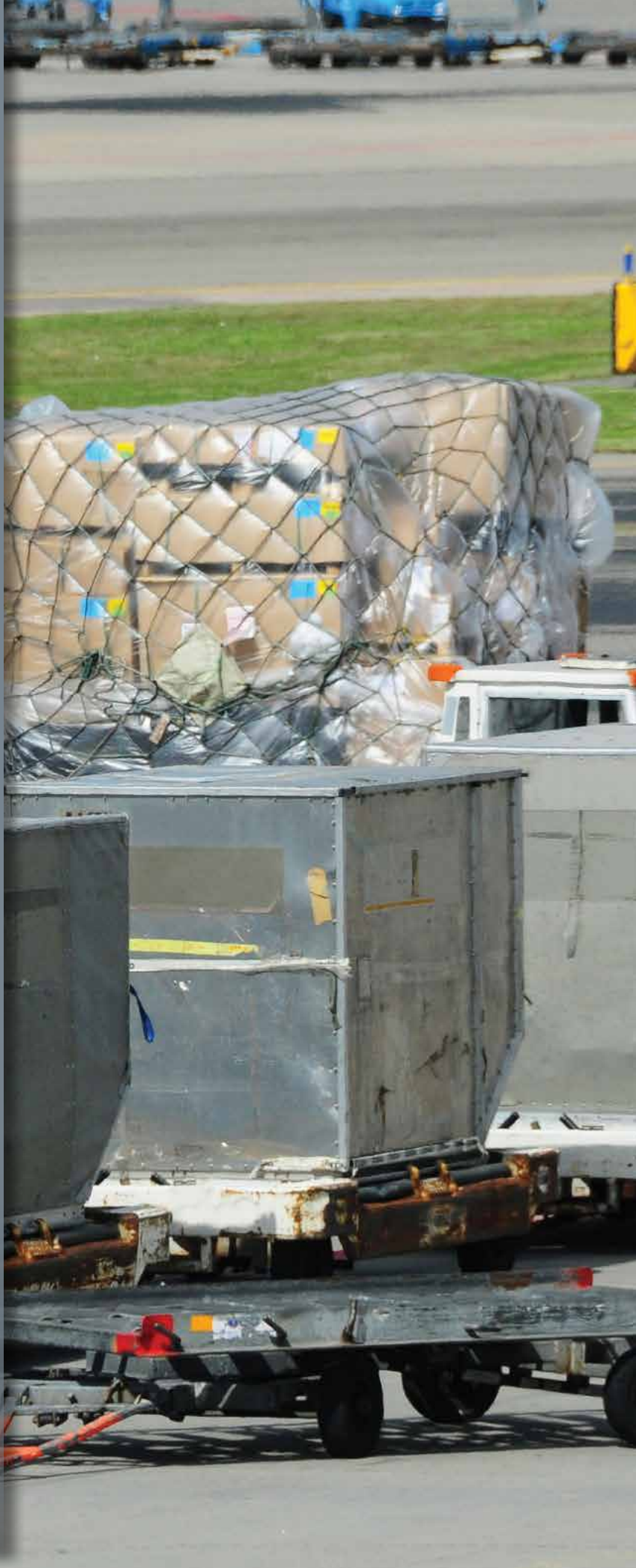
This task will be facilitated when:

- Certainty around the airport's ability to handle international aircraft can be provided;
- Definite destination(s) for dedicated freight flights are announced which will enable potential exporters to evaluate market opportunities;
- Air freight costs to these destinations are available;
- The services available at the perishable facility are known;
- The costs of these services are available

Conclusion

There is support for BWWA and its potential perishable handling facility, and confidence amongst producers, processors and exporters in its evolution as an export hub.

BWWA has a number of comparative advantages over Brisbane and Sydney airports; potential for dedicated air freight services, airspace capacity, greenfield site, unrivalled expansion capacity and its location within a business and intermodal logistics hub providing air, road and proposed east coast rail connectivity.



Perishable Facility Design

Design Brief

Based on preliminary discussions with John Wagner, Chairman of Wagner Global Services, a site visit to the Menzies Aviation facility at Brisbane airport and the data collected from industry interviews, a design brief for the perishables facility at BWVA was developed in collaboration with representatives from Wiley & Co.

Best practice operational and management features

The design has been developed to include a number of operational and management features that will provide a “best practice” operation. Key design area should include:

- Biosecurity management;
- Cold chain management;
- Hygiene and food safety;
- Energy Efficiency;
- Minimisation of OH&S risk;
- Minimisation of Labour;
- Transport security.

Best practice food handling and processing facility features

Construction materials and features should comply with industry “best practice” for food handling and processing facilities. It is important to identify and comply with any prospective target market’s importing requirement.

Key features should include:

- Concrete structural and wearing slabs;
- Non-slip epoxy resin hi-build floor sealants;
- Galvanised structural steel frame;
- In-ground or under slab HDPE drainage;
- Colourbond roofing and weather fascias;
- Impervious Insulated panel ceilings and walls;
- Low energy lighting up to 600 lux;
- Hot Dipped Galvanised or powder coated pallet and materials conveying systems;
- Hygienic, Stainless steel pipe, metalwork, fittings and equipment throughout.

The facility should be designed to meet Department of Agriculture border protection, Queensland Department of Environment and Heritage Protection, Australian Customs, Toowoomba Regional Council and the relevant Queensland and Australian standards.

Capacity

It is envisaged that the facility will be designed initially to handle and ship up to 100 tonnes of chilled fresh produce in a single flight. A dedicated air freighter with this payload would equate to Boeing 747-400F or 777F utilising both main and below deck cargo areas. The plant should be designed with a future focus and be configured to allow expansion and growth. The facility has been configured to allow for a frequency of flights ranging from 1 per week initially to potentially 10 flights per week.

Manning

The manning for the facility is not expected to be significant. There would need to be a base team that was available for the receipt of products and the subsequent processing and configuring of loads prior to shipping.

On the arrival of a freighter, there would need to be a short term increase in manning to allow for the fast and efficient transfer of goods from the facility, onto the airside transfer equipment and for loading onto the plane.

Water and waste water

It is expected that the total water usage of the plant will be minimal. The largest requirement will be for the administration and amenities functions as well as the periodic wash-down of the rooms. It is not anticipated that there will be any significant water using process within the facility. The total requirement is negligible for this study.

Solid waste management

The major solid waste streams expected to be generated are minimal and will generally consist of the following,

- Disposable Personal Protective Equipment (PPE) and packaging material; and,
- General waste including office and canteen wastes.

For the perishable goods facility to gain Quarantine Approved Premises status provision must be made for the storage and disposal of bio-waste.

Energy usage

The total peak energy requirement for refrigeration, ventilation, equipment for process, lighting, administration and electric forklift trucks is estimated to approaching 350 kW for Concept 1 and 400 kW for Concept 2.

Facility Layout

Wiley & Co developed two concept drawings based on the design brief. Initial sketches of the concept plans were discussed with the operators of BWWA before the final concept plans were developed.

Preliminary layouts of the facility have been developed for two separate concepts. The first (Concept 1, refer drawing No SK01-3) is configured to minimise the scope of the facility in the early phases of the operations. The second (Concept 2, refer drawing SK02-3) is configured to provide a facility with the same features as Concept 1 but includes additional capability for freight forwarding services to be provided along with short-term storage of goods.

The two concepts, if required, also provide for future expansion and business growth. It will be feasible to start with the Concept 1 layout and extend later to achieve the concept 2 layout. The inclusion of “expansion capability” should be a key design consideration to enable the development of the facility as demand increases.

Concept 1 – Cargo Terminal Operator (CTO) Perishable Goods facility

Concept 1 has been suggested with the intention to provide compliance to “best practice” cold chain management and utilise efficient materials handling technologies to receive, schedule and prepare goods as cost effectively as possible. This concept assumes that there will not be any build up or break down of air freight pallets or ULD’s within the facility whereby all products will be packed and sealed for export to border protection requirements by the manufacturer or some third party service provider (e.g. freight forwarder).

The flight storage area has a capacity to hold 190 tonnes of freight and the individually controlled temperature zones are capable of storing both AKEs (containers) and PMCs (pallets).

Concept 2 – Integrated CTO-Freight Forwarding facility

Concept 2 provides all the capability of concept 1 with additional features to allow the receipt of standard palletised goods, their short term storage and the building of airfreight pallets and ULD’s for export.

Concept Plan 1

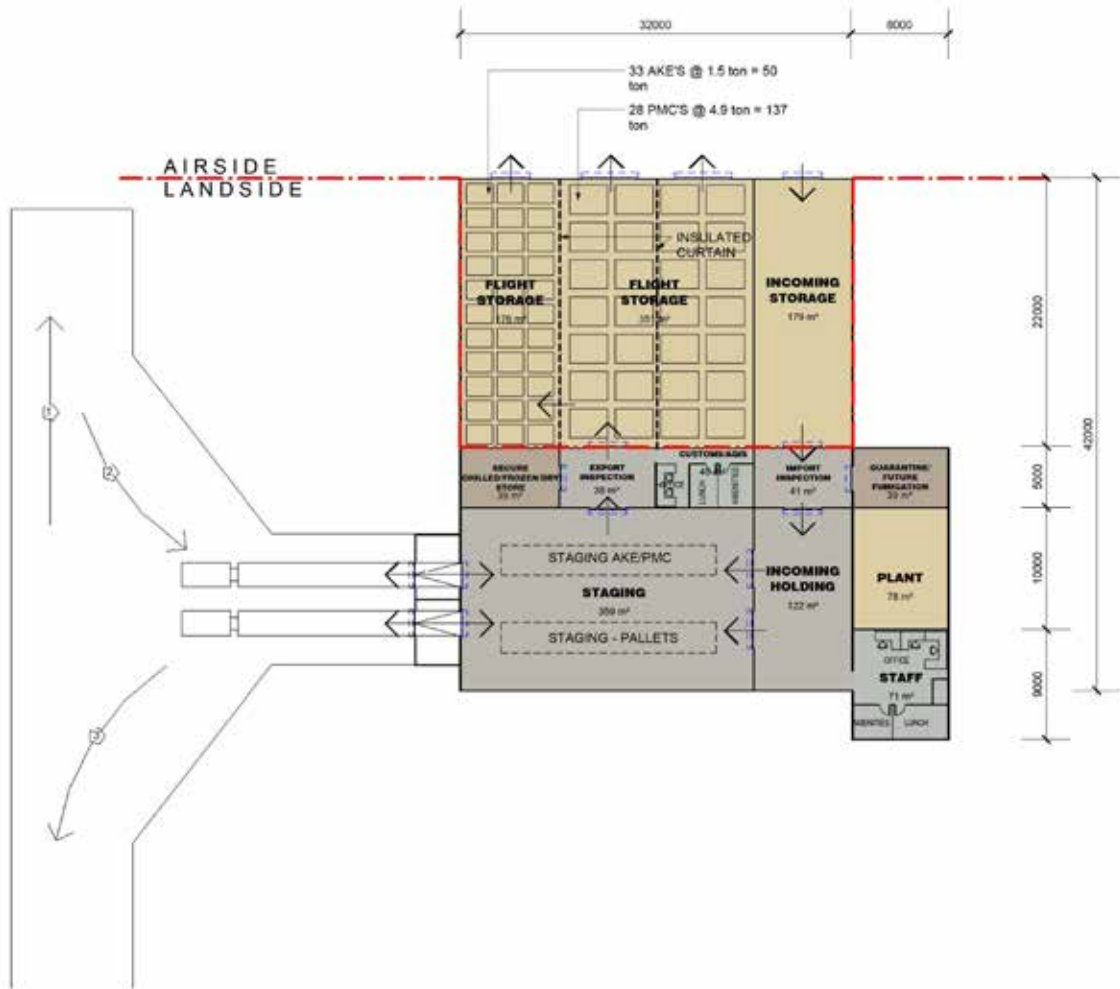
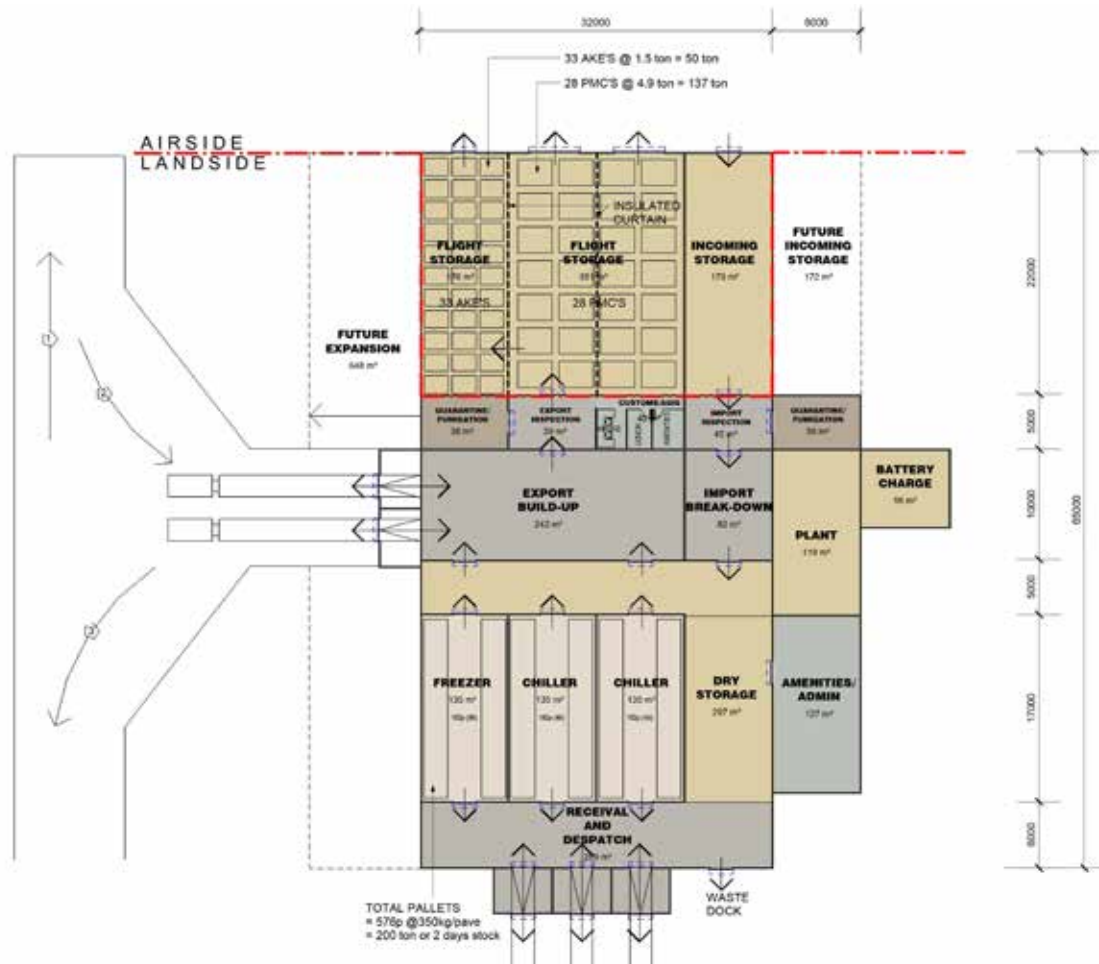


Figure 7: Concept Plan 1 – CTO Facility (SKO 1-3)
(Source; Wiley & Co)

Figure 7 illustrates the concept plan for a Cargo Terminal Operator (CTO) perishable goods facility at BWWA.

Concept Plan 2



Perishable Goods Facility

Figure 8: Concept Plan 2 – Integrated CTO-Freight Forwarding Facility (SKO 2-3)
(Source; Wiley & Co)

Figure 8 illustrates the concept plan for an integrated CTO-Freight Forwarding facility.

Facility Specifications

Concept 1 includes the following key production areas and features:

- 2 x load docks for receipt of pre packed air pallets and ULD's;
- Central receipt area for staging prior to customs/export inspection and clearance;
- Border protection/customs areas for secure holding of documentation and staff facilities;
- Export inspection room for the inspecting, checking, weighing, labelling, temperature recording of pallets and products as required for export clearance;
- Air pallet roller and materials handling systems throughout to provide efficient and safe movement of the prepacked air pallets and ULD's;
- 3 x load outs to airside for transfer of pallets and ULD's to the airside pallet transport systems and dolly trains;
- 3 x refrigerated rooms for holding pallets and ULD's prior to shipping. These rooms would be configured with the pallet roller systems to allow the scheduling of pallets in the correct order by the loadmaster to achieve the optimum configuration of available space and weight distribution within the freighters. It is important to correctly schedule and arrange the load at this stage to minimise the time of products on the tarmac and maintain quick turnaround times for the aircraft;
- Each room is individually controlled for temperature to ensure the correct temperature is maintained for the products it holds;
- Insulated curtain separating each room to allow flexibility in configuration;
- Amenities to suit employees (4 in total);
- All refrigerated and humidity controlled rooms will be configured to operate between 0 – 14° C depending on application/product;
- Maintenance workshop/engineering stores to be incorporated in plant room;
- Maintenance will be outsourced to routine and on call contractors;

Concept 2 provides these additional features:

- 3 x load in/out docks for receipt of goods packed on standard (chep type) pallets;
- 3 x chilled + 1 x frozen store for short term storage and load accumulation prior to packing for export;
- Central corridor and building access to allow forklift movement of goods into the air freight build and break areas;
- Space for fumigation of goods in/out as required for customs clearance purposes;
- Additional amenities.

Cost Analysis

Preliminary cost analysis is based on Concept 1 – the CTO facility as this is the basic infrastructure requirement for BWWA to operate as perishable goods freight facility. The estimated operating costs of the perishable goods facility includes labour, insurance, repairs and maintenance, and lease of land.

The Perishable Goods Facility is projected to have a 20 year project life.

The estimated capital expenditure for the Perishable Goods Facility is estimated to be \$11.75 million which includes construction costs, external pavements, plant and equipment.

The preliminary cost analysis conducted over a range of throughput scenarios indicates that the construction and operation of a CTO perishable goods facility at BWWA is financially feasible.

Air Freight Scenarios

PESSIMISTIC

Year 1 – based on 1 flight/week.

Reaching full capacity of 10 flights/week by Year 10.

LIKELY

Year 1 – based on 1 flight/week.

Reaching full capacity of 10 flights/week by Year 4.

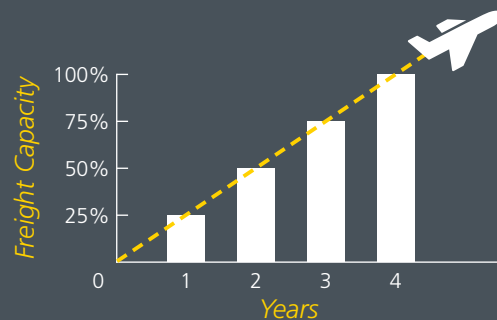
OPTIMISTIC

Year 1 – based on 3 flights/week.

Reaching full capacity of 10 flights/week by Year 3.

Calculating factors:

- Average freight volume per flight = 100 tonnes
- Out-Bound Revenue = \$68 per tonne
- In-Bound Revenue = \$61 per tonne



In-Bound Freight Volume per flight

PESSIMISTIC

Internal rate of return 13.3%, payback in 9 years.

LIKELY

Internal rate of return 22.5%, payback in 7 years.

OPTIMISTIC

Internal rate of return 32.8%, payback in 6 years.



Ownership and Operating Options

A range of potential ownership and operating models exist. These include owner/operator, external investment and leasing arrangements.

Owner/Operator

The owner/operator model offers complete control of the facility to the owners of BWWA. There appear to be two obvious advantages of this model:

- The operator has maximum flexibility in the packaging of services that can be offered to potential clients;
- The operator can gain operational efficiencies by the sharing of administrative and some labour costs across the multiple operations of the airport.

The major disadvantages of the model are:

- The operator bears the full capital and operating risks of the facility. This disadvantage is reduced if an external investor is involved;
- The operator has to develop the skills and implement the systems required to manage a CTO facility.

Leasing

The leasing of on-airport facilities is a common option for freight facilities. For example, the Menzies Aviation CTO facility at Brisbane airport is leased from the Brisbane Airport Corporation.

The major advantages of this option are:

- The capital costs are offset by the lease payments;
- There are no operational costs to the owners;
- The lessee would have the necessary skills and systems to operate the facility.

The major disadvantage for the owner is the loss of flexibility.

Bottom: Owner-operator model has most appeal due to strategic and operational flexibility.



Governance and Operations Conditions

The initial concept for a perishable goods facility presented in Concept Plan 1 assumes that it will operate as a Cargo Terminal Operator (CTO) facility and that consignment consolidation will be done off-airport by exporters themselves or through the use of specialist services offered by freight forwarders. In the latter case, this would provide an opportunity for one or more freight forwarders to establish operations off-airport in the Wellcamp area.

If an integrated Cargo Terminal Operator (CTO) Freight Forwarding facility was to be built as presented in Concept Plan 2 then the governance and operations conditions may become more complicated.

Concept Plan 2 makes provision for the operator of the facility to provide two different service options to potential customers;

- A stand-alone CTO service;
- An integrated CTO-Freight Forwarding service.

Complications arise in the areas of governance and operations if the freight forwarding section of the perishable goods facility was to cater for multiple users. This was the model canvassed by the Brisbane Airport Authority in the mid 1990's under its 'Freshport' proposal.

While a multiple user freight forwarding facility may offer efficiencies in equipment and operational costs, these potential efficiencies would be offset by competition for resources at peak times as well as client confidentiality and accountability issues.

The owner/operator model from a governance perspective has the most appeal because it offers strategic and operational flexibility. This model is applicable to both the CTO facility and the integrated CTO-Freight Forwarder facility.

The preferred operational model for integrated CTO-Freight Forwarder facility is a sole user facility because of the inherent complications associated with a multi user operation.

Bottom: Preferred operational model is a sole-user CTO facility.



Study Conclusions

- Key export destinations for fresh Australian produce include Singapore, Middle East, Hong Kong and China.
- There is sufficient in-bound freight from China and Hong Kong to suggest that back-loading of freighters servicing BWVA is possible;
- There is interest from major meat processors and horticultural producers/exporters in the proposed establishment of a perishable goods facility at BWVA;
- The utilisation of this facility will depend upon the potential destination options, the frequency of flights and the costs relative to existing options out of Brisbane and Sydney;
- BWVA offers several comparative advantages over Brisbane and Sydney airports including proposed dedicated freighter services, airspace capacity, greenfield site, infrastructure connectivity and location;
- The perishables facility will initially have CTO capability and will be designed to maintain the integrity of the cold chain for a range of perishable goods;
- The design has the capacity to handle 747-400 or 777 freighters and up to 10 flights per week. The modular design allows for expansion through the addition of storage and consolidation spaces;
- Based on a preliminary financial analysis, under a range of operational scenarios, a CTO perishable goods facility at BWVA is financially feasible;
- The preferred ownership and operational model for such a CTO facility is an owner/operator model because of its strategic and operational flexibility especially in the initial stage of development.

Pictured: Maintaining the cold chain is critical to delivering fresh, safe produce to Asian supermarkets.



Ongoing Research

Research that will assist farmers and food processors to develop value added products for export is continuing. The Australian Centre for Sustainable Business and Development at the University of Southern Queensland has an ongoing commitment to facilitating the transformation of Queensland's agricultural value chains including the ability for BWVA to become a major air freight export hub with the potential to service the east coast of Australia. Current research includes an investigation of air freight charges and cool chain quality, and providing summary information on protocols related to the export of fresh produce to a range of destinations.



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