Chapter 2
Air Cargo Trends and Overview

INTRODUCTION

This chapter provides an overview of the U.S. air cargo industry, air cargo carriers and airports. This chapter also provides a brief overview of the services, carriers and airports utilized in today's air cargo industry. Air cargo trends specifically related to airports in the State of Florida are also presented. The following specific topics are discussed:

- Air Cargo Industry Overview
- Air Cargo Trends
- Florida Air Cargo Trends

AIR CARGO INDUSTRY OVERVIEW

Air Cargo Carriers

Air cargo services are provided by a segmented group of air carriers that provide differing services based upon wide ranging customer demands. The following four basic types of carriers provide these services:

- Integrated express operators
- All-cargo carriers
- Commercial service passenger airlines
- Ad-hoc cargo charter carriers

Integrated express operators (FedEx, UPS, DHL) operate a fleet of scheduled aircraft, trucks, and couriers offering door-to-door delivery service. These carriers operate extensive hub-and-spoke networks providing expansive geographic coverage. In 2003, integrated express carriers accounted for 61 percent of the U.S. domestic air cargo market, yet held only 12 percent of the international market (projected to increase to 31 percent by 2019).[1]

All-cargo carriers (Atlas Air Cargo, Gemini) generally operate scheduled widebody aircraft from one major airport to another, such as Chicago to Tokyo and are highly reliant on the air freight forwarding industry. Approximately 10 to 15 percent of world air cargo traffic is moved by all-cargo carriers, primarily on long-haul international or trans-continental routes. Due to their airport-to-airport service structure, all-cargo carriers are typically concentrated in large, high volume market airports; geographic coverage is limited. In 2003, scheduled all-cargo operators accounted for 19 percent of the U.S. domestic market.[2]

Commercial service passenger airlines (United, Delta, US Airways) are scheduled passenger airline operators. Space in the bellies of these aircraft is generally available

[1] Boeing World Air Cargo Forecast, 2004/2005.
2 Ibid.

to move cargo airport-to-airport. Commercial air carriers account for the majority of international air cargo lift, yet provide limited domestic lift. It is estimated that 50 percent of U.S. international air cargo traffic is moved in the bellies of passenger aircraft. However, within the U.S. domestic market, commercial carriers account for only 15 to 20 percent of the domestic air cargo – a market dominated by the integrated express carriers. The air cargo market share of commercial passengers carriers, particularly on domestic routes, has declined significantly due to security measures and restrictions brought about by the September 11 terrorist attacks. Pre-September 11, it was estimated that commercial passenger carriers accounted for 25 percent of the domestic air cargo market.

Ad-hoc cargo charter carriers (Grand Aire, Volga-Dnepr) are unscheduled air charter operators who move goods from airport-to-airport. The market share of these operators is minimal, difficult to gauge and often lumped together with the all-cargo carriers. Sporadic and unscheduled operations make tracking tonnage difficult; best estimates put ad-hoc cargo operator market share at 5 percent domestically and 2 to 3 percent internationally.

Air Cargo Services

The four types of air cargo carriers discussed in the previous section provide the following three primary types of air cargo service options:

- Integrated express service
- Freight forwarding
- Airport-to-airport

Integrated express carriers move the customer's material door-to-door, providing shipment pickup, transport via air or truck, and delivery. Integrated express operators include FedEx, UPS, newly merged DHL/Airborne Express, and to a certain extent U.S. Postal Service (USPS). Express companies provide next day, document, and small package (two to 70 pounds) services to the customers they serve. Increasingly, however, express operators are transporting "heavy" freight, identified as more than 70 pounds. Burlington Air Express (BAX) is an integrator that specializes as an express "heavy freight" carrier. In addition to "overnight" service, express carriers now offer deferred service or second-day and third-day "time-definite" service, changing the dynamics of the air cargo industry significantly. Deferred service is predicted to surpass the overnight (express) delivery of letters, documents, and packages. In addition, the wider use of facsimiles and e-mail has cut into the overnight letter and document delivery market, and is anticipated to continue doing so. The lower cost deferred delivery does not mean uncertain delivery; most is "time-definite," meaning guaranteed delivery at a specific time on a certain date. This service is increasingly used to move freight over 70 pounds.

Integrated express carriers operate using a hub-and-spoke system similar to the passenger airline system. The hub is the backbone to the integrated express carrier since it provides connections to each market in the integrator's system. Each day of operation, flights from around the U.S. arrive at the hub where packages are offloaded, sorted in the hub to the appropriate destination market, and then reloaded onto the aircraft.

Traditional integrated express service focuses on the small-volume, infrequent shipper or higher volume shippers moving product to multiple destinations. This market can be termed the "retail" air cargo market; this market includes individual, private and business-to-consumer (B-to-C) shippers. However, integrated express carriers are well established in the "wholesale" market, catering to larger freight movements demanded by manufacturing and distribution operations. This traditional freight forwarder and all-cargo-carrier market includes corporate, block-space (guaranteed capacity shippers) and business-to-business (B-to-B) customers.

Freight forwarding companies act as brokers between the shipper and the carrier (all-cargo, commercial passenger or ad-hoc charter). The forwarder handles wide-ranging types and sizes of freight, from small packages to be consolidated into container loads, to oversized, one-time freight movements. These loads are then tendered to an air cargo carrier or commercial carrier to deliver to the forwarder's agent or subsidiary at another airport. Serving a dual role, the air freight forwarder is, to the shipper, an indirect carrier. It's classified as such because the forwarder receives freight from the shipper under the forwarders' own tariff, usually consolidating it into larger units that are then tendered to the airlines. From the perspective of the all-cargo carriers (e.g. Polar Air Cargo) and commercial carriers (e.g. United Airlines), the freight forwarder is the shipper.

In addition to using third-party service providers to move freight from airport to airport (commercial carriers and all-cargo airlines), freight forwarders also often rely on third-party less-than-truck load (LTL) motor carriers to move consignment to and from the airport. Their market areas are defined by individual customers rather than large population or industrial centers. The forwarder's customer tends to be large-volume, high frequency shippers with demand driven by either manufacturing facilities or centralized distribution operations.

Airport-to-airport service is provided by all-cargo, ad-hoc charter and commercial passenger carriers. Freight must be dropped off at the airport by the shipper, or the shipper's freight forwarder, and must be picked up at the destination airport by the customer, or the customer's freight forwarder.

All-cargo carriers operate airport-to-airport air cargo services for their customers, but do not offer passenger service. All-cargo air carriers include Polar Air Cargo, Kitty Hawk and Northern Air Cargo, to name a few. All-cargo carriers offer scheduled service to major markets throughout the world using widebody and/or containerized cargo aircraft.

Commercial airlines provide air cargo services, but these services tend to vary in scope and size from airline to airline. Industry-wide, five to 16 percent of passenger airline revenue comes from cargo. An airline's aircraft fleet is a significant factor in determining the size and amount of cargo the airline can fly. A regional airline with a fleet of turboprop and regional jets cannot accommodate large, bulky shipments. Airlines operating widebody aircraft, such as the B747, B777, and A300, have containerized lower decks (which allow speed in loading and offloading) and generally are capable of handling large, bulky shipments.

Air Mail Overview

Another primary user of air cargo lift is the U.S. Postal Service (USPS). The USPS has the difficult task of transporting mail in a timely and efficient manner and doing so within budget constraints. As a result of less capacity in domestic passenger aircraft and increased costs in transporting mail, the USPS has reevaluated its use of air transport and, has had a major paradigm shift in logistics. This paradigm shift has resulted in the following:

- A reduction of staff and budgets, yet moving more mail per employee
- The formation of alliances with the air cargo industry
- Increased reliance on trucking

In the past, USPS formed several business alliances and capacity agreements with multiple all-cargo carriers, blurring the distinction between postal and private delivery. However, in August 2001, FedEx and the USPS initiated an exclusive strategic alliance. Through a business agreement, the USPS will allow FedEx to locate FedEx overnight service collection boxes at post offices nationwide and FedEx, in turn, will provide space on FedEx airplanes for the transportation of Express Mail, Priority Mail, First-Class Mail, and some International mail. This deal has brought FedEx approximately 3.5 million pounds of mail each day, enough to fill 30 DC-10-30 freighters. The USPS's goal through the alliance is to obtain more reliable service, reduce costs, and manage cost growth in future years. The USPS has determined that it needs to use one integrated national air transportation network with a highly reliable transportation supplier rather than an assortment of air transportation providers.

The alliance, coupled with post-September 11 security measures, is also reducing the volume of mail formerly carried by commercial passenger airlines, cutting into a source of belly revenue that has already been eroded by the increasing use of electronic alternatives to mail and by lower revenue-generating contract rates the USPS pays the airlines.

The USPS also relies more heavily on trucking than it has historically. First class mail received at a USPS facility will be trucked if the destination is within 800 miles; mail destined for points beyond the 800 mile radius is typically flown.

Air Cargo Aircraft Types

There are three major kinds of aircraft that serve as air freighters: widebody jets, narrowbody jets, and narrowbody turboprop aircraft (commonly called "feeder aircraft"). A significant amount of freighters in service today are converted passenger aircraft that have reached the end of their service life as passenger carriers. Other freighters, particularly widebody freighters, are manufactured as such by Boeing and Airbus. The converted freighters tend to be significantly older, less fuel efficient, and given their age are more susceptible to maintenance problems than their passenger carrier counterparts and recently manufactured freighters. Freighters used on international North Atlantic and Pacific routes are usually widebody freighter aircraft with payloads ranging from 80,000 to 234,000 pounds. The exception to this is the DC-8 which is a narrow body transoceanic aircraft. (See **Exhibit 2.1**)

Exhibit 2.1
Various Widebody Freighters

Boeing B747

McDonnell Douglas MD-11

Airbus A380

Various Narrowbody Freighters

Douglass DC9-15

McDonnell Douglas MD-80

Boeing B727-200

Various Air Cargo Feeder Aircraft

Cessna Caravan

Fairchild Metro III

Shorts SH360

The sharp increase in jet fuel costs has forced air cargo carriers to reconsider the practice of flying older, fuel inefficient aircraft. In 2005, Boeing had a record year for orders of pure freighter aircraft. The rising fuel costs made airlines realize they needed to "re-fleet" to modern, more fuel efficient aircraft. For example Nippon Cargo Airlines (NCA) currently operates 13 B747-400 aircraft. In 2005, they ordered 10 B747-800, which is marketed as the most efficient cargo plane in the world with greater fuel efficiency and space for four additional main deck containers.

Perhaps one the most unique attributes of widebody and narrowbody aircraft is their ability to accommodate containers and pallets. These aircraft have large doors and rollers built into the deck of the aircraft. These aircraft allow containers and pallets laden with freight and mail to be rolled on and off aircraft with relative ease. (See **Exhibit 2.2**) Widebody aircraft have rollers on both the main and lower decks while narrowbody aircraft have rollers strictly on the main deck. The lower decks of these aircraft are bulk

loaded or load manually. Specialized ground handling equipment lifts containers and pallets to the main deck. Containers and pallets are typically loaded and unloaded in a warehouse which may or may not be located on an airport. Containerizing or palletizing air cargo allows for quick and efficient loading and unloading of aircraft as well as trucks. In addition, some warehouses have "roller deck" flooring which allows for movement of pallets and containers without the need for forklifts, dollies or tugs.

Exhibit 2.2

Upper Deck Container

Lower Deck Container

Upper Deck Pallet

Approximately 50 percent of international air cargo travels in the baggage compartment, or lower deck, of passenger aircraft; this cargo is also referred to as "belly cargo." The widebody aircraft that typically serve these routes offer substantial freight capacity in lower deck containers. In fact this capacity is increasing with the next generation of aircraft. For example, the Airbus A330/340 passenger aircraft have much greater cargo capacity per available seat than its predecessors, offering 32 lower deck containers.

Narrowbody jet aircraft are typically used for short haul domestic routes, while feeder aircraft serve small market needs. Narrow body aircraft payloads range from 18,000 pounds to 95,000 pounds. Feeder aircraft payloads can range from 2,000 to 10,000 pounds. Upper decks on narrowbody aircraft accommodate containers, while the lower deck is bulk loaded in a process where individual pieces of freight are placed directly into the aircraft without the benefit of containers. Feeder aircraft are typically bulk loaded only.

Introduction of the Airbus A380

The European Airbus A380 has been designed and built as the world's largest passenger airplane. The aircraft boasts a double-decker, twin-aisle design with an oval cross-section fuselage, the first of its kind. Currently, the largest aircraft commercial airports accommodate is the Boeing 747 (B747), which has a wingspan of 210 feet and a maximum takeoff weight of approximately 850,000 pounds. By comparison, the wingspan of the A380 is 261 feet and maximum takeoff weight is 1.24 million pounds. The A380 family's baseline passenger aircraft has a capacity of 555 passengers in three classes, and a range of up to 8,000 nautical miles. The freighter version, the A380-800F, will carry a payload of 150 tons (330,000 lbs) over 5,600 nautical miles.

Given the size and design of the aircraft, the A380 will play a limited role in the world's air transport system. For passenger service, it will operate between international gateway airports. The freight version of the A380 will operate on high-volume, long-haul routes. To date, five cargo carriers have ordered freighter versions including FedEx, UPS, Lufthansa, Air France and Emirates. It is anticipated that FedEx and UPS will route their A380s through their respective national hubs on transpacific routes where

pure freighter demand is greatest (limited belly capacity in relation to freight demand). Freight density on Air France and Lufthansa all-cargo routes indicate these aircraft will be utilized on Europe-Asia routes and Europe-North America routes. Based on current Air France and Lufthansa gateway usage (both cargo and passenger), the U.S. airports most likely to see A380 freighters are New York's JFK International and Miami International, with additional potential at Atlanta's Jackson-Hartsfield International and Chicago O'Hare International. Emirates core markets for both freight and passengers are in connecting the Middle East with Europe and Asia. It is anticipated that few, if any, Emirates freighters will serve U.S. markets in the foreseeable future.

Airports seeking to accommodate the A380 will likely not need lengthy extensions to runways. At sea level, an A380 with a typical load of 80 percent of maximum payload will require as little as 9,000 feet of runway to take off, according to Airbus' "Airplane Characteristics for Airport Planning" publication. Most international passenger and cargo gateways have runways built to at least 10,000 feet. Taxiways, however, may require redesign to accommodate the A380. While most taxiways are wide enough to accommodate the aircraft (Airbus illustrates the aircraft taxiing on 75-foot wide and larger taxiways), the wingspan and turning radius of the aircraft may require increased separation of runways and taxiways and additional pavement at taxiway intersections. Likewise, the weight of the aircraft may force some airports to reinforce pavements on taxiways and ramps.

As a result of the design characteristics forced by the plane's size, most airports are not undertaking the costs of accommodating the A380. Airports in the U.S. that have stated they are working to accommodate the aircraft include JFK International (New York), San Francisco, Los Angeles and Miami. Additionally, Anchorage, Huntsville, Louisville, and Memphis International airports are working to accommodate the aircraft for cargo operations. Overseas airports that are making preparations include the new Bangkok International Airport, Changi International Airport (Singapore), Frankfurt, London's Heathrow, Paris-Charles de Gaulle, Tokyo-Narita, Incheon in Seoul, and Sydney International Airport. The costs to airports for such changes are high; for example, Frankfurt is spending US$130 million, Los Angeles $53 million, and Heathrow US$842 million.

Airport Infrastructure Facilitating Air Cargo Demand

There are relatively few airports in the world that are considered strictly "air cargo airports".[3] Nearly all airports that facilitate the air cargo industry are either passenger airports with extensive cargo activity or "industrial" airports where cargo is one of many aviation activities taking place on the airport. Commercial, general aviation and industrial airports can each experience various levels of air cargo activity that places them in the top tier of airports accommodating air cargo. An airport's air cargo function or classification can be divided into the following four distinct types; these functional types are not mutually exclusive:

- Local market station
- Air cargo hub
- International gateway

[3] In North America the only true air cargo airport is Airborne Airpark (ILN) in Wilmington, OH which is a former military base but is now privately owned by DHL.

- Intercontinental hub

Local Market Station - The criteria for a local market station, or direct air cargo service (origin and destination [O&D] service to an airport's surrounding market area), generally coincide with large population centers where there is a concentration of industry, commerce, and transportation infrastructure. Often referred to as a "node" within a cargo carrier's network, the local market station is the simplest and most common type of air cargo facility. These airports represent the "spoke" in a hub-and-spoke air carrier network. For airport-to-airport service providers, the local market station represents the origin or destination point for the cargo they are transporting.

The sole function of a direct air cargo service facility is to collect outbound air cargo and distribute inbound air cargo to the airport's surrounding market area. In order to make direct air cargo service economically feasible, the airport's surrounding market area, or "catchment area," must generate enough inbound and outbound traffic and revenue to offset an air carrier's operational costs at that airport.

Air Cargo Hub - The exception to direct air cargo service criteria is the location of a hub operation and associated sort facility at an airport or a gateway facility. A hub/sort facility can operate independently of the surrounding market area and local demand for air cargo service. At an air cargo hub, the majority of the material to transit the hub/sort airport has an origin and destination that does not coincide with that airport's surrounding market area. In effect, the hub generates artificial demand for air cargo facilities and operations at the host airport.

International Gateway – To a certain extent, an air cargo gateway is similar to a hub airport in that the gateway airport is not reliant on the surrounding market area to generate sufficient material to justify operations. The gateway functions as a consolidation, distribution, and processing point for international air cargo. As with the air cargo hub, much of the material moving through a gateway airport does not originate, and is not destined for the gateway airport's surrounding market area.

Intercontinental Hub – An intercontinental hub connects two or three continents by air cargo and passenger aircraft and can be located in relatively remote parts of the world away from dense populations. These airports offer cargo hub capability as well as aircraft service centers for aircraft needing to refuel and change out crews. Intercontinental hubs are discussed in more detail in a later chapter of this report.

Location Criteria for the Air Cargo Industry

The criteria used by air cargo carriers to select and locate an air cargo facility at a specific airport tend to vary with the operational, financial, and strategic objectives of the carrier. Despite varied needs and objectives, it is possible to identify some typical location requirements used by air cargo businesses. These requirements are based on the anticipated use of the air cargo facility and type of air cargo carrier or carriers that may operate there. The following section examines the location criteria for air cargo businesses, based on air cargo carrier needs (integrator, forwarder and/or all-cargo carrier).

Local Market Station Criteria

The prime factor in determining where to provide direct air cargo service is strong local production and consumption of air cargo intensive commodities within the served airport's market area. This can be driven by either large population centers or concentrations of industry requiring, providing, or distributing the following commodities and products that utilize airfreight at the highest rates:

- Aeronautics - Equipment & Parts
- Automotive - Equipment & Parts
- Pharmaceuticals
- Computers & Computer Components
- Diagnostic Equipment
- Medical Equipment
- Software
- Textiles – Garments
- Consumer Electronics
- Perishables - Flowers, Fruit, Vegetables & Fish
- Economically Perishable Materials - Printed Material
- Telecommunications Equipment - Cell Phones, Blackberries
- Photographic Film

Integrated Express Carrier Requirements - Airport market area requirements are most stringent for the integrated express carriers (FedEx, UPS, DHL) providing door-to-door overnight service. Due to the very tight time constraints dictated by both commitments to the customer and operational demands of the carrier's tightly controlled network, the integrated express carrier will most likely serve the airport nearest their customers (or market area). The market area/or catchment area of an express carrier will rarely extend beyond a 60-mile radius of the airport being served. The core market for most integrated express carriers is based on large population centers that drive document and parcel shipments (though industry concentrations are typically a component of this core market).

There is little flexibility for the integrated express carrier to relocate to alternate or competing airports based on any factor or criteria other than, perhaps, a geographical shift in customer base (movement or expansion of the surrounding market area). For example, as the population of Los Angeles grew and expanded inland, integrated express carriers began to shift service eastward to Ontario International Airport from Los Angeles International. Now most integrated express carriers operate at both airports to serve the Los Angeles market (and UPS established a regional hub at Ontario International Airport).

Freight Forwarder and All-Cargo Airline Requirements - Freight forwarders (for example Eagle Global Logistics and Panalpina) and all-cargo airlines (for example Kitty Hawk and Polar Air Cargo) have less stringent location criteria when selecting an airport to locate their air cargo operations. Freight forwarders tend to be more nomadic than integrated express carriers. Their market areas are defined by individual customers rather than large population or industrial centers. Long-term, independent consolidation and distribution stations (other than international gateway facilities) are virtually nonexistent in the freight forwarder community; these services and facilities are

contracted to third-party operators. In essence, the freight forwarder's customer location is its local market station, and the nearest airport is the consolidation point.

Since freight forwarders generally do not operate under the same time constraints as an express integrator, the forwarder can be more selective than an express integrator when choosing an airline or airport. Freight forwarders will truck material to airports, depending on shipment size and service commitment, anywhere from 200 miles (Eagle Global Logistics) to 600 miles (Panalpina). With any given freight forwarder's operation at an airport, or "consolidation point", the airport will act almost as a mini truck-hub.

By not having a fixed network of hubs and stations throughout the nation, the freight forwarder has a high degree of responsiveness and flexibility when dealing with market fluctuations. The absence of this network, however, limits the freight forwarder's ability to handle numerous small shipments transiting through multiple origins and destinations.

Freight forwarder operations differ from the integrated express carriers in the following ways:

- Provide airport-to-airport versus door-to-door service
- Higher usage and reliance on truck feeder service
- Do not offer express service
- Catchment area can extend to 600 miles from the airport, and can encompass several market areas

Since forwarders and all-cargo airlines generally operate with less rigid time constraints than an integrated express operator, there is more flexibility in terms of the location of the airport used to serve a given market area. The selection criteria for an all-cargo airline tend to be the following:

- Access to interstate highways to facilitate trucking
- Location of transportation and distribution infrastructure
- LTL trucking services and facilities
- Core customer base

These criteria tend to be consolidated around the primary airports in any given market area. This is demonstrated by the almost universal co-existence of integrated express carriers, all-cargo airlines, and freight forwarders at every major airport in the nation.

All-cargo carriers are reliant on freight forwarders to generate cargo, thus all-cargo carriers will tend to locate at airports with demonstrated freight forwarder cargo volume. If the volume within a given market is not sufficient to economically justify dedicated, scheduled air service, the forwarder will truck the air cargo to the nearest airport with available lift or will charter ad-hoc lift on an as needed basis. Note, however, that if time constraints allow, trucking is almost always the preferred and most economical option for the shipper (75 to 90 percent cheaper than air transport).

Air Cargo Hub Criteria (National and Regional)

If an air cargo carrier is considering establishing or relocating a hub operation, the single largest concern will be the potential site's central geographic location relative to U.S.

population centers. Air cargo hubs are categorized into National and Regional; the criteria for each differ slightly and are discussed below.

National Hub - The ideal location for a national hub must be centrally located to U.S. population centers, and centrally located geographically to allow fluid hub-and-spoke network operation. National hubs must also have superior access to multiple interstate highways since feeder trucking activity (to the extent that service levels will allow) will be maximized in an effort to reduce network costs.

In North America, it has been determined that the Midwest, particularly the Ohio Valley, is the prime location for national hub operations. Examples of national hubs located in, or near, the Ohio Valley are the following:

- FedEx Memphis, TN
- UPS Louisville, KY
- Menlo/Emery Dayton, OH (to be closed in Aug. 2006)
- DHL Worldwide Express Cincinnati, OH (Closed Oct. 2005)
- DHL/Airborne Express Wilmington, OH
- Kitty Hawk Ft. Wayne, IN
- BAX Global Toledo, OH

Exhibit 2.3 depicts the locations of U.S. national air cargo hubs. Note that the DHL Cincinnati hub is scheduled to close and operations will merge with Airborne's Wilmington, Ohio hub. Also scheduled to cease operations is Menlo/Emery's Dayton hub; operations will be shifted to the UPS Louisville hub due to the UPS acquisition of Emery in 2004; Menlo will continue to operate independently as a freight forwarder only.

Regional Hub – Criteria for regional hub development is more dependant on a carrier's network structure than market characteristics (population and industry). Regional hubs were developed by integrated express carriers to divert cargo away from congested national hubs by facilitating intra-region freight flow. Regional hubs, as their name implies, serve a region of the country as a central collection, sort, and distribution facility.

As the air cargo industry stands today, FedEx and UPS are the only two air cargo carriers that operate regional hubs with significant air operations. The size and scope of operations by these two market leaders logistically prevents their operation from a single national hub. However, the newly merged DHL/Airborne does operate two large regional sort centers on the east and west coast, and is planning a number of smaller sort centers throughout the country. Regional hubs, unlike their national hub counterparts, tend to concentrate more heavily on trucking operations for deferred material or intra-region movement of freight. While air cargo aircraft serve these facilities, their primary function is to facilitate truck-to-truck and air-to-truck freight transfer, whereas the national hub's main function is to facilitate air-to-air transfer of air cargo. **Exhibit 2.4** depicts the location of FedEx, UPS and DHL regional hubs.

Exhibit 2.3
U.S. National Air Cargo Hubs

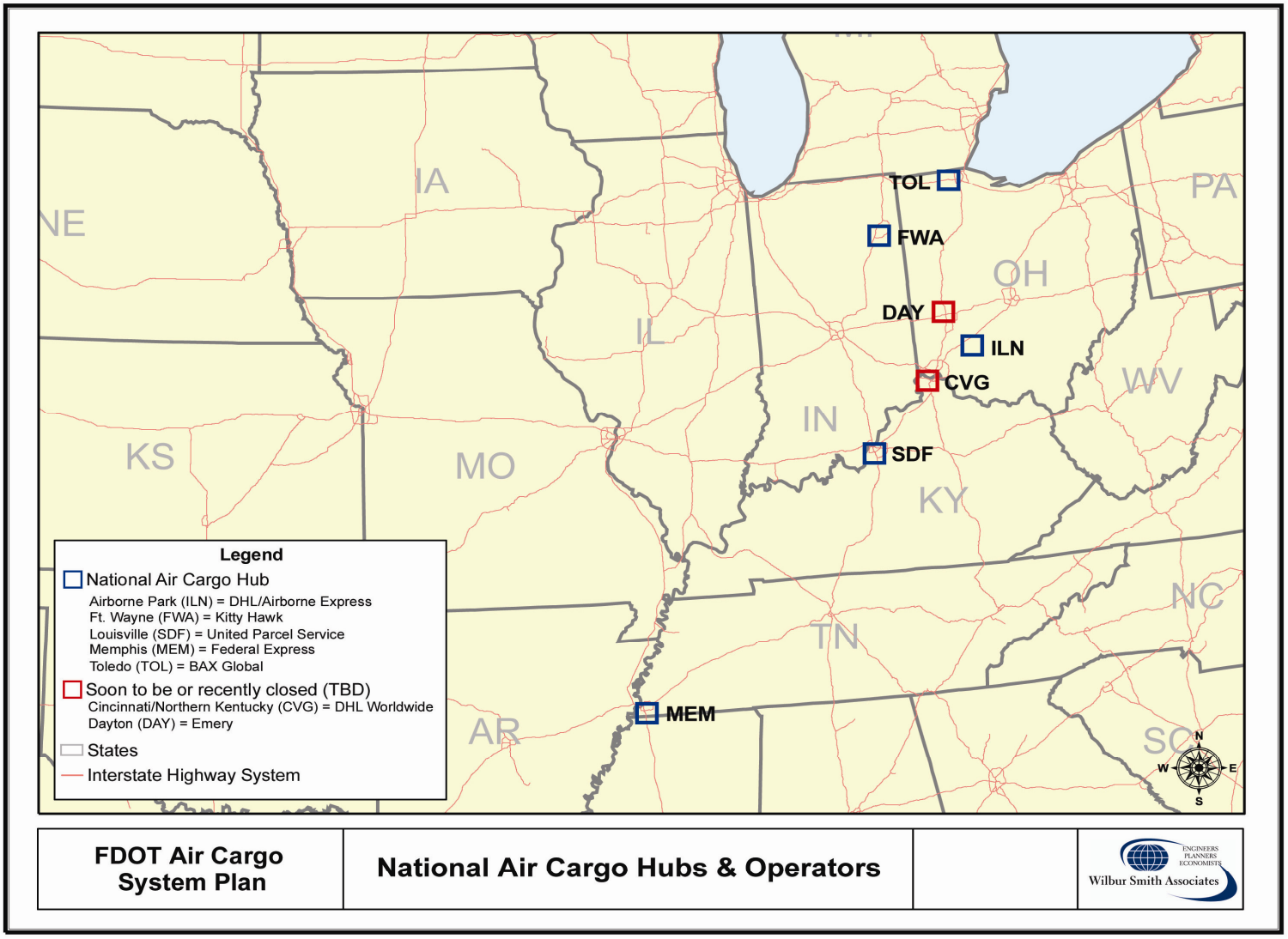
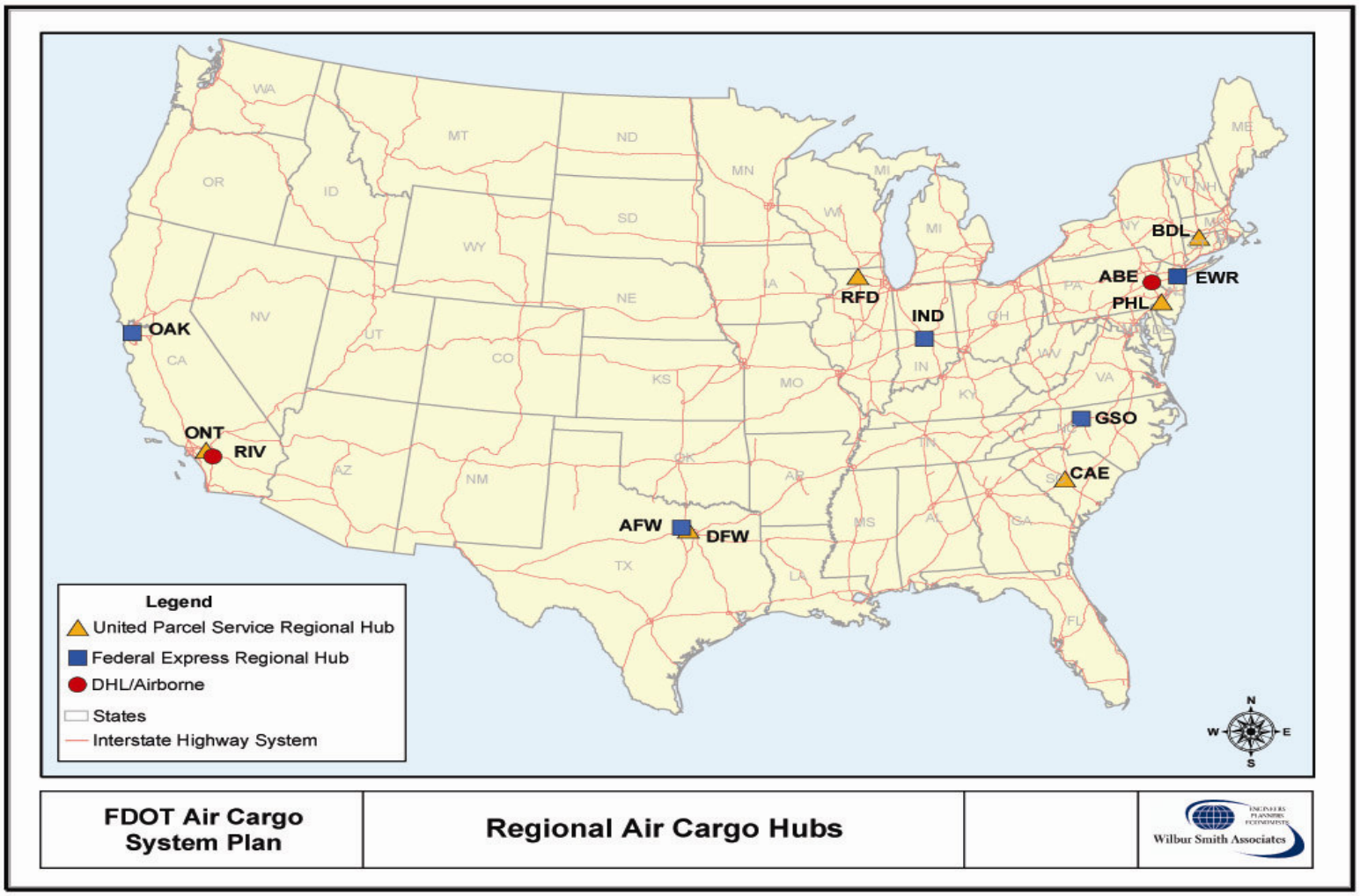


Exhibit 2.4
Regional Air Cargo Hubs



Due to the differing focus of a regional hub, truck versus air operations, there is an added dimension to site selection criteria for a regional hub, which is direct highway access to the airport facility either by, or connecting to, the Interstate Highway System. It is essential that the regional hub facility be in proximity to multiple interstate and interstate highway intersections to provide easy and rapid access to the markets that will be served.

Focusing on the eastern U.S. as an example of regional hub development, FedEx, UPS and DHL all have northeast regional hubs along the Washington D.C.-Boston corridor (Philadelphia, PA, Newark, NJ, Allentown, PA and Bradley, CT). These sites were chosen for their proximity and ability to serve the most densely populated areas of the U.S. The importance of proximity to market rule is also applied to regional hub selection. In the southeastern U.S., both UPS and FedEx chose sites in the Carolinas for their regional hubs. Not coincidentally, both hub sites are centrally located on the east coast. By creating efficient north-south flows of material along the coast, intra-region material can bypass national hubs and, in some cases, move solely by truck. These choices reflect each carrier's network design that attempts to keep as much material out of the national hubs as possible, while reducing the reliance on aircraft and increasing truck operations. The deferred service shippers (non-express) driving trucking operations are the primary beneficiary of these regional sites (Columbia, South Carolina-UPS and Greensboro, North Carolina-FedEx).

Being within second-day trucking range (500 miles) of the major population centers of the northeast and the southeast markets were primary considerations in each carrier's Carolina site selection. This focus on trucking considerations as a major factor in the development of the integrated express carriers regional network (particularly for FedEx) exemplifies the shift from independent truck and air networks to the more integrated approach of moving air cargo.

Freight forwarders do not operate hubs (national or regional) in the same manner as an express air cargo integrator or an all-cargo airline. Since the freight forwarder relies heavily on third-party operators (commercial passenger carriers, all-cargo airlines, LTL trucking) to move material, the forwarders themselves have very little influence on where their third-party contractors locate hub, warehouse, or distribution facilities. The freight forwarder (with the exception of Panalpina in Huntsville, Alabama) will locate where there is a critical mass of air cargo lift, trucking operations, warehouse, and distribution facilities. Generally, these transportation facilities and services tend to reach said critical mass in major market areas and near, or on, international airports with widebody and cargo aircraft service. These markets are generally also served by an extensive network of highways and interstates. Some larger examples include the following:

- New York – JFK (serving Northeast and Europe)
- Atlanta Hartsfield (serving Southeast and Europe)
- Los Angeles International (serving West Coast and Asia)
- Chicago O'Hare (serving Midwest, Europe and Asia)
- Houston George Bush Intercontinental (serving South, Southwest and Latin America)
- Miami International (serving Southeast and Latin America)

International Gateway Criteria

International gateways tend to be facility-and service-oriented. The primary driver for international gateway selection is an abundance of widebody lift to international destinations. This lift is provided by the following three sources:

- Commercial passenger carriers (e.g. United, Lufthansa)
- Express integrators or all-cargo airlines (e.g. UPS, DHL)
- All-cargo carriers - scheduled or chartered (e.g. CargoLux, Gemini Air Cargo)

Lower deck, or belly space, on commercial passenger carriers provides approximately half of all international air cargo movement in and out of the U.S. This heavy usage of commercial passenger carriers is evident when examining the top U.S. international air cargo gateways in comparison to the largest international passenger embarkation /debarkation airports.

Exhibit 2.5 lists the top 20 continental non-hub U.S. international gateways by tonnage exported and imported. With few exceptions, the largest gateways coincide with airports exhibiting heavy international passenger traffic.

Exhibit 2.5
2005 North American Preliminary Traffic Report : Total Air Cargo

Rank	Airport	Total Air Cargo (Metric Tonnes)
1	Memphis (MEM)	3,598,500
2	Anchorage (ANC)	2,609,498
3	Los Angeles (LAX)	1,928,894
4	Louisville (SDF)	1,814,730
5	Miami (MIA)	1,761,926
6	JFK-New York (JFK)	1,649,055
7	Chicago O'Hare (ORD)	1,547,859
8	Indianapolis (IND)	1,082,339
9	Newark (EWR)	957,374
10	Atlanta Hartsfield (ATL)	764,717
11	Dallas/Ft. Worth (DFW)	720,623
12	Oakland (OAK)	675,227
13	San Francisco (SFO)	584,926
14	Philadelphia (PHL)	558,071
15	Ontario (ONT)	521,853
16	Houston (IAH)	384,451
17	Boston Logan (BOS)	356,121
18	Toledo Express (TOL)	352,347
19	Seattle-Tacoma (SEA)	341,567
20	Dayton (DAY)	338,869

Source: Airports Council International-North America

Factors contributing to the heavy reliance on commercial passenger carriers for air cargo movement include the following:

- Competitively priced airport-to-airport service
- Available belly capacity
- Developed international networks
- Domination of international air cargo markets by freight forwarders

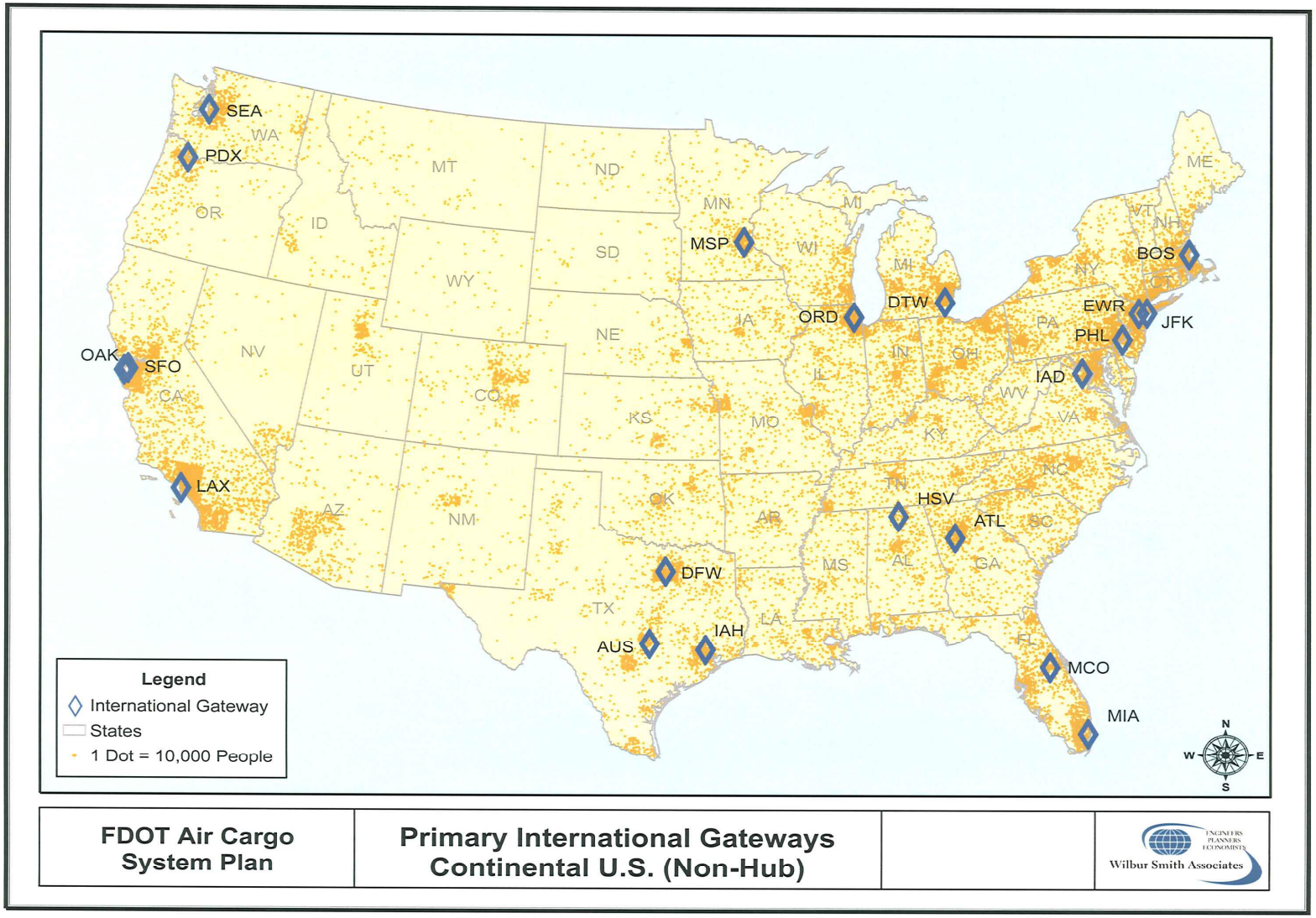
Commercial passenger carriers cater their networks to the demands of passenger traffic, regardless of the demand for cargo lift. Demand for international passenger lift, as would be expected, is centered on large population centers. As **Exhibit 2.6** illustrates by overlaying gateway location on a U.S. population density map, each of the top international gateways is located in a densely populated area of the U.S. International cargo lift provided by commercial passenger carriers, which accounts for over 50 percent of international capacity, is nearly always be tied to international passenger airports located in major population centers.

Seldom will a passenger carrier change or end an international passenger route due to the lack of air cargo traffic. This strict focus on passenger service, which drives most market and financial decisions, leads to an inadvertent subsidizing of air cargo movement by passenger revenues. Since the plane is essentially "paid for" by passenger revenues, a commercial passenger carrier can exercise substantial pricing advantages over all-cargo and express integrators when flying international air cargo.

Freight forwarders, which currently facilitate 80 percent of international air cargo tonnage, are naturally attracted to the larger international airports listed in **Exhibit 2.6.** At these airports, freight forwarders can gain access to well developed domestic and international air networks, negotiate highly competitive air service rates, and achieve proximity to large market areas with vital transportation/distribution infrastructure. Freight forwarders will utilize either scheduled aircraft (all-cargo carriers or commercial passenger belly space) or operate charter aircraft on a regular basis to serve markets large enough to support these dedicated aircraft. As previously mentioned, these markets tend to be large metropolitan areas served by large commercial service airports.

All-cargo carriers offering international airport-to-airport air cargo service also tend to operate at large, commercial airports in major metropolitan areas. Airport-to-airport service requires a heavy reliance on ancillary service companies such as freight forwarders, LTL trucking companies, and customs brokers. Due to the international freight volumes generated by commercial passenger carriers, the ancillary companies needed to service airport-to-airport air cargo provided by all-cargo carriers are currently in place at large international airports. These airports have achieved a "critical mass" of carriers, trucking, infrastructure, and forwarders that make these airports attractive in terms of cost, efficiency, and flexibility.

Exhibit 2.6
U.S. National Air Cargo Hubs



Chartered and contracted aircraft flying on international routes can be operated either on a scheduled basis or an ad-hoc basis. For the purposes of evaluating the support needed for an international gateway facility, it is necessary to focus on scheduled contract aircraft. Scheduled contract aircraft are generally for use by express integrators or freight forwarders. Express integrators use these aircraft to supplement their own fleet of aircraft and provide added flexibility as air cargo demand fluctuates. These aircraft will serve either the integrator's national hub directly or an international gateway that has a surrounding market area large enough to support a dedicated aircraft (e.g. New York metro area and Los Angeles metro area).

Integrated express carriers move a majority of their international traffic directly from their respective national hubs. International-bound material is collected from locations throughout the U.S. via the integrator's domestic network and consolidated at the national hub for transit on an integrator-owned or operated aircraft. Through the utilization of the domestic network to collect, consolidate, and distribute international freight via the express integrator's national hub, the integrator has essentially created a catchment area for its national hub spanning the entire nation. This fact explains why Memphis (FedEx hub), Indianapolis (FedEx hub), Louisville (UPS hub), Cincinnati (DHL hub), and Dayton (Menlo hub) are in the top 25 list of international cargo gateways, despite their location at airports with limited or no international passenger service.

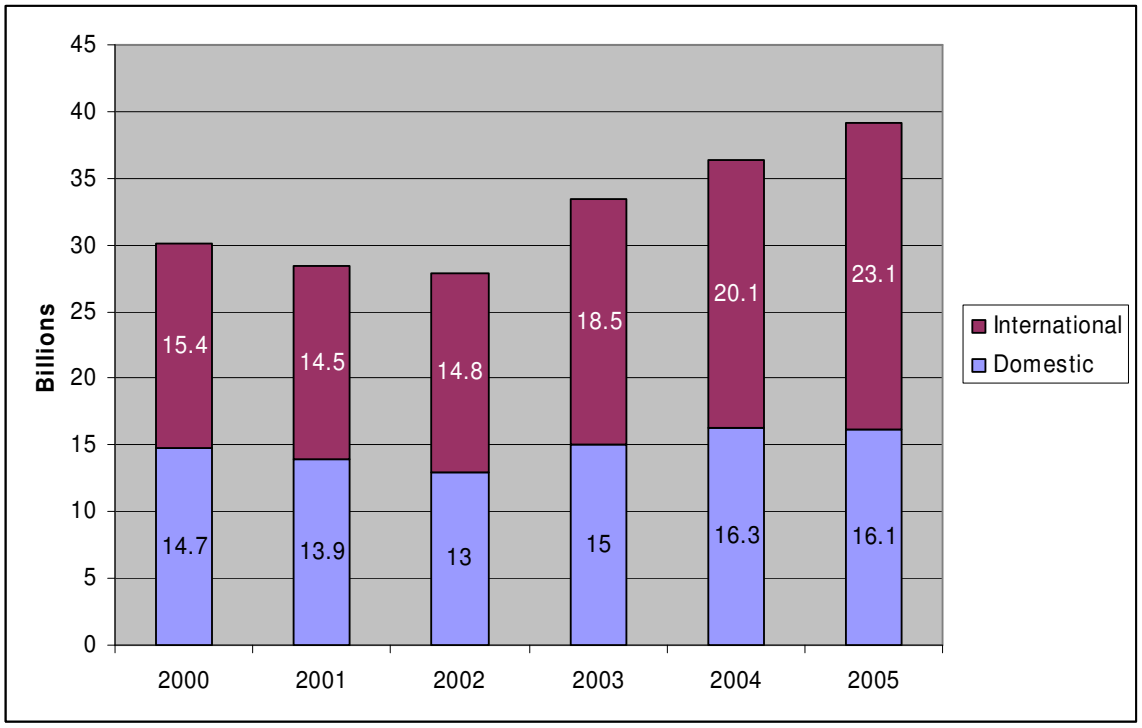
AIR CARGO INDUSTRY TRENDS

The FAA Aerospace Forecast 2006 to 2017 provides insight into recent trends in the air cargo sector of aviation. The following text is from this recent publication summarizes U.S. air cargo trends:

U.S. air carriers flew 39.2 billion revenue ton miles (RTMs) in 2005, up 7.5 percent from 2004. Domestic cargo RTMs (16.1 billion) decreased 1.6 percent, while international RTMs (23.1 billion) were up 14.8 percent. The decrease in domestic RTMs reflects a continuation of the modal shift from air to ground shipments and the impact of air fuel surcharges. The increase in international RTMs is attributable to increases in trade (e.g., Asia) and military shipments to the Middle East. (See **Exhibit 2.7**)

Air cargo RTMs flown by all-cargo carriers were 70.8 percent of total RTMs in 2005: passenger carriers flew the rest, or 29.2 percent of the total. Total RTMs flown by all-cargo carriers increased 7.6 percent in 2005, from 25.8 billion to 27.7 billion. Total RTMs flown by passenger carriers were 11.4 billion in 2005 (up 7.2 percent).

Exhibit 2.7
US Commercial Air Carriers Cargo Revenue Ton Miles 2000-2005



Source: FAA Aerospace Forecast 2006-2017

CASS USA, a division of IATA, has 78 member airlines which provide monthly air cargo tonnages. This data indicates worldwide air cargo activity for the historic six year period of 1999 to 2004 experienced an up tick in tonnage flown in 1999 and 2000 followed by a decrease in tonnage in 2001 and 2002. (See **Exhibit 2.8**) While this data does not capture the entire universe of air cargo activity it does provide a sample of worldwilde trends within the industry. Air cargo tonnage increased significantly in 2004 indicating resiliency in the air cargo sector as well as world economy.

Exhibit 2.8
Worldwide Air Cargo Trends 1999-2004

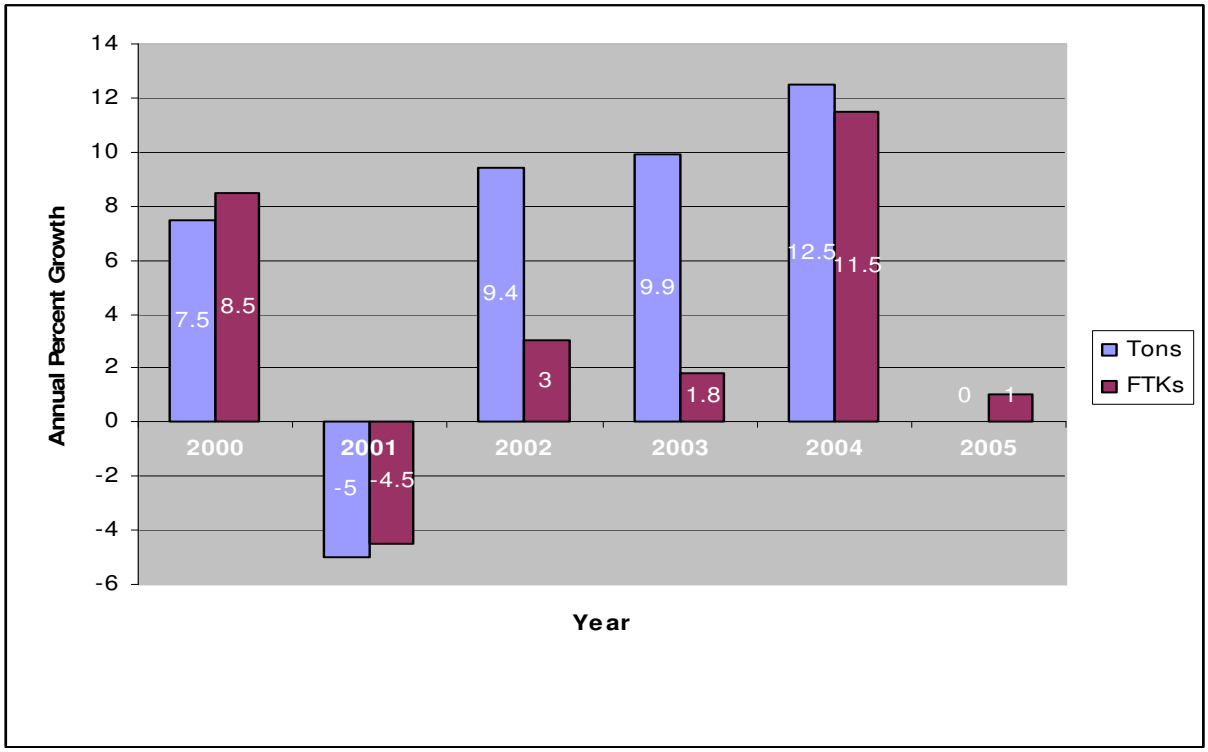
Region	1999	2000	2001	2002	2003	2004
Africa	25,118	24,894	23,490	23,124	26,282	31,405
Asia	469,012	516,640	459,618	458,087	501,186	640,391
Europe	778,548	775,780	690,130	620,428	669,334	775,847
Middle East	73,944	69,392	69,078	68,573	82,783	108,726
N & C America	54,444	63,997	56,474	56,588	54,763	62,472
South America	111,971	115,305	95,919	76,862	96,369	138,884
Total	**1,513,037**	**1,566,009**	**1,394,709**	**1,303,660**	**1,430,717**	**1,757,725**

Source: CASS USA Market Monitor

The FAA Aerospace Forecast 2006-2017 indicates worldwide air cargo demand continued to grow rapidly in 2004 responding positively to stronger global economic activity, with freight tonnes and freight ton kilometers (FTKs) up 12.5 and 11.5 percent, respectively. However, it appears that high fuel prices have taken their toll on air cargo demand in 2005 as illustrated in **Exhibit 2.9.** For the first ten months of 2005, IATA reported that member carrier cargo traffic was up only 2.6 percent. AEA and AAPA statistics show that their member carriers' FTKs were up only 2.2 and 3.2 percent,

respectively, during the January to November 2005 time period. ICAO estimated that member cargo carrier traffic increased about 1.0 percent in 2005.

Exhibit 2.9
World Air Cargo Demand 2000-2005



Source: FAA Aerospace Forecast 2006-2017

Industry Consolidation

The explosive double digit growth experienced by the express carrier industry in the 1980s and 1990s has moderated. As the express carrier market matured, the distinctions among players have blurred. The express carriers have begun to carry larger packages and offer second- and third-day economy service ("deferred service"). For example, UPS originally was a trucking company which broke into the air express market in the late 1980's; FedEx on the other hand is an integrated express company which broke into the trucking industry in the late 1990s.

Freight forwarders, anxious to carve out a role in the global transportation and supply chain management business, are also entering into a wide variety of horizontal and vertical partnerships. Panalpina, one of the largest international freight forwarders, has advanced a new business model whereby freight forwarders, on behalf of one or more shippers, use dedicated air freighters to provide scheduled service to selected destinations. "Integrated forwarders" are more prevalent in transcontinental markets, controlling a significant majority of international air cargo.

Supply-chain-managers are utilizing more economical, time-definite, deferred cargo services which have proven highly successful and represent one of the largest growth areas in the cargo business. As time-definite air transport has become the rule rather than the exception, shippers and consumers have grown to expect that a shipment will be handled with care and arrive at the promised time. The focus on service has made

shippers and consumers more price sensitive and less mode-sensitive. This trend has opened the door to surface-based competition, particularly in the regional express markets where the line haul is less than 1,000 miles.

Modal Shift

The shift in focus from express to time-definite service, coupled with financial and cost-saving measures, has led to the increasing use of trucks on longer distance routes traditionally served by aircraft. This modal shift is particularly pronounced within the integrated express carrier community.

Integrated express carriers, either through acquisitions or contracts, are using trucks to provide overnight service on short-haul segments or to meet longer delivery schedules. UPS began as a road service and expanded into air cargo. FedEx has built extensive ground service capability through the acquisitions of RPS, Inc., Caliber Systems, Inc., American Freightways and Viking Freight.

Passenger and cargo airlines are also using trucks as a substitute for aircraft. This road feeder service (RFS) is commonly used in the Southeast U.S. by both domestic and international airlines, and also by some of the large domestic heavy-weight integrated carriers such as BAX Global. Among the largest national suppliers of road feeder service are Forwardair, Air Cargo, Inc., Towne Air Freight, and Aeroground.

Less-than-truckload (LTL) companies have also become major competitors to air freight and enjoy a significant cost advantage over the air freight industry because of lower capital costs for equipment and lower wage scales. To compete effectively in this segment, FedEx has recently formed its own LTL subsidiary, FedEx Freight. Other larger LTL companies competing for time-definite shipments include Consolidated Freightways, Yellow Freight System, Con-Way, and Roadway Express. LTL companies also operate using a hub-and-spoke system similar to the integrated express carriers in which several banks of trucks arrive and depart daily. The key to LTL expansion into traditional air cargo markets is not increased speed of delivery, but time-definite delivery; a service once exclusively in the domain of the integrated express carriers.

The USPS has also increased the use of trucks in the transport of mail in order to reduce costs. Trucking of mail per pound costs one-fifth of air transport cost. The USPS has made a concerted effort to truck as much mail as possible and still make time schedules. Trucking distances for priority mail and first-class mail can now be as far as 800 miles, a distance previously limited to 500 miles.

The shift to truck operations, where logistically possible, is not singularly due to the cost benefits of ground versus air transport. In the past one to two years, there has been a fundamental shift in supply chain thinking away from just-in-time (J.I.T.) manufacturing and lean-inventory strategies. Events from September 11, to natural disasters in the far east, to the 2002 dock worker strike on the west coast, have led many logistics managers and purchasing agents to pursue more regional distribution systems, as well as increase safety stock and warehouse additional inventory. This move toward a more conservative and concentrated supply chain favors trucking over air operations. With the need for speed eliminated in these “cushioned” supply chains, coupled with time-definite service now offered by many LTL truckers, the cost premium required for air cargo transport is often not justified. Whether this is a temporary trend manifested in uncertain times, or a long-term shift in logistics strategies, remains to be seen.

The increasing use of trucks in air cargo operations underscores the need for airports facilitating the air cargo industry to be linked to the interstate system. Air cargo operators are increasingly looking at airport connectivity to the highway system when evaluating the suitability of an airport for intensive air cargo operations. One prominent LTL carrier, Forward Air, has located two hubs on-airport at Rickenbacker International in Columbus, Ohio and Kansas City International, Missouri.

Declining Availability of Belly Space

Air cargo operations are increasingly separating from passenger airline operations. Currently, 55 percent of air cargo carrying capacity is in the bellies of passenger aircraft. Use of belly space is decreasing, while use of dedicated all-cargo aircraft is increasing. This change can be attributed to the following reasons:

- Increased market share held by the integrated express carriers
- Higher passenger load factors
- Increased use of smaller regional jets
- Security restrictions post-September 11.

Careful planning, coupled with increased use of regional jets on domestic short-haul routes, has increased the passenger occupancy of many aircraft, resulting in more weight and space requirements for passengers and their baggage, and less for cargo. Further, airlines are seeking to increase the amount of time aircraft spend in the air and to reduce gate turnaround times. This shorter turnaround affects cargo operations because shorter gate turnarounds reduce the window of time for loading and offloading cargo.

While there is likely to be a continued market for the passenger airline belly cargo, the integrated carriers have been very successful in expanding their markets to capture freight that formerly was the exclusive domain of the heavy cargo carriers (inclusive of commercial carriers). Because of this, most projections indicate continued strong growth for the integrated carriers and a gradual decline for air cargo traveling on commercial passenger airlines, particularly in the domestic market.

Declining Dollar

The recent decline of the U.S. dollar versus the other major currencies is having an impact on international air cargo in not so unexpected ways. The U.S. is a net importer of goods from around the globe, as is indicated by the reoccurring U.S. trade deficit. This net imbalance in trade has led to a backhaul issue for most air cargo carriers; aircraft arrive into the U.S. full, but leave with excess capacity. The declining U.S. dollar is making imports more expensive for the U.S. consumer and U.S. exports more affordable in the global market.
The following compares the various currencies and their impact on air cargo traffic.

U.S. to Europe - Until 2003, the Euro was weak relative to the dollar. This had the effect of reducing eastbound traffic (U.S. to Europe) growth by 1.4 percent between 1999 and 2004. Then, the fall of the dollar stimulated exports from the U.S. to Europe as the Euro gained value and increased spending power for Europeans. In 2004, the appreciation of the Euro against the dollar resulted in an eastbound traffic growth of 5.4 percent.

U.S. to Asia – Westbound transpacific growth, historically driven by the Japanese economy, produced a 3.9 percent annual growth rate between 1999 and 2004, and picked up steam in 2004, reaching 10.7 percent. The 2004 westbound growth increase can be explained in part by the falling dollar coupled with growth in intermediate materials shipped to Asia for final assembly; Japanese demand for United States perishables and seafood; and high consumer demand in Australia.

U.S. to Latin America - High commodity prices and a falling dollar fueled southbound North America to Latin America air cargo to 11.7 percent growth in 2004. Strong economic recovery in Argentina and Brazil during 2003 and 2004 has reduced the previous downtrend in the southbound market to an annual average of 1.2 percent decline between 1999 and 2004.

The affects of the falling dollar have either reversed, or significantly slowed the erosion of the backhaul market from the U.S. to foreign markets. Whether this trend continues or not is dependant on the continued devaluation of the dollar in relation to other world currencies.

Increasing Fuel Costs

For the first time in two decades, fuel expense is the top cost category for U.S. airlines, adding billions of dollars to the industry's expenses in 2005 alone, and jeopardizing chances of profitability in the near future.

In January 2002, the price of jet fuel on the spot markets averaged nearly 56 cents per gallon. Shortly before Hurricane Katrina, the price stood at $1.87 per gallon. Following Katrina, the price peaked at $2.36 per gallon, and has since fallen to around $2.00 per gallon, a 243-percent increase over four years. [4] Driving the price of jet fuel is the cost of crude oil, now hovering in the mid-to-upper $60-per-barrel range, and the additional premium that refiners charge to produce jet fuel. This premium has grown dramatically in recent years, and it exploded after Katrina. In 2002, it averaged $3.63 per barrel but shortly after Katrina it peaked at $30 per barrel. The premium has dropped but the average will exceed $15 per barrel, a 414-percent increase over four years. As a result, fuel costs today are unsustainable for the airline industry, two legacy carriers are in bankruptcy, and many carriers continue to operate at a loss.

The implications of increased fuel charges go beyond high operating costs; it impacts the volume of cargo traffic. For example, American Airlines has raised their fuel surcharge four times in 2005. Some customers are willing to pay the increase while others are not and a shift in mode has taken place in some trade lanes. For example, fish exporters located in the southern portion of the Caribbean are freezing fish on vessels and shipping them to the US rather than flying fresh fish on aircraft. In addition, flower exporters in Latin America, are beginning to feel pressure on their already thin profit margins.

ATA's latest indicators show that the industry paid $9.2 billion more for fuel in 2005 than 2004. In 2005, for roughly 452 million barrels of jet fuel, the industry spent $30.6 billion which led to an estimated loss of $10 billion in 2005 for the industry; this is in addition to the $32 billion the industry lost from September 11, 2001, through 2004. The industry's

[4] Based on testimony of Air Transport Association (ATA) President and CEO James May before the U.S. Senate's Aviation Subcommittee on Commerce, Science and Transportation, September, 2005.

fuel bill for 2005 topped $97 billion which makes up 25 percent of total costs. In short, in less than two years, the total bill for fuel for the industry has more than doubled.

Airlines are searching for fuel economy solutions. They are working to conserve fuel and increase operating efficiency. For example, airlines are increasing efficiency by measuring onboard weight more accurately, re-distributing belly cargo, and modernizing fleets with more fuel-efficient planes. ATA indicates these and other practices are making a difference in conservation. From 2000 to the first quarter of 2005, airline fuel efficiency rose 17 percent within the industry.

Another solution considered by the airlines is to rationalize schedules based on fuel expenses. Higher fuel costs could impact where and how often a carrier flies to a destination. The result will mean passengers and shippers may see a reduction in service or loss of service entirely for markets where profit margins were thin to begin with.

Integrated express companies are fairing soaring fuel prices better than the legacy airlines. The steady stream of performance announcements issued this year by UPS, FedEx, and TNT makes this apparent. In August, UPS ordered eight new Boeing 747-400 freighters; in May it announced plans to expand five regional freight hubs at airports across the country; in April UPS Philippines unveiled plans to expand its three-year-old intra-Asia air hub; and in January the company ordered 10 Airbus A380 freighter aircraft. In September 2005, FedEx announced the first overnight express link between India and China as part of its new eastbound around-the-world flight, which connects Europe, India, China, and Japan with the FedEx Express U.S. hub in Memphis. Earlier in the year FedEx disclosed plans to build a hub at Guangzhou Biayun International Airport in China which is scheduled to open in 2008. TNT's express division indicates it is on pace to reach its target of a 10-percent operating margin in 2007. Integrated express operators are less vulnerable to the spikes in fuel costs by tapping into alternate revenue streams and expanding their ground networks. Unfortunately, passenger airlines do not have that luxury.

Air Cargo Related Security Issues

Since 9/11 the FAA and the Transportation Security Administration (TSA) have issued security directives aimed at strengthening security standards for transporting cargo by air. These directives have caused the diversion of a portion of the freight and mail cargo from passenger to all-cargo carriers. In November 2004, TSA issued a notice of proposed rulemaking that applies security requirements throughout the supply chain. This rule, which is expected to become final in 2006, is likely to increase the shift in cargo share from passenger to all-cargo carriers.

FLORIDA AIR CARGO INDUSTRY TRENDS

The story of air cargo in Florida over the past seven years presents a picture of systemic shocks to air cargo activity on airports followed by surprising resiliency. Shocks to the system include: 9/11, hurricanes, SARS, war, terrorism and soaring fuel prices. These shocks forced airlines to restructure, re-engineer and dramatically improve efficiency; and for airports to increase security without hindering trade, and improve facilities to adapt to changes in technology, commodities and increased trucking.

The overall trend for air cargo activity indicates a 0.1 percent decrease in cargo activity in Florida from 1999 to 2005[5]. Growth in air cargo activity in Florida on the surface appears to be flat, but when considering these shocks to the national and global economy, statewide air cargo activity resiliency, or rebound, has been impressive. **Exhibit 2.10** identifies historic air cargo activity for the seven SIS airports in the State. Peak performance occurred in 2000 when over 2.6 million tons of air cargo was accommodated at these airports. This peak was followed by two years of decline followed by a tremendous resurgence in 2004 which nearly reached the 2000 benchmark (See **Exhibit 2.11**). These trends follow domestic and world growth trends experienced by the air cargo industry for the same time period. Air cargo activity year-over-year growth between 2005 and 2004 in the State declined just under 1 percent below the North American rate of decline. North American air cargo tonnages declined 1.6 percent whereas world air cargo year-over-year increased by 2.5 percent. The worldwide increase was largely supported by increases of over 4 percent and 5 percent between North America and Asia and Europe and Asia, respectively.

Exhibit 2.10
Florida Air Cargo Activity 1999-2005 At Sis Airports[6]
(In short tons)

	MIA	MCO	FLL	TPA	JAX	PBI	RSW	Total
1999	1,820,384	287,809	229,710	121,900	73,856	25,503	16,528	**2,575,690**
2000	1,811,184	299,191	277,172	113,600	67,193	23,121	17,421	**2,608,882**
2001	1,807,894	315,000	241,950	88,100	67,026	22,715	17,519	**2,560,204**
2002	1,790,784	218,619	180,566	101,059	75,973	19,980	17,389	**2,404,369**
2003	1,805,158	212,836	173,252	103,036	77,891	20,129	17,256	**2,409,559**
2004	1,961,303	224,417	179,212	100,344	79,720	20,257	18,542	**2,583,795**
2005	1,934,546	227,373	178,539	100,456	80,948	20,397	19,148	**2,561,406**

Source: Airport Management

Several factors contributed to the decline of 2005 which was experienced not only in Florida but throughout North America. Impacts to global trade include the devastating tsunami in the Indian Ocean basin as well hurricanes in the U.S. and a major earthquake in Pakistan. While none of these events shocked the entire global economy they impinged growth by an overall slowing in global demand, particularly American consumer demand. In addition, fuel prices soared to over $60 per barrel in the second half of 2005. As a result, fuel surcharges by airlines became common and shippers looked to alternative transportation for non core products. The reality of these high fuel prices also hit consumer's pocket books and reduced consumer disposable income which in turn depressed the consumer electronics market. To add insult to injury, the ongoing financial problems of the legacy airline carriers placed three carriers into bankruptcy in 2005 resulting in less air cargo lift capacity as airlines reduced flight frequency and relied more on regional jets.

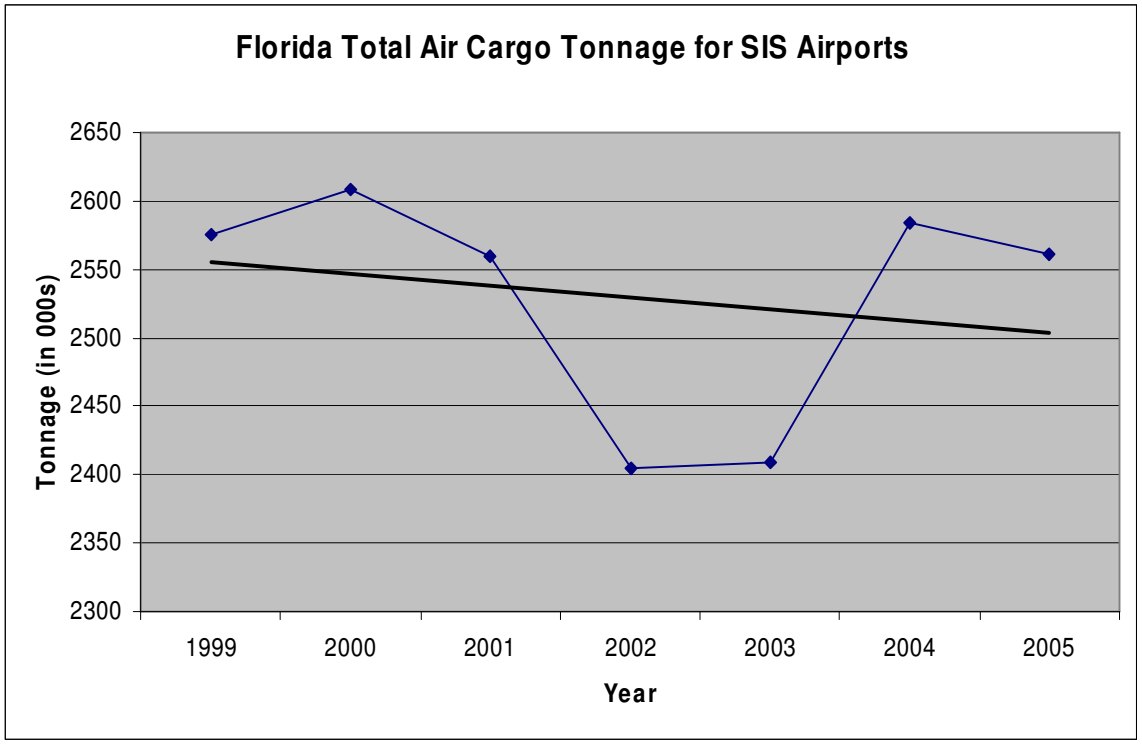
Air Cargo Ranking of Florida Airports

Airports Council International – North America provides historic air cargo tonnages and rankings of 160 member airports. In 2004, Miami International Airport ranked fourth in total air cargo accommodated at the airport. Orlando International ranked 32nd and Fort

[5] 1998 was final year of FDOT Task 2.3.A Florida Air Cargo Inventory
[6] MIA=Miami International, MCO=Orlando International, FLL=Fort Lauderdale/Hollywood International, TPA=Tampa International, JIA=Jacksonville International, PBA=Palm Beach International, RSW=Southwest Florida Regional

Lauderdale/Hollywood International ranked close behind at 36th. Tampa International and Jacksonville ranked 49th and 59th, respectively. West Palm Beach and St. Petersburg/Clearwater each fell into the top 100 airports in cargo tonnage for 2004. **Exhibit 2.12** identifies these rankings. It is noteworthy to point out that Miami falls behind only to: Memphis, an international FedEx hub; Anchorage, an intercontinental gateway; and LAX, the largest gateway on the West Coast. **Exhibit 2.13** identifies historic trends for the top 20 cargo airports in North America.

Exhibit 2.11



Source: Airport records

Exhibit 2.12
2004 North American Airports Traffic Statistics

Rank	City/Code	Cargo (Metric Tons)	% Chg
1	MEMPHIS (MEM)	3 554 575	4.8
2	ANCHORAGE (ANC)**	2 252 911	7.2
3	LOS ANGELES (LAX)	1 913 676	4.3
4	**MIAMI (MIA)**	**1 778 902**	**8.7**
5	LOUISVILLE (SDF)	1 739 492	7.5
6	NEW YORK (JFK)	1 706 468	3.1
7	CHICAGO (ORD)	1 474 652	(2.4)
8	NEWARK (EWR)	984 838	2.4
9	INDIANAPOLIS (IND)	932 449	5.9
10	ATLANTA (ATL)	862 230	7.5
11	DALLAS/FT WORTH AIRPORT (DFW)	742 289	11.4
12	OAKLAND (OAK)	644 753	7.9
13	PHILADELPHIA (PHL)	571 407	9.0
14	SAN FRANCISCO (SFO)	562 826	(1.9)
15	ONTARIO (ONT)	548 855	5.8
16	HONOLULU (HNL)	434 613	3.0
17	CINCINNATI (HEBRON (CVG)	413 305	5.3
18	HOUSTON (IAH)	401 136	5.0
19	BOSTON (BOS)	366 298	0.9
20	TOLEDO (TOL)	352 407	25.2
21	SEATTLE (SEA)	346 966	(1.3)
22	DAYTON (DAY)	334 296	2.2
23	DENVER (DEN)	317 372	(2.5)
24	WASHINGTON (IAD)	307 564	7.8
25	PHOENIX (PHX)	302 270	6.1
26	MINNEAPOLIS/ST PAUL (MSP)	299 683	(5.2)
27	PORTLAND (PDX)	252 079	5.4
28	BALTIMORE/WASHINGTON (BWI)	251 841	6.9
29	VANCOUVER (YVR)	234 015	8.4
30	DETROIT (DTW)	221 691	0.7
31	SALT LAKE CITY (SLC)	211 581	(2.4)
32	**ORLANDO (MCO)**	**203 544**	**5.4**
33	FT WAYNE (FWA)	198 916	60.9
34	FORTH WORTH (AFW)	172 046	10.0
35	CHARLOTTE (CLT)	165 962	18.5
36	**FT LAUDERDALE/HOLLYWOOD (FLL)**	**162 905**	**4.1**
37	HARTFORD/SPRINGFIELD (BDL)	150 595	8.6
38	KANSAS CITY (MCI)	139 893	2.4
39	SAN DIEGO (SAN)	138 416	2.1
40	WINNIPEG (YWG)	130 359	14.9
41	PITTSBURGH (PIT)	120 522	(0.8)
42	COLUMBIA (CAE)	118 211	2.3
43	SAN ANTONIO (SAT)	116 017	3.0
44	AUSTIN (AUS)	115 383	0.9
45	SAN JOSE (SJC)	108 762	(0.3)
46	RALEIGH-DURHAM (RDU)	108 362	15.1
47	ST LOUIS (STL)	103 854	(12.4)

Exhibit 2.12 (Continued)
2004 North American Airports Traffic Statistics

Rank	City/Code	Cargo (Metric Tons)	% Chg
48	COLUMBUS (LCK)	97 925	5.5
49	**TAMPA (TPA)**	**96 004**	**2.7**
50	CLEVELAND (CLE)	95 846	0.1
51	MILWAUKEE (MKE)	92 676	2.4
52	OMAHA (OMA)	91 767	3.1
53	LAS VEGAS (LAS)	91 205	11.0
54	DES MOINES (DSM)	84 452	(4.7)
55	NEW ORLEANS (MSY)	79 860	(0.4)
56	GREENSBORO (GSO)	74 743	4.0
57	MANCHESTER (MHT)	73 506	0.9
58	EL PASO (ELP)	73 077	4.9
59	**JACKSONVILLE (JAX)**	**72 309**	**2.4**
60	ALBUQUERQUE (ABQ)	71 789	0.3
61	SACRAMENTO (SMF)	67 452	(5.3)
62	NASHVILLE (BNA)	64 095	8.2
63	SACRAMENTO (MHR)	57 738	5.9
64	HUNTSVILLE (HSV)	55 482	(1.2)
65	SPOKANE (GEG)	52 004	5.6
66	LONG BEACH (LGB)	51 976	1.8
67	TULSA (TUL)	51 789	7.1
68	BUFFALO (BUF)	50 856	6.2
69	RICHMOND (RIC)	50 692	(3.5)
70	RENO (RNO)	48 124	2.1
71	KAHULUI (OGG)	46 129	0.1
72	BURBANK (BUR)	46 090	3.2
73	MIDDLETOWN (MDT)	44 183	1.6
74	BOISE (BOI)	43 720	10.1
75	EDMONTON (YEG)	38 448	9.5
76	GRAND RAPIDS (GRR)	36 070	7.8
77	SIOUX FALLS (FSD)	35 627	5.5
78	FAIRBANKS (FAI)	35 271	11.2
79	KNOXVILLE (TYS)	35 226	1.1
80	WICHITA (ICT)	33 900	10.7
81	OKLAHOMA CITY (OKC)	32 168	(0.3)
82	NORFOLK (ORF)	31 890	(1.2)
83	HALIFAX (YHZ)	31 841	8.6
84	TUCSON (TUS)	31 470	10.6
85	BIRMINGHAM (BHM)	29 913	(12.5)
86	KAILUA-KONA (KOA)	28 820	0.2
87	NEW YORK (LGA)	26 589	(6.5)
88	SHREVEPORT (SHV)	25 764	(12.9)
89	LANSING (LAN)	23 954	6.0
90	ALBANY (ALB)	22 581	0.8
91	MONCTON (YQM)	22 544	14.9
92	HILO (ITO)	21 800	0.2
93	CHICAGO (MDW)	21 462	(7.8)
94	ALLENTOWN (ABE)	21 252	(3.0)
95	NEWBURGH (SWF)	20 944	10.1
96	SYRACUSE (SYR)	20 735	4.3
97	PEORIA (PIA)	20 566	(8.4)
98	**WEST PALM BEACH (PBI)**	**20 257**	**10.7**
99	CEDAR RAPIDS (CID)	19 799	(12.0)
100	**ST PETERSBURG (PIE)**	**19 645**	**6.8**

Source: Airport Council International

Exhibit 2.13
Historic Air Cargo Activity^ At Top 20 North American Airports

Airport Name	Airport ID	Air Cargo^ 2000	Air Cargo^ 2001	Air Cargo^ 2002	Air Cargo^ 2003	Air Cargo^ 2004	CAGR	% Change 2004 - 2000
Memphis International	MEM	2,489,078	2,631,631	3,390,800	3,390,515	3,554,575	9%	30%
Ted Stevens Anchorage Int'l	ANC	1,804,221	1,873,750	1,771,595	2,102,025	2,252,911	6%	20%
Los Angeles International	LAX	2,038,784	1,774,402	1,779,855	1,833,300	1,913,676	-2%	-7%
Miami International	**MIA**	**1,642,744**	**1,639,760**	**1,624,242**	**1,637,278**	**1,778,902**	2%	8%
Louisville International	SDF	1,519,528	1,468,837	1,524,181	1,618,336	1,739,492	3%	13%
JF Kennedy International NYC	JFK	1,817,727	1,495,128	1,589,648	1,626,722	1,706,468	-2%	-7%
Chicago O'Hare International	ORD	1,468,553	1,299,628	1,473,980	1,510,746	1,474,652	0%	0%
Newark Liberty International	EWR	1,082,406	894,443	850,050	874,641	984,838	-2%	-10%
Indianapolis International	IND	1,165,431	1,112,434	901,917	889,163	932,449	-5%	-25%
Hartsfield Atlanta International	ATL	894,471	735,796	734,083	798,501	862,230	-1%	-4%
Dallas/Ft Worth International	DFW	904,994	742,428	670,310	667,574	742,289	-5%	-22%
Metro Oakland International	OAK	685,425	593,633	634,643	597,383	644,753	-2%	-6%
Philadelphia International	PHL	559,452	518,385	541,039	524,485	571,407	1%	2%
San Francisco International	SFO	869,839	635,143	589,730	573,523	562,826	-10%	-55%
Ontario International	ONT	464,164	419,039	496,547	518,710	548,855	4%	15%
Cincinnati/Northern Kentucky	CVG	390,820	321,917	350,014	392,695	413,305	1%	5%
George Bush Intercontinental	IAH	368,498	337,842	329,788	381,926	401,136	2%	8%
Boston-Logan International	BOS	474,943	395,126	387,960	363,082	366,298	-6%	-30%
Seattle/Tacoma International	SEA	455,997	401,535	374,753	351,418	346,966	-7%	-31%
Total		**21,097,075**	**19,290,857**	**20,015,135**	**20,652,023**	**21,798,028**	**1%**	**3%**

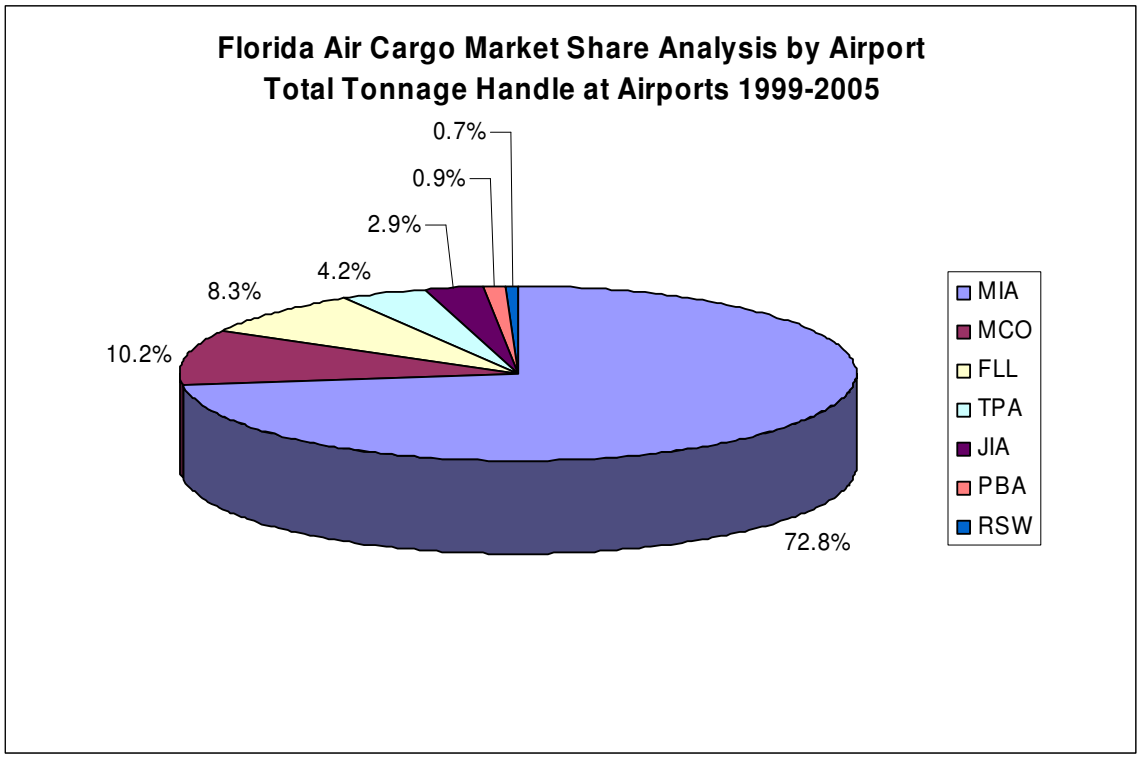
Source: Airports Council Int'l

^ Freight and mail in metric tons

Market Share of Florida's SIS Airports

Air cargo in Florida is highly concentrated and segmented. As **Exhibit 2.14** illustrates, Miami accommodates 73 percent of air cargo in the State. Orlando and Fort Lauderdale follow but with much smaller market shares of 10 and 8 percent respectively. In 1998, Miami's market share was 69 percent.

Exhibit 2.14



Source: Airport records

Florida Air Cargo Commodities

US Census conducts commodity flow analysis for each state every five years. 2002 was the last update to the bureau's report and is summarized in **Exhibit 2.15** In 2002, the entire value of goods transported in the United States was estimated at $8,397 billion. Approximately 3.5 percent of the total U.S. commodities transported flowed through Florida's highways, ports and airports. Trucking is the predominant mode of transport in the U.S. and Florida in terms of tonnage and commodity value. In 2002, trucking accounted for 67 percent of the total tonnage transported in the U.S. and 79 percent of total tonnage in Florida. In 1997, pure air cargo[7] comprised 3 percent of the value of goods transported in the State. By 2002 it had increased to 3.7 percent which is higher than the US value of 3.2 percent. Air cargo weighing less than 100 pounds per parcel is consolidated by the US Census in the Multimode Category – Parcel, USPS and Courier. The values of Parcel, USPS and Courier in the US in 2002 were 11.8 percent of all items transported. When focusing on Florida, these values were 13.2 percent of all

[7] Air cargo with items weighing over 100 pounds.

Exhibit 2.15
2002 and 1997 US Census Commodity Flow Survey Summary Table

	US 2002 Value (millions$)	Percent	Florida 2002 Value (millions$)	Percent	1997 Values (millions$)	Percent	US 2002 Tons (thousands)	Percent	Florida 2002 Tons (thousands)	Percent	1997 Tons (thousands)	Percent
Total	$8,397,210	100.0%	$296,989	100.0%	$214,397	100.0%	11,667,919	100.0%	455,084	100.0%	397,287	100.0%
Single Modes	$7,049,383	83.9%	$245,096	82.5%	$167,304	78.0%	11,086,660	95.0%	444,398	97.7%	389,467	98.0%
Truck	$6,235,001	74.3%	$226,639	76.3%	$154,035	71.8%	7,842,836	67.2%	361,197	79.4%	307,514	77.4%
Rail	$310,884	3.7%	$6,701	2.3%	$5,678	2.6%	1,873,884	16.1%	S		77,311	19.5%
Water	$89,344	1.1%	$320	0.1%	$188	0.1%	681,227	5.8%	S		186	0.0%
Air^	$264,959	3.2%	$10,922	3.7%	$6,405	3.0%	3,760	0.0%	238	0.1%	S	
Pipeline	$114,195	1.4%	$513	0.2%	S		684,953	5.9%	S		S	
MultiMode	$1,079,185	12.9%	$39,863	13.4%	$36,673	17.1%	216,686	1.9%	1,724	0.4%	36,673	9.2%
Parcel, USPS, Courier*	$987,746	11.8%	$39,094	13.2%	$35,413	16.5%	25,513	0.2%	884	0.2%	669	0.2%
Truck and Rail	$69,929	0.8%	$191	0.1%	$415	0.2%	42,984	0.4%	309	0.1%	1,298	0.3%
Truck and Water	$14,359	0.2%	S		$808		23,299	0.2%	S		1,775	0.4%
Rail and Water	$3,329	0.0%	$0	0.0%	S		105,107	0.9%	0	0.0%	S	
Other	$3,822	0.0%	$124	0.0%	S		19,782	0.2%	S		S	
Other/Unknown Modes	$268,642	3.2%	$12,030	4.1%	$10,419	4.9%	364,573	3.1%	8,963	2.0%	3,060	0.8%

Source: US Census, Commodity Flow Surveys 2002 and 1997

^ Air Cargo is comprised of items weighing >100 pounds

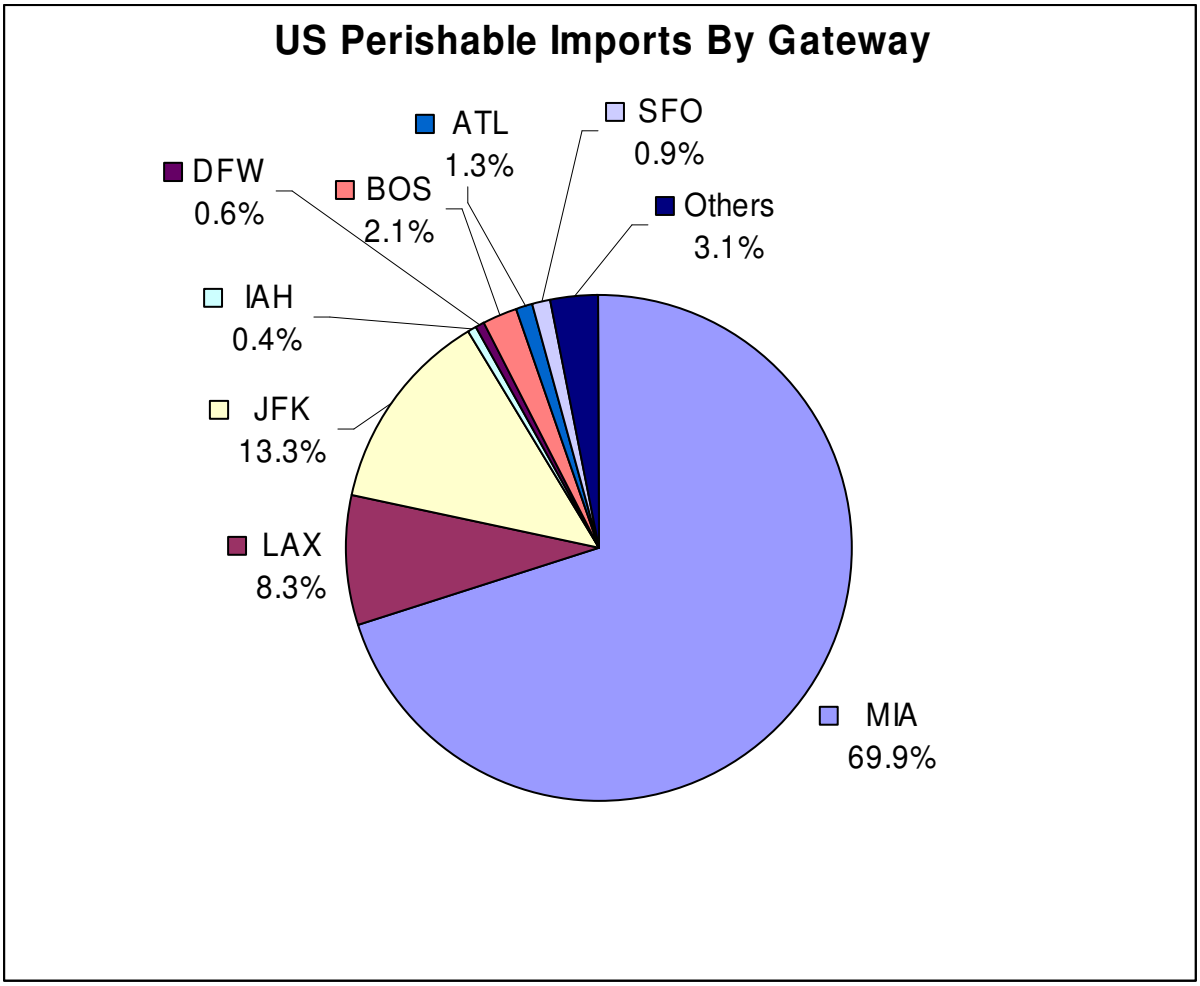
*** Parcel, USPS and Courier include parcel transport via integrated express carriers such as UPS and DHL.**

items transported in the State, higher than the national trend. In 1997 these same values were rated at 16.5 percent. This decrease over the five year period reflects the transition of products being transported by trucking companies as opposed to integrated express businesses.

MIA Commodities

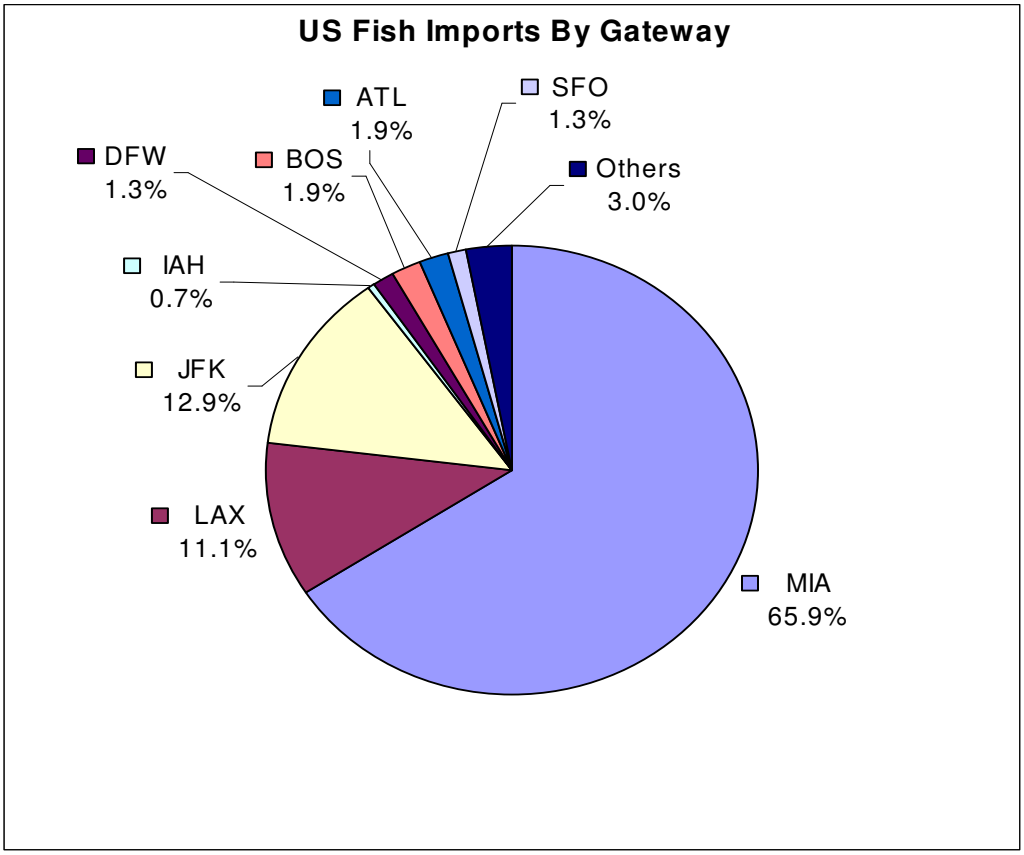
Statewide, Miami International Airport is the predominant international cargo airport. While the majority of MIA's international import cargo comprises perishable products including flowers, fruits, vegetables, seafood, and its export cargo comprises computers and peripherals, machinery, medical equipment, telecommunications equipment, agricultural machinery, and aircraft parts, some apparel articles are exported by air and some assembled clothing is imported. When compared to other airports in North America, MIA is the leading airport when it comes to importing perishables (See **Exhibit 2.16, 2.17 & 2.18**).

Exhibit 2.16



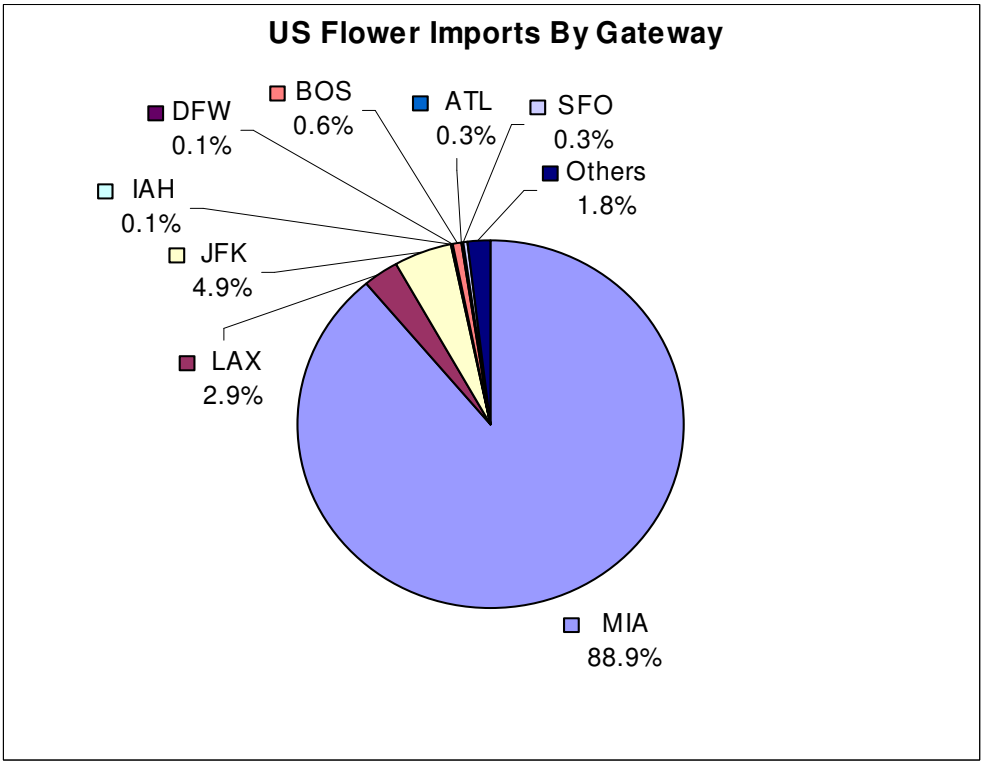
Source: US Department of Commerce

Exhibit 2.17



Source: US Department of Commerce

Exhibit 2.18



Source: US Department of Commerce