Overview of the Cargo Industry and Airports:
A Case Study of Memphis International Airport

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1 Introduction

In the 1970s, the first all-cargo airline was formed under the belief that carrying both passengers and freight was more inefficient than servicing them separately. Today, the U.S. industry is served by two major all-cargo airlines: United Postal Service (UPS) and Federal Express (FedEx). This report aims to:

- Give an overview and history of the global air cargo industry.
- Compare and contrast differences with the passenger industry.
- Study the growth of the air cargo industry in relation to U.S. carriers.
- Examine the effects of the industry on U.S. airports.
- Case study of Memphis International Airport (MEM), the U.S. hub of FedEx, observing its history and future expansion plans, operational challenges, and its coexistence as a passenger airport.

We leverage ideas from class to determine the constraints and goals of a cargo airport that serves a major all-cargo airline. To fully understand the operational necessities and constraints of a cargo airport, we seek to understand the purpose of air freight within the greater value chain as well as industry trends and forces that help shape the economics of operating an airport.

2 A History of Aviation and Air Cargo

Just seven years after the Wright Brothers flew in a powered and controlled aircraft, the first practical demonstration of air freight occurred in November 1910 [1], when a department store shipped silk from Dayton to Columbus, Ohio. Excitement grew because of potential of the commercialization of air freight to shorten distances between manufacturers, businesses, and consumers. Essentially, the value of products increased, because the aspect of time from production to shipping to consuming could be shortened greatly. All of a sudden, there was a large demand for products that could be delivered quickly, reliably, and efficiently.
As well see in the next few sections, in the recent years, air cargo has been increasingly important on the effects of globalization, acting as a key link between markets that were traditionally separated by huge geographic distances. Within the U.S. in particular, the amount of freight transferred by air grew exponentially for the next 100 years. Freight was carried by airlines that shared capacity with passengers as well.

It was not until after World War II and shortly before airline deregulation that the market was ripe for the foundation of an all-cargo airline.

In 1973, the first cargo airline was formed in an effort to separately optimize the business process for freight traffic without the need to worry about passenger traffic. In a time where dual optimization methods were not developed, either passenger traffic or cargo traffic had to take a backseat to the other load being optimized. Named Federal Express (FedEx) and based in Memphis, TN, the company’s chief business models involved guarantee of next-day delivery. The company believed that by separating cargo from passenger traffic, it could focus on delivering a higher quality of service that could sustain a company that exclusively flies freighter planes. Within 3 years, the company had turned its first net profit. For the next 40 years, FedEx has continued to grow and remains the largest cargo airline player in the U.S. industry today [2].

Alternatively, in 1988, United Postal Service (UPS) received permission from the FAA to begin operations of its cargo airline, UPS Airline [3]. Today, UPS is the main U.S. all-cargo airline competitor to FedEx, based in Louisville, KY. As we shall see in the next few sections, the U.S.
The cargo industry is nearing maturity as the market has become saturated and the growth of cargo traffic has slowed in recent years. However, the global cargo industry continues to grow (albeit not as fast as projected), primarily in developing nations in Asia and the growing demand for consumer goods as the country gains prosperity.

3 Overview of the Air Cargo and Delivery Services Industry

3.1 Trends and Forces in The Global Air Cargo Industry

On a worldwide level, the transport of commercial cargo is a key economic indicator of international trade as well as a thermometer for the state of the global economy. The logic is simple: as people become more productive, they become richer. As they become richer, they demand more consumer goods. The supply chain and logistics industry exists to connect manufacturers with suppliers and middlemen shippers with the end customer.

Currently, the total revenue carried by global air cargo airlines are around $73.2B in 2012 [8]. Major world cargo carriers (ranked by revenue–ton–kilometers) include: FedEx, UPS, Cathay Pacific, Lufthansa Cargo, Air France–KLM and Emirates [7]. Notice that the top two spots are dominated by U.S. all–cargo carriers which are part of their parent courier companies, while the others are populated by companies which are also concerned with passenger traffic.

Growth in air cargo is expected to exceed passenger traffic growth in every regional market [6]. Although global air cargo traffic had been growing since 2001, in the last five years YoY traffic growth has not kept up (See: Figure 2). This is due to the global economic recession in 2007 as well as rising costs of operating fuel costs. However, the fastest growth region of the world include the Asian markets, in a similar fashion to passenger traffic.

3.2 Cargo Airlines versus Passenger Airlines

Within the air cargo industry, there are two distinct types of airlines that transport cargo:
1. So-called “Combination Carriers”, which carry both passenger traffic as well as cargo. These include major passenger airlines such as Air France–KLM, United Airlines, etc.

2. “All–Cargo Airlines”. As the name implies, these airlines only carry air freight. These companies are usually subsidiaries of a larger courier–focused company. These companies include UPS and FedEx, the largest all–cargo carriers in the United States.

The air cargo airlines remain distinct from passenger-based airlines through underlying constraints on efficiency as well as bureaucratic impositions. For safety reasons (and perhaps bureaucratic reasons), for example, cargo planes in the United States are forbidden from carrying non–crew and non–employee passengers [4].

In terms of supply, costs, and operations, both industries share similar challenges: balancing operating costs of managing flight legs vary depending on fuel and labor with some minor differences (the FAA requires flight attendants on board passenger aircraft, for example). Both passenger and cargo airlines adhere to the maxim of hub–and–spoke network, which are instrumental in economies
of network size. Each additional spoke added to the network adds the number of destinations equal to the total number of spokes and hubs within the system.

Figure 3: A Hub–and–Spoke Model

In terms of the business model between cargo operations and passenger operations, there exist many similarities as well as differences. To summarize, key similarities include [6]:

- Similar revenue management tools and concepts such as demand forecasting, overbooking, capacity forecasting, route generation, bid prices (opportunity cost).

- A growing movement towards network capacity as opposed to leg capacity, in a similar fashion for passenger airlines. However, cargo shipments do not care about the quality of the service (nonstop vs. connecting) as much as passengers, disregarding time.

Major differences include:

- A focus on building customer, supplier, and retailer relationships because of a limited number of customers.

- Focus on profitability rather than load factor. Average load factors hovered around 60% in 2010 [7].

- Medium to long term allotment management – optimal assignment of space to customers. This is in contrast to the passenger airline business where a majority of passengers book in the short term for business trips and/or leisure travel.
• New optimization factors such as freight mix based on density of payload and revenue.
• Schedule optimization based on alternate constraints on noise and airport utilization (night-time flying).

3.3 Characteristics of Air Freight within the Value and Supply Chain

Air cargo airlines and airlines which carry a portion of freight traffic contribute to the larger courier service industry, which, simply put, delivers messages, packages, and mail. Air freight is a small portion of a much larger logistics networks which involve production, packaging, material handling, inventory, transportation, warehousing, security, and information flow.

In the supply chain, customers include end–consumers, retailers, and businesses. These customers contract logistics to shippers, forwarders, or integrators who then select relevant modes of transportation to ship the good. Modes include air, water, and ground transportation. We see in Figure 4 that air cargo becomes a small link within the overall chain. The end package then becomes delivered to the consignee.

As a form of transportation, air freight remains just one option out of many. In fact, the growth of the air cargo industry resulted in contributions to the trucking industry, because air freight often feeds into regional trucking as the end mode of transportation. There are different characteristics in terms of operations, delivery, and economics at play between the different modes.

For example, air freight is the fastest form of transportation in terms of distance divided by time traveled. However, given extra costs within total delivery time such as customs processing, security considerations, consolidation of loads at a hub, warehousing, etc. air freight becomes less economical at lower distances. There are certain scenarios where air transport becomes the optimal mode. Since the key value added by air transport is time, the quick delivery of key items or packages results in a demand and high willingness to pay for specific types of items. Common items shipped by air include electronics and clothing.
Figure 4: Air Cargo Transport within the Larger Supply Chain

Because of these differences, air freight accounts for a minuscule percentage (less than 1%) of total freight carried in terms of both volume and weight. However, air freight accounts for about 40% of its value [5].

3.4 Growth of Air Freight and Dominance of Major Players in the US

In the period from 1990 to 2000, there was continuously positive growth in the air cargo industry in terms of revenue-ton-miles shipped. However, the industry suffered significant shocks during the early 2000s (September 11th attacks) as well as in 2007 (with volatile and high oil prices and an economic recession). As a result, the major carriers have continually shifted their strategy in terms of maintaining fleets and choosing which airports to serve.

In the United States, two companies dominate the courier/shipping industry: FedEx and UPS. The two largest companies combine for about 65% of the yearly $85 billion industry [10]. Both of these
companies operate their own all-cargo airlines: FedEx Express and UPS Airlines. FedEx Express is the largest airline in terms of freight tons flown and the fourth largest in terms of fleet size. FedEx Express is centered at Memphis International Airport “SuperHub”. UPS Airlines is headquartered in Louisville, KY.

The choice of fleet size, hubs, and their operational characteristics and business models are tightly integrated with the airlines’ relationships with airports. Airport forecasts, and therefore master plans and investments, are based heavily on the economics and performance of the air cargo and courier industry.
3.5 The Role of Airports and Airlines in a Cargo–Based Business Model

Cargo airports play a large role in conjunction with the operations of cargo airlines. Figure 7 shows the interaction of airports within the shipping industry supply chain. Airport operations are responsible for activities such as [11]:

- Warehousing and Storage – safety, security, and space.
- Customs – Operations can run smoothly and efficiently.
- Security Clearance
- Dangerous Goods Protocol
- Package Validation
- Cargo Operations

The airline is responsible for activities at the airport such as:

- Resource management of terminal staff
- Loading/unloading cargo
- Shipment prioritization
- Receive shipments

Figure 7: Airport Operations within the Courier Supply Chain

3.6 Federal Aviation Administration Classification of Cargo Airports in the U.S.

The FAA defines Cargo Service Airports as airports that are served by freighters only carrying cargo with a total weight of more than 100 million pounds [12]. U.S. airports may be both designated as
a commercial service as well as a cargo service airport.

In 2012, 111 U.S. airports qualified and fit this definition. Examples include large passenger hubs including Atlanta (ATL), Dallas/Ft. Worth (DFW), Detroit (DTW), Newark (EWR), Washington–Dulles (IAD), New York (JFK), and Chicago (ORD), various regional airports, as well as the two hubs for the largest all–cargo carriers: Louisville (SDF) and Memphis (MEM). In fitting the definition as a cargo service airport, the airport qualifies for additional funding under the airport improvement program.

3.7 The Modern Domestic Market: Consolidation Toward Hub Airports

Within the passenger airline industry, airlines have moved towards hub consolidation in response to rising flight operating costs, driven chiefly by the increase in fuel prices. Within the cargo airspace, we find that similar patterns have occurred.

Table 1 shows the top ten U.S. cargo service airports in 2000, with their corresponding total metric tons landed per year, ranked in order from most throughput. We see in 11 years that only 4 airports have grown in demand, with most being concentrated at MEM, ANC, and SDF (which are now the top three busiest airports). This is significant because the system had not necessarily seen a decrease in cargo traffic, but rather a rearrangement from cargo traffic at the smaller airports to the two main superhubs for FedEx and UPS.

Recalling from Figure 5 that the overall courier industry saw a stagnation, not a loss, from 2000 onwards. It is evident that the two major cargo airlines are shifting their operations model to a more network–dependent hub and spoke model.

In Figure 9, the growth of cargo traffic at MEM and SDF (vs. 2002) are plotted versus the total revenue seen by the industry. Although there is a bump from 2007–2008, despite industry stagnation, there is a growth in the amount of traffic that is carried through those two hubs. This has serious
implications for airports: (1) As airlines depend more heavily on a hub and spoke network, we can expect to see consistently large traffic at the major hubs; and (2) We see that it becomes difficult to forecast the amount of traffic (and therefore the necessity capacity at airports for airport design) given the unpredictability of demand, even when economics indicate otherwise.

Given these implications, it is interesting to examine a case study of Memphis International Airport (MEM) and study its response to increasing demand in the airport master plan. Since forecasts are highly volatile, we question how the airport planners at MEM have planned for capacity to meet its growing demand. We examine the alternation between passenger traffic at the daytime versus cargo traffic at night.

Figure 8: Memphis International Airport as the Key FedEx “Super-Hub” [17]
4 Memphis International Airport: A Case Study

4.1 Overview and History of Memphis International Airport

Memphis International Airport is located seven miles southeast of downtown Memphis (See Figure: 10). Opened in 1927, MEM grew for the next fifty years as an airport for passenger and commercial traffic [15]. The airport went through major periods of growth, spurred by FedEx’s entrance in 1973, designation of a hub for Republic Airlines in 1985. The next year, Republic Airlines merged with Northwest Airlines, causing even large numbers of passengers to flow through Memphis – new construction projects were allocated such as expanding baggage handling facilities, relocating existing and building new car rental centers, updating food and beverage centers, etc. At the peak of its operation in 2007, Northwest Airlines accounted for approximately 81% of total enplanements at the airport [16]

Its major setback came in 2008 in the wake of the Delta–Northwest Airlines Merger. In adhering to
the principles of redundant capacity and rationalization, Delta dropped Memphis as a hub (particularly because of its proximity to Atlanta-Hartsfield. It is less than 350 miles away.). As of 2013, Memphis has lost significant passenger demand as Delta continues to cut down to around 40 flights per day by 2014.

Modern-day MEM features four runways and three terminal buildings. Its top destinations are Atlanta, Charlotte, Dallas/Fort Worth, Chicago, and Los Angeles, supporting evidence that MEM is a spoke that flies to major hubs.

Of course, in addition to Memphis’ legacy as a passenger destination, it has enjoyed significant cargo traffic as well. In 1973, Federal Express built up its primary sorting facility, administration building, and headquarters at Memphis where it became the first all-cargo carrier in the United States. For the next 20 years, cargo traffic grew exponentially as worldwide economic growth and trade took place. From 1992 through 2009 in particular, Memphis International Airport was the busiest airport in terms of annual metric tons of cargo landed. In the recent years, Hong Kong International Airport took the title of busiest airport, but MEM remains a significant hub for cargo traffic.

Figure 10: Location of Memphis International Airport [14]
4.2 Technical Features of the Airport

The airport occupies a 5100 acre site. Primary passenger access flows from Winchester Road to the terminal building, at the center of the airport site. Winchester Road bisects the airport into north–south regions. The northern region is occupied primarily by FedEx sorting facilities, employee parking, administration offices, and aircraft maintenance bays, along with R1 which is oriented east to west. The southern region primarily houses the passenger facilities, which includes three terminal buildings, as well as three runways which are oriented north to south [16]. Figure ?? shows an overview of the airport.

Runways

The configurations of the four runways are listed:

- R1: 9/27 orientation. 8,946 feet long by 150 feet wide. Asphalt material.
- R2: 18R-36L orientation. 9,320 feet long by 150 feet wide. Concrete material.
- R3: 18C-36C orientation. 11,120 feet long by 150 feet wide. Concrete material.
- R4: 18L-36R orientation. 9,000 feet long by 150 feet wide. Concrete material.

Passenger Complex

There are three concourses, which accommodate 79 aircraft gates. The terminal buildings include the usual passenger processing facilities, ground transportation, parking garages, as well as a hotel. For combination carriers, there are also air cargo terminals for operational necessities.

Air Cargo Facilities

The FedEx Super-Hub is located on the northern end of the airport. Its facilities occupy about 18% of the total land area of the airport. It has facilities to support cargo operations, sorting facilities, maintenance bays, corporate offices, parking, as well as a fuel farm. Additionally, there are also sorting facilities for UPS and USPS which are located in the south end of the airport.
Figure 11: Facilities and Runways at Memphis International Airport
4.3 A Long Relationship with FedEx Express

Memphis International Airport would not be where it is today without the collaboration with FedEx Express. Currently, over 10,000 people in the Memphis area are employed by FedEx Express. Fred Smith, the founder of FedEx, decided to centralize operations and corporate offices at Memphis for a variety of reasons:

- There is good weather in Memphis, which is absolutely crucial for cargo operations.
- Central Time Zone, which meant that FedEx could have an extra hour over the east coast.
- Geographic location, an area that connects both the east coast with the south and the west.
- It was his hometown.
- The Memphis Airport Authority offered a $6M loan, which was part of its expansion plan to open a runway in 1972.

Essentially, with the partnership in Memphis, the airport is investing in the future of the courier industry.

4.4 FedEx Express: The Operational Nature of the Beast

Hub-and-spoke networks provide the extreme benefit of efficiency, particularly for a network of shipping needs as large as FedEx’s. Inbound flights arrive every night around the same time, starting at 10:00 PM. Loads are consolidated and shuffled onto outbound flights, which arrive in the morning and get transferred to local delivery vehicles.

In order to support hub-and-spoke operations, however, there is an extreme demand for resources on the part of the company as well as on the airport. With the largest fleet in the world, as of 2013, about 150 of those aircraft operate in and out of Memphis Airport. On the airport side, FedEx operates out of 179 aircraft gates, with an average of one flight every 30 seconds at its peak in Memphis.

Every night, beginning at 10PM [19], inbound flights arrive at Memphis International Airport. In total, there are 2.2 million packages that get processed every night [21] by its 7,500 associates in
night sort (3,500 associates in day sort) within the “primary matrix,” a sorting facility that occupies more than 3.5 million square feet of space [20]. 3,000 support personnel are present to streamline operations.

As a package arrives, it is placed by hand onto the top rack of its 80 conveyor belts. The package is first scanned and then measured by a light curtain, which retrieves information about its origin, destination, weight, and shipper. After scanning, the package leaves its primary matrix via robotic controls and is sorted at least two more times. It finally clears security and makes its way to the outbound container, where it is loaded onto the aircraft. All packages are loaded and flown off before 6:00 AM.

Figure 12: [Clockwise from Top Left] Packages are dumped from a truck. A package gets scanned by a light curtain. Package moves along the conveyor belt after being sorted to an outbound container. Outbound container is loaded onto aircraft.
4.5 Operational Challenges of a Hub–and–Spoke System

Hub–and–spoke systems provide large amounts of benefit, but they operate at a large risk to the system as well. The most concerning aspect of operations is weather: with too much rain or wind or tornados (at the origin and destination airports as well), aircraft can be delayed. Delayed aircraft are problematic because Memphis as a hub imposes certain connecting banks, which would delay package delivery even further if the connecting was not made.

Additionally, because of the connecting bank system, a large number of packages and planes arrive in a very short window. For that reason, the airport capacity needs to be designed with peak operational demand in mind. Additionally, as opposed to the passenger industry, the number of packages can be highly variable, which puts more or less strain on the sorting facilities.

Given these challenges, there are a number of factors that are instrumental to the success of a cargo airline. Firstly, the airline requires privileged access and space to the airport terminal and runways, which are formed by the symbiotic relationship with the airport authority. By design, a portion of FedEx flights fly half empty, with an average 60% system load factor. The benefits of this approach are mitigation of many of the challenges listed before; the drawbacks, of course, are less–than–optimal aircraft utilization, particularly given the enormous upfront capital cost of aircraft.

Particularly since cargo operations occur at night, there is concern for the amount of noise. A noise study in 2009 [16] indicates that aircraft noise affects approximately seven schools and 8,750 housing units affecting areas north, south, west, and east from the airport.

To combat these complaints, the airport has acquired unused land in the south and western portions of the airport. Noise abatement strategies include operational optimization, focusing on “preferential corridors for VFR departures, designating calm wind orientations for maintenance run-ups to minimize noise exposure, and extending residential and nonresidential noise mitigation programs to areas exposed to DNL 65.”
Additionally, FedEx has stated that, as of 2013, all FedEx Express aircraft comply with FAA Stage 3 noise requirements, with many meeting Stage 4 requirements. FedEx Express also is in the process of replacing older 727s and MD-11Fs with newer 757s and widebody 777Fs.

4.6 Challenges in Passenger and Cargo Forecasts

Memphis International Airport contracted a consultant to produce forecasts for unconstrained passenger demand. Jacobs Consultancy researched certain variables and predicted the changes in these variables, obtaining forecasts for demand. Such variables researched were [24]:

- Domestic Average Fare and Average Yield of neighboring airports, which defined the capture region of MEM.
- Population, which is projected at a 0.7% growth through 2027.
- Employment, projected at a 1.0% growth.
- The rise of tourism, through increased bookings at hotel and motel rooms.
- Per capita income, which is projected to increase at 2.0% growth.

Through these variables, a forecast was produced at 2007 for the next twenty years, with uncertainty errors pertaining to Baseline, Low Growth, and High Growth. In Figure 13, the growth rates are detailed as lines. In 2013, data for passenger enplanements for the past 5 years are known and overlaid in red circles.

Unfortunately, there was a tremendous drop in passenger traffic at Memphis Airport. The primary reason for this loss in enplanements was due to the Delta–Northwest merger, which prompted Delta to cut capacity at Memphis because it was a redundant hub—Atlanta is only about 400 miles away.

Again, this reaffirms classroom lessons that forecasts are rarely correct – even though the mathematical and statistical foundations may be solid and sophisticated, there will always be unforeseen circumstances that mess up the forecast.
In contrast to passenger forecasts, Jacobs Consultancy also performed a cargo forecast through 2027. In this case, the real cargo weight landed is slightly off the low growth figure, but still in the relatively same ballpark in Figure 14.

### 4.7 Plans for Future Expansion

In terms of airport expansion, there were only modest additions within the Airport Master Plan [23]. The consultants assumed that FedEx would request additional acreage within the next twenty years, so plans for relocating parcels directly adjacent to FedEx’s areas as well as areas on the eastern side of the airport would be reappropriated. The south midfield area could be allocated as a replacement fuel farm area.

The recommended development plan recognized the uncertainty of long-range demand forecasting and gave three planning activity levels (PALs) to represent potential future levels of activity. Uses
of PAL targets would give checkpoints for planning recommendations to be tied to demand activity.

A listing of important airport expansion activities are given:

**PAL 1 (2008 – 2012)**

- # 6: Concourse C North Extension ($55.8M)
- # 10: Building System Upgrades ($16.2M)
- # 11: Building Interior Renovations ($12.4M)
- # 23: Industrial Park Acquisitons ($12.2M)
- # 1: Angled M6 Exit Taxiway ($3.5M)

**PAL 2 (2003 – 2017)**

- # 8: Concourse C South Pavilion, FIS, and International Gates ($79.0M)
- # 7: Concourse C North Pavilion ($58.7M)
• # 16: Rental Car Administration, Maintenance, and Storage ($38.3M)
• # 2: Consolidated Deicing Pad and South–Side Cross–Field Taxiways ($36.6M)
• # 21: Building Interior Renovations ($35.6M)

PAL 3 (2018 – 2027)

• # 9: Concourse A North Extension ($54.7M)
• # 19: Replacement Authority Office Building ($34.1M)
• # 11: Building Interior Renovations ($28.8M)
• # 12: Building Seismic Retrofits ($28.8M)
• # 13: Phase II of New Parking Garage ($24.2M)

5 Conclusion

The transport of commercial cargo is a key economic indicator of international trade and the state of the global economy. The supply chain and logistics industry exists to connect manufacturer of goods to end customers who are willing to pay for these services and goods. The air cargo segment is just one link in an entire system designed to market and transport goods across the globe. Characteristics of goods shipped by air include time as the key value being added. The quick delivery of key items or packages results in a higher priced demand because customers are more willing to pay for goods that are delivered fast and on–time. Common goods shipped by air include electronics and clothing.

Cargo is carried by both Combination Carriers, which carry both passenger and cargo, and All–Cargo Airlines. The first all–cargo airlines were founded on the basis that dual optimization of both passengers and cargo is not optimal. The cargo industry and passenger airline industry share many of the same features in operating aircraft and fundamental business models such as the network hub-and–spoke orientation. However, there are many key differences as well — namely, air cargo carriers focus on building longer term customer, supplier, and retailer relationships and air cargo
Carriers operate at a distinctly lower load factor in order to buffer against weather and delays.

In the U.S., there are two major players in the industry — United Postal Service (UPS) Airlines and Federal Express (FedEx) — who operate out of Louisville, KY and Memphis, TN, respectively. Air cargo landed at U.S. airports have grown until 2000, where it has stagnated due to the effects of September 11 and rising fuel prices. However, there has been a huge movement to consolidate traffic at these two major hub airports, at the expense of smaller, regional airports. For these reasons, there are huge implications and potential problems in attempting to predict demand for these major airports as well as having enough service capacity to process, sort, and deliver the cargo.

Memphis International Airport was founded about 100 years ago and is currently a medium-sized airport, which formerly served as the hub for Northwest Airlines. With four runways, Memphis International Airport is the prime location for FedEx’s hub, having good weather, located in the Central Time Zone, and positioned optimally in terms of geography. FedEx operates its corporate offices and its primary sorting facility on the north end of the airport. The amount of traffic funnelled through this hub make Memphis the 2nd busiest airport in terms of cargo traffic in the world, which has large implications on future needs for expansion and forecasts.

The master plan was completed in 2007, forecasting constant passenger growth, which did not take into account the Delta–Northwest merger and the de-hubbing of the airport. Given the already diminishing numbers of connecting passengers, Memphis International Airport needs to seriously reconsider its expansion recommendations as well as propose new ideas to draw in other airlines. However, cargo traffic has more or less maintained its presence at Memphis, and could be the saving grace of this airport, as it has been the lifeline of the metropolitan region for the last 50 years.
References


[28]