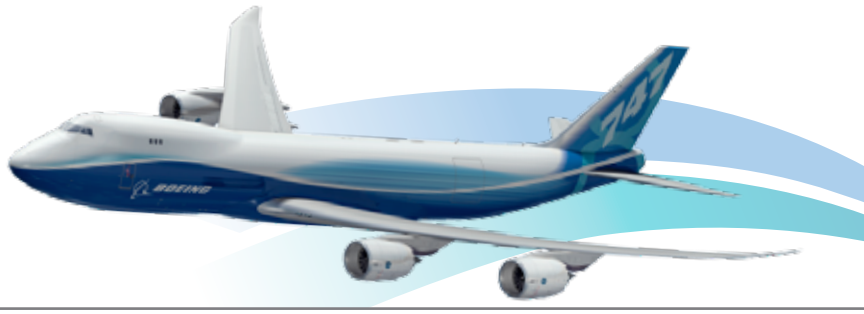
BOEING

World Air Cargo Forecast
2012-2013

Foreword



The Boeing Company issues the biennial *World Air Cargo Forecast* (WACF) to provide a comprehensive, up-to-date overview of the air cargo industry. The forecast summarizes the world's major air trade markets, identifies major trends, and presents forecasts for the future performance and development of markets, as well as for the world freighter airplane fleet.

After rebounding nearly 18.5% in 2010 over the depressed levels of 2009, world air cargo traffic slowed again in early 2011, eventually finishing down 1% relative to year 2010. As of this writing, air cargo traffic has contracted roughly 2%, according to 2012 year-to-date statistics. More worrisome is the slowing long-term growth trend. Since 2001, world air cargo traffic has only grown 3.7% per year. The global economic downturn, rising fuel prices, and improving surface transport mode options have dampened air cargo growth. On the other hand, long-term projected economic and international trade growth, the continuing globalization of industry, increasing adoption of inventory-reduction strategies, and ongoing renewal of the world freighter fleet with more efficient capacity should help world air cargo traffic growth return to a rate closer to historic norms.

Data represented as historical in this document was compiled from many sources including, but not limited to, the Air Cargo Management Group (ACMG), Airports Council International (ACI), Airlines for America (A4A), the Association of Asia-Pacific Airlines (AAPA), the Association of European Airlines (AEA), Boeing Foreign Trade Database (TRADE), Eurostat, IHS Global Insight, the United Nations Council on Trade and Development (UNCTAD), Clarkson Research Services, Drewry Maritime Research, the International Air Transport Association (IATA), the International Civil Aviation Organization (ICAO), the Civil Aviation Administration of China (CAAC), China Statistic Yearbook 2009, China Statistical Bulletin, Centre for Asia Pacific Aviation, and US Department of Transportation (DOT) Form 41. Historical information is updated each year as individual sources revise their respective publications.

This document would not be possible without the efforts of several contributors. The Boeing World Air Cargo Forecast 2012-2013 production team included the Creative and Information Services Group design, production, and web teams; the Writing and Editing Services team; and our colleagues in the Market Analysis Group. Many thanks are due to Mr. Kensuke Sakaki for his research efforts on the North America, intra-Europe, Africa, and Europe–Asia chapters. Ms. Merve Guvendik provided valuable insight on the Turkey air cargo market and cross-checked individual airline-reported traffic statistics for the Appendix.

The next update to the WACF will appear fourth quarter 2014. The authors welcome any questions or comments readers may have. All queries and suggestions should be directed to:

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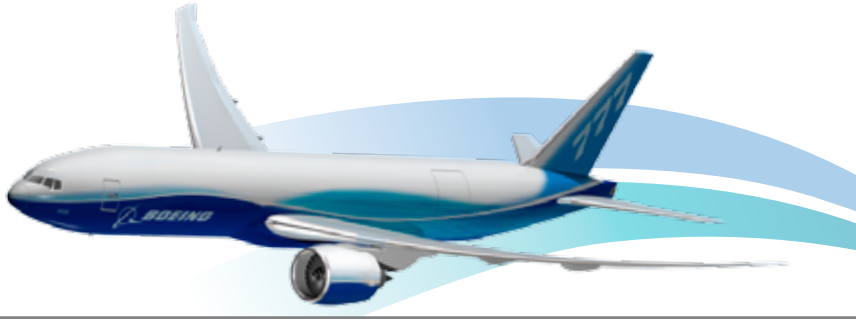
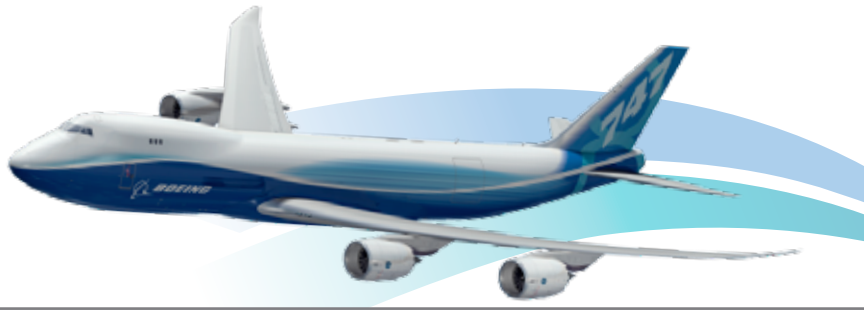


Executive Summary



Air cargo traffic contracted slightly in 2011 and 2012

After rebounding sharply in 2010 from the depressed levels of 2009, demand for air cargo transport began to weaken in early 2011, sliding into contraction by May of that year. The slide continued into the first 8 months of 2012, with year-to-date traffic down 2%. Despite the near-term slowdown, world air cargo traffic will more than double over the next 20 years, compared to 2011 levels, for an average 5.2% annual growth rate. The number of airplanes in the freighter fleet will increase by more than 80% over the next two decades.

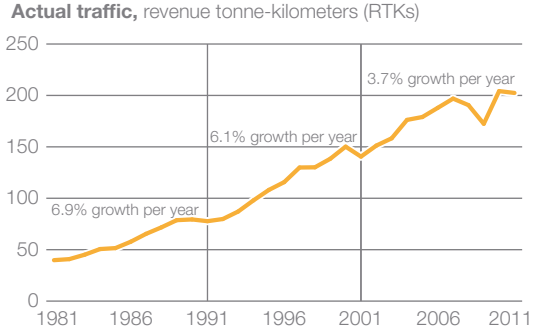
In 2011, world air cargo traffic declined about 1.0%, after expanding 18.5% in 2010. This exaggerated expansion reflects a normal recovery from the precipitous drop in cargo traffic during 2008 and 2009, when traffic fell 3.2% and 9.6%, respectively—the first time that air cargo traffic contracted in two consecutive years. If the current decline continues through the remainder of 2012, however, the years 2011 and 2012 will mark the second such occurrence. World air cargo traffic has expanded only 3.7% per year on average since 2001. Of greater concern, traffic has grown only 2.0% per year since 2004—much slower than the 6.7% historical growth trend maintained for the 23 years between 1981 and 2004. The slowing of world air cargo traffic since 2004 can largely be attributed to the global economic downturn of 2008–2009 and the rising price of fuel.

The global economic downturn of 2008 and 2009, the worst economic contraction since the Great Depression, dragged down all modes of transport. Statistics for world seaports show that container handling fell 9.7% in 2009, prompting containership lines to cut services, reduce frequencies, and idle ships on a global scale for the first time on record. Air cargo traffic fell 12.5% between mid-2008 and year-end 2009, the worst decline since the beginning of the jet transport age. By mid-2009, however, worldwide industrial production began to perk up, nudging air cargo traffic toward recovery. Air cargo surged in 2010 as world industry moved to restock depleted inventories.

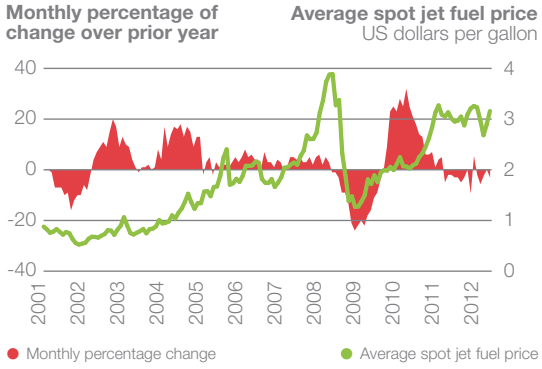
Growth continued during the first quarter of 2011, expanding an estimated 4.5% compared to first quarter 2010, after peaking at a level not seen since 2007. But starting in June 2010, jet fuel prices were on the rise, climbing 42% by December 2011. This contributed significantly to an air cargo traffic slowdown that was aggravated by the civil unrest of the Arab Spring uprisings, the Japan ("Tohoku") earthquake, and flooding in Thailand. The latter two exogenous shocks disrupted manufacture of automobile components and information technology (IT) goods, both of which are key commodity groups for air cargo.

Rising fuel prices have been a factor in air cargo traffic slowdowns since late 2004, diverting air cargo to road transport and maritime modes, which are less sensitive to fuel costs. The price of jet fuel has tripled over the past 8 years, and prices are likely to remain volatile as the threat of supply disruptions persists. In the near term, high unemployment in developed economies, tight fiscal policy in Europe and the United States, and overall restrained consumer spending will also dampen air cargo growth.

World air cargo traffic has slowed over the past decade



Rising fuel costs have dampened world air cargo traffic growth



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On a positive note, however, oil and jet fuel prices are forecast to remain around mid-2012 levels or, in some scenarios, even decline over the next 3 to 5 years. Economic activity, as measured by world GDP, remains the primary driver of air cargo traffic growth. World economic growth averaging 3.2% over the next 20 years, coupled with the forecasted stable fuel prices, will help air cargo traffic grow.

Yield trends

Freight yields have declined at an average rate of 4.2% per year over the past 20 years.

Continuing profit challenges at passenger airlines have focused airline attention on opportunities to earn lower-hold cargo revenue. On average, cargo revenue represents approximately 15% of total air transport revenue, with some airlines earning nearly 40% of their revenue from cargo. Declines in yield for cargo and passenger services reflect productivity gains, technical improvements, and intense competition. While declining yield creates pricing pressure on all industry segments, it also helps stimulate growth for the industry by enabling lower shipping costs for the consumer.

Averaged over the past two decades, freight yield has declined 4.2% per year. The most recent decade saw a slight yield increase of 0.9% per year, compared to the 9.0% average annual decline recorded in the preceding decade.

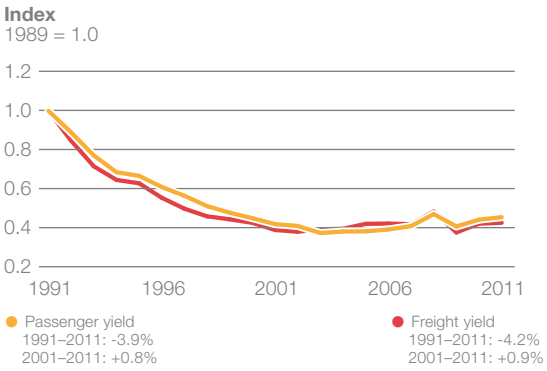
Freight yield diverged from the 20-year downward trend between 2002 and 2008, increasing approximately 4.1% per year during that 6-year period. Much of the increase is due to fuel and security surcharges that began to rise in 2003. In 2008, significant fuel surcharges imposed in response to the fuel crisis helped push yields up 15.4% compared to 2007. Although the global economic downturn drove freight yields down 22.1% in 2009, yields rose steeply by 11.9% when cargo traffic rebounded in 2010. In 2011, total cargo capacity increased while demand stayed nearly flat, holding yield growth to slightly more than 1%.

The higher cost of shipping by air held world air cargo traffic growth to only 3.7% averaged over the past 10 years—well below the historical trend. Industrywide freight yields are expected to return to the historical downward trend as more efficient airplanes enter the market, helping to stimulate market growth.

2011 air cargo growth by major market

World	**-0.9%**
Intra-North America	**-1.1%**
Latin America–North America	**1.1%**
Latin America–Europe	**3.8%**
Europe–North America	**3.4%**
Intra-Europe	**0.1%**
Middle East–Europe	**2.3%**
Africa–Europe	**-0.6%**
Asia–North America	**-5.0%**
Europe–Asia	**-7.0%**
Intra-Asia	**-1.9%**
South Asia–Europe	**2.0%**
Domestic China	**2.8%**

International air freight yields have risen with fuel cost



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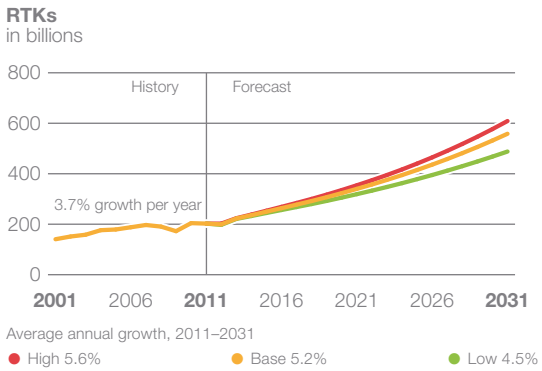
World air cargo traffic growth detail

International air freight will drive overall world air cargo growth through 2031.

Over the next 20 years, world air cargo traffic will grow 5.2% per year. Air freight, including express traffic, will average 5.3% annual growth, measured in RTKs. Air mail traffic will grow much more slowly, averaging only 0.9% annual growth through 2031. Overall, world air cargo traffic will increase from 202.4 billion RTKs in 2011 (down from its 2010 record of 204.2 billion RTKs) to more than 558.3 billion RTKs in 2031.

Asia will continue to lead the world air cargo industry in average annual growth rates, with domestic China and intra-Asia markets expanding 8.0% and 6.9% per year, respectively. Latin America markets with North America and with Europe will grow at approximately the world average growth rate, as will Middle East markets with Europe. The more mature North America and Europe markets reflect slower and thus lower-than-average traffic growth rates.

World air cargo traffic will more than double over the next 20 years



Historical and forecast air cargo growth rates

	Historic 10 years 2001–2011	Forecast 20 years 2011–2031
World	**3.7%**	**5.2%**
Intra-North America	**-1.5%**	**2.3%**
Latin America–North America	**1.8%**	**5.6%**
Latin America–Europe	**3.2%**	**5.3%**
Europe–North America	**1.5%**	**3.5%**
Intra-Europe	**1.6%**	**2.4%**
Middle East–Europe	**9.5%**	**5.7%**
Africa–Europe	**3.2%**	**4.8%**
Asia–North America	**4.3%**	**5.8%**
Europe–Asia	**6.2%**	**5.7%**
Intra-Asia	**4.5%**	**6.9%**
South Asia–Europe	**6.1%**	**5.8%**
Domestic China	**10.9%**	**8.0%**

Executive Summary

Freighter fleet

The number of airplanes in the worldwide freighter fleet will increase by more than 80% during the next 20 years, as demand for air cargo services more than doubles.

Freighter airplanes are crucial to the overall health of the air cargo industry. Dedicated freighters provide reliable capacity to shippers of general cargo, mail and express packages, and cargo that cannot be accommodated in passenger airplane lower holds. Since 2001, freighter airplanes have carried on average just over 60% of the world's total air cargo traffic each year.

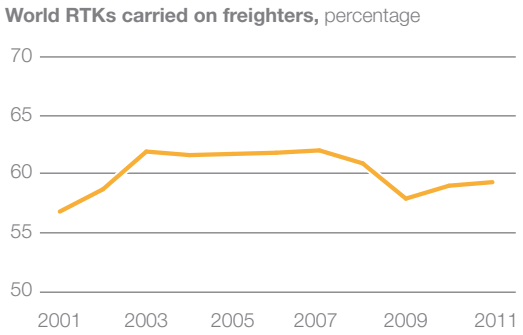
The role of large freighters will increase as the large freighter share of the fleet rises to 36% by 2031, compared to 31% today and 22% a decade ago. The significant efficiency and capability advantages of large freighters will enable carriers to manage projected traffic growth without increasing the number of airplanes proportionately.

About two-thirds of fleet additions for airplane replacement and fleet growth will come from modified passenger and combi airplanes. Yet, production freighters will continue to play an important role because their superior reliability, operating cost, and capability can outweigh the significant on-ramp acquisition cost advantages enjoyed by conversions.

About 1,300 of the 2,754 projected freighter deliveries will replace retiring airplanes, with the remainder expanding the fleet to meet the requirements of projected traffic growth. Two-thirds of deliveries will be freighter conversions, 60% of which will be from standard-body passenger airplanes. Of the projected 935 new production airplane deliveries (valued at $250 billion 2011 US dollars), about three-fourths will be in the large freighter category.

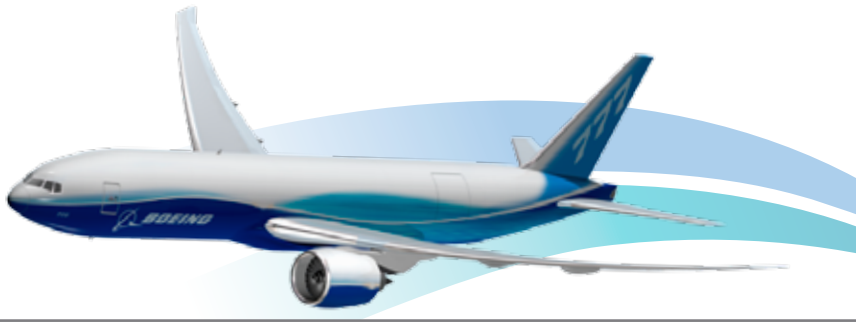
Continuing a trend of many years in the Asia Pacific region, all-cargo and combination carriers will take the greatest number of large freighters, which are uniquely suited to long-haul, intercontinental markets. Express carrier networks will take the majority of medium widebody freighters, ideally sized to support high-yield, time-critical operations. Standard-body freighters will serve emerging regional and niche markets, as well as express markets.

Nearly 60% of world air cargo traffic is carried on freighters



Fleet grows more than 80%, shifts toward large freighters

World Overview



Despite near-term challenges, the world economy will return to its long-term historic growth trend

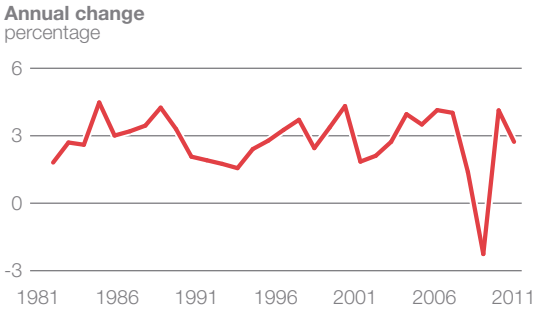
World economic activity, as measured by gross domestic product (GDP), is forecast to grow an average 3.2% per year through 2031. GDP growth is a major driver of international trade and air cargo traffic. The current deceleration in world trade dating back to 2011 is expected to end sometime in 2013 as the pace of global growth strengthens. GDP growth is forecast to expand at a rate of nearly 4% by 2018, before reverting to a rate closer to the long-term trend for the remainder of the forecast period.

After a strong rebound in 2010, global economic activity began to slow in 2011, due in part to rising oil prices and the disruptive effects of the Arab Spring uprisings and the Japan ("Tohoku") earthquake. Global economic growth continued to cool in 2012. High debt levels and sluggish growth resulting from decreased consumer confidence and austerity measures have tempered growth in some of Europe's economies. Some European nations have already slipped into recession. High unemployment and restrained business investment curbed growth in North America. China, along with other rapidly expanding emerging market nations like India and Brazil, showed some signs of slower growth as 2012 progressed.

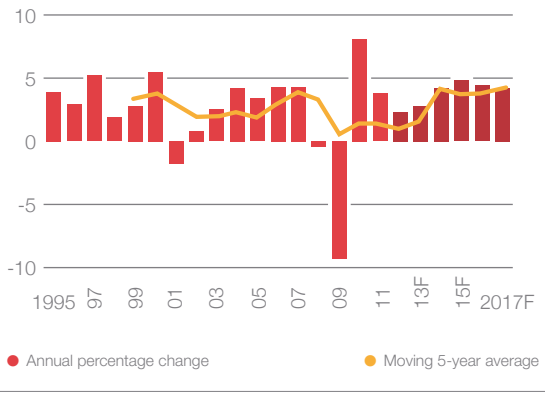
Prospects are encouraging for strengthened economies over the course of 2013 and 2014. Measured steps by European policymakers will encourage business investment and consumer confidence, spurring the region's slowly recovering economy to regain modest growth by 2014. The US economy remains on a modest growth track, with continuing improvement in housing indicators and consumer spending. China's government will continue to invest in infrastructure to stimulate their economy. Overall global economic expansion is expected to accelerate, fueled by deferred demand and renewed industrial investment.

World industrial production, a component of world GDP, is a measure of change in manufacturing, mining, and utilities output. It is a key measure of economic performance and a significant indicator of long-term air cargo trends. Industrial activity tends to correlate well with air cargo growth because freighter aircraft are often used to move in-progress manufacturing items between production facilities. The strong decline in industrial production in 2009 and its subsequent rebound in 2010 helps to explain the severity of the corresponding downturn and the vigor of the resurgence in world air cargo traffic. Global manufacturing slowed over the course of 2011 and remained muted in 2012. Growth is expected to moderately strengthen in 2013, then expand further in 2014 to a rate of more than 4%, which will be sustained through 2017, supporting the positive outlook for continued long-term world air cargo traffic growth.

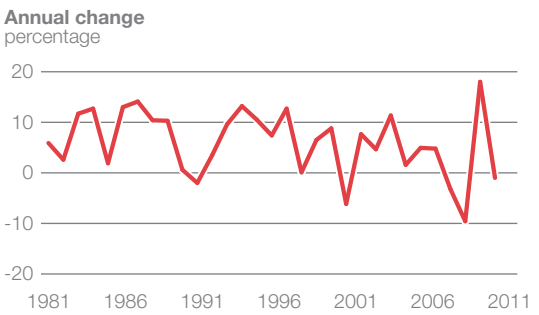
World economic growth, GDP



World industrial production history and forecast



World air freight traffic, RTKs



World Overview

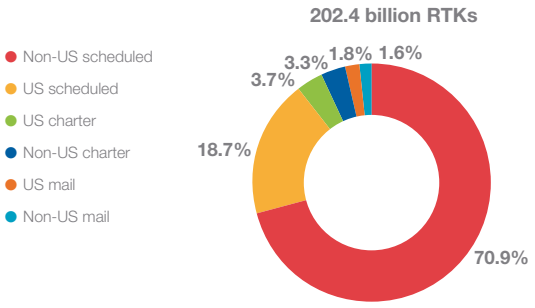
World air cargo components

The US share of air cargo RTKs fell below 25% of the world total for the first time in history.

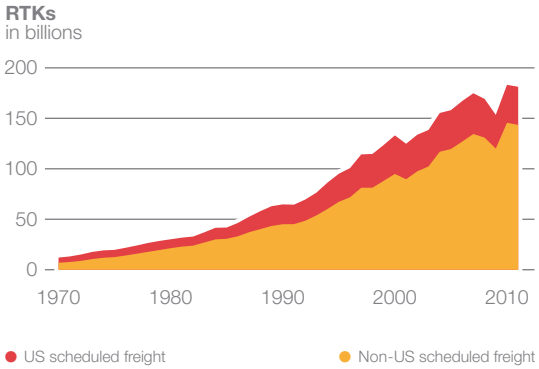
World air cargo comprises freight (scheduled, charter, and express) and mail, with scheduled freight and express being the largest components. For most of the past four decades, world air cargo traffic carried by non-US airlines has grown faster than traffic carried by US-domiciled carriers, reflecting both faster international air trade growth and slower US domestic growth.

Scheduled air cargo traffic accounts for 90% to 93% of all world air cargo. Most shippers try to use regularly scheduled cargo capacity to meet their transport requirements. The remaining 7% to 10% of world air freight transport is provided either by charters or through ad hoc requests for cargo capacity, usually to meet urgent or special needs. Generally, charter freight share rises during times of strong world air cargo growth and, conversely, falls during times of slow or negative traffic growth. But contrary to this general trend, world charter air freight remained nearly flat in 2011 while world scheduled air freight declined 1.1%.

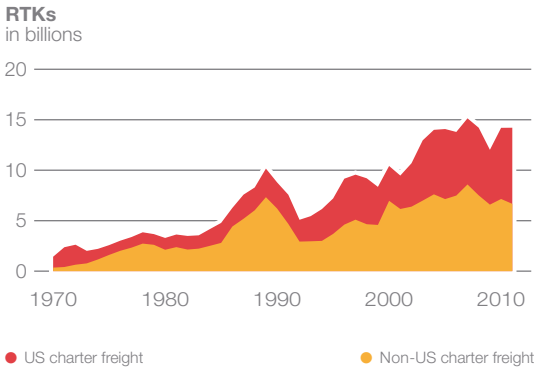
2011 air cargo market share by airline domicile



World scheduled air freight fell 1.1% in 2011



World charter air freight grew 0.1% in 2011



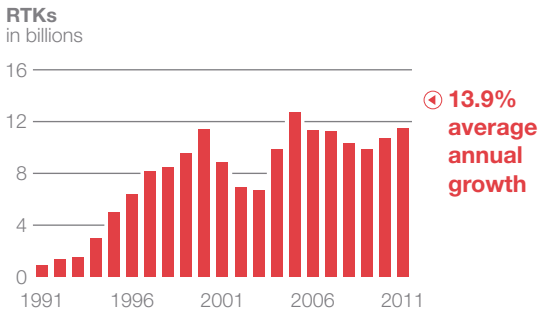
Large widebody freighter ACMI services

Large widebody ACMI traffic volumes resumed growing after the global economic downturn.

Aircraft, crew, maintenance, and insurance (ACMI) providers, sometimes called "wet lease providers," offer cargo operators the flexibility to obtain lift on a trial basis, augment existing markets, and provide service in markets that are highly seasonal—all with no capital equipment investment required. Large freighters in long-haul markets account for the most significant segment of the air cargo ACMI business. The ACMI business is sensitive to changes in the air cargo business, but it has become an established industry subsector since the early 1990s, maintaining a share of almost 6% of total world air cargo traffic since 2001.

Annual growth for ACMI large freighter traffic has averaged 13.9% since 1991, although growth is uneven from year to year. ACMI traffic contracted 8% in 2008 and 4% in 2009 as the effects of the global economic downturn took their toll. As demand for dedicated freighter airplane capacity rebounded in late 2009 and 2010, this segment benefited greatly from the limited availability of long-haul freighters in operator fleets. In 2010 and 2011, large freighter ACMI traffic grew 7.9% and 7.4%, respectively.

About 6% of world air cargo traffic is transported by ACMI providers



International express

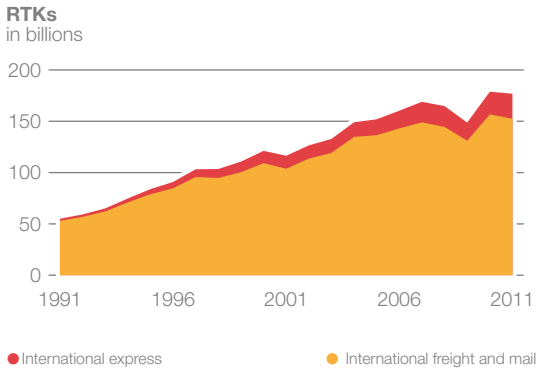
International express traffic rebounded from the global economic downturn with growth of 24.8% in 2010 and 10.2% in 2011.

The distinction between express and general air cargo continues to blur. Traditional providers are expanding their time-definite offerings, and express carriers, freight airlines, and postal authorities are consolidating. Ultimately, the air cargo customer benefits from increased service options and lower prices as market pressure brings competing products into the market.

International express traffic grew at nearly triple the rate of total worldwide air cargo traffic, averaging more than 22% annually from 1992 to 2000, as measured in revenue tonne-kilometers (RTKs). However, growth slowed considerably to about 6.8% between 2000 and 2008. This pattern of rapid growth followed by more modest growth parallels the double-digit growth of the domestic US express industry during the 1970s and 1980s, which was followed by slower growth. However, international express traffic growth was interrupted in 2009, falling 12.7% as a result of the global economic downturn. The recovery was robust, with express traffic increasing 24.8% in 2010 and 10.2% in 2011.

The international express share of total world air cargo RTKs expanded from 4.1% in 1992 to 12.8% in 2008, reflecting higher-than-average annual growth in express traffic. International express maintained its share at about 11.9% of total traffic in 2009 because the decline in international express flows was about the same magnitude as the drop in the overall world air cargo market. In 2010, the international express market share had a small increase to 12.4%, then increased to 13.8% in 2011. The average international express shipment size is estimated to have grown from 2.7 kg in 1992 to 6.2 kg in 2011, further bolstering the overall express component of international air freight traffic. As businesses continue to expand beyond domestic or nearby regional markets, the international express sector will continue to grow, albeit at more sustainable, long-term rates.

International express market share reached 13.8% in 2011



World air cargo and maritime traffic

Containership traffic had a strong recovery, but is struggling with financial losses in the current economic environment.

Air cargo is only one part of the global goods distribution network. Shippers demand that shipments arrive at their destination on time, undamaged, and at a reasonable price, regardless of transportation mode. Different transport modes—road, rail, maritime, and air—can often move the same commodities. But shippers usually have only two choices for intercontinental freight: air and maritime. Maritime transport offers the primary benefit of low cost; air transport offers the benefits of speed and reliability.

Comparison of maritime and air cargo transport in tonnes

The maritime transportation industry is much larger than the air cargo industry, measured in tonnes of goods transported. In 2011, the world maritime industry carried an estimated total of 8.8 billion tonnes compared to 43 million tonnes for the air cargo industry. However, this maritime traffic includes the movement of bulk commodities such as oil, metal ores, and grains, most of which cannot be directly compared to the high-value dry commodities associated with transport by air. A more useful measure is to compare the maritime dry cargo that remains after subtracting the 5.3 billon tonnes of bulk commodities carried by maritime transport in 2011.

Containerized cargo, a segment of maritime dry cargo, is one of the fastest growing forms of freight transport. Since the late 1980s, globalization and regional specialization of industry, particularly in Asia, have driven containership freight flows to grow rapidly. Worldwide containership tonnage in 2011 is estimated to be 1.38 billion tonnes, representing about 40% of the world maritime dry cargo.

Comparison of maritime and air cargo transport in RTKs

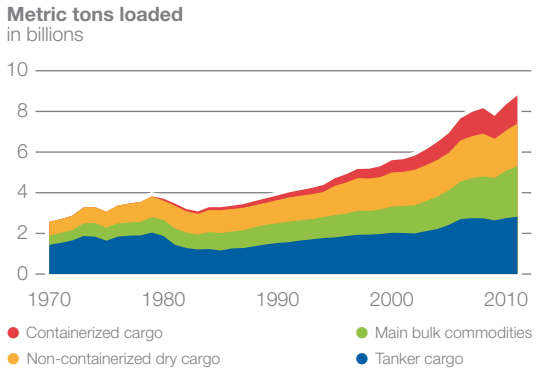
Containership cargo traffic is estimated at 10.5 trillion RTKs in 2011, while world air cargo traffic is 202 billion RTKs. The largest containership markets mirror the largest air cargo markets. In 2011, Europe–Asia was the largest containership market, with 2.8 trillion RTKs, followed by Asia–North America with 1.9 trillion RTKs and Europe–North America with 0.3 trillion RTKs.

Until the global economic downturn of 2009, the containership industry had grown steadily every year since its inception. Between 1980 and 2011, containership tonnage averaged 8.9% growth per year.

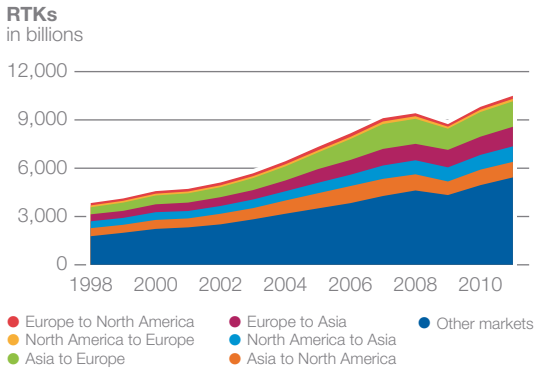
Both air and maritime cargo had major declines during the global economic downturn of 2008 and 2009. World air cargo traffic fell by 9.6% and containership freight dropped 7.2% in 2009. In response to deteriorating economic conditions and the drop in demand for shipping services, the container shipping industry reduced capacity. Measures taken include operational changes such as “slow steaming,” decreasing ports of call, reducing frequencies, and taking ships out of service. At the beginning of 2010, 11.6% of the world containership fleet was idle.

As the global economy recovered, idled containerships were returned to service, and by mid-2010, only 2% of the world containership fleet remained out of service. Global trade increased and containership traffic grew 12.3% in 2010 and 7.0% in 2011 in terms of tonne-kilometers. In addition to returning idled ships to service, available containership capacity was further

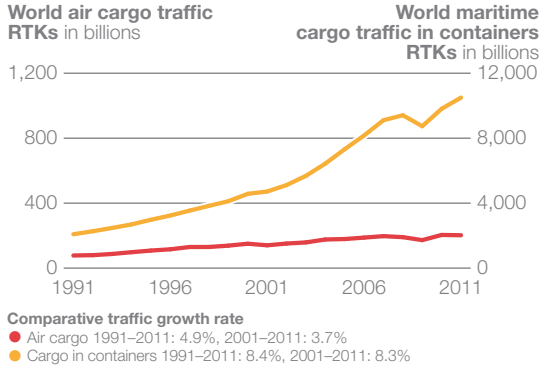
World containership transport has averaged 8.9% growth since 1980



World containership traffic rebounded in 2010 and 2011



World containership traffic growth has outpaced air cargo growth



increased by the delivery of new ships that had been ordered before the downturn. When the economic recovery slowed in 2011, the containership industry had a severe excess of capacity, as the demand for shipping services failed to keep up with available capacity. As a result, containership yields dropped to very low levels to maintain loads. Concurrently, rising fuel prices led to increased operating costs. These factors were major contributors to industry losses, estimated at US$5 billion in 2011. To minimize continued losses, containership companies are currently trying to stabilize and increase yields. As the economy improves, it is expected that containership rates will rise and return to sustainable levels.

Forecasting methods

Several approaches can be used to handle the range and complexity of forecasting challenges. Each approach is carefully matched to the specific issue and application.

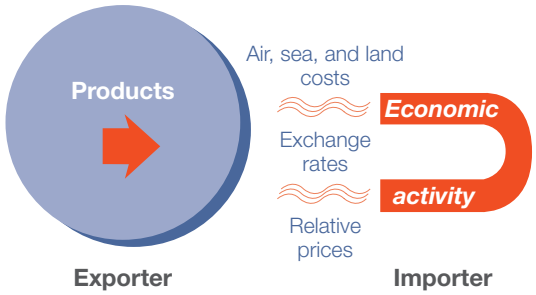
Four approaches—econometric modeling, judgmental evaluation, trend analysis, and potential analysis—provide useful forecasts. Econometric modeling helps determine the overall importance of underlying economic factors (e.g., GDP) and provides forecasts that are linked to expectations of those factors. This method is useful for medium- and long-range forecasts in regional markets.

The demand for air freight depends on the economic activity in the importing region or country, conditioned by transportation costs, exchange rates, and relative prices. Econometric modeling may be used to predict demand, assuming that adequate capacity will be in place to meet the demand and that factors not included in the model will exert the same influence as in the past. Judgmental modifications often account for expected changes in non-econometric growth factors. For example, estimating the effect of air service agreements, trade quotas, restrictions on night operations, and changes in trade patterns could be vital to an airline's strategic plan. Incorporation of anticipated increases in capacity, route restructuring, and market programs can contribute to more reasonable forecasts.

A simple trend analysis often is used to evaluate changes in economic factors. This approach is useful in evaluating general changes in the marketplace that can be attributed to the combined effects of a number of factors. Such trends can be extrapolated into the future. However, extrapolation from a small base with large growth can produce unrealistic results.

Potential analysis is particularly useful for forecasting markets in their early stages of development. For example, commodities transported by air tend to be valued at more than $16 per kilogram. It is therefore possible to project a potential air cargo market based on the percentage of traded goods (regardless of transport mode) that are valued above $16 per kilogram.

Demand pulls air cargo traffic



Market environment

Although economic activity is the primary influence on world air cargo development, other factors must be considered.

The acquisition of aircraft and expansion of services have had particularly favorable effects on the express and small-package market. Factors beyond the control of airlines include inventory management techniques, modal competition, environmental regulations, globalization, market liberalization, national development programs, and the introduction of new air-eligible commodities. All these factors play significant roles in air cargo growth. Constraints to economic growth, primarily those originating outside the airline industry, can hinder air transport industry growth dramatically. A variety of air transport industry constituencies and policymakers address these interrelated growth issues.

Air cargo growth has slowed over the past decade

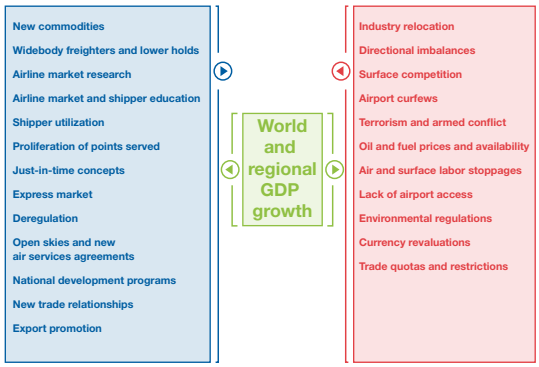
World air cargo growth has slowed markedly since 2004. The global economic downturn and rising fuel prices are key factors in the slowing of air cargo growth, but other macro trends may be at work as well.

Fuel prices have been a persistent problem for air cargo. As fuel prices roughly tripled between 2004 and 2012, freight forwarders and the greater shipping community diverted a larger portion of general cargo to less expensive modes of transport. As of third quarter 2012, jet fuel prices were near historic highs (even after removing the effect of inflation). One consequence has been the contraction of world air cargo traffic by 2% for the year 2012 through July.

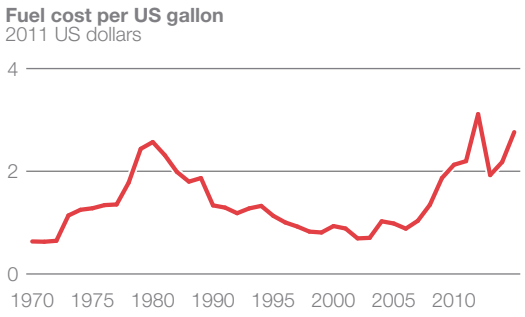
Changes in the containership industry have also enticed shippers to move their freight away from air cargo. Containership pricing is generally 10 times less expensive than air cargo, per unit weight. The average containership size has more than doubled since 1990, resulting in lower average unit cost per container transported. At the same time, the number of ships in the world containership fleet has quadrupled, allowing containership lines to expand their networks to give shippers better geographic coverage and more service options. The rise in air cargo pricing caused by fuel surcharges only exacerbated the problem.

Changes in the behavior of shippers have also weighed in favor of containerships. Improved telecommunication and information access have had wide-reaching consequences. For example, e-mail and the electronic transmission of documents have reduced the need to ship many types of small parcels and documents that are the life blood of express and courier companies. In addition, “track and trace” tools, once the sole provenance of the air express industry, are now commonplace at containership transport providers. Better information and improved supply chain visibility allow shippers to plan and manage their supply chains with a higher degree of confidence, eroding one of the primary advantages of air cargo. Air cargo has traditionally served as a unique tool that enables shippers to recover from unforeseen events and emergencies. Anecdotal evidence suggests that improved supply chain visibility has reduced the occurrence of situations that demand the speed and reliability of air transport.

Forces and constraints for air cargo growth



Jet fuel prices are at near historic highs



Source: A4A

World Overview

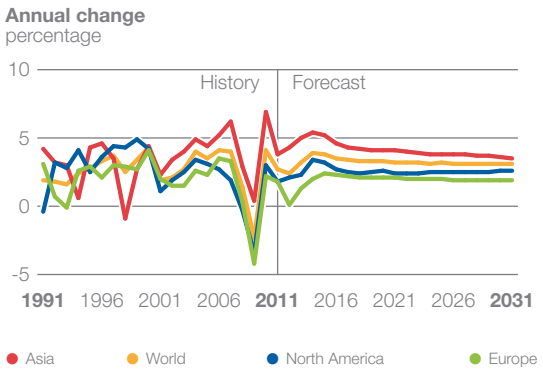
World economic growth outlook

The world's economy is forecast to grow at an average annual rate of 3.2%.

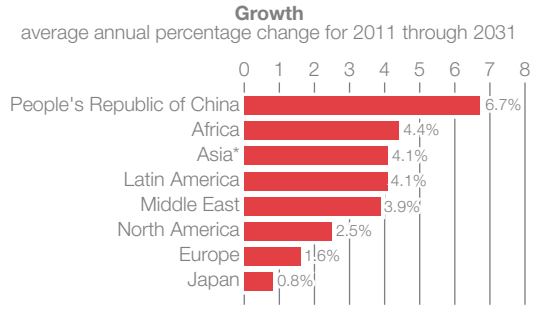
The global economy is expected to outperform historic averages over the next five years and return to a long-term average of 3.2% by 2031. The long-term growth rate for North America is expected to average 2.5% per year over the forecast period. Europe is projected to grow about 1.6% per year during those 20 years.

In general, emerging market economies, with an aggregate long-term growth trend of nearly 5%, continue to grow much faster than established economies. Asia will continue to lead the world's major economies with projected growth of 4.1% per year between 2011 and 2031. China leads the other Asian economies in long-term growth with a 6.7% average annual increase. In contrast, Japan's economy will grow less than 1.0% per year. Asia's share of world GDP is projected to rise from 27% in 2009 to more than 35% by 2031. The world GDP share held by North America and Europe, which together currently account for more than half of economic activity, will drop to less than 45% by 2031.

Historical and forecast world economic growth by region



Forecasted average regional GDP growth rates



*Includes People's Republic of China and Japan

World air cargo traffic forecast

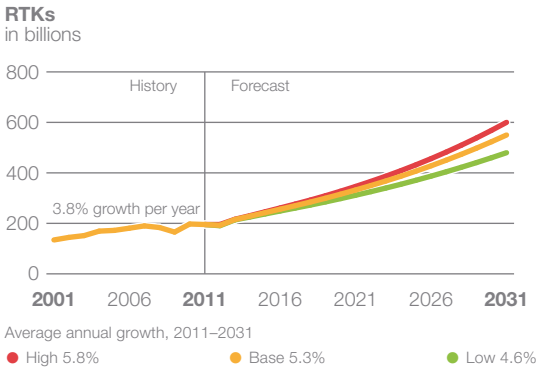
World air cargo is the sum of freight and mail. World air freight traffic is strongly related to GDP and average yield. The world airmail component, however, depends less on yield and therefore correlates most strongly with GDP.

Low, baseline, and high annual growth of 4.6%, 5.3%, and 5.8%, respectively, are forecast for world air freight traffic. High and low scenarios correspond to GDP growth of 0.5% above long-term projections and 0.5% below, respectively. Worldwide air freight is expected to more than double over the next 20 years, increasing from 195.4 billion RTKs in 2011 to 550.0 billion RTKs by 2031.

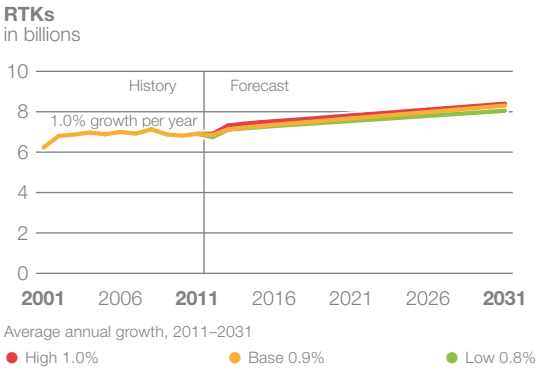
World airmail is forecast to grow at a consistent 0.9% per year. Risks that could affect future airmail growth include inroads by express operators into package mail, increasing reliance on Internet communication, entry of traditional postal services into express air freight operations, and more stringent security requirements.

The baseline forecast for total world air cargo predicts that traffic will more than double between 2011 and 2031. Worldwide traffic will grow from 202.4 billion RTKs in 2011 to more than 558.3 billion RTKs by the end of the forecast period. Sustained economic growth, along with decreasing yields, contributes significantly to the growth of the air cargo industry.

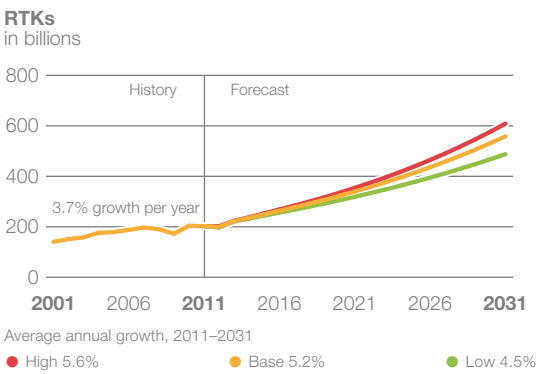
World air freight will grow 5.3% per year through 2031



World airmail will grow 0.9% per year through 2031



World air cargo (freight and mail) will grow 5.2% per year through 2031



Regional air cargo markets

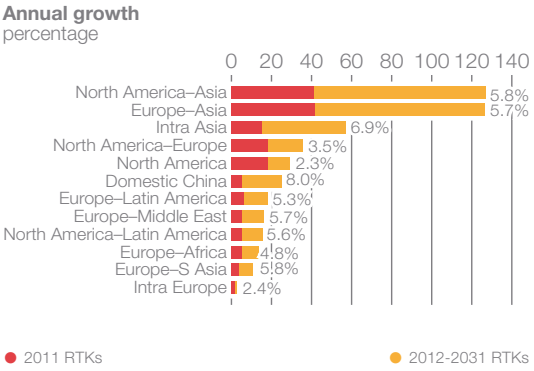
Air cargo markets linked to Asia, especially the Pacific Rim countries, will lead all other international markets in average annual growth between 2011 and 2031.

Intra-Asia traffic will grow faster than any other international world market, averaging 6.9% growth per year. The North America–Asia and Europe–Asia markets will expand at average annual rates of 5.8% and 5.7%, respectively. Domestic China will be the fastest growing contiguous market in the world, averaging 8.0% growth per year for the forecast period.

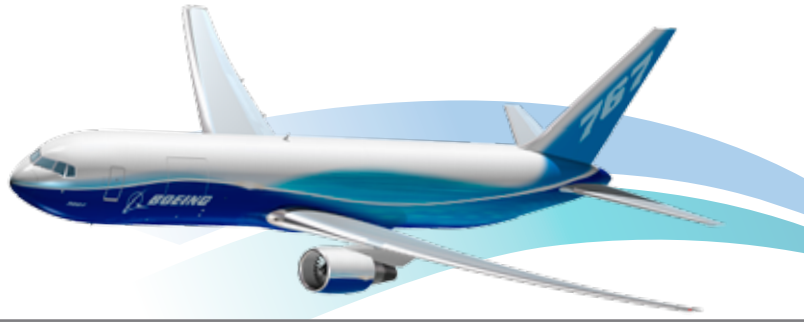
The mature markets of North America and intra-Europe will grow slowly, with 20-year annual growth rates of 2.3% and 2.4%, respectively. Also projected to lag behind the world average growth rate are the markets of North America—Europe at 3.5% growth and Europe–Africa at 4.8% growth.

The Europe–South Asia market is forecast to exceed the world average at 5.8% annual growth per year. The Europe–Middle East market will grow at an annual average of 5.7%. Europe–Latin America will grow 5.3%, and North America–Latin America 5.6%. Market shares will continue to change as a result of varying regional growth rates. Although it will grow 8.0% per year over the next 20 years, domestic China will still possess a relatively small market share, given its current size and the market's relatively short average trip distance. The share of world air trade connected to all of Asia's markets, including the domestic markets of China and Japan and all international markets, will increase from 51.5% in 2011 to 59.9% in 2031.

Asia markets will continue to lead industry growth



Regional Markets
North America



For the purposes of this forecast, North America is defined as the United States and Canada.

Air cargo traffic declined in 2011

Air cargo moving to, from, and within the United States and Canada accounts for 9.1% of the world's air cargo traffic in terms of tonne-kilometers and 14.0% in terms of pure tonnage.

The North American air cargo market has grown modestly, reflecting the slow recovery from the global economic downturn. The US domestic air cargo market, which accounts for 95.9% of total North American air cargo traffic, grew 4.1% in 2010, only to give back 1.3% in 2011. Uneven performance of the domestic market helped drive overall North American air cargo traffic to grow 4.2% in 2010, then dip 1.1% in 2011.

Canadian domestic air cargo, which is 2.2% of the total North American market, grew 4.1% in 2010 and 2.9% in 2011. Transborder traffic from the United States to Canada accounts for 1.6% of the 2011 North American market, while transborder traffic from Canada to the United States accounts for 0.3% of the North American market.

US domestic air cargo market

The US domestic market grew a total of 2.7% during 2010 and 2011.

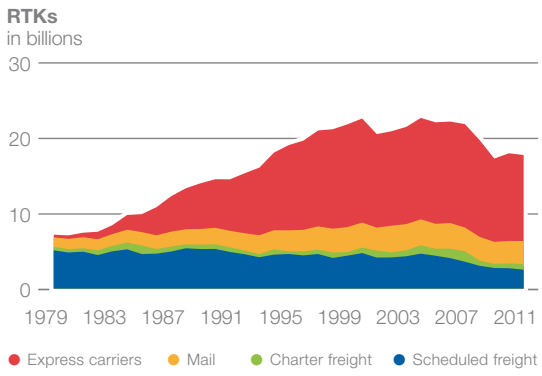
The US domestic market is mature and has remained flat or in slight decline in recent years, except during the global economic downturn, which resulted in a drop of 12.4% in 2009. Traffic recovered in 2010, growing 4.1% to 17.9 billion revenue tonne-kilometers (RTKs). In 2011, US domestic air cargo traffic declined 1.3% to 17.7 billion RTKs as the recovery stalled. Revenue for the US domestic air cargo industry was $26.1 billion in 2010 and $28.1 billion in 2011. Although revenues increased over this period, they are still 15% below the industry peak of $32.8 billion, which was set in 2007.

The express carrier market share has remained stable, posting 64.1% in 2009, 64.8% in 2010, and 64.4% in 2011. Express carrier traffic increased 5.2% from 11.0 billion RTKs in 2009 to 11.6 billion RTKs in 2010. Traffic declined 1.9% in 2011 to 11.4 billion RTKs. After increasing continuously during the 1980s and 1990s, the volume of express shipping leveled off between 2001 and 2007, reflecting the maturing of the market. Shipping volumes have remained flat since the 2008–2009 global economic downturn. Express carrier volume was 5.3 million shipments per day in 2009, then increased 1.1% to 5.4 million per day in 2010 and remained at 5.4 million shipments per day in 2011.

Scheduled freight traffic in the domestic US market decreased 1.0% in 2010 and 7.2% in 2011 to end at 2.5 billion RTKs. The market share of scheduled US domestic freight carriers declined from 15.8% in 2009 to 15.1% in 2010, then declined again in 2011 to 14.2%.

Scheduled mail accounted for 17.3% of the US market in 2011 with 3.1 billion RTKs. Mail traffic increased by 2.4% in 2010 and 2.7% in 2011. Chartered operations accounted for 4.2% of the US market with 0.7 billion RTKs in 2011. After declining 19.1% in 2009, charter operations increased 15.2% in 2010 and grew again in 2011, increasing 15.2%.

Express service dominates the US air cargo market



North America

Canada domestic air cargo market

Canada's share of the region's air cargo market has remained steady.

The Canadian domestic market accounted for 2.2% of the total North American air cargo market in 2011. Typical of a mature market, domestic Canada traffic has remained flat or declined slightly since 2002. After dropping 9.4% in 2009, traffic rose 4.1% in 2010 and 2.9% in 2011 to log 402 million RTKs.

Canada's economy declined 2.8% in 2009

Economic recovery followed in 2010 and 2011 with GDP growth of 3.2% and 2.5%, respectively.

US–Canada transborder air cargo increased in 2011

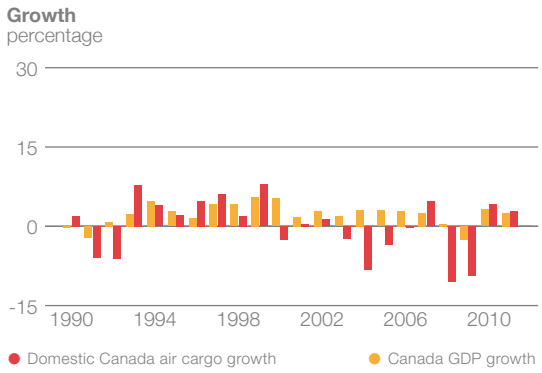
The transborder air cargo market was 318,000 tonnes in 2009. It grew 7.9% in 2010 and 3.6% in 2011. Traffic from the United States to Canada rose 8.3% in 2010 and 5.7% in 2011. Traffic from Canada to the United States was up 6.3% in 2010 and down 6.0% in 2011 as the economic recovery stalled in the United States.

Canada's largest trading partner is the United States. In 2011, air cargo represented 4.7% of Canada's total trade with the United States in terms of value, compared with 5.1% in 2010.

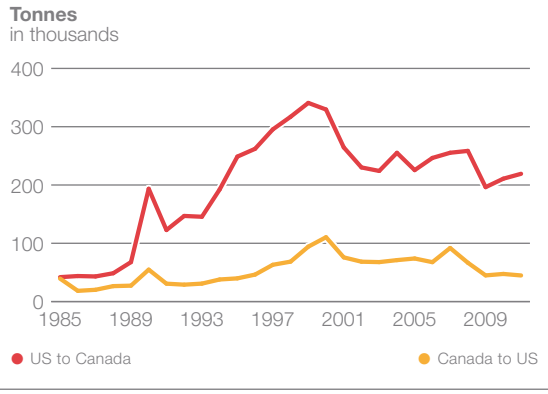
Northbound tonnage continued to exceed the southbound tonnage, as it has since the mid-1980s.

Commodities shipped from the United States to Canada included small packages, industrial machinery, electrical machinery, and ferrous products. Commodities shipped from Canada to the United States included industrial machinery, electrical machinery, specialized equipment, and small packages.

Canada GDP and domestic Canada air cargo growth



Northbound transborder tonnage continues to exceed southbound tonnage



North America

Cargo carriers increase use of trucks

The decline in the number of airplanes in the passenger fleet, the predominance of narrow-body airplanes on domestic routes, and the demise of scheduled domestic air freight airlines have reduced North American domestic air cargo capacity, measured in available tonne-kilometers (ATK).

Continuing the trend of past years, combination carriers continue to rely on trucks to offset the loss of domestic capacity that has resulted from reduced fleet size and the shift of widebody airplanes from domestic to international markets. Truck flights allow combination carriers to offer service comparable to that of pure cargo carriers. Rising fuel costs have magnified the inherent cost advantages of ground transport over air transport.

The global economic downturn dramatically decreased domestic shipping demand after years of fairly steady growth. In 2008 and 2009, both air and truck tonnage declined significantly. The slow economic recovery that began in 2010 is reflected in sluggish growth in both truck and air tonnage in 2010 and 2011.

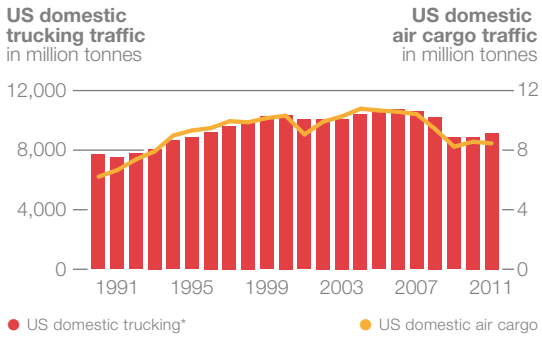
North America economic forecast

The US economy grew 3.0% and the Canadian economy grew 3.2% in 2010. In 2011, the US and Canadian economies grew 1.7% and 2.5%, respectively.

In 2008 and 2009, the world and North American economies suffered the most severe downturn since the Great Depression. As the economies recovered, the US GDP grew 3.0% in 2010 and 1.7% in 2011. The Canadian GDP grew 3.2% in 2010 and 2.5% in 2011. In the long term, the US GDP is forecast to average 2.6% growth per year between 2011 and 2031, while Canada's GDP averages 2.4% annual growth during the same period.

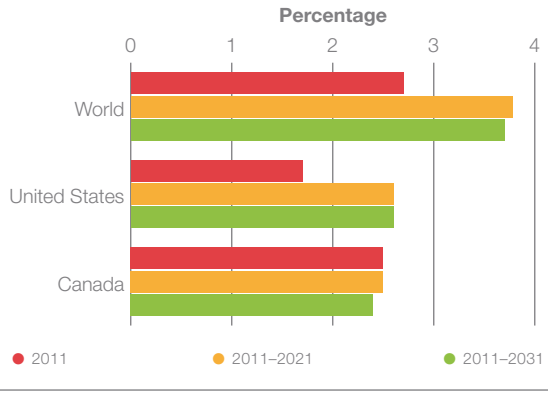
Trucking and air cargo traffic growth has been sluggish in 2010 and 2011

Sources: IATA and American Trucking Associations



*Figures include for-hire and private carriage.

A return to historic GDP growth rates is forecast



North America

North America air cargo forecast

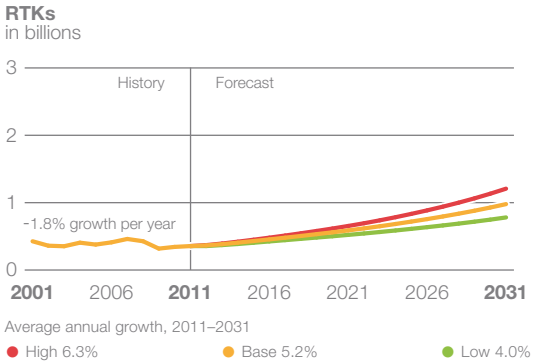
Air cargo traffic in North America grew 4.2% in 2010 and declined 1.1% in 2011, reflecting the slow recovery from the global economic downturn. North America air traffic is projected to average 2.3% growth over the next 10 years and to sustain that rate over the full 20-year forecast period.

Transborder air cargo traffic is expected to exceed the growth rate of both the GDPs and the domestic air cargo markets of the two countries. Liberalization of air transportation agreements will foster the continued use of relatively uncongested and accessible Canadian airports by US shippers for transport to Europe and Asia. Transborder air trade between Canada and the United States is projected to grow 5.2% annually over the next 10 years and to hold steady at that rate for the entire forecast period through 2031.

The US domestic market will maintain the dominant share of the total North American market, which was 95.9% of the total RTKs in 2011. The US domestic market is forecast to grow at an average annual rate of 2.2% over the next 10 years and to sustain that rate over the full 20-year period from 2011 to 2031.

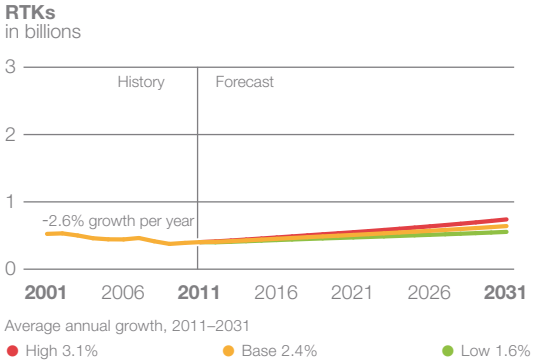
The Canadian domestic market is forecast to grow at an average annual rate of 2.4% through both the 10-year and 20-year forecast periods, roughly matching Canada's GDP growth. Overall, growth in both North American domestic air cargo markets could be limited by continued expansion of trucking services in the time-definite sector.

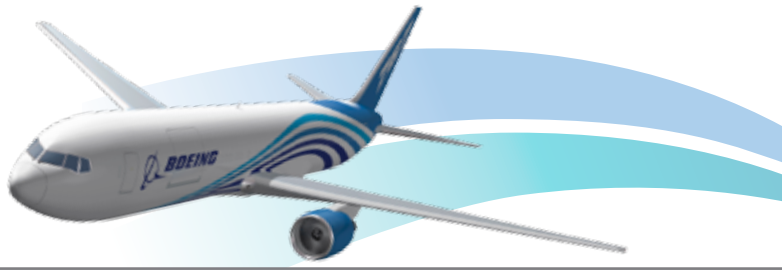
US and Canada transborder air cargo traffic will grow 5.2% per year



US domestic market will grow 2.2% per year

Domestic Canada air cargo market will grow 2.4% per year





Regional Markets
Latin America and North America

For the purposes of this forecast, we define Latin America as South America; Central America, including Mexico; and the Caribbean Basin. We define North America as the United States and Canada.

Air cargo grew 1.1% in 2011

The Latin America–North America market, which represents 2.6% of the world's air cargo traffic measured in tonne-kilometers and 3.0% measured in tonnes, grew 1.1% in 2011, following growth of 17.1% in 2010.

Market growth projected to continue

The Latin America–North America air cargo market grew in both 2010 and 2011 after its 15.1% decline in 2009. Strong demand for foreign goods in South America drove air imports in that market to grow 22.4% in 2010 and 6.6% in 2011. Growth of South American air imports is expected to continue as Latin American economies develop.

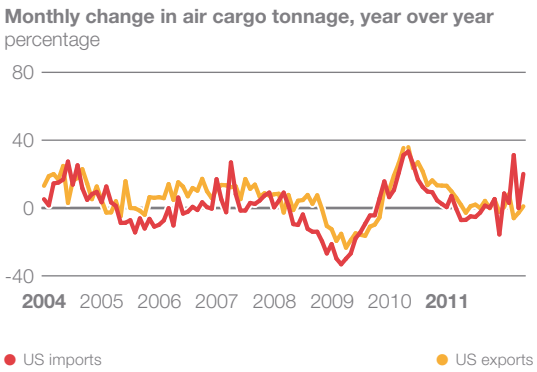
Latin America–US air cargo market

Air trade between North America and the three subregions of Latin America grew at different rates. South America posted its second consecutive annual gain in 2011, while Central America gave back nearly a third of its 2010 gain and the Caribbean Basin relinquished 1% more than it gained in 2010.

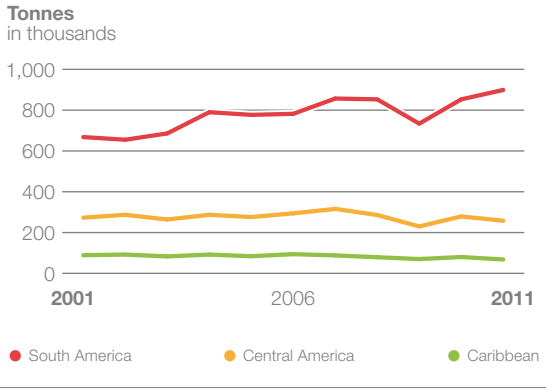
The United States is Latin America's most important trading partner, accounting for 99% of North America's air exports to Latin America and 99% of North America's imports from Latin America in 2011. Monthly Latin America–US trade therefore serves as a good approximation of month-to-month activity in the overall air cargo market. Recent trade agreements, including the Canada-Colombia Free Trade Agreement and the US Trade Promotion Agreements with Colombia and Panama, should foster increased commerce between Latin America and North America.

Consistent with recent history, air cargo growth between North America and Latin America's three subregions remains uneven. South America accounted for 73.3% of the 1.2-million-tonne Latin America–North America air cargo market in 2011, while Central America accounted for 21.1% and the Caribbean Basin for the remaining 5.6%.

Latin America–US trade recovered in 2010



Latin America–North America air cargo is unevenly distributed



Latin America and North America

South American air trade with North America mirrored the overall Latin America–North America market, rising 16.2% in 2010 as the world recovered from the 2008–2009 global economic downturn. During 2011, growth continued at 5.4%. Brazil and Colombia ranked evenly as the largest North America air trade partners in South America, each accounting for 24% of the market, measured in tonnes. Chile and Peru followed in third and fourth place.

Central America's air trade with North America declined by 7.5% in 2011 following growth of 21.3% in 2010. Mexico remained North America's most important Central American air trade partner, accounting for 57.6% of tonnage transported between the two regions. Total air traffic tonnage to Mexico fell 6.7% in 2011, following growth of 26.5% in 2010.

The Caribbean Basin's air trade with North America fell 14.2% in 2011 following growth of 13.2% in 2010. The largest economy in the region, the Dominican Republic, saw air trade with North America decline 7.9% in 2011 after growth of 11.5% in 2010.

Air trade commodities

The latest commodities data, from 2011, shows that flows from North America consisted primarily of higher value commodities, while flows to North America were made up primarily of perishables and small packages.

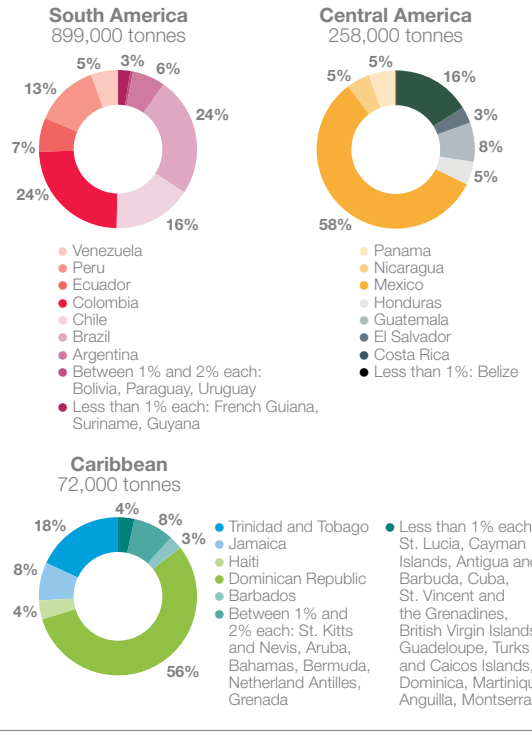
Latin America–North America air cargo forecast

The total Latin America–North America air cargo market is forecast to grow 5.7% per year between 2011 and 2031.

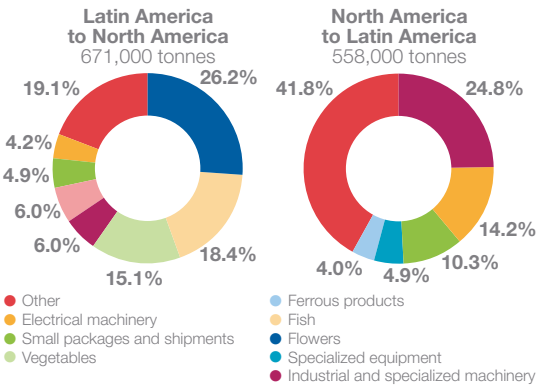
The economic growth of Latin America's subregions is expected to continue over the next 20 years. South America and Central America GDPs are forecast to grow 4.4% and 3.6% per year, respectively, through 2031. The Caribbean Basin economies are projected to grow 4.3% during the same period.

Air trade from Latin America to North America is forecast to grow 5.6% per year over the next 20 years, while air traffic from North America to Latin America will grow 5.8%.

Latin America–North America trade can be classified into subregions



Latin America–North America commodities



Latin America and North America

Air cargo traffic will grow in both directions for all three Latin America subregions

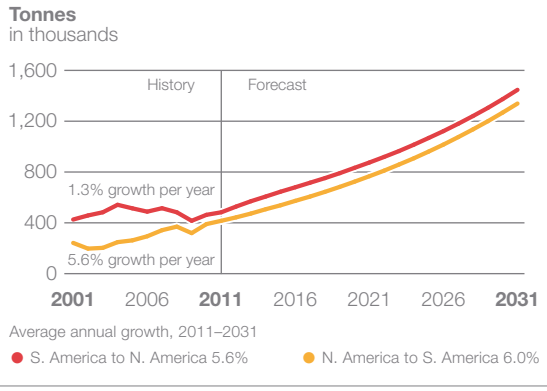
Air cargo traffic between Central and North America will grow at close to the average global rate, while Caribbean Basin air traffic growth will lag at around half that rate, owing to attractive maritime shipping alternatives.

Air trade between South America and North America is projected to grow at an average annual rate of 5.8% over the next 20 years. Traffic to North America is forecast to grow 5.6%, and traffic from North America is expected to grow 6.0% through 2031. Such growth depends on the continued strength of the South American economies and a stable political environment.

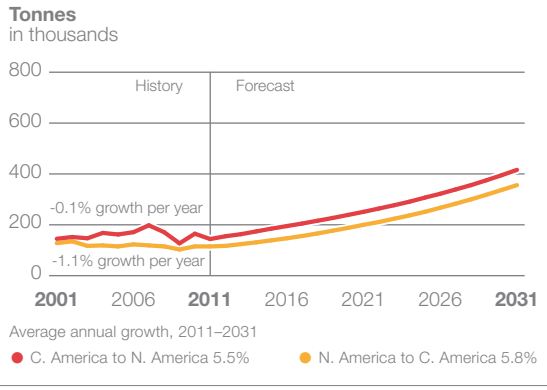
The total Central America–North America air cargo market, led by Mexico, is forecast to grow 5.6% per year over the next 20 years. Air trade to North America is projected to grow 5.5% annually, and air trade from North America will grow 5.8% for southbound flows.

Air trade between the Caribbean Basin and North America is projected to grow modestly over the next 20 years at a rate of 1.9% per year, as the relatively short transit times and lower costs make ocean shipping a more cost-effective option for many shippers in this market.

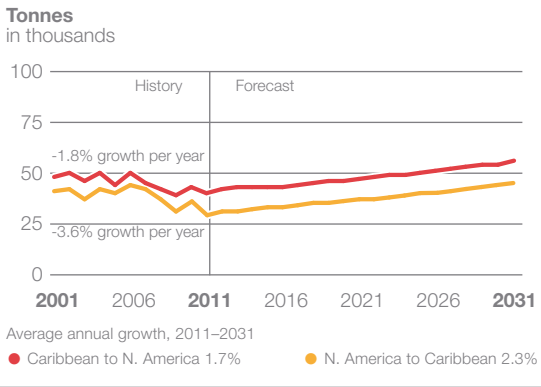
South America–North America air trade will grow 5.8% per year



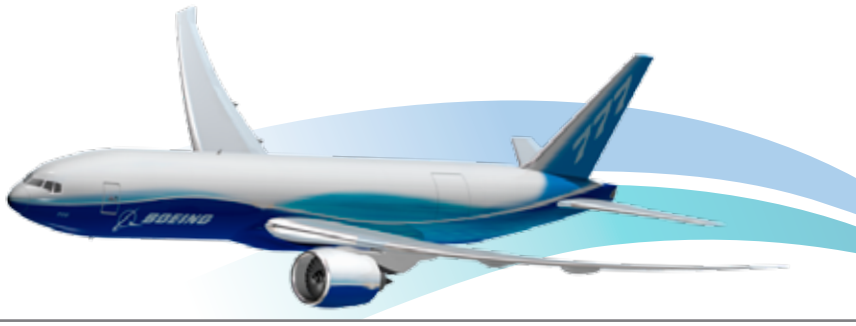
Central America–North America air trade will grow 5.6% per year



Caribbean–North America air trade will grow 1.9% per year



Regional Markets
Latin America and Europe



For the purposes of this forecast, we define Latin America as South America; Central America, including Mexico; and the Caribbean Basin. We define Europe as all 27 member countries of the European Union (EU) plus Switzerland, Norway, Iceland, Turkey, Albania, Gibraltar, and all the countries of the former Yugoslavia.

Latin America–Europe market growth resumes

The Latin America–Europe market, which represents approximately 3.2% of the world's air cargo traffic in terms of tonne-kilometers and 1.8% in trade tonnage, grew 9.2% in 2010 and 3.8% in 2011.

After declining 8.7% in the 2009 global economic downturn, the Latin America–Europe air cargo market recovered and grew 9.2% in 2010 and 3.8% in 2011. Air cargo from Europe to Latin America grew 13.8% in 2010 and 8.3% in 2011. Europe's weak economic recovery from the global economic downturn is reflected in Latin America's air cargo exports to Europe, which grew 4.6% in 2010, but declined 1.2% in 2011.

The EU remains an important trade partner for Latin America, second only to the United States. The EU is also the region's leading source of foreign direct investment.

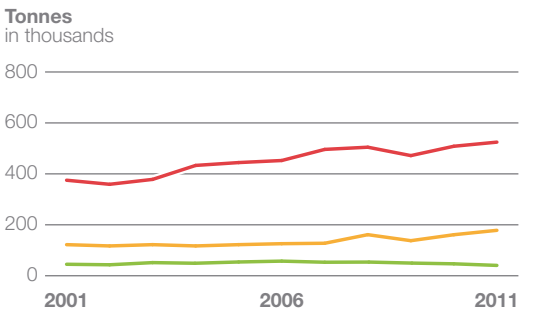
South America dominates air trade between Europe and the Latin America subregions

Of the more than 743,000 tonnes of cargo transported by air between Latin America and Europe in 2011, South America accounted for 70.7% of the market, followed by Central America with 23.8%, and the Caribbean with the remaining 5.5%.

After falling 6.4% in 2009, South America's air trade with Europe increased 8.0% in 2010. A further increase of 3.1% followed in 2011. Brazil, South America's largest economy, accounted for 48.6% of the subregion's total air trade with Europe in 2011. Air imports to Brazil, which fell 13.1% in 2009, rebounded 19.2% in 2010 and grew 4.4% in 2011. Brazil's air exports to Europe fell 16.1% in 2009, then rebounded 5.4% in 2010 and 14.3% in 2011. Colombia's and Ecuador's air trade with the EU continued to increase through the wider region's downturn, growing 10.2% and 7.5%, respectively, in 2009, followed by 5.8% and 9.8% respective growth in 2010. European air trade for each country declined in 2011, falling 9.6% for Colombia and 11.9% for Ecuador. Colombia and Ecuador retained their positions as the second and third largest air cargo trade partners with the EU in the South American subregion. Argentina remained in fourth position.

Air cargo traffic between Central America and Europe recovered strongly from the 2009 decline of 14.5%, growing 16.7% in 2010 and 10.2% in 2011. Mexico, Europe's most important Central American air trade partner, accounted for 85.8% of the air trade in tonnage between the two regions in 2011. Imports to Mexico grew 3.2% in 2010 and 18.8% in 2011. Exports from Mexico to Europe increased 38.7% in 2010, then slowed to 1.1% in 2011.

Traffic between Latin America and Europe is unevenly distributed



Latin America and Europe

Air trade between the Caribbean and Europe declined in 2011, with an 11.9% reduction in tonnage, following a slight contraction of 1.3% in 2010. The Dominican Republic continued to be Europe's largest air trade partner in the Caribbean, accounting for 40.5% of the subregion's total trade with Europe in 2011.

Since 2002, air cargo flows between Latin America and Europe have been generally balanced. In the recovery after the global economic downturn of 2009, growth of air cargo imports from Europe to Latin America outpaced exports from Latin America to Europe. Europe shipped 329,000 tonnes of air cargo to Latin America in 2009. This grew to 374,000 tonnes in 2010 and to 405,000 tonnes in 2011.

Recovery has been slower in Latin America–Europe air cargo exports. In 2009, air cargo from Latin America to Europe totaled 327,000 tonnes. In 2010, this grew to 342,000 tonnes, then retrenched to 338,000 tonnes in 2011.

Economic outlook for Latin America and Europe

The economies within the Latin America region grew by 4.3% in 2011 after 5.9% growth in 2010.

The economies of the Latin America region are forecast to grow an average of 4.1% per year between 2011 and 2031. The South American economy is projected to lead with an average growth rate of 4.4% over the forecast period. Brazil is expected to remain the region's largest economy, with forecast growth of 4.6% per year, accounting for 54.4% of South America's total GDP by 2031. Central America's economy, led by Mexico, the subregion's largest economy, is forecast to grow 3.6% per year during the 20-year forecast period. The Caribbean is projected to grow an average of 4.3% per year. Cuba is forecast to remain the largest economy in the region in terms of GDP through 2031, with forecast growth of 5.8% per year over the 20-year period.

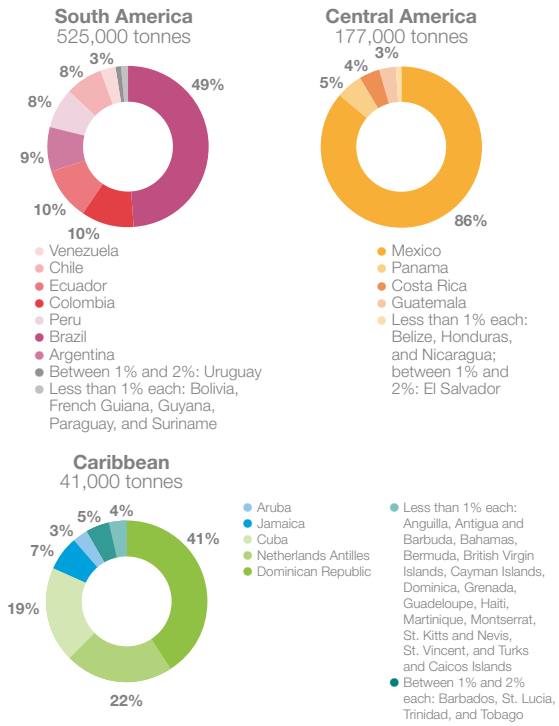
Over the next 20 years, the European economy is forecast to grow 1.9% per year, which is slower than Latin America's projected GDP growth. This will lead air cargo traffic from Europe to Latin America to grow at a higher rate than traffic in the other direction, from Latin America to Europe.

Latin America–Europe air cargo market forecast

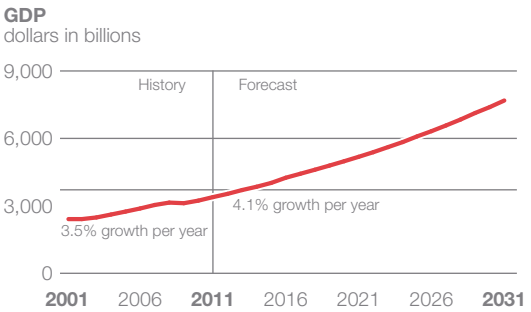
Latin America and Europe continue to work toward increased trade liberalization.

Europe and Latin America have maintained strong relations over many decades based on historical, cultural, and economic ties. In an effort to further strengthen cooperation and trade, heads of state from the two regions have held regular summit meetings since 1999. The EU and the South American countries of Colombia and Peru signed a trade agreement in 2012. In addition, the EU and the Central American countries of Costa Rica, El Salvador, Guatemala, Honduras, Nicaragua, and Panama signed an Association Agreement that includes a trade component in 2012. If successful, these agreements will provide an additional boost to air cargo demand between the two regions.

Europe–Latin America trade can be classified into three subregions



Latin America's economy will grow 4.1% per year



Latin America and Europe

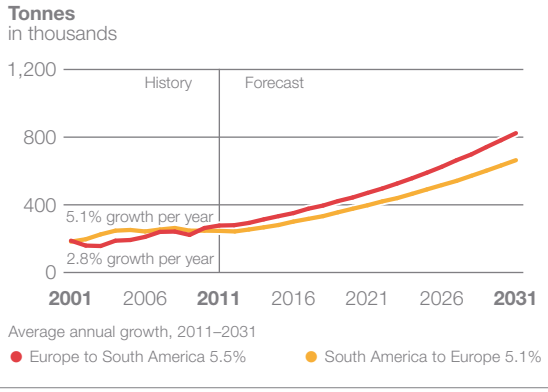
After growing at an annual rate of 3.2% during the past 10 years, the Latin America–Europe air cargo market is projected to grow 5.3% per year from 2011 through 2031. Europe-to-Latin America air trade is forecast to grow 5.6% per year on average, and Latin America-to-Europe air trade is forecast to grow 4.9%.

Air trade between South America and Europe is projected to grow an average of 5.4% over the next 20 years. Europe-to-South America air cargo traffic is forecast to grow 5.5% on average, while South America-to-Europe traffic grows 5.1%. This rate assumes growth in the European economy and continued political and economic stability in South America.

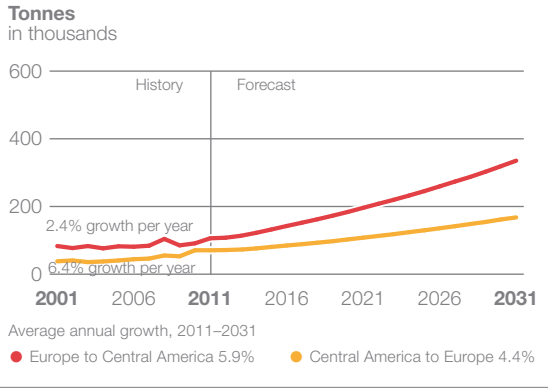
The Central America–Europe market is projected to grow 5.4% on average over the next 20 years. Europe-to-Central America traffic is forecast to grow at a rate of 5.9%, while Central America-to-Europe traffic grows 4.4% per year through 2031.

Air trade between Europe and the Caribbean Basin is forecast to grow 3.8% annually over the next 20 years. Air cargo traffic from Europe to the Caribbean is forecast to grow at an average annual rate of 3.3%. Air cargo traffic from the Caribbean to Europe will grow an average 4.2% annually. Traffic growth rates for the Caribbean Basin will depend on continued political reform and integration in the region.

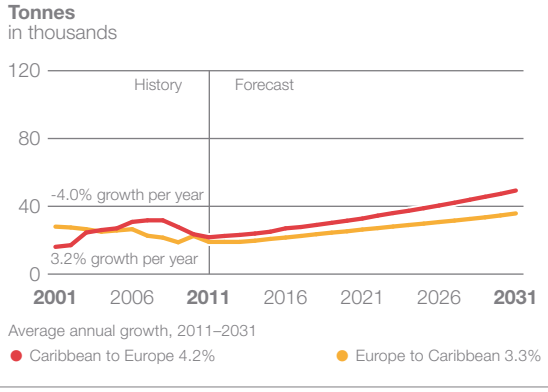
South America–Europe air trade will grow 5.4% per year



Central America–Europe air trade will grow 5.4% per year



Caribbean–Europe air trade will grow 3.8% per year



Regional Markets
Europe and North America

For the purposes of this forecast, we define Europe as all 27 member countries of the European Union (EU) plus Switzerland, Norway, Iceland, Turkey, Albania, Gibraltar, and all the countries of the former Yugoslavia. We define North America as Canada and the United States.

Market grew 25.5% between 2009 and 2011

The Europe–North America market, which accounts for approximately 6.9% of world air cargo tonnage and 8.9% of the world's tonne-kilometers, rebounded dramatically after the global economic downturn of 2008–2009, growing 21.3% in 2010 and 3.4% in 2011. This rebound was not, however, sufficient to return the region's market to its 2007 peak of 3.1 million tonnes.

Air trade between Europe and North America, as measured in metric tons, stabilized in late 2009 for a strong rebound in 2010, after a 6.7% drop in 2008 and the precipitous 21% decline during the greater part of 2009. Demand picked up in mid-2010, remaining above the long-term growth trend until mid-second quarter 2011, when it slowed again.

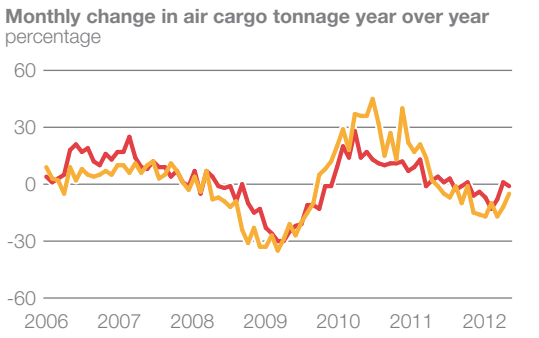
The United States accounted for 95% of North America's air exports to Europe and 94% of the region's air imports from Europe during 2011, so monthly Europe–US air trade closely approximates the overall North Atlantic air cargo market.

Both directions of Europe–US air cargo volumes grew 20.5% in 2010 and 4.1% in 2011. Flows from Europe to the United States expanded 28.8% in 2010 and 4.4% in 2011. Growth in Europe-to-US air trade remained above 10% until June 2011, and for the remainder of 2011 was slightly negative. During the first five months of 2012, Europe-to-US flows continued to fall, contracting 14.9% compared to the first five months of 2011.

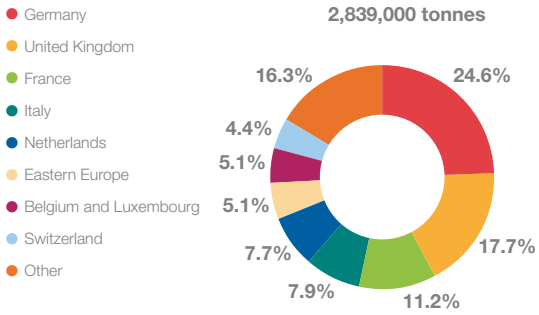
The flow of goods via air from the United States to Europe also bounced back, growing 12.9% in 2010 and 3.8% in 2011. Like the Europe-to-US air trade flow, growth slowed in the US-to-Europe direction starting mid-second quarter 2011. Contrary to trade in the Europe-to-US direction, however, US air exports remained slightly positive every month through the end of 2011. During the first five months of 2012, US-to-Europe air trade fell 7.9% compared to the first five months of 2011.

The resumption of growth in Canadian air trade with Europe paralleled that of the United States. Europe–North America (United States and Canada combined) air trade grew 21.3% compared to 2009 as industrial production surged in the first half of 2010. Continued economic growth and increasing industrial activity in 2011 spurred air trade to grow an additional 3.4% compared to 2010. By the end of 2011, overall North American air trade with Europe had grown 25.5% in tonnage since 2009. Europe-to-North America flows expanded 29.6% in 2010 and then 3.7% in 2011. North America-to-Europe trade grew at a more moderate pace, expanding 13.2% in 2010, then 3.7% in 2011.

Europe–US air trade began slowing in mid-2011



Five countries account for 69% of Europe–North America air trade



Europe and North America

Five European countries—Germany, the United Kingdom, France, Italy, and the Netherlands—have accounted for nearly 70% of all European air trade with North America since 1980. However, faster growth elsewhere in Europe reduced this share to 69% by 2011. Germany was the only leading economy to gain market share between 2009 and 2011, expanding its total bidirectional air trade by 33% in 2010 and 12% in 2011.

Eastern European countries, which account for 5.1% of total North Atlantic air trade, enjoyed strong growth in North American air cargo, expanding 42% in 2010, then 11% in 2011. Of the countries in this subgroup, Estonia, Romania, and Slovakia all experienced strong double-digit growth in both 2010 and 2011.

Trade momentum shifts toward Asia

In the 20 years between 1980 and 2000, the North Atlantic air cargo market surged with an average annual growth rate of 6.9%, growing from 708,000 tonnes to 2.71 million tonnes. The market has since slowed markedly, averaging only 0.4% growth during the past 11 years with a meager rise to 2.84 million tonnes.

Even after taking the effects of the 2001–2002 and 2008–2009 recessions into account, the growth rate of the past decade is far below the norm set during the preceding 20 years. Notably, this slowdown was not confined to air trade. Growth in containership trade between Europe and North America also sagged, expanding only 1.5% between 2000 and 2011. The slowdown in total Europe–North America commerce may reflect the shift of trade and investment on both sides of the Atlantic toward Asia.

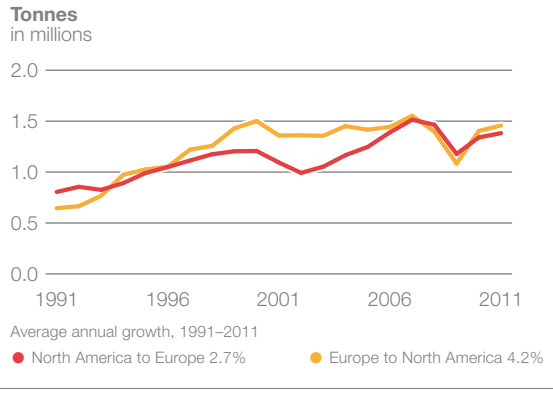
Air trade commodities

Five commodity categories account for approximately 70% of the air cargo flow between the major trading partners of Europe and North America. Industrial products and miscellaneous manufactured goods, which include work in progress shipped from manufacturing facilities on one continent to assembly facilities on the other, are key components of cargo flows in both directions.

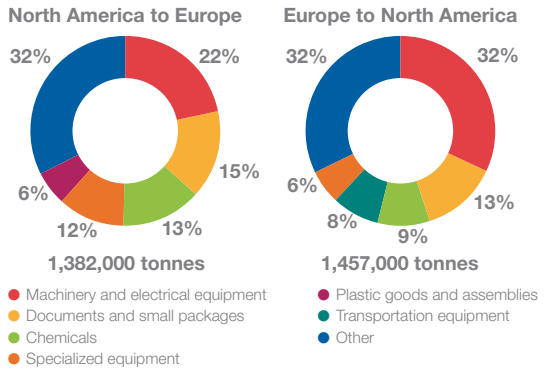
In the North America-to-Europe flow, capital equipment (machinery and electrical equipment) and express shipments—primarily document and small parcel shipments—led all other commodity categories. Chemicals, specialized equipment, and plastic goods and assemblies followed, in that order. Other leading categories that do not figure among the top five European air imports from North America include transportation-related goods, vegetable products, and wood products.

The top five commodity categories in the Europe-to-North America direction were capital equipment, express shipments, chemicals, transportation-related goods, and specialized equipment. Other leading commodity categories that do not figure among the top five European air exports to North America include plastic goods, animals and animal products, vegetables, and textiles.

Europe–North America air trade has grown 3.4% per year since 1991



Top commodities account for about 70% of the directional flows



Europe and North America

Air trade forecast

The baseline GDP projections through 2031 for Europe and North America anticipate average annual growth of 1.9% and 2.5%, respectively. GDP growth will continue to be the broadest-based indicator of trade growth between Europe and North America. Low- and high-growth scenarios are based on projections of 0.5% below and 0.5% above baseline GDP growth rates.

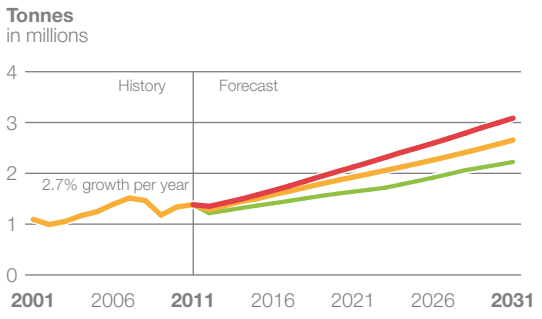
Baseline North America-to-Europe air trade will grow 3.3% per year and 3.6% per year in the Europe-to-North America direction. The combined total market growth rate is projected to be 3.5%, compared to 3.4% average growth since 1991.

The low-growth projections assume that both continents will continue to focus on foreign direct investment (FDI) and trade with Asia, at the expense of transatlantic business development. The low-growth North America-to-Europe scenario assumes restrained capital spending, slow economic and labor market reform, and continued generous social entitlements in southern EU member states. The low-growth Europe-to-North America scenario assumes poor management of deficits, lower capital investment, and relative weakness of the US dollar.

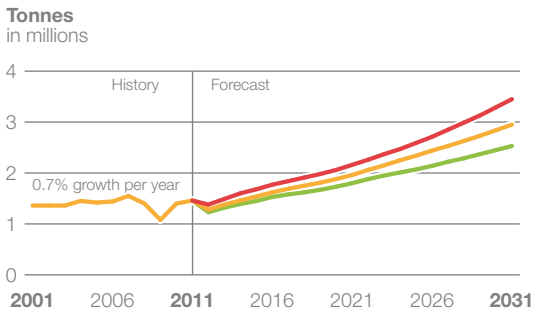
The high-growth North America-to-Europe scenario assumes an expanding European Union, substantive economic reform, deregulation in EU cross-border services, and increasingly flexible labor markets. The high-growth Europe-to-North America trade scenario assumes increased capital spending, a stronger dollar, and increased US fiscal discipline.

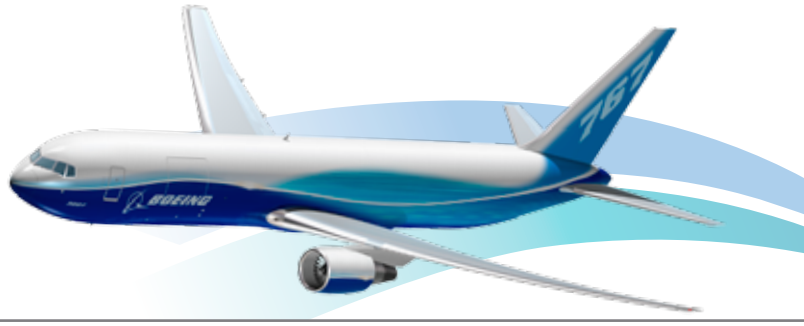
A country-by-country forecast was used to capture overall market growth in each direction. The effect of currency exchange rates figures in the forecast for each major country pair. Aggregate continent-to-continent flows were modeled in a convergent top-down approach to validate the country-level forecasts.

North America-to-Europe air trade will grow 3.3% per year



Europe-to-North America air trade will grow 3.6% per year





Regional Markets
Intra-Europe

For the purposes of this forecast, we define Europe as all 27 member countries of the European Union (EU) plus Switzerland, Norway, Iceland, Turkey, Albania, Gibraltar, and all the countries of the former Yugoslavia.

Air cargo traffic within Europe reflected the global downturn

The intra-Europe air cargo market comprises approximately 3.3% of the world's air cargo tonnage, but because it is geographically compact, only 0.8% of tonne-kilometers.

Approximately 72% of all air cargo moving into, within, and out of Europe passes through one or more of the northern European countries of Germany, France, the United Kingdom, the Netherlands, Belgium, and Luxembourg. The compact geography of air cargo markets within Europe generally limits routes to relatively short hauls, typically between 900 and 1,200 kilometers.

The intra-Europe air cargo market grew 11.2% (in revenue tonne-kilometers) in 2010, after falling 9.1% in 2009. The market, however, stagnated in 2011, growing only 0.1%. Between 1990 and 2000, as express carriers built air networks and expanded service offerings, market growth averaged 6% per year. Traffic growth has eroded since then, however, as relaxation of border controls and harmonization of transport regulations within the EU allowed truck shipments to compete more effectively with air transport.

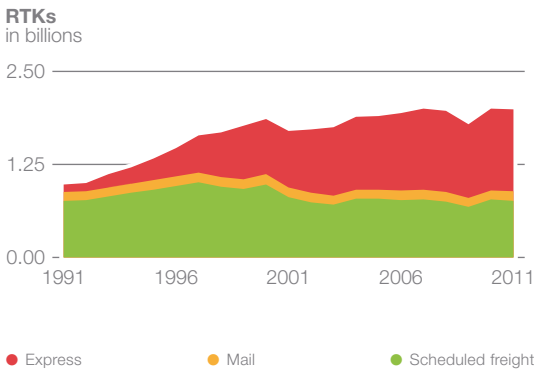
The three primary components of air cargo traffic within Europe—scheduled freight, mail, and express—grow at differing rates. Express traffic averaged nearly 13% growth per year during the past 20 years. Scheduled freight traffic, on the other hand, was stagnant and mail traffic grew modestly at an average rate of 1% per year during the same period.

Except during the global economic downturn of 2008–2009, freight and mail traffic have been stable for the last decade, measured both in tonne-kilometers and pure tonnage. The stagnation of the scheduled freight and mail segments reflects an almost complete diversion of market growth to the express segment.

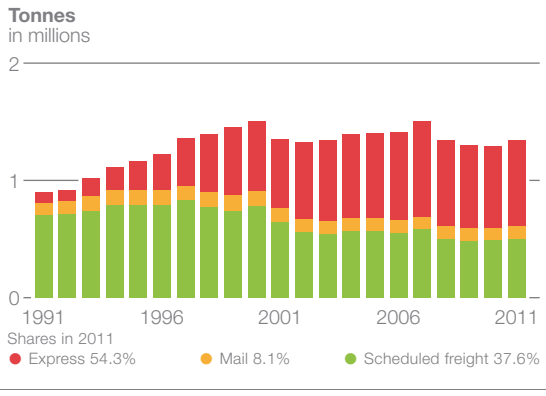
Express traffic in 2011 was almost unchanged from 2010. Traffic growth averaged over the entire decade fell to only 3.8% per year, a marked decline from the previous decade's 22.8% average annual growth.

Despite this deceleration, integrated express carriers now transport almost 54% of all intra-Europe air cargo, reflecting the declining market share of scheduled freight and mail over the past two decades. It is important to note that express network traffic within Europe includes significant general freight to fill out freighter loads when traffic is light in the small parcels and documents that traditionally make up express cargo.

Intra-Europe air cargo market recovered after the global economic downturn



Express operators carry more than half the air cargo within Europe



Intra-Europe

Nearly all air cargo growth in the past 20 years has resulted from the expansion of integrated air express carrier services.

The Schengen Accord of June 1990, which removed customs inspection on goods moving between several countries in northern Europe (and later within most of the EU), facilitated intra-Europe truck transport and reduced the need for expedited scheduled air freight service. Consequently, trucking has become the preferred mode of transport for most freight and mail, even for small-parcel express shipments in short-haul markets. The shift toward ground transport has held overall intra-Europe air traffic to only 0.6% average growth for the five years between 2006 and 2011, and 1.6% average growth during the 10-year period from 2001 to 2011.

After 8% average annual growth for the 10 years between 1997 and 2007, the estimated number of daily international air express shipments declined during the 2008–2009 global economic downturn. Shipments revived, however, in 2010 and 2011. Intra-Europe express shipments have grown about 3.8% per year, from 342,100 shipments per day in 2001 to about 495,500 shipments per day in 2011.

Trucks complement scheduled aircraft freight services

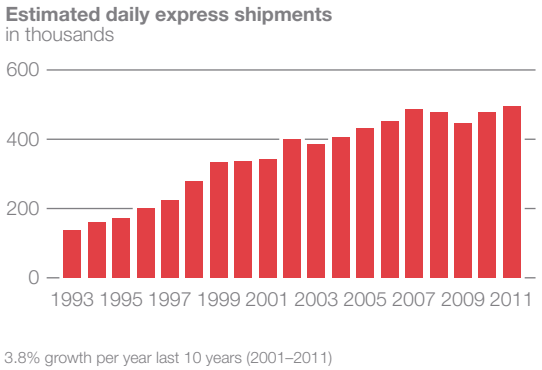
Air cargo has never been solely an airport-to-airport service. Rather, air cargo is a single component of a transportation infrastructure that links the shipper and the consignee. Trucking offers door-to-door and factory-to-distribution center service, which air transport alone cannot provide.

Scheduled airlines that serve the intra-Europe market have long used truck flights (trucking services registered with their own flight number) to extend their networks and add scheduling flexibility.

Long-haul truck-flight operations in Europe supplement overall air logistics systems. Their dramatic rise over the past decade has clearly contributed to a decline in growth of scheduled freight carried by air. Between 2002 and 2012, the number of airport pairs increased by nearly a factor of 3 and weekly frequencies of truck flights increased by nearly 5 times.

These truck-flight operations provide regularly scheduled freight service for high-value or work-in-progress goods between manufacturing facilities, especially to and from central and eastern Europe. Scheduled truck operations are often used where demand is too low or infrequent to warrant dedicated freighter aircraft service.

Intra-Europe express shipments recovered after the global economic downturn

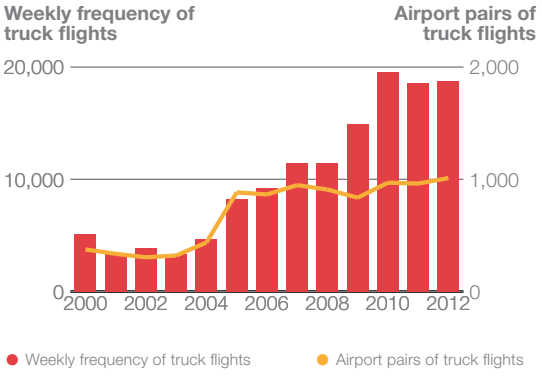


3.8% growth per year last 10 years (2001–2011)

Truck flights augment scheduled airline capacity

Lines represent scheduled truck-flight cargo service routes as of May 2012

Truck-flight airport pairs tripled and weekly frequency quintupled over the past decade



Intra-Europe

Intra-Europe air cargo forecast

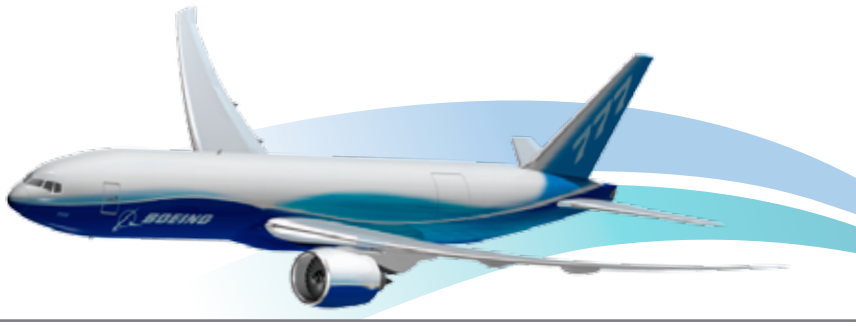
Led predominantly by express carriage and longer scheduled freight sectors to eastern and southern Europe, the intra-Europe air cargo market is forecast to expand at an average annual rate of 2.4% per year through 2031. The 20-year forecast growth in air cargo traffic is lower than the 3.7% growth trend recorded during the previous 20-year period from 1991 to 2011.

Economic activity, as measured by GDP, and industrial activity will remain the primary drivers for traffic growth in this market. For the long term, the baseline GDP for Europe will average 1.9% growth per year through 2031. GDP projections of 0.5% below and above the baseline were assessed, and the results of these growth rates are reflected in the low- and high-growth scenarios. Intra-Europe air cargo growth is forecast to range between 1.7% and 3.2%.

Inflexible labor markets, an aging population, expensive pension systems, and slow economic reforms will limit long-term economic growth, especially in the countries of northern Europe. In the near term, tight fiscal and monetary policies will continue to curb economic growth and entrepreneurial activity, thereby slowing air cargo growth. On a positive note, the more distant eastern and southern markets, where longer trucking times may be unacceptable for some shippers, offer air cargo traffic growth prospects for the next two decades.

Intra-Europe air cargo traffic will grow 2.4% per year

Regional Markets
Middle East



For the purposes of this forecast, we define the Middle East as Bahrain, Iran, Iraq, Israel, Jordan, Kuwait, Lebanon, Oman, Qatar, Saudi Arabia, Syria, the United Arab Emirates, and Yemen.

Air cargo traffic expands strongly on economic growth

Air cargo moving into, within, and out of the Middle East is estimated to have accounted for 8.2% of the world's tonnage and for 7.0% of the world's revenue tonne-kilometers during 2011.

Political instability related to the Arab Spring affected a number of countries within the Middle East in 2011 and 2012. Despite political tensions, the region continued to perform well economically, with GDP growth of 5.6% in 2011. High oil prices and increased oil and gas production gave the region's economy a strong boost, sustaining the past decade's robust GDP growth trend, which averaged 4.8% per year between 2001 and 2011. Over the next 20 years, the annual growth rate is projected to average 3.9%. The largest economies in the region—those of Iran, Israel, Saudi Arabia, and the United Arab Emirates—commanded more than 60% of the region's GDP in 2011.

The large volume of air cargo that flows through Middle East cargo hubs reflects the region's history as the crossroad between Africa, Asia, and Europe. Dubai, in the United Arab Emirates, is the largest air cargo center in the region and one of the largest re-export hubs in the world, handling more than 35% of the region's air cargo traffic in 2011. Doha (Qatar) and Abu Dhabi (United Arab Emirates) follow Dubai in traffic volume.

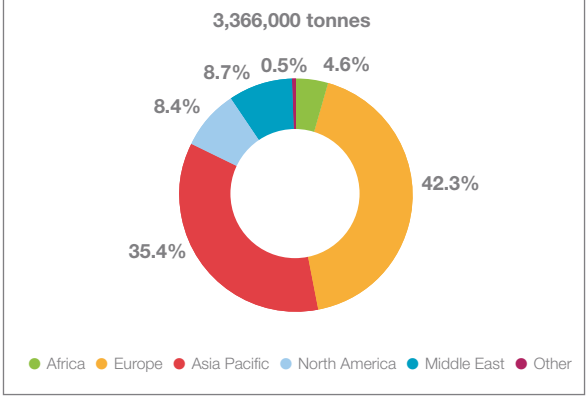
New infrastructure will reinforce the region's role as a hub. Dubai's new Al Maktoum International Airport received its first cargo flight in the summer of 2010 and is planned to be the world's largest cargo hub. The airport will be home to an integrated operation, combining different transportation modes, logistics, manufacturing, and assembly in a single free-trade zone.

The region also has a significant sea-air market in which goods from South Asia arrive in the Middle East on ships and continue to Europe by air. Information systems in place today are not capable of disaggregating this component from the total air freight moving through the region.

The Middle East is starting to diversify beyond the oil industry to industrial and business development. A long-term effort in Dubai, for example, has resulted in an economy that is strong in logistics, tourism, banking, and construction. This expansion will lead to growing air cargo flows.

There also has been movement toward economic liberalization and cooperation between countries. These changes should improve the investment climate and economic competitiveness of the region. New roads and trade agreements will facilitate increased cargo flows within the region. Middle East nations should benefit from combining their strength as trading hubs as well as from the growth of their own markets.

Europe is the largest Middle East trade partner



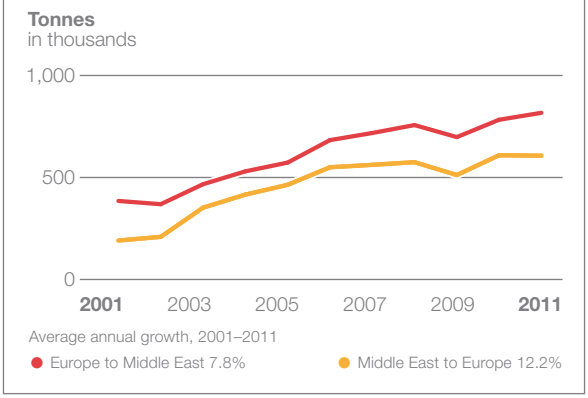
Middle East

Middle East–Europe traffic

Air cargo growth between the Middle East and Europe has been strong since 2001, with the smaller export market growing 12.2% per year to outpace the import market, which grew at a rate of 7.8%.

Accounting for 1,424,000 tonnes of air cargo in 2011, trade with Europe represented 42% of the Middle East's international air cargo market. The primary products shipped to Europe are garments and perishables. Leading commodities shipped from Europe include telecommunication equipment, machinery, and finished goods. The Middle East exports market has grown faster than the larger imports market since 2001, averaging 12.2% growth per year while imports averaged 7.8%. Overall air cargo traffic in both directions has averaged an impressive 9.5% growth annually between 2001 and 2011.

Middle East–Europe air trade grew 9.5% per year, 2001–2011

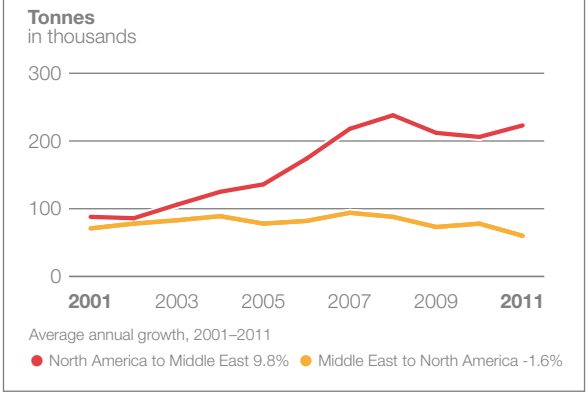


Middle East–North America traffic

In 2011, North America accounted for approximately 8.4% of the air cargo market in the Middle East at 283,000 tonnes.

Air cargo shipments arriving from North America consisted predominantly of fruits and vegetables, machinery, small packages, chemicals, and scientific equipment. Shipments to North America consisted mainly of telecommunication equipment, textiles, medical supplies, and scientific equipment. Growth in the Middle East imports market from North America has been robust, with an annual growth rate of 9.8%. This flow is still small, however, compared to others in the Middle East region. Middle East air cargo exported to North America has remained essentially flat for the past decade, contracting 1.6% annually. Total Middle East–North America traffic is down 13.2% from its 2008 peak. The main Middle East countries involved in air trade with North America are Israel, the United Arab Emirates, Saudi Arabia, and Kuwait.

Middle East–North America air trade grew 6.0% per year, 2001–2011



Middle East–Asia traffic

In 2011, air cargo between the Middle East and Asia represented 35.4% of the total Middle East traffic at 1,193,000 tonnes.

The most significant products exported to Asia are personal items, machinery, chemicals, flowers, and perishable foods. Imports from Asia include apparel, luxury goods, electronics, finished goods, and perishables. A total of 1,193,000 tonnes of air cargo were shipped between Asia Pacific and the Middle East in 2011. Liberalizing markets, economic growth, increasing numbers of direct flights, and lower costs will contribute to further expansion in this market, possibly diverting high-value shipments from surface transportation.

Middle East

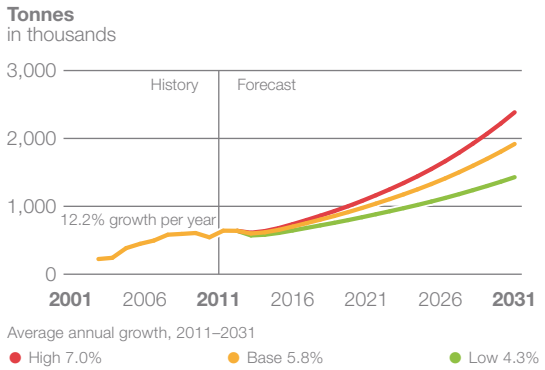
Middle East forecast

Overall air cargo between the Middle East and Europe is forecast to grow at an average annual rate of 5.7% between 2011 and 2031.

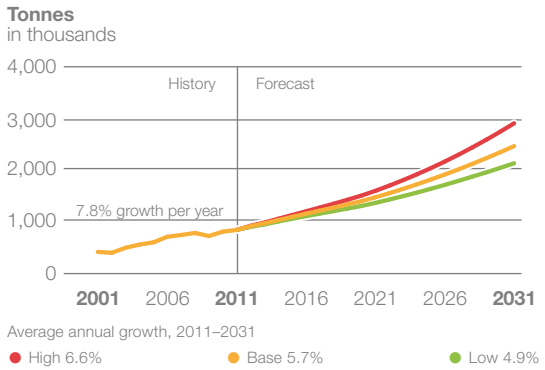
Direct flights connecting production centers in Asia and Europe pose some risk to air cargo traffic between the Middle East and Europe. Nevertheless, increasing local exports, coupled with the continued European market for goods transshipped from Asia and Africa, should keep growth in the Middle East air cargo market healthy.

The price of oil will have a significant effect on Middle East demand for products from Europe, as will the ability of the region's economies to diversify and become more competitive. In particular, the competitiveness of local products, including perishables, fish, and textiles, together with the products of emerging light industries, will affect long-term growth prospects.

Middle East-to-Europe air trade will grow 5.8% per year



Europe-to-Middle East air trade will grow 5.7% per year



Regional Markets
Africa

For the purposes of this forecast, we define Africa as the entire continent of Africa plus the nations of Cape Verde, Madagascar, Reunion, the Seychelles, Mayotte, Mauritius, the Comoros Islands, and São Tomé and Principe. Data from ACI, IATA, ICAO, governments and airport authorities, the United Nations, and the US Department of Commerce was used to model air cargo flows associated with Africa.

Africa air trade patterns are changing

The Africa–Europe market accounts for approximately 2.6% of the world's air cargo tonnage and 2.6% of the world's air cargo tonne-kilometers.

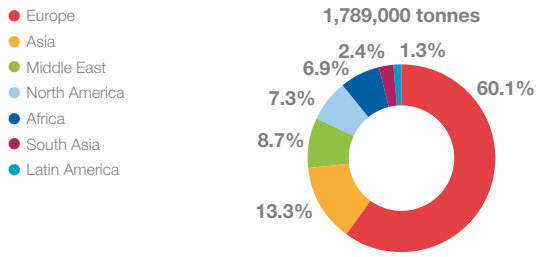
Based on the region's airport statistics, air trade originating in or destined to Africa is estimated at 1,789,000 tonnes in 2011. Principal markets in the region include Europe, Asia, and the Middle East. Europe commands the majority (an estimated 60.1% in 2011) of Africa's international air trade, owing to its proximity and long-standing historical and investment ties with the region.

Over the past decade, however, Asia and the Middle East have rapidly expanded their share of African air trade. Asia currently garners a 13.3% share of total regional air trade and the Middle East accounts for 8.7%. Asia has established new commercial ties with Africa as Chinese enterprises seek to secure sources of raw materials to fuel that country's industrial expansion. Middle East air trade with Africa has expanded as fast-growing airlines domiciled in the Middle East have added both passenger lower-hold and dedicated freighter capacity.

International air trade flows tend to concentrate in a few leading economies among the 57 countries of Africa. The leading international markets include South Africa, Kenya, Egypt, Nigeria, and Ethiopia, which hold 19.3%, 16.4%, 15.7%, 9.2%, and 7.3% shares of Africa's international air cargo flows, respectively. All of these leading air cargo markets expanded in 2011, with the exception of Egypt, which contracted 8% due to the civil and economic disruption during the Arab Spring.

In general, African air exports tend to be dominated by perishables, while air imports tend to be industrial machinery, computers and telecommunication equipment, oil and gas exploration and extraction equipment, and pharmaceutical goods. Apparel was a major air export commodity group, but in the past several years, increased competition from producers in other regions has diminished its importance.

Europe and Asia are Africa's primary air trade partners



Africa–Europe traffic

Europe-to-Africa air cargo flows have resumed growing since the global economic downturn, but Africa-to-Europe flows have continued to decline.

Air exports from Africa to Europe totaled 465,500 tonnes in 2011, while air imports from Europe totaled 609,700 tonnes. This is a reversal of the long-standing historical trend. Between 1995 and 2007, air exports to Europe exceeded air imports from Europe. The global economic downturn of 2008, however, dragged exports to Europe down about 1% from 2007 levels, while air imports grew 13.5%. In 2009, trade fell in both directions. In 2010 and 2011, the two flows diverged as air imports from Europe rebounded, but air exports to Europe continued to decline.

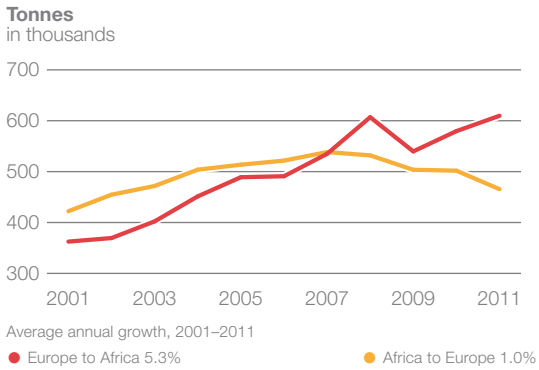
The resumption of growth in Africa air imports can be easily explained by renewed growth of African extractive industries, infrastructure development, urbanization, and growing demand for consumer goods. The causes of the continued decline of Africa exports to Europe are, on the other hand, more complex. Possible factors include weak European economic growth and disruption of North African industry during the Arab Spring uprisings of early 2011. In addition, the expanded availability of refrigerated capacity on containerships that serve many African ports has given shippers of perishables, Africa's primary air cargo commodity, lower-cost transport alternatives. The rapid expansion of Middle East air cargo carrier capacity, which can blur the true origin and destination of cargo, may also explain part of the decline.

Africa–North America traffic

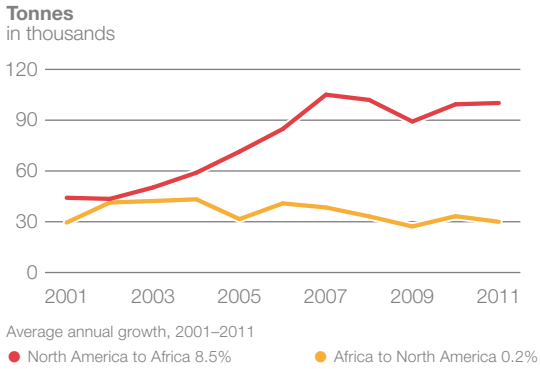
The North America-to-Africa air cargo flow has grown 8.9% annually since 2001.

Air trade with North America represents 7.3% of Africa's international air cargo market. While air trade in both directions was very nearly balanced in 2002, the volume of the two flows began to diverge in 2003 when demand for imported specialty oil and gas extraction equipment manufactured in North America began to grow. African exports have been stagnant for the past decade, largely due to a reduction of US demand for miscellaneous manufactured articles. Leading African air exports to North America include apparel, perishables, and automobile components. African imports from North America represent 77% of the total Africa–North America air cargo flow, which comprises small parcels and documents, oil and gas equipment, industrial and mining equipment, and chemicals.

Africa–Europe air trade has grown 3.2% per year



Africa–North America air trade has grown 5.9% per year



Africa–Asia traffic

Africa–Asia air trade is driven by continued Asian investment and African consumer demand.

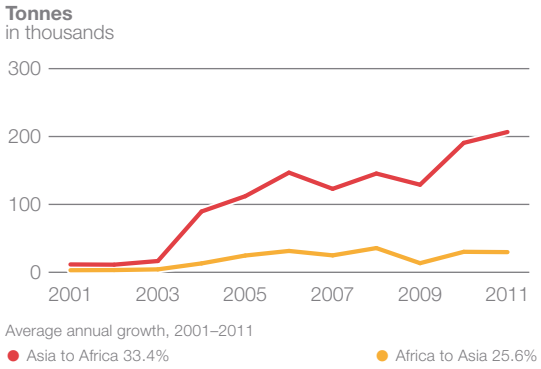
The developing Africa–Asia air cargo market has increased 32% per year on average since 2001. Growth has slowed in recent years, however, compared to the tremendous expansion in the first half of the last decade. Air cargo flows are significantly imbalanced, with about seven times as much air cargo entering as leaving Africa.

Total air cargo tonnage between Africa and Asia grew at an average rate of 65% per year between 2001 and 2006. The average rate declined to 5.8% between 2006 and 2011. Capital investment in African extractive industries (e.g., oil from Sudan and copper from Zambia) and growing demand for consumer goods—especially those imported from China—will continue to drive imports to Asia.

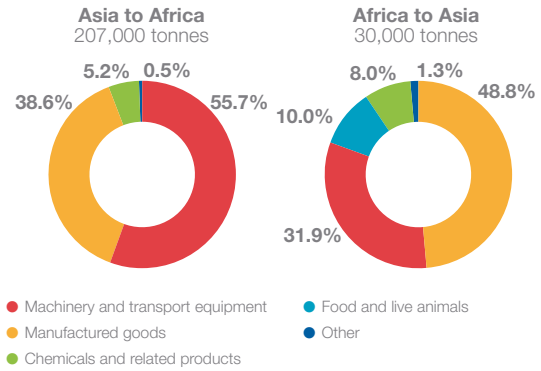
Major commodities for both directions are machinery and transport equipment, manufactured goods, and chemicals and related products. Food and live animals account for about 10% of African exports to Asia.

Estimation of the size of the Africa–Asia market is complicated by two shipping practices. First, a large portion of Asia-to-Africa freight is transported to the Middle East by containership before being shipped by air to its final destination in Africa. While such "sea-air" cargo transport combines the advantages of low-cost containership transport with the reliability of air cargo for shippers, it can cause a significant percentage of Asian air cargo to appear to originate from the Middle East. Second, small-scale importers carry significant amounts of Asian goods into Africa in their baggage.

Africa–Asia air trade has grown 32% per year



Machinery and transport-related goods lead Africa air trade with Asia



Africa–Middle East and intra-Africa traffic

The Middle East market accounts for 8.7% of African air cargo. Middle East air cargo routes are an important conduit for goods traveling both into and out of Africa. African goods such as meat products, fruits and vegetables, and flowers travel to the Middle East. Oil industry products, pharmaceuticals, and machinery from other parts of the world move to Africa from the Middle East. The proximity of emerging east African oil and gas producing countries, such as Uganda, to the Middle East will likely expand that air commerce flow.

Intra-Africa air cargo represents 6.9% of African air cargo. Air cargo flows among the nations of Africa are dominated by the diverse economy of South Africa, which functions as a manufacturing and trading hub for the continent. South African investment in other African economies also spurs air cargo growth. Limited ground transport infrastructure continues to drive the need for air cargo within Africa. New bilaterals and further implementation of the Yamoussoukro Declaration will encourage operators to develop new intra-Africa air cargo lanes.

Domestic African air cargo is not included in this analysis, but is estimated to total 189,000 tonnes. Domestic air cargo in Africa is strongest in some of the largest economies: Congo-Brazzaville, Democratic Republic of the Congo, Nigeria, South Africa, Angola, and Sudan. Air cargo often offers the most secure and reliable transit in these markets.

Africa forecasts

Overall, air trade between Africa and Europe will grow 4.8% per year, while air trade between Africa and Asia will average 6.1% growth per year. Air trade between Africa and North America will grow 5.2% per year, albeit from a smaller base than either Europe or Asia.

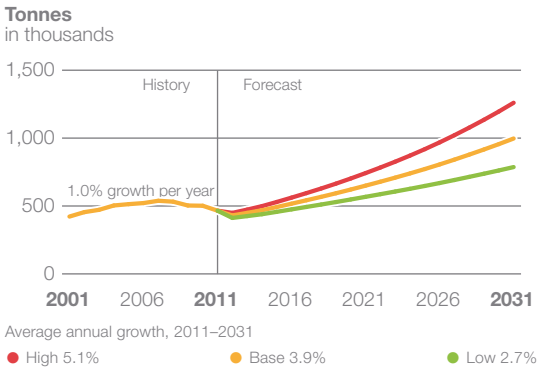
Base, low, and high models were developed to forecast the Africa–Europe air cargo market. GDP projections of 0.5% below and above the baseline were assessed, and the results of these growth rates are reflected in the low- and high-growth-rate scenarios. The Africa-to-Europe market is expected to average 3.9% growth per year, as Europe gradually recovers from its current economic strife. Further African economic diversification into manufactured products and resumption of moderate growth in the market for African perishables are assumed in the baseline forecast for this air trade flow.

A higher level of growth is forecast for the Europe-to-Africa market, reflecting the higher economic growth rates expected for Africa. At 5.4%, the base forecast reflects both African consumer buying power for goods that arrive by air and increased investment in industries that depend on air cargo for time-critical shipments. As the manufacturing base in Africa continues to develop, the diversity of inbound air cargo should increase, reducing the region's vulnerability to swings in commodity prices.

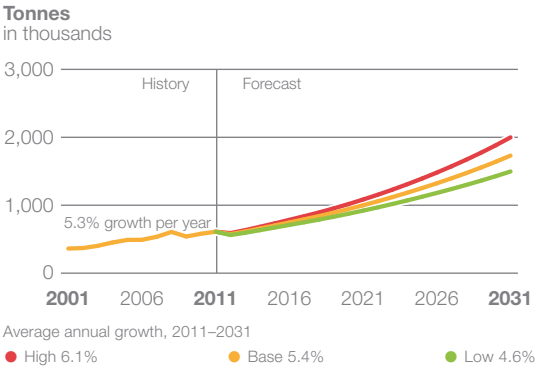
Asian imports to the region will drive the growth of Africa air trade with Asia. Follow-on investment by China in extractive industries in Africa and—equally important—continuing urbanization and rising demand for consumer goods in Africa will propel Asia-to-Africa air trade to grow 6.4% per year for the forecast period. Africa-to-Asia air trade will expand at the slower rate of 3.8% per year as Africa gradually develops industrial ties with Asia.

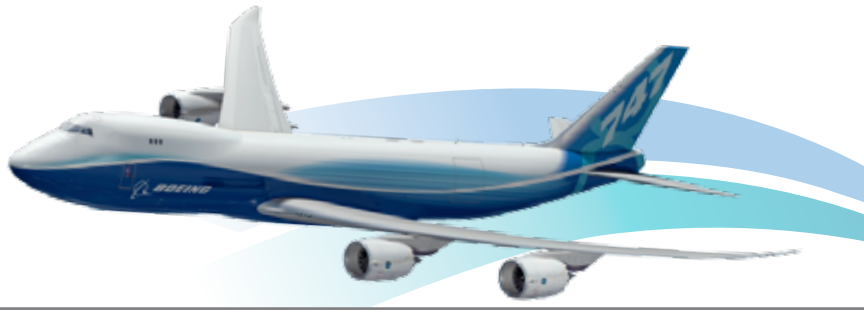
Development of African air trade with North America also will remain directional. North America-to-Africa flows are expected to grow 5.5% per year through 2031, driven by continued US and Canadian investment in African extractive industries. Africa-to-North America air trade will grow more slowly, averaging 4.0% per year as African light manufacturing develops export markets in North America.

Africa-to-Europe air trade will grow 3.9% per year



Europe-to-Africa air trade will grow 5.4% per year





Regional Markets
Asia and North America

For the purposes of this forecast, we define Asia as Japan, China, Hong Kong, Taiwan, Macau, Singapore, Thailand, Malaysia, the Philippines, Indonesia, Cambodia, Vietnam, South Korea, Australia, and New Zealand. We define North America as Canada and the United States.

The Asia–North America market contracted 5.0% in 2011

The Asia–North America market represents 20.3% of the world's air cargo in terms of tonne-kilometers and 8.3% in tonnage.

The overall Asia–North America market contracted 5.0% in 2011, after growing 29.5% in 2010. This decline reflects the global economic downturn and reduced world industrial production in 2011. Growth in the North America-to-Asia air cargo market slowed to 3.0% in 2011, following growth of 32.5% in 2010. Air cargo traffic in the Asia-to-North America direction, which accounts for 54.0% of the overall Asia–North America market, retrenched 11.0% in 2011 following its 27.2% gain in 2010.

Total air freight tonnage in the Asia-to-North America direction was 1.8 million tonnes. The tonnage in the North America-to-Asia direction was approximately 1.6 million tonnes.

The overall Asia–US market grew 30.8% in 2010, followed by a decline of 4.3% in 2011. Asia-to-US air cargo traffic declined 9.3%, while US-to-Asia traffic grew 2.7% in 2011. During the first two months of 2012, overall Asia–US air cargo traffic declined 1.8% compared to the first two months of 2011. Asia-to-US traffic declined 1.0% and US-to-Asia declined 2.6%.

Because air cargo traffic to and from the United States accounts for 96.8% of the overall Asia–North America air trade, US monthly market activity can be taken to approximate recent changes in the overall transpacific market.

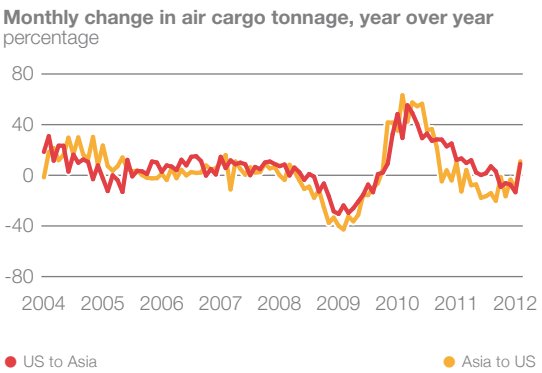
China now accounts for the largest share of the Asia–North America air cargo market. Growing at an average annual rate of 15.0% since 1991, China's market share rose from 7.5% to 19.0% by 2001, and reached 40.5% by 2011. Japan, the second largest air cargo market in Asia, has a 16.9% market share. As China's market share rose, Japan's declined, dropping from 35.4% in 1991, to 28.6% in 2001, and 16.9% in 2011.

Investment in transportation infrastructure has increased Asia's ability to accommodate air cargo growth, allowing the region to take advantage of global commerce trends and the manufacturing capabilities of Southeast Asia, China, South Korea, and Japan.

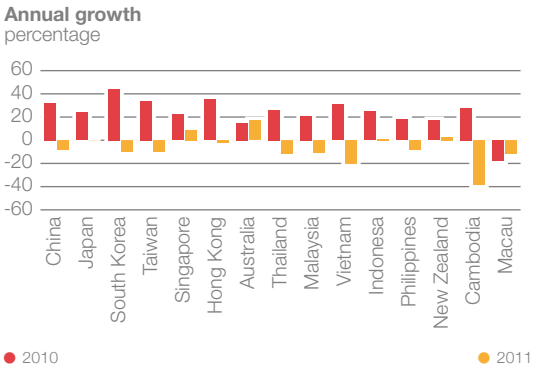
Total transpacific air tonnage is influenced by a combination of factors, including economic activity in North America and Asia, international trade patterns, and commodity mix. The directionality of the flow, on the other hand, is determined by economic growth and purchasing power in the importing region.

Exchange rates affect the price of imported goods in local currencies, which in turn, influence the directionality of cargo flows. A strengthening US dollar increases traffic from Asia to North America. Conversely, a weakening dollar increases flows from North America to Asia.

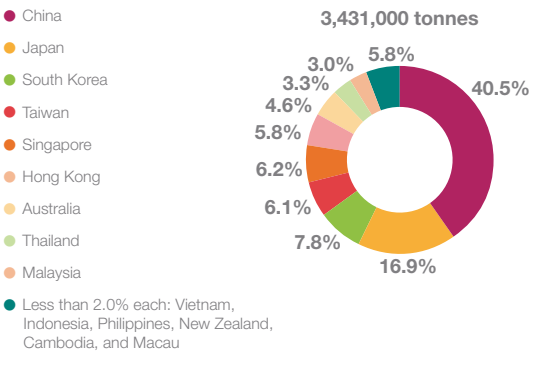
Asia–US air trade declined 4.0% for Jan-July 2012 compared to Jan-July 2011



Asia–North America air freight market contracted 5.0% in 2011



China accounts for 40% of the transpacific air cargo market



Asia and North America

By way of illustration, Asia-to-North America traffic share dropped from 68.3% to 49.3% of total Asia–North America air cargo traffic between 1985 and 1995, a period when the US dollar dropped approximately 25% with respect to Pacific Rim currencies. Conversely, Asia-to-North America traffic share rose from 49.3% to 58.3% of total Asia–North America air cargo traffic between 1995 and 2001, a period when the US dollar gained nearly 40% against Asia's currencies.

Imbalances in air trade continue to produce extreme disparities in directional load factors. Long-term exchange rate forecasts anticipate a weakening of the US dollar relative to Asian currencies. This will help ease the imbalance that currently favors Asia-to-North America flows.

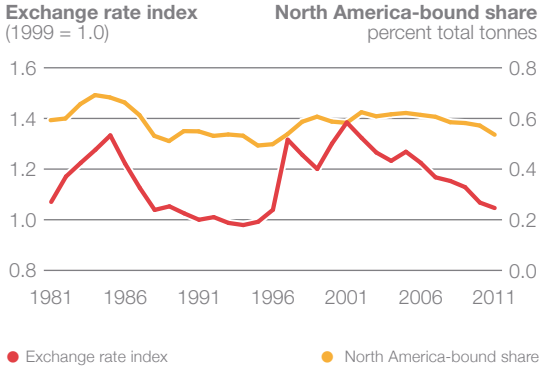
Asia–North America air trade commodities

Three commodity categories account for 69.0% of Asia-to-North America air cargo traffic: apparel, telecommunication equipment, and general industrial machinery and equipment. Five categories account for 52.0% of the North America-to-Asia traffic: general industrial equipment, documents and small packages, electrical machinery, scientific and specialized equipment, and chemical materials.

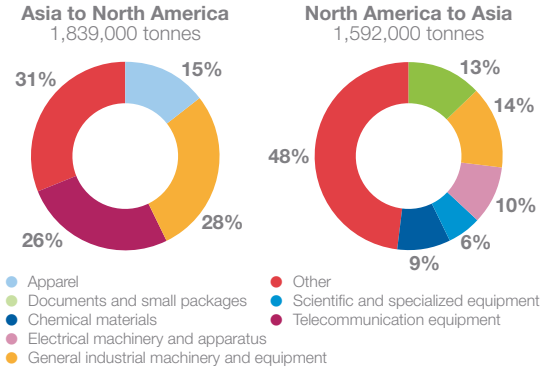
In 2011, Asia's export segment contracted 9.3%, while Asia's imports grew 2.7%. All of Asia's export commodity groups saw contractions. Telecommunication equipment, which grew 27.8% from 2009 to 2010, declined 12.5% in 2011. Asia's apparel exports saw tonnage grow 35.7% in 2010, but then contract 27.4% in 2011.

Several Asia import commodity groups saw growth in 2010 and 2011. North America's document and small package exports grew 31.9% and 4.0% in 2010 and 2011, respectively. Electrical machinery exhibits similar characteristics, growing 29.2% and 5.1% in 2010 and 2011. Scientific and specialized equipment also grew, rising 19.0% and 2.3% during the two years. General industrial equipment tonnage grew 44.5% in 2010, but contracted 4.1% in 2011.

Exchange rate affects transpacific trade flow directionality



Consumer goods lead North America-bound flow; manufacturing materials lead Asia-bound flow



Asia and North America

Asia–North America air cargo traffic forecast

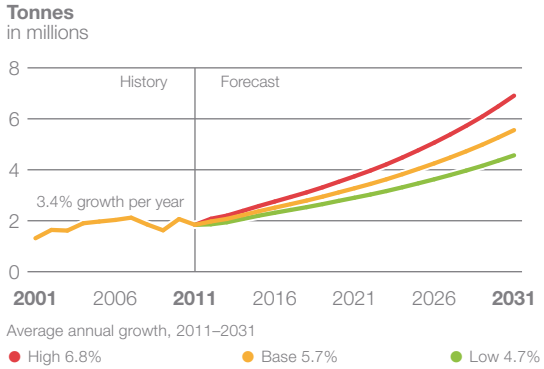
Asia's GDP will grow 4.1% annually over the next 20 years. China will continue to play a major role in Asia, buoyed by China's membership in the World Trade Organization (WTO), the US–China civil aviation agreement, and China's expected GDP growth of 6.7% per year over the next 20 years. Japan's GDP will grow at a much slower rate of 0.8% per year. The mature economies of North America are expected to grow 2.5% per year.

The forecast assumes a global recovery; it also assumes that rapid economic growth in Asia will continue and that economic growth in North America will recover and then slow over the long term.

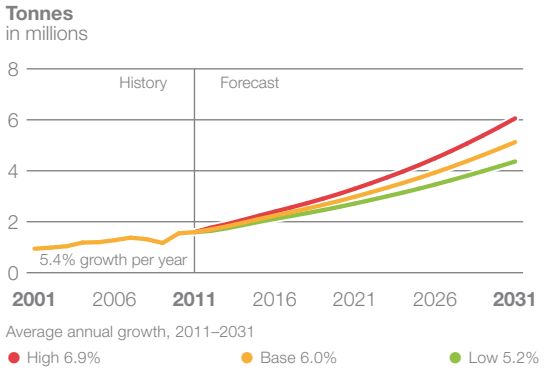
Air trade scenarios for Asia, to and from North America, were developed for baseline, low, and high economic growth rates. The low- and high-growth scenarios reflect GDP performance that falls 0.5% below and above baseline GDP projections.

Air trade flowing in both directions across the Pacific is forecast to grow an average of 5.8% per year over the next 20 years. The flow from Asia to North America is forecast to grow at an average rate of 5.7% per year. The flow from North America to Asia is forecast to grow at a slightly higher rate of 6.0% per year over the next 20 years.

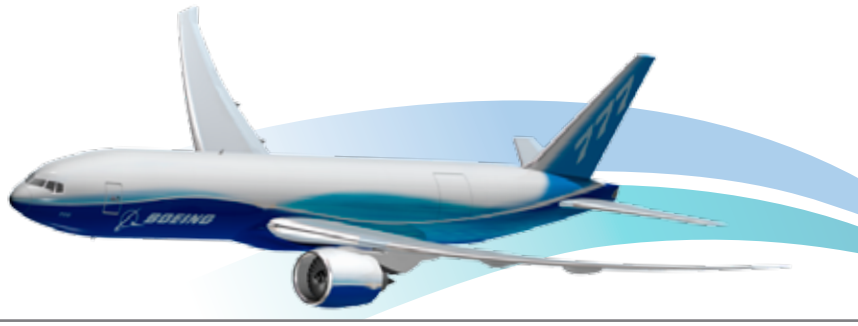
Asia-to-North America air trade will grow 5.7% per year



North America-to-Asia air trade will grow 6.0% per year



Regional Markets
Europe and Asia



For the purposes of this forecast, we define Europe as all 27 member countries of the European Union (EU) plus Switzerland, Norway, Iceland, Turkey, Albania, Gibraltar, and all the countries of the former Yugoslavia. Asia is defined as Japan, China, Hong Kong, Taiwan, South Korea, Singapore, the Philippines, Indonesia, Malaysia, Thailand, Vietnam, Macau, Cambodia, New Zealand, and Australia.

Air cargo traffic growth remains strong

The Europe–Asia market comprises approximately 20.6% of the world's air cargo traffic in tonne-kilometers and 10.4% in tonnage.

The Europe–Asia air cargo market grew 26.7% in 2010, but then declined 7.0% in 2011. The Europe–Asia annual growth chart shows overall air traffic flows between Europe and Asia that also contain some "sixth freedom" traffic that flows into or out of other regions. The chart does not represent the actual trade flows by direction. Therefore, comparisons should not be made between the chart and the following air trade flow analysis.

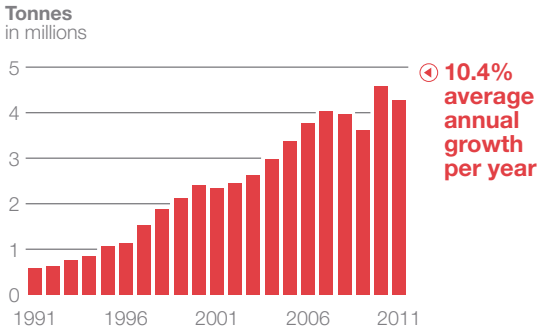
During the early 1990s, Europe's imports showed no growth as the recession that followed the 1991 Gulf War took a heavy toll on growth in the European economy. At the same time, Asia's demand for Europe's goods increased dramatically.

Since 1998, Asia-to-Europe flows have exceeded Europe-to-Asia flows. By 2007, Europe was importing 2.4 million tonnes from and exporting 1.6 million tonnes to Asia. The gap between Europe's imports and exports has narrowed significantly, however, because of the 2008–2009 global economic downturn and the attendant aggressive financial stimulus packages in Asia. China's stimulus package led the way, with the equivalent of 3.2% GDP in 2009, exceeding the 2% GDP level recommended by the International Monetary Fund. In 2011, the gap between Europe's imports and exports was approximately 60,000 tonnes.

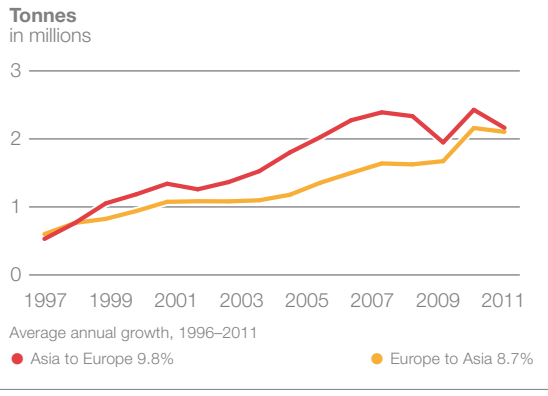
Air cargo flows were marked by declines in 2011 after the strong 2010 recovery from the 2008–2009 global economic downturn. The overall Europe–Asia market declined 7.0% in 2011 after its 26.7% rebound in 2010. The Europe-to-Asia flow declined 2.6% in 2011 after growing 29.1% in 2010. In the Asia-to-Europe direction, the flow declined 10.9% in 2011 after growing 24.6% in 2010. The 2011 slowdown reflects the effects of numerous challenges, including fuel price rises resulting from the Arab Spring conflicts, disruption of the global supply chain by the Japan earthquake and tsunami, and the Euro crisis, which dragged down the overall Europe–Asia cargo market.

Long-term air cargo growth has maintained a steady 9.3% average annual rate since 1996, despite these temporary reversals. The air cargo market in the Europe-to-Asia direction has grown 8.7% per year over the same 15-year period. In the Asia-to-Europe direction, the market averaged 9.8% growth.

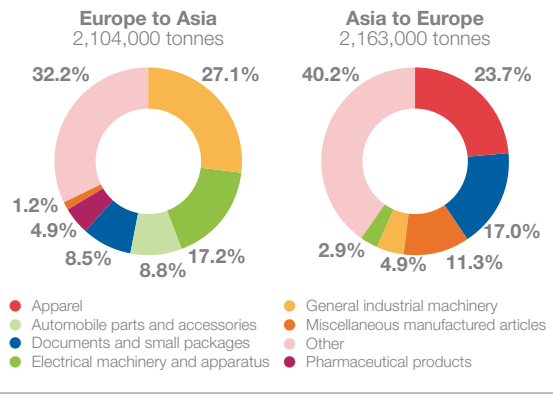
Europe–Asia air cargo market traffic has grown 10.4% per year since 1991



European air imports from Asia have driven overall market growth since 1997



Europe-to-Asia flows are more diverse than Asia-to-Europe flows



Europe and Asia

Europe–Asia air trade commodities

The Europe-to-Asia flow consists primarily of manufactured goods, while the Asia-to-Europe flow is primarily consumer goods.

In the Europe-to-Asia direction, the top five commodity categories account for 66.5% of air cargo traffic. In descending order, the categories are general industrial machinery, electrical machinery and apparatus, automobile parts and accessories, express packages, and pharmaceutical products. In the Asia-to-Europe direction, the top five commodity categories account for 59.8% of air trade. Included are apparel, express packages, miscellaneous manufactured goods, general industrial machinery, and electrical machinery and apparatus.

One particularly fast-growing market segment between Europe and Asia has been documents and small packages, sometimes referred to as "traditional express traffic." This trade flow has averaged 6.8% annual growth in daily shipment counts in both directions since 1996, as the movement of business samples, legal documents, and other expedited small-batch items has increased between Europe and Asia. The total bidirectional express market averaged nearly 305,500 shipments per day in mid-2011.

Europe–Asia air cargo market forecast

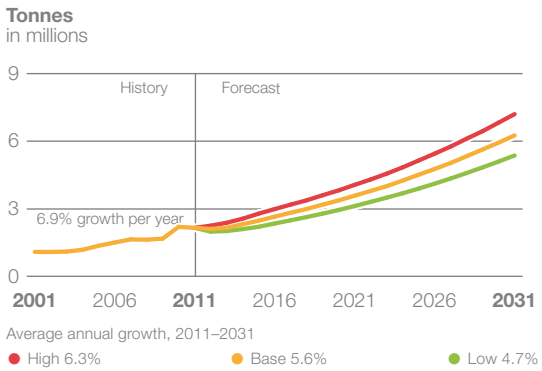
Asia's GDP will grow 4.1% per year over the next 20 years. China will continue to play a major role in Asia, buoyed by China's membership in the World Trade Organization (WTO) and the expected GDP growth of 6.7% per year over the next 20 years. The more mature economies of Europe are expected to grow 1.9% per year.

Base, low, and high models were developed to forecast the Europe–Asia air cargo market. GDP projections of 0.5% below and above the baseline were assessed, and the results of these growth rates are reflected in the low- and high-growth scenarios.

Europe-to-Asia flows will average 5.6% growth as China continues to open its markets in accordance with WTO guidelines. Several hundred million people in Asia will become moderately affluent and are expected to eventually demand increasing quantities of goods from Europe.

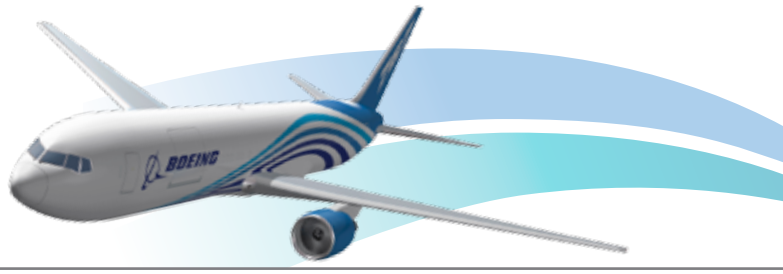
Asia-to-Europe flows will grow slightly faster, with long-term growth averaging 5.8% during the forecast period. Continued investment and government spending on infrastructure improvements in south and east Europe will help bolster Asia's exports that are related to technology and light industry.

Europe-to-Asia air trade will average 5.6% growth per year through 2031



Asia-to-Europe air trade will average 5.8% growth per year through 2031

Regional Markets
Intra-Asia



For the purposes of this forecast, we define Asia as the eastern Pacific Rim countries: Japan, China (including the special administrative districts of Hong Kong and Macau, unless otherwise noted), Taiwan, Singapore, Thailand, Malaysia, the Philippines, Indonesia, South Korea, Australia, and New Zealand.

Please note that this section does not examine domestic flows within the nations in Asia. Domestic flows for China may be found in the Regional Markets, Domestic China section. A high-level treatment of Japan's historic and future air cargo growth is presented in the World Overview section and in the Appendix, though Japan's less dynamic domestic market is not analyzed separately.

Global economic uncertainty continues to affect near-term air cargo volume following a record rebound from the global economic downturn

The intra-Asia air cargo market constitutes 14.7% of the world's air cargo traffic in tonnage and about 7.4% in tonne-kilometers. Nearly half of Asia's total exports represent trade among countries within the region. However, more than 60% of this trade comprises subassemblies or components that are integrated into completed products within Asia before being shipped outside the region. Intra-Asia air cargo traffic is therefore still very sensitive to world economic conditions. Continuing global economic uncertainty constrained the region's air cargo recovery to slightly below the world norm in 2010 and drove a decline that was slightly deeper than the world average in 2011.

Air cargo traffic within Asia mirrored market trends in other regions, recovering strongly from the global economic downturn with 14.7% growth in 2010. The following year, however, global economic uncertainty and natural disasters within the region dragged traffic down 1.9%. Despite that small decline, the record rebound of 2010 was strong enough to lift the region's air cargo tonnage to its third highest mark on record. Strong traffic between China and the other Asian countries mitigated the effects of the sluggish global economy, but the region's heavy dependence on exports to Europe and North America caused air cargo traffic growth within the region to lag behind world averages in both 2010 and 2011.

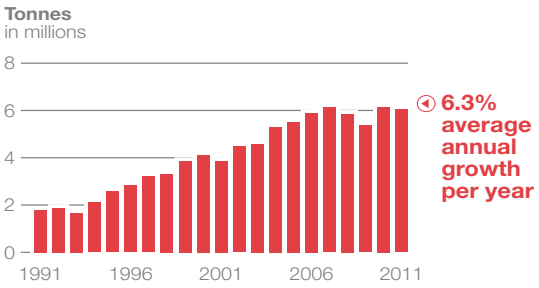
Trade among countries within Asia continues to expand. Currently accounting for nearly half of the exports from countries within the region, this burgeoning commerce drives the region's air cargo traffic. Global production chains that move in-progress manufacturing products sequentially through various factories throughout Asia ultimately generate intercontinental exports. Rising per capita incomes that create new indigenous markets for consumer goods insulate traffic within the region somewhat from economic downturns outside the region.

Significant market considerations

Vast distances, wide expanses of water, and minimal ground transport alternatives make air cargo essential to the development of international markets within Asia.

Differentiating between international air traffic within Asia and the region's intercontinental air traffic is particularly difficult. A large volume of manufacturing work-in-progress passes through multiple airports in Asia before shipping to a final destination. A growing consumer market within the region also complicates

Intra-Asian air cargo growth slowed by recent world economic weakness



the picture. With a vast expanse of challenging terrain and a lack of ground transport infrastructure connecting countries, "truck flight" service is very limited. China, where ground infrastructure is developing rapidly, accounts for well over half the region's truck-flight frequencies. As a whole, the region remains highly dependent on air transport for economic growth.

Well over half the region's cargo requirement comes from work-in-progress manufactures. Maritime transport is an unusually attractive alternative for this requirement because many of the region's manufacturing centers are separated by water and intercontinental cargo ship schedules include stops at multiple ports. Yet continued development of the region's economies and attendant growth in per capita incomes will spur air cargo growth by broadening intra-regional trade of the high-value industrial goods, consumer products, and perishables that are the core of air transport.

The intra-Asia regional air cargo market is unusually concentrated in relatively few high-volume segments. The top 10 pairs of trading economies constitute nearly one-half of the total annual intra-Asia air cargo flows. China's role is key, inasmuch as 8 of the top 10 pairs involve China, Hong Kong, or Taiwan. Interestingly, Hong Kong (as intermediary for all of China) and Japan each appear four times in the top 10 flows. South Korea's economic strength is apparent by its participation in the two largest markets and three of the top five intra-Asia air cargo markets.

Abundant lower-hold capacity on widebody passenger airplane flights provides, on average, the equivalent of more than 50 weekly medium-widebody freighters in the top 10 markets. This available capacity, along with that of intercontinental large-freighter routings that extend into the largest intra-Asia markets, limits the requirement for regional freighters.

Although exports to North America and Europe continue to be a primary source of Asia's air cargo growth, air transport is also crucial to efficient production in the region's industries, carrying raw materials, components, and subassemblies between manufacturing centers. The prompt and dependable supply chain enables manufacturers to take advantage of specialized local skills, labor cost differentials, and optimum inventory practices to achieve low prices and to produce a wide variety of products.

Economic performance and outlook

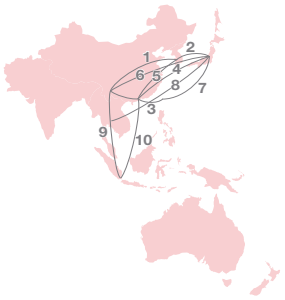
Strong regional demand contributes to Asian economic resilience, despite global and regional challenges.

Asian economic growth rates reached a decade high during the 2010 recovery. Although these export-dependent economies were among the world's hardest hit economies during the two-year global economic downturn, they showed the strongest recovery. Regional growth was more than 7% in 2010, with China growing more than 10%. This record rebound was not sustainable, however, as global economic and political uncertainty, high fuel prices, and natural disasters combined to reduce 2011 growth to 4%. In light of the magnitude of these adversities, even this lower growth rate was remarkable. Continuing gains in private consumption, lower savings rates, and an emerging regional market should continue in the near term. Post-disaster reconstruction will boost government investment spending, but there remains a tremendous need for further infrastructure upgrades and expansion in many countries.

The top 10 economy pairs constitute nearly half of the intra-Asia market

Top economy pairs for intraregional air cargo traffic

1. China–South Korea
2. Japan–South Korea
3. Hong Kong–Taiwan
4. Hong Kong–Japan
5. South Korea–Hong Kong
6. China–Japan
7. Japan–Taiwan
8. Thailand–Japan
9. China–Singapore
10. Singapore–Hong Kong



Intra-Asia

Asian economies (apart from Japan) are projected to grow at an average annual rate of more than 4% during the forecast period, which is among the fastest regional economic growth rates in the world. China's GDP is expected to grow nearly 7.0% per year, compared to less than 1.0% for Japan, 1.6% for Europe, and 2.5% for North America. China will continue to buoy overall Asian economic growth during the forecast period, as it competes with current trading partners for investment and market share, graduates to higher value manufactures, and migrates production to currently underdeveloped interior areas.

Risks to the region include uncertain resource prices; reliance on foreign consumption; global imbalances exacerbated by structural rigidities in Asian economies; and the threat of a pandemic, major terrorist activity, or natural disaster.

The combined economies of Japan and China currently constitute more than 70% of Asia's aggregate economy. China's share alone has grown from low double digits in 2000 to practical parity with Japan's 35% share. Remarkably, China is projected to surge to well over half (55%) of the region's total economy by the end of the forecast period in 2031. Other major economies in the region, apart from Japan, will maintain nearly their current shares as Asia's overall GDP increases by nearly two and a half times.

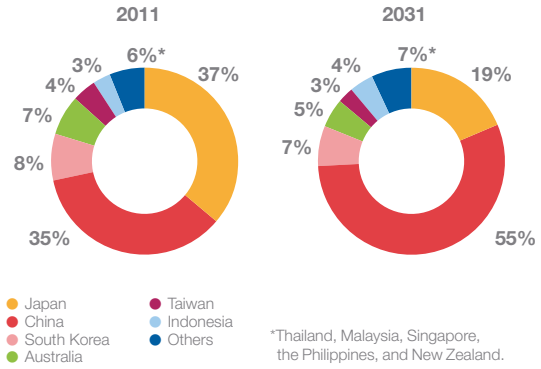
Intra-Asia air cargo traffic forecast

Strong regional economic growth, coupled with continuing demand from North America and Europe, are projected to sustain a healthy long-term annual air cargo growth baseline of 6.9% through 2031.

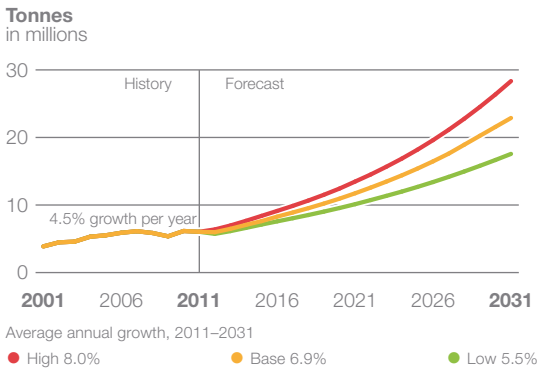
GDP growth for countries within Asia is projected to exceed 4% per year during the forecast period, which is among the highest regional rates in the world. China, with expected GDP growth of nearly 7% over the next 20 years, drives the region, bolstering air trade prospects. Demand from intercontinental export markets and increasing regional consumption contribute to a forecasted long-term average annual air cargo baseline growth rate of 6.9%. Among the highest forecasted average annual air cargo growth rates of any region, this contrasts with the 6.3% rate over the past 20 years and the 4.5% rate over the past 10 years.

GDP projections of 0.5% below and above the baseline were assessed. The results of these growth rates are reflected in the low and high scenarios. The low-growth-rate scenario depicts slowing growth in China and in the region in general, and the high-growth rate forecasts a regional growth rate even more vibrant than the baseline 6.9% through 2031.

Asian economic power distribution shifts dramatically toward China



Intra-Asia cargo market will grow 6.9% over the next 20 years



Regional Markets
South Asia

For the purposes of this forecast, South Asia (sometimes referred to as the Indian Subcontinent) comprises Afghanistan, Bangladesh, Bhutan, India, the Maldives, Nepal, Pakistan, and Sri Lanka. Data from IATA, ICAO, European governments, the Indian government and airport statistics, the United Nations, and the US Department of Commerce are used to model South Asia air trade flows.

South Asia air cargo flow exceeds 1.9 million tonnes per year

The South Asia market constitutes approximately 4.8% of the world's air cargo traffic in tonnage and 4.9% in tonne-kilometers.

Total international air cargo flowing to, from, and within South Asia amounted to nearly 1.99 million tonnes in 2011, up from 1.95 million tonnes in 2010.

South Asia continues to expand economically. The region saw 8.2% collective economic growth from 2008 to 2010, but growth slowed to 6.4% in 2011. South Asia continues to be one of the largest population centers in the world with more than 1.6 billion people. India is the international air trade hub of South Asia. Its population alone exceeds 1.2 billion people, and the country possesses one of the 10 largest economies in the world.

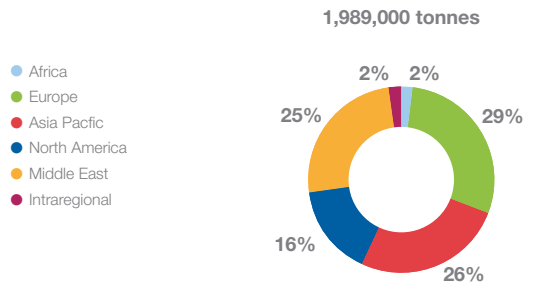
The three largest air cargo trade flows account for 80% of the total South Asia international air cargo market. Europe is the leading regional air trade partner with South Asia, accounting for 29% of total trade with the region. Trade with Europe grew 2% in 2011 to 581,000 tonnes, building on the sharp rebound of air cargo volumes in 2010 that followed the deep decline of 2009.

Asia is South Asia's second largest trade partner. Air cargo tonnage between South Asia and Asia expanded 1.8% in 2011 to 515,000 tonnes a year. The Middle East, which has expanded rapidly over the past decade, is South Asia's third largest air trade partner. It should be noted that transshipment of goods through the Persian Gulf nations can blur the true origin of many regional air cargo flows because a large volume of European, Asian, North American, and intraregional air trade passes through Persian Gulf cargo centers, either by air or by sea and air.

Much of the cargo transported to and from the region is carried by foreign carriers. In India, the largest air cargo market in the South Asia region, foreign carriers carried more than 80% of all international cargo to and from the country. Many cargo flights incorporate intermediate stops in the South Asia region as an add-on service between Europe, the Middle East, and Asia.

Overall air exports for the region comprise primarily textiles and apparel. Other smaller, yet growing, air export commodities for the region include industrial chemicals, consumer goods, pharmaceuticals, and electrical equipment. South Asia imports are led by computing equipment, small packages, capital equipment, electrical equipment, and telecommunication equipment.

Europe is the largest South Asia trade partner



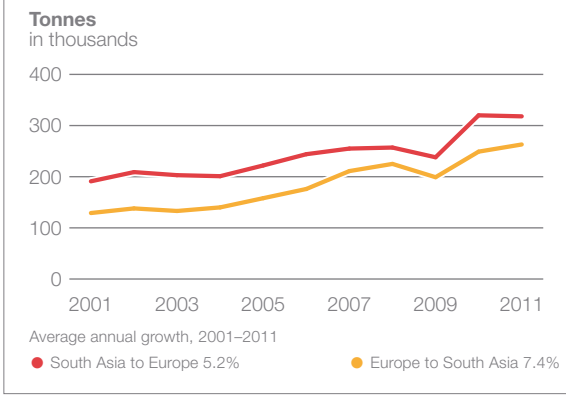
South Asia

Air trade with Europe increased 33% from 2009 to 2011

In 2010, air trade between South Asia and Europe increased about 30% to 569,000 tonnes from 437,000 tonnes in 2009, as trade volumes recovered from the global economic downturn. Air trade increased again in 2011 to 581,000 tonnes, approximately a 2% improvement over 2010.

The air cargo market between South Asia and Europe continues to be imbalanced in favor of exports. In 2011, South Asia's air total export tonnage outweighed air import tonnage by a ratio of 1.2 to 1. Air exports from South Asia to Europe include apparel, vegetables, fruit, industrial chemicals, recorded media, and pharmaceuticals. Air imports from Europe to South Asia are led by capital equipment (especially for garment and textile manufacture), industrial pumps, telecommunication equipment, power generating machinery, and electrical machinery.

South Asia–Europe air trade grew 6.1% per year, 2001–2011

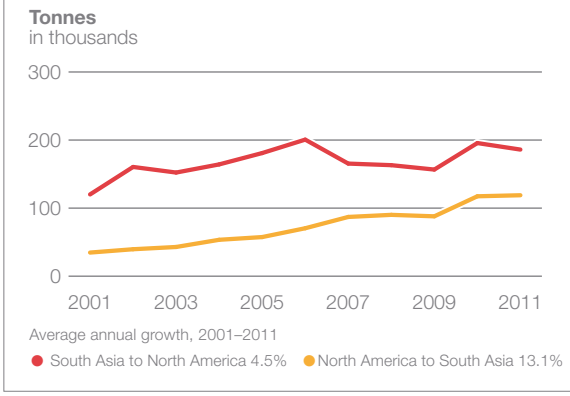


South Asia air trade with North America

South Asia's air trade with North America has grown 7.0% annually since 2001.

The imbalance in the South Asia–North America market has been decreasing for the past decade. South Asian exports to North America have grown more slowly than South Asian imports from North America. In 2010, overall air trade between South Asia and North America increased 27% to 313,000 tonnes from 245,000 tonnes in 2009. In 2011, total air trade between the regions declined slightly to 305,000 tonnes. The leading commodity groups in South Asia's air imports consist of express documents, industrial equipment, telecommunication hardware, and computers. South Asia's air exports to North America consist primarily of apparel, textiles, express documents, pharmaceuticals, and medical equipment.

South Asia–North America air trade grew 7.0% per year, 2001–2011



South Asia

Indian domestic air cargo market expands

The Indian domestic market has grown rapidly over the past decade in parallel with the development of the Indian economy. From 2001 to 2011, the domestic Indian air cargo market expanded at a 10.8% average annual rate. In 2010, domestic Indian air cargo increased 15.8% over 2009 to 395,000 tonnes. The domestic air cargo market continues to expand, increasing 13.7% to 450,000 tonnes in 2011. The expansion is projected to maintain a rate of 8.5% per year from 2011 to 2031, when it will reach 2.2 million tonnes flown per year.

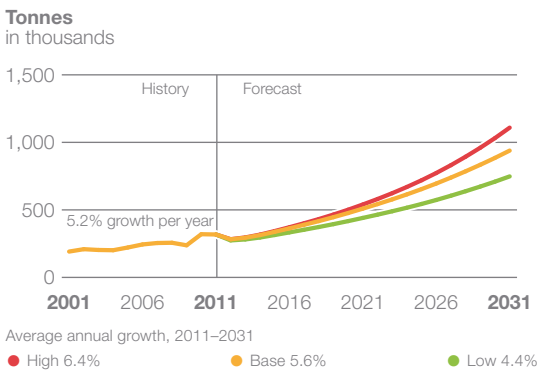
South Asia–Europe air cargo traffic forecast

South Asia's air trade with Europe is expected to continue to expand as the South Asia economies continue to develop. The South Asia–Europe market has expanded 6.1% per year from 2001 to 2011.

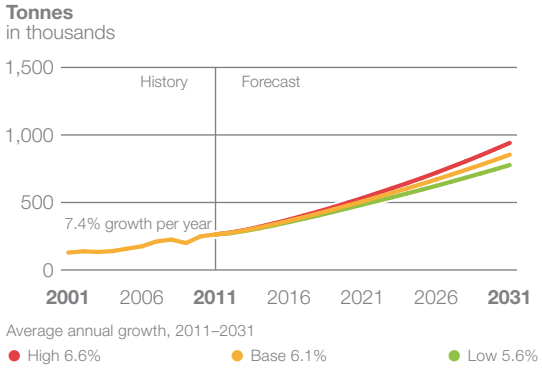
Base, low, and high models were developed to forecast the South Asia–Europe air cargo market. GDP projections of 0.5% below and above the baseline were assessed, and the results of these growth rates are reflected in the low- and high-growth scenarios. Flows from Europe to South Asia will grow an average 6.1% per year in the base model. This base model assumes continued economic expansion, further privatization of India's industry, and rapprochement between India and Pakistan.

Flows from South Asia to Europe will expand approximately 5.6% per year for the forecast period. Continued privatization should make India's industry more cost competitive with its counterparts in Southeast Asia, leading to increased demand for South Asia's goods in Europe. Diversification into other light industries—particularly into sectors other than textiles and garments—bode well for this trade lane.

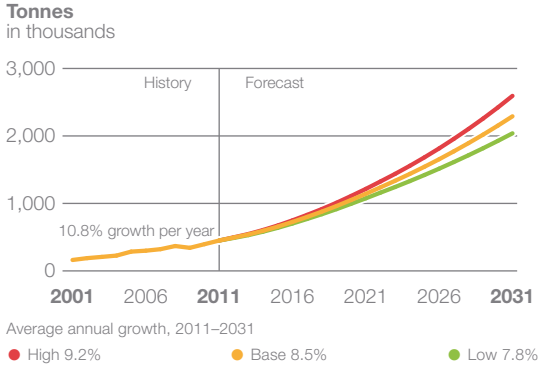
South Asia-to-Europe air trade will grow 5.6% per year

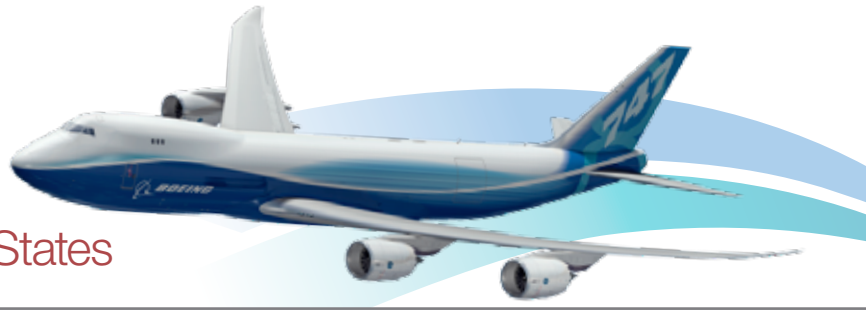


Europe-to-South Asia air trade will grow 6.1% per year



The domestic India air trade will grow 8.5% per year





Regional Markets
Commonwealth of Independent States

The Commonwealth of Independent States (CIS) comprises 12 of the 15 republics of the former Soviet Union: the Russian Federation, Ukraine, Belarus, Moldova, Armenia, Azerbaijan, Georgia, Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan, and Uzbekistan.

Overall CIS air trade grew rapidly from 2009 to 2011

The CIS market is estimated to account for approximately 1.2% of the world's total air cargo traffic in terms of tonne-kilometers and 2.1% in terms of pure tonnage.

Based on the region's airport statistics, air trade originating in or destined to the CIS is estimated at 1,332,000 tonnes in 2011. Principal markets in the region include domestic Russia, Asia, and Europe. Russia commands the largest share of regional air commerce because of its size and economic concentration. Total CIS air trade grew rapidly between 2009 and 2011. In 2010, air trade expanded 25.5% during the recovery from the depressed levels of 2009. In 2011, helped by high oil and gas prices and relative political stability, the region's air trade reached its highest level since the breakup of the Soviet Union in 1991 with a 21.8% gain.

Domestic air trade

Domestic air trade is a vital part of commerce in this expansive region, particularly in Russia. In 2011, Russian domestic air cargo comprised about 627,000 tonnes in airport-measured flows. Measured by airline-reported statistics, however, Russian air cargo flow totals slightly less than one-half of this figure. The region's vast distances and relatively underdeveloped surface transportation links often necessitate air transport to move goods and industrial materials, especially to remote oil and gas extraction projects in the Arctic regions, Siberia, and the Russian Far East. Leading air freight cities, apart from Moscow, include St. Petersburg, Mirnyy, Norilsk, Vladivostok, Krasnoyarsk, Yuzhno-Sakhalinsk, and Khabarovsk. The domestic markets of the other 11 CIS countries contributed an additional 8,000 tonnes of regional air trade in 2011.

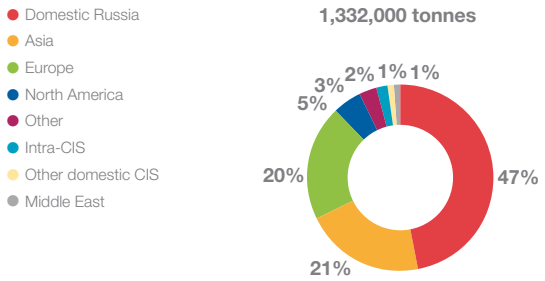
International air trade

The remaining 697,000 tonnes of CIS air cargo represent international trade among the nations within the region and with countries outside the region. Flows to and from Russia account for 399,000 tonnes of this number. Kazakhstan, Ukraine, and Uzbekistan account for another 225,000 tonnes. CIS international air trade centers almost exclusively on Europe and the Asia Pacific nations.

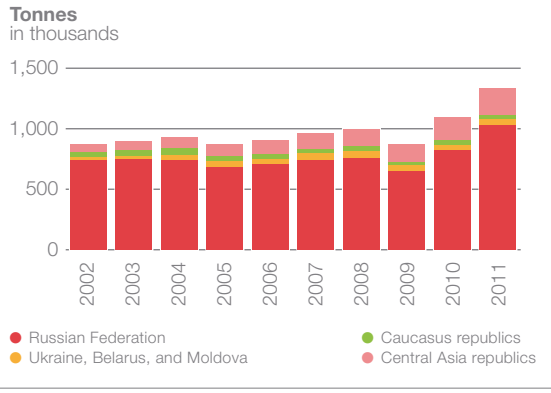
Imports to CIS

Demand for consumer electronics and apparel, particularly from China, Japan, Korea, and Thailand, helps make CIS–Asia traffic one of the region's strongest flows. However, Russia has implemented customs regulations since 2002 that have curbed direct air import to Russia from Asia, leading some importers to transport Russia-bound freight to nearby countries by air. The freight then enters Russia by truck.

Domestic Russia leads all CIS-related air trade



CIS airport air cargo traffic has grown 53% since 2009



Commonwealth of Independent States

The rise of containership ports, particularly in the Baltic and Black Sea regions, also dampens air imports to Russia and Ukraine. Container port activity has grown an average 20% per year in Russia and Ukraine since 2002, reducing the need to transport relatively low-value consumer goods by air. Steady improvements in the region's port and road infrastructure have facilitated this diversion from air transport to containerships.

Europe is the other large market for this region. Total CIS air trade with Europe was 262,000 tonnes in 2011, with about 206,000 tonnes imported from Europe. CIS air imports consist primarily of industrial machinery, automotive components, luxury consumer goods and apparel, pharmaceutical and medical products, computing and telecommunication equipment, and oil and gas extraction equipment. CIS airborne exports to Europe now total about 56,000 tonnes annually. Apparel, industrial machinery, industrial chemicals and metals, scientific instruments, specialty sporting goods, and transportation equipment are the main products flown from the CIS to Europe.

CIS-based carrier traffic grew 5.2% in 2011

CIS air cargo traffic continued to grow in 2011 after rebounding strongly in 2010 from the global economic downturn.

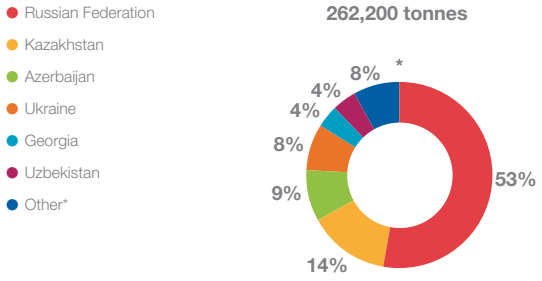
Overall, CIS air cargo traffic grew 5.2% in 2011, after rebounding 30% in 2010 from the depressed levels of 2009. CIS-domiciled carriers were able to expand their international traffic on non-CIS routes to mitigate the overall traffic declines of 2008 and 2009. During the past 19 years, international traffic on CIS-domiciled carriers, as measured in revenue tonne-kilometers, has grown to lead domestic traffic by a ratio of nearly 5 to 1. Domestic CIS traffic grew 24% and 8.9% in 2010 and 2011, respectively.

Non-CIS freight transported by CIS carriers

To accurately assess CIS air cargo traffic volumes, it is necessary to distinguish between true origin-and-destination traffic and cargo flights that stop in the CIS in transit to and from countries outside the region. CIS-based operators carry a significant portion of the region's international cargo on scheduled international flights that pass through the CIS. CIS-based operators also provide charter services for multinational firms and foreign governments, carrying freight to and from markets unconnected to the CIS. Russian airlines carried an estimated 390,000 tonnes of non-CIS international cargo in 2011, representing approximately 57% of the total international traffic on Russian carriers.

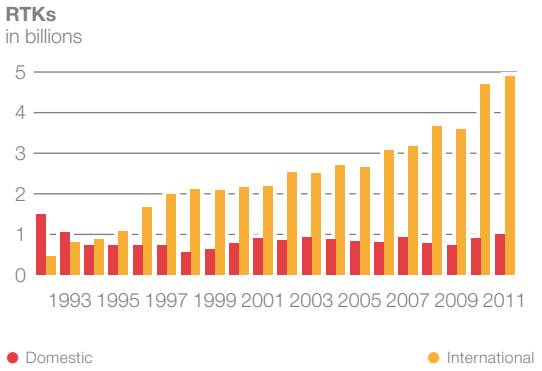
Some Russian carriers take advantage of the geographical location of their domicile to serve fast-growing routes between Europe and Asia. In 2009, Russian carriers transported about 245,000 tonnes between Europe and Asia, transiting Russia without commercial stops inside the country. This represents more than a nine-fold increase over the 2004 tonnage.

Russia and Kazakhstan lead overall CIS air trade with Europe

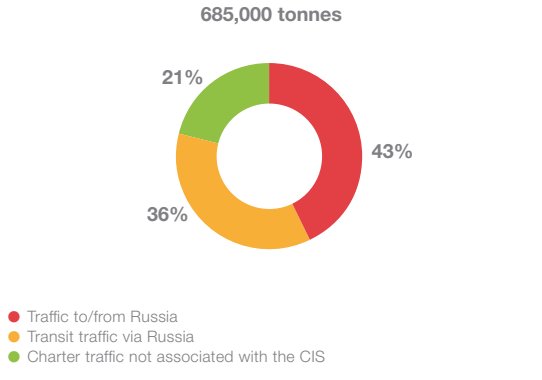


*2% or less: Turkmenistan, Moldova, Belarus, Armenia, Kyrgyzstan, and Tajikistan.

Traffic on CIS-based carriers has more than doubled since 2000



Russia-domiciled carriers depend on international traffic flows



Military-design freighters remain essential to regional air trade

CIS-based airlines operate a sizable fleet of former Soviet military turboprop and jet airplanes with rear-ramp loading that is crucial in serving remote areas.

The combined effects of an ample supply of used military aircraft, low acquisition costs, and lagging airport infrastructure investment have kept indigenous military aircraft in CIS fleets for the past two decades. As of mid-2012, approximately 200 CIS-built freighters domiciled in the region are airworthy and serving civilian air freight markets, a decline of 140 aircraft since 2004. CIS airlines are augmenting or upgrading their fleets with Western-built freighters in response to aging aircraft, high fuel consumption, and community noise issues associated with their military freighters.

Certain CIS cargo carriers have parlayed their military aircraft assets to become unique providers of air transport for freight that is too large or too heavy for civilian widebody freighters. A select group of carriers in Russia and Ukraine serves this specialized sector, which accounts for nearly 132,000 tonnes of freight annually worldwide, using very large ramp-loading military freighter aircraft. It should be emphasized that most of the outsize cargo traffic does not originate or terminate in the CIS.

Most outsize traffic is conducted by charters, transporting industrial shipments between Europe, North America, and Asia. Typical industries served by these carriers include oil and gas extraction, aerospace manufacturing, electrical power generation, entertainment, and infrastructure development. These carriers also have transported materiel in support of US and European military forces in the Middle East and Afghanistan.

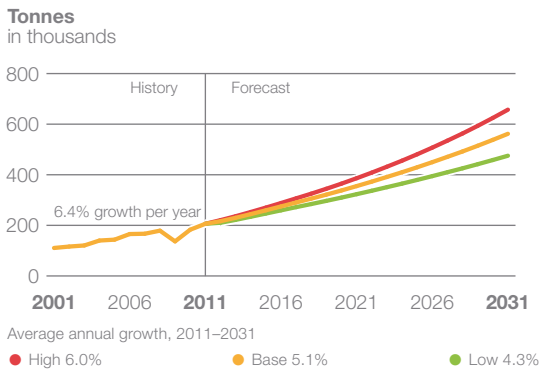
CIS–Europe air cargo forecast

The CIS–Europe combined import and export air cargo market will grow at an average annual rate of 5.3% for the next two decades.

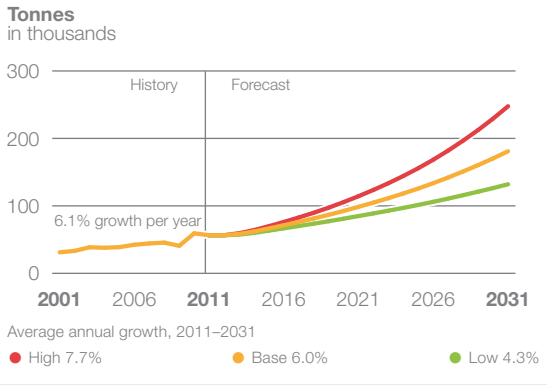
Customs issues affecting imports from Asia and the difficulty of obtaining reliable data on traffic between the CIS and regions other than Europe make CIS–Europe flows key to projecting the overall CIS market. CIS air imports from Europe are forecast to grow 5.1% per year, expanding from 206,000 tonnes in 2011 to 562,000 tonnes by 2031. Growth in air imports from Europe will continue to depend on petroleum prices and the development of the CIS middle class, particularly in Russia. If petroleum prices remain high by historical standards, CIS demand for European consumer goods, industrial equipment and spare parts, and oil and gas extraction equipment will remain strong. CIS air import traffic should then develop in accordance with the baseline forecast or even the high-growth projection. Conversely, a decline in petroleum prices and/or a lack of CIS economic diversification will drive the trend toward the low-growth projection.

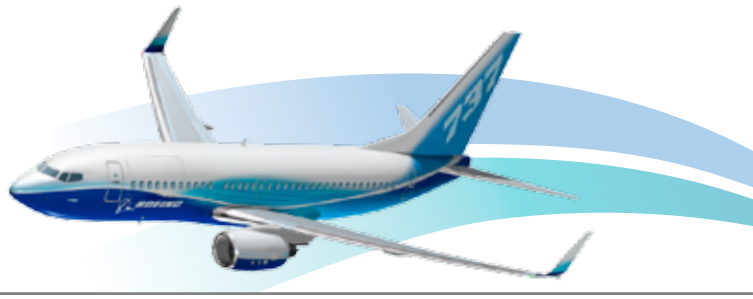
CIS air exports to Europe will grow at a rate of 6.0% to reach nearly 181,000 tonnes by 2031. European industrial demand for CIS-produced apparel, specialty chemicals and industrial metals, specialized scientific equipment, and aerospace goods will bolster growth for the entire forecast period. Political stability and an improved foreign investment climate could promote an export-driven economy for a wide array of manufactured and semimanufactured goods. The recent acceptance of Russia into the World Trade Organization bolsters the case for both the baseline and high-growth scenarios. Conversely, political uncertainty, renationalization of industries, price competition with Asian manufacturers, and continuing regional conflicts would impede air trade growth, leading to the low-growth projection.

Europe-to-CIS air trade will grow 5.1% per year



CIS-to-Europe air trade will grow 6.0% per year





Regional Markets
Domestic China

For the purposes of this forecast, we define domestic China as the mainland or what is commonly referred to as the People's Republic of China. The special administrative regions of Hong Kong and Macau are not examined in this chapter.

Domestic China air cargo traffic to grow 8.0% annually

China's domestic air cargo traffic currently accounts for an estimated 9.1% of the world's total air cargo traffic by weight, but only about 2.7% of the world market in terms of cargo tonne-kilometers.

China has rapidly become the world's premier manufacturing center, with key industries geared toward commodities such as computing, telecommunication equipment, and apparel. These commodities are traditionally transported by air.

Most of these goods are intended for export, and China has witnessed a tremendous increase in international air trade. Strong air export traffic to Asia, Europe, and North America has long been a major driver of China's domestic air cargo traffic growth. During the past decade, however, domestic demand in the region's rapidly developing large cities has become an important driver.

China's domestic air cargo market grew 2.8% in 2011, following growth of 13.6% in 2010 and 11.6% in 2009. Scheduled freight accounts for 94% of domestic China air cargo traffic. Mail accounts for the remaining 6%.

Throughout the 1990s, strong economic growth, rising foreign investment, and extremely competitive labor rates have stimulated 15.2% average annual growth in domestic air cargo.

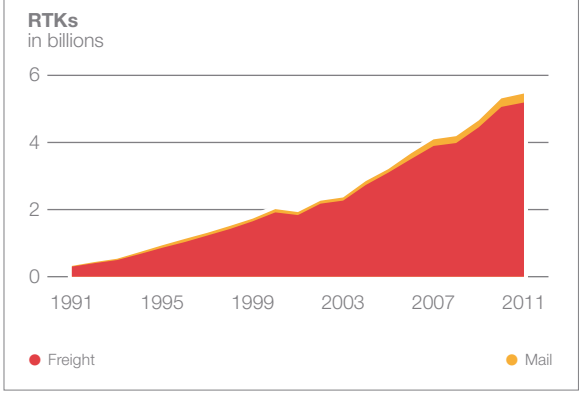
Air cargo activity is concentrated in the coastal and southern provinces, where the bulk of the country's 1.3 billion people and $4.2 trillion economy are situated.

At 3.7 million tonnes transported annually, China's domestic air cargo market has become the second largest in the world, led only by the US domestic market.

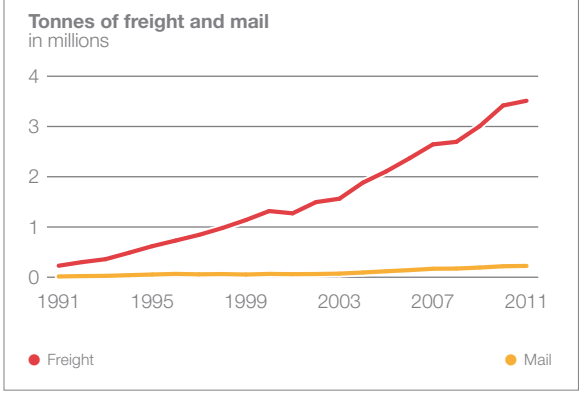
The types of goods transported on domestic routes vary by region. In the southeastern provinces, especially the Pearl River Delta region, domestic air cargo consists largely of apparel, home electronics, telecommunication equipment, and light industrial products. Goods transported from the eastern provinces include textiles, apparel, electronics, perishable foods, and live animals.

In the northern regions, apparel and electronics are supplemented by precision instruments. Pharmaceuticals, cashmere, cut flowers, and industrial equipment constitute the bulk of the cargo flow that originates in the western provinces.

Domestic China air cargo traffic has grown 15.2% per year since 1991



China's domestic air cargo market is more than 3.5 million tonnes



Domestic China

Infrastructure development remains key to continued growth

From 2006 to 2010, China invested 250 billion yuan (US$39 billion) in infrastructure, equivalent to the aggregate investment in civil air transportation infrastructure during the previous 25 years. The investment brought 31 new airports, increasing the total number of airports for commercial services to 175 in 2010. Shanghai Pudong airport became the third largest cargo airport in the world in terms of tonnage. Air services became accessible to 76% of the population.

China's 12th Five-Year Plan (2011-2015) calls for investment of 1,500 billion yuan (US$235 billion) in civil air transportation infrastructure, of which 340 billion yuan (US$53 billion) is for airport construction and upgrades, with the objective of having a total of 230 airports by 2015. The majority of new airports will be in the rural west and central area of China, in line with the unprecedented urbanization wave and supporting the government's "Go West" development plan.

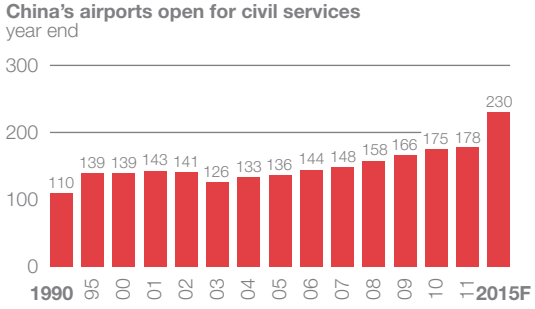
The first 10 years of the Go West plan has shown impressive results. In response to tax and investment incentives and growing local market demand, many multinational companies (including HP, Intel, Foxconn, and Cisco) have either established new or moved existing manufacturing centers from the coastal provinces to interior cities such as Chengdu, Chongqing, Zhengzhou, and Xi'an. Go West policy success has laid a strong foundation for continued growth as the development plan commences its second decade.

China has been investing in road infrastructure since the mid-1980s. Infrastructure investment became a national priority during the 1990s. The government invested heavily to develop road networks connecting major industrial centers in the coastal regions, as well as to improve roads in provinces and towns. Originally, most of the road development resources went to the coastal regions. The government shifted its investment focus to the west as part of a strategy to develop that region.

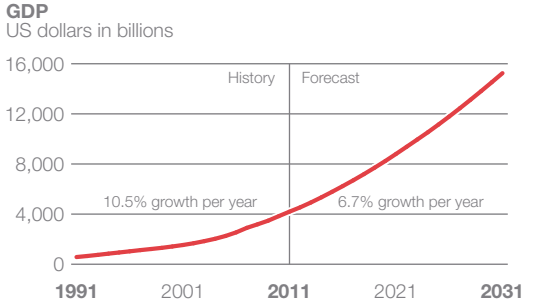
China has added about 3,000 kilometers of expressway per year, resulting in a 30,000-kilometer network of highways, second only to the US in total kilometers. China invested US$4.3 billion in Beijing's infrastructure in 2004, then another US$22 billion in 2008 to improve Beijing's traffic congestion.

China's 12th Five-Year Plan targets construction of more than 40,000 kilometers of express rail lines and more than 85,000 kilometers of highway. Completion of the road network could ignite modal competition for time-definite, short- to medium-distance domestic transport services. New surface transport modes could divert traditional air cargo traffic from airplanes to ground transport, as has happened recently in North America.

China's airport development



China's GDP is expected to more than triple over the next 20 years



Domestic China

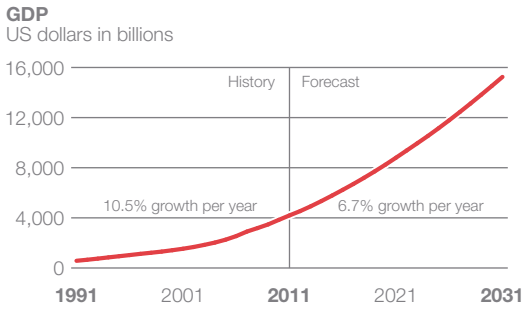
Domestic China air cargo traffic to expand

China's GDP is projected to grow 6.7% per year on average during the forecast period. Considering population growth predictions, per capita GDP is expected to exceed its current level by a factor of 3.5 in 20 years.

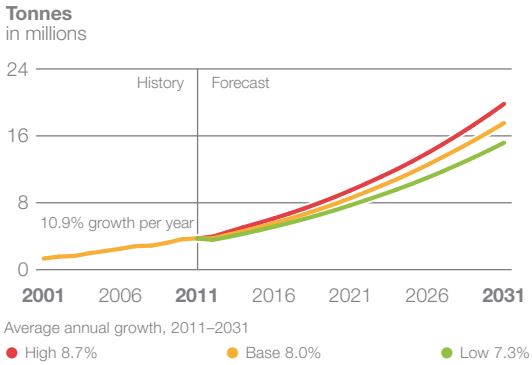
Base-, low-, and high-growth GDP models were developed to forecast China's domestic air cargo growth. The low- and high-growth air cargo scenarios reflect GDP projections for 0.5% below and 0.5% above the baseline GDP growth, respectively.

Overall air trade within China will grow 8.0% annually for the forecast period, with growth most rapid in the first decade of the forecast period.

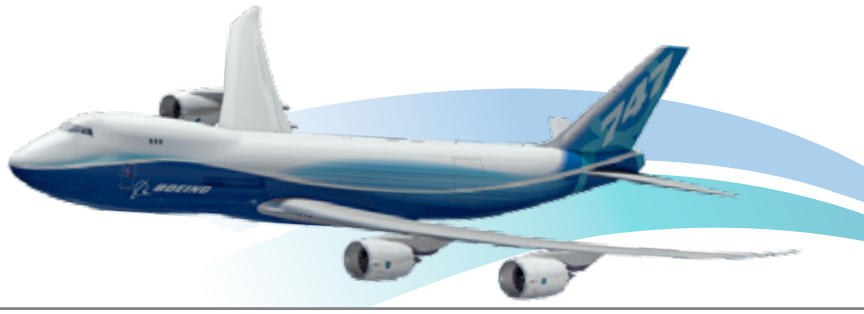
China's GDP is expected to more than triple over the next 20 years



Domestic China air cargo is forecast to grow 8.0% per year for the next two decades



World Freighter Fleet



Air cargo fleet growth and change

The number of airplanes in the worldwide freighter fleet will increase by more than 80% during the next 20 years, as demand for air cargo services more than doubles. Large freighters will play an increasing role in air cargo transport as the large freighter category comes to represent 36% of the world's freighter fleet by 2031, compared to 31% today and 22% a decade ago. By leveraging the significant efficiency and capability advantages of large freighters, carriers will be able to manage projected traffic growth without proportionately increasing the number of airplanes.

Despite natural disasters and a continuing series of political and economic challenges, air cargo traffic remains relatively flat, after rebounding strongly in 2010 from the global economic downturn of 2008 and 2009. Cargo operators have varied freighter utilization, temporarily grounded portions of the fleet, and/or retired older freighters in response to market uncertainties. In the long term, the industry will benefit from this removal of surplus capacity and replacement of older freighters with more efficient airplanes.

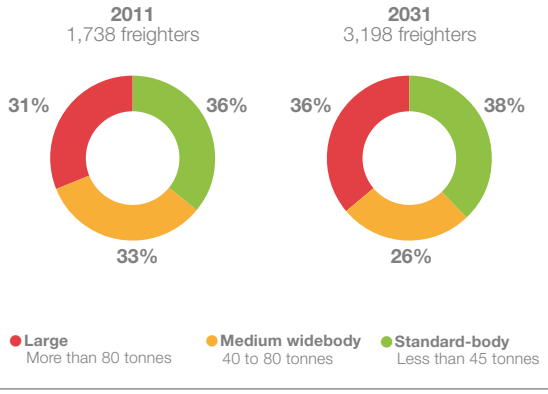
Reflecting traffic stability, the number of airplanes in the freighter fleet has remained virtually the same since 2009 (1,755 in 2009 compared to a current 1,738). The mix of airplane sizes has shifted, however, toward large freighters. The large freighter share of the fleet has grown from 26% to 31% since 2009. As deliveries of newer, larger freighters increased over the past 18 months, yields and load factors came under pressure. Please note that the accompanying charts present actual data, as opposed to the rounded totals presented in the Boeing *Current Market Outlook 2012-2031*.

The industry's oft-demonstrated resilience is projected to prevail over recent adverse pressures. Demand for air cargo services will more than double by 2031 in response to the industry's growing dependence on speed and reliability, continued product innovation, and global interdependence. This demand growth will spur the world freighter fleet to expand by more than 80%, from the current 1,738 airplanes to 3,198 airplanes by the end of the forecast period.

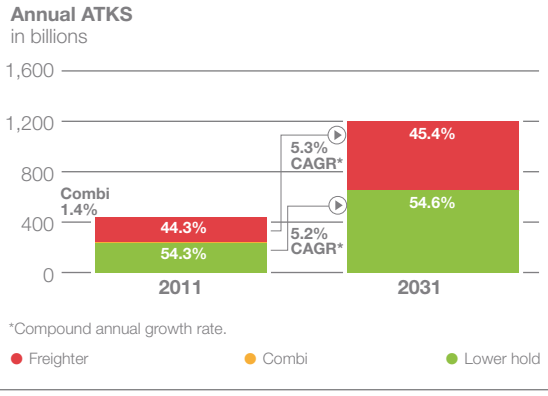
About 1,300 of the 2,754 projected freighter deliveries will replace retiring airplanes, with the remainder expanding the fleet to meet the requirements of projected traffic growth. Two-thirds of deliveries will be freighter conversions, 60% of which will be from standard-body passenger airplanes. Of the projected 935 new production airplane deliveries (valued at $250 billion in 2011 US dollars), about three-fourths will be in the large freighter category.

Cargo capacity (measured in available tonne-kilometers [ATKs]) supplied by dedicated freighters will continue to rise slightly faster than lower-hold capacity in the passenger airplane fleet. By 2031, freighters will provide nearly 45% of the world's cargo capacity, despite the continuing trend toward passenger airplanes with greater lower-hold capability.

Fleet grows more than 80%—shifts toward large freighters



Capacity growth balanced between freighters and lower hold



World Freighter Fleet

The freighter share of the total commercial fleet will decline slightly to 8% even as the number of freighter airplanes grows. The continual increase in average freighter size and the influx of newer, more efficient airplanes will facilitate higher airplane utilization and load factor to meet projected demand growth without a proportional increase in freighter numbers.

Significant developments and trends

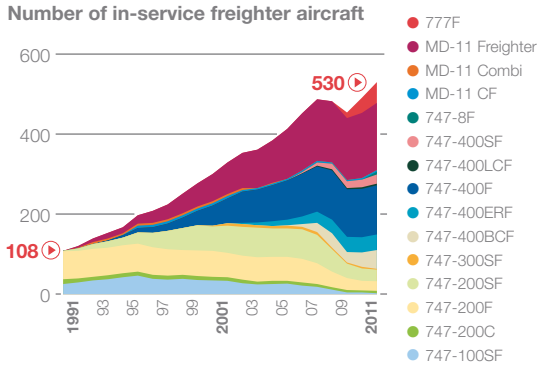
Diverse factors affect world freighter fleet growth, often exerting contrary pressures. For example, rising fuel prices increase air cargo transport costs, depressing demand for services. At the same time, high fuel prices are an incentive for airlines to replace aging airplanes, bolstering demand for new freighters.

The forecast takes into account several significant world freighter fleet developments and trends:

- The introduction of widebody passenger airplanes with increasingly capable lower holds continues to moderate freighter demand. The unique advantages offered by freighter operations—including superior focus and control, timing and routing, capacity (volume, weight, hazmat, and dimensional), handling location and ramp proximity, and, most importantly, reliability and predictability—often offset a lower-hold price advantage.
- Freighter orders during the first six months of 2012 were far fewer than the near-record number received in 2011, as a five-year delivery backlog exceeding 200 airplanes was worked down.
- Volatile fuel prices accelerate freighter retirements and enhance the value of newer airplanes that offer higher operating efficiency. Near-term overcapacity exerts downward pressure on the fleet as relatively new freighters are parked and even considered for retirement in the face of declining yield, load factor, and utilization.
- Noise, emissions, and aircraft aging regulations drive carriers to accelerate evaluation of their fleet requirements.
- Passenger carriers continue to emphasize the revenue potential of cargo. Airlines that operate both passenger airplanes and freighters typically enjoy 20% higher cargo load factors and increased yields in the lower holds of their passenger airplanes than passenger-only airlines.
- Cost-effective ground transport alternatives and abundant lower-hold capacity will moderate medium widebody fleet growth in large established regional markets. Growth will concentrate in a few large express carriers and developing regions where difficult terrain or lack of alternative modes favors air transport. Profitable long-haul operation of medium widebody freighters is challenging, even with full loads, because of the 20% to 30% advantage in operational economics enjoyed by large freighters.

Large freighter fleet modernization continues

Sources:
Ascend database,
Boeing as of April 2012



World Freighter Fleet

Forecast approach

The model mix within the three freighter payload categories remains unchanged from previous forecasts. Our integrated top-down/bottom-up approach combines a thorough analysis of macro trends in the industry with detailed consideration of regional and operator-specific information, developments, and strategies.

The current and projected fleet is divided into three payload categories by fuselage width and payload capability, regardless of range or presumed service markets. The three payload categories are standard-body (all freighters less than 45 tonnes, with no subcategories), medium widebody (40 to 80 tonnes), and large (greater than 80 tonnes).

We begin with a top-down analysis of worldwide air cargo flows and traffic. Next, we subtract current and projected lower-hold cargo capacity (adjusted for passenger baggage requirements) from the total air cargo demand, as developed for the *World Air Cargo Forecast.* We use analysis from the companion Boeing publication, *Current Market Outlook* (www.boeing.com/commercial/cmo), to evaluate available lower-hold lift for each carrier by region, as well as actual reported load factors. More recent developments, such as the imposition of checked baggage fees and restrictive security requirements on lower-hold capacity, are considered. The freighter fleet lift requirement is calculated from the difference between total demand for air cargo services and the supply of revenue cargo capacity provided by the passenger fleet. Remaining air cargo traffic is apportioned to regional domiciles and specific carrier freighter fleets.

After identifying the likely nature and timing of future freighter offerings, an assessment is made of airplane capability, performance, and availability. At the regional domicile level for each airline (or from the bottom-up), we factor in such variables as fleet type and age, airplane size, retirements, utilization, load factor, market share, service, and market strategies. The exhaustive top-down/bottom-up analysis is rounded out, balancing these variables with total air cargo lift, traffic, and availability of passenger aircraft for conversion.

Freighter fleet development

During the past decade, the large freighter category boosted its share from 22% to 31% of the fleet. Average freighter size increased nearly 2% per year, highlighting the importance of size and efficiency for freighter operations. It is not surprising, therefore, that the fleetwide operating cost improvement trend of about 1% per year is expected to continue, even as fuel price and other cost pressures intensify.

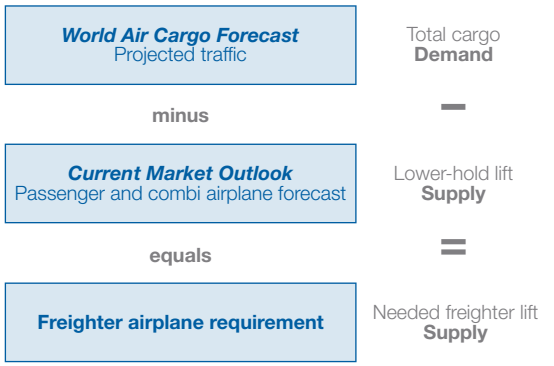
Several striking comparisons illustrate the crucial importance of freighter efficiency and capability. Widebody freighters, with their inherent payload and economic efficiency advantages, account for about 65% of the current fleet, yet they supply 95% of its capacity. Within the widebody fleet, the large category of freighters alone currently represents 31% of the freighters in the fleet and will grow to 36% by 2031. Large freighters, which supplied 66% of the fleet's capacity in 2001, supply nearly 80% today.

Freighter size categories

Standard-body less than 45 tonnes	**Medium Widebody** 40 to 80 tonnes	**Large** more than 80 tonnes
BAe 146	767*	MD-11
DC-9*	A300*	747*
737*	A310*	777
727*	DC-10*	A350
Tu-204	787	A380
707	A330*	IL-96T
DC-8*	IL-76TD	AN-124
757-200		
A320*		
MD-80*		

*Represents a model series.
Note: Production and conversion (SF) models assumed for each type unless otherwise specified.

Freighter fleet forecast methodology



World Freighter Fleet

In particular, the largest line-haul freighter in service, the 747 Freighter, represents less than 17% of the freighter fleet, with about 235 purpose-built and conversion freighters flying. Yet, its size, high utilization, and high load factors allow the 747F to provide more than half of the world's total freighter capacity.

Freighter operating costs have improved an average of about 1% per year across the fleet for more than 20 years. In fact, the trend extends all the way back to the replacement of piston-engine airplanes by jet freighters and is expected to continue throughout the forecast period. The accompanying chart shows operating cost averaged over history, which tends to smooth out the periodic nature of new freighter model introductions. The forecast portion of the curve, however, displays improvements expected from replacement of older 747Fs and MD-11Fs by more efficient 747-8 Freighters and 777 Freighters, as well as from future freighters yet to be introduced. Profitability margins are much narrower for freight carriers than for passenger carriers, owing in large part to competition from ground transport and lower-hold passenger alternatives. The growth of the large freighter share of the cargo fleet reflects the heightened sensitivity of freighter operations to airplane operating costs.

Production and conversion freighters

While two-thirds of fleet additions will come from converted passenger airplanes, operators targeting premium, long-range service often find production freighters more attractive than conversion freighters. Greater reliability, utilization, and capability can be significant competitive advantages.

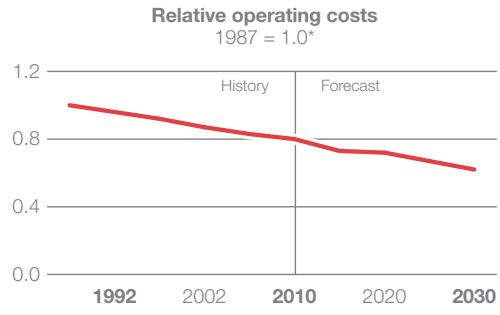
During the next 20 years, about two-thirds of fleet additions for replacement and market growth will come from modified passenger and combi airplanes. Yet, production freighters will continue to play an important role because their superior reliability, operating cost, and capability can outweigh the significant on-ramp acquisition cost advantages enjoyed by conversions.

The breadth of the airplane family can be as important in the conversion market as it is in the production freighter market. Therefore, aircraft manufacturers and conversion providers continue expanding their product offerings, matching size and capability to market demand.

Cargo payloads, on average, generate only half as much revenue by weight as passenger payloads. Freighter profitability is therefore extremely sensitive to airplane size. The relatively tight profit of smaller airplanes makes acquisition cost highly significant, favoring freighter conversions. All standard-body fleet additions will be conversions, mostly 737s, 757s, A320s, and A321s.

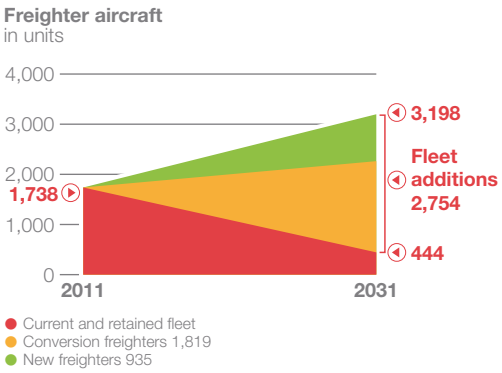
The ratio of new freighters to conversions increases with airplane size. In the medium widebody category, nearly 65% of fleet additions will be conversions. Because of the ready availability of newer medium widebody passenger airplanes, many of these airplanes will be converted before the typical 15- to 20-year average service life for passenger airplanes. The most common widebody conversions will be 747, 777, 767, and A330 passenger airplanes. In the large freighter category, only slightly more than 25% of fleet additions will be conversions. Production freighters can achieve higher utilization and better profit potential in the high-yield, long-distance markets typically served by large freighters.

Continuing 1% per year freighter operating cost improvement trend



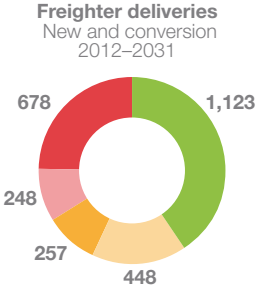
*Based on fuel prices at $3.00 per US gallon.

Production and conversion freighter additions support fleet growth



Percentage of new to conversion deliveries grows with freighter size

Freighter size	Total
Large	926
Medium	705
Standard	1,123
Total	**2,754**
Converted	1,819
New	935



Large
More than 80 tonnes
● **New** ● Converted

Medium widebody
40 to 80 tonnes
● **New** ● Converted

Standard-body
Less than 45 tonnes
● **Converted**

Freighter deliveries by carrier domicile and operational model

Continuing a trend of many years in the Asia Pacific region, all-cargo and combination carriers will take the greatest number of large freighters, which are uniquely suited to long-haul, intercontinental markets. Express carrier networks will take the majority of medium widebody freighters, ideally sized to support high-yield, time-critical operations. Standard-body freighters will serve emerging regional and niche markets, as well as express markets.

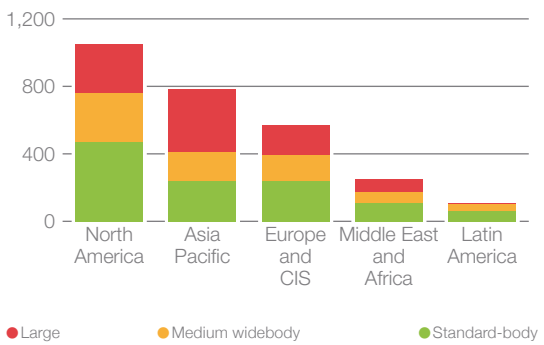
Nearly 40% of all freighter deliveries during the 20-year forecast period will be to carriers in North America, predominantly to express operations. Historically, up to three-quarters of medium widebodies, both production and conversion, have supported express operations, where relatively low airplane utilization makes converted freighters economically attractive.

Asia Pacific carriers will continue to receive the greatest number of large freighters to serve their long-haul, intercontinental routes. Standard-bodies will continue to support the needs of emerging regions, niche segments, and express operations. Competitively priced surface transport and lower-hold air freight alternatives constrain expansion of the medium widebody fleet in Asia and Europe. Deliveries to the Middle East and Africa will be more balanced in terms of freighter size. Latin America is forecast to receive mostly standard-body freighters for use within the region and will rely predominantly on medium widebodies, rather than large freighters, for service to other regions.

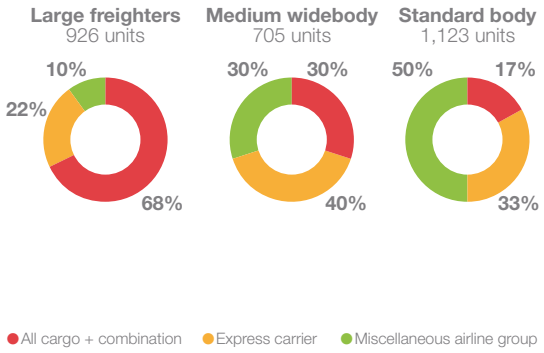
The largest share of medium widebody freighters delivered during the next 20 years will go to dedicated express operators or airlines supporting express operations. High-yield express traffic is growing faster than the industry average, which helps make medium widebodies attractive for fleet growth as express carriers seek to expand their networks as well as replace smaller freighters. Aircraft utilization tends to be relatively low for express carriers, so converted freighters are particularly suitable for these operations.

Long-distance and general cargo carriers tend to favor the economics of large freighters and the reliability of production freighters. Regional and niche carriers, challenged by cost-competitive ground transport modes, tend to favor standard-body converted freighters for their lower purchase price and low trip costs. The medium widebody market is therefore bounded on both sides. The large freighter category consequently enjoys the highest potential for new freighter market growth.

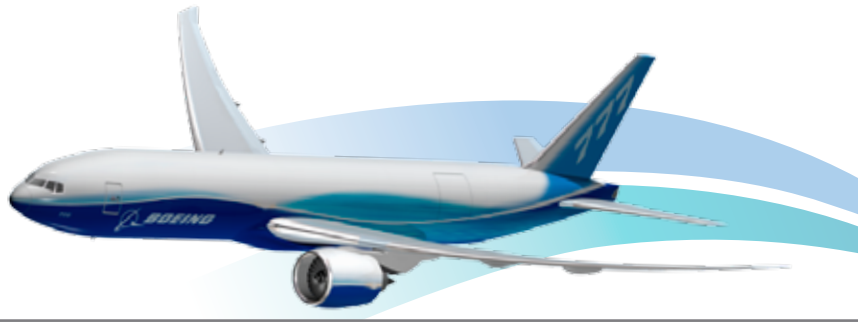
North America leads in total deliveries; Asia with large freighters



Large freighters to general carriers; medium widebodies for express



Glossary

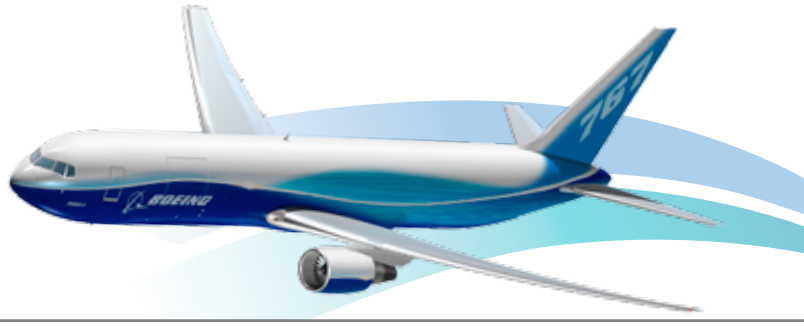


ACI	Airports Council International
A4A	Airlines for America
Agreement on Textiles and Clothing	A World Trade Organization agreement in place between 1995 and 2004 that required nations to remove gradually the textile quotas allowed under the Multifiber Arrangement
aircraft, crew, maintenance, and insurance (ACMI)	Package (or wet) lease of an airplane. The package includes the aircraft, crew, maintenance, and insurance but excludes fuel
ASEAN free trade signatories	Association of Southeast Asian Nations composed of Brunei, Cambodia, Indonesia, Malaysia, Myanmar, the Philippines, Singapore, Thailand, and Vietnam. Trade objectives include tariff reductions and customs harmonization with similar agreements concluded recently covering non-member nations such as China, India, Korea, and Japan
Asia's Pacific Rim (PAC-12)	The 12 major Asia-Oceania economies: Australia, Hong Kong, Indonesia, Japan, South Korea, Malaysia, New Zealand, the People's Republic of China, the Philippines, Singapore, Taiwan, and Thailand
available tonne-kilometer (ATK)	One tonne of available freight capacity for one kilometer. Basically, the number of tonnes that can be carried multiplied by the number of kilometers flown
bottom-up approach	Analysis technique that begins at the most detailed (micro) level and moves with less specificity toward the macro level only after considering complex, interrelated foundational effects
CAAC	Civil Aviation Administration of China
CAEP	Committee on Aviation Environmental Protection. An ICAO consultative body that studies the impact of aviation on the environment concerning noise and emissions consistent with the Kyoto Protocol framework to the United Nations
CAGR	compound annual growth rate
cargo	Freight, express, and airmail (for the purposes of this document)
CIS	Commonwealth of Independent States
combi (combination)	An aircraft capable of simultaneously carrying passengers and cargo on the main deck
combination carrier	A commercial operator (scheduled and chartered) that carries both passengers and cargo on revenue flights. Most do so on passenger aircraft with cargo in the lower hold, but many of the world's largest cargo carriers also operate freighters in addition to passenger aircraft
daily shipment count	An alternate method of recording revenue cargo traffic volume in addition to more conventional measures such as weight (e.g., tonnes and tons) and combining weight with distance (e.g., revenue tonne-kilometers and revenue ton-miles). Most often used by integrated (express) carriers because their business is composed largely of smaller parcels
European Union (EU)	A political and economic regional bloc in Europe that consists of Austria, Belgium, Bulgaria, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, and the United Kingdom

Eurozone	A currency union among European Union member states (Austria, Belgium, Cyprus, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Malta, the Netherlands, Portugal, Slovenia and Spain) that have adopted the euro as their sole official currency. The Eurosystem, headed by the European Central Bank, is responsible for monetary policy within the Eurozone
express	Cargo with a guaranteed or time-definite service component. Express carriers usually are characterized as "integrated" because, in addition to carrying mostly airport-to-airport, time-definite cargo, they also offer many other services, such as door-to-door pickup and delivery
foreign direct investment (FDI)	Investment in a country's manufacturing or service sector by an entity domiciled in another country. Normally a holding of 10% or more in an enterprise
freight tonne-kilometer (FTK)	One tonne of cargo carried one kilometer
GDP	Gross domestic product; the total output of goods and services for a country
global economic downturn	The most severe period of economic contraction since the Great Depression. Exacerbated by the mid-2008 doubling of fuel prices, culminating in financial collapse during 2009. Full calendar-year aggregate worldwide GDP declined 2%
IATA	International Air Transport Association
ICAO	International Civil Aviation Organization
ICAO noise regulations	Noise certification standards adopted by an ICAO council and contained in Annex 16. Subsequent additions—currently up to Chapter 4 starting January 1, 2006, covering newly certificated and recertificated airplanes—define ever more stringent noise standards. A Chapter 3-compliant example is the Boeing 737-300/-400
industrial production	An economic report that measures changes in output of manufacturing, mining, and utilities. It is an important component of GDP and economic performance
integrator	A cargo company that offers its customers complete services: pickup, airport-to-airport transport, delivery, and all the supporting ancillary services. Usually synonymous with a carrier that provides express services
jet fuel (spot market) price	Price for one-time open market transaction covering immediate delivery purchased at current market rates
just-in-time	A manufacturing and distribution approach that meets immediate needs as opposed to relying on large inventories
less than truckload (LTL)	A term used by motor carriers to designate smaller shipments handled as loose pieces as opposed to full truckloads
line-haul	Point-to-point basic cargo carriage that offers minimal additional services
load factor	Revenue tonne-kilometers divided by available tonne-kilometers
Mercosur	A regional trade agreement between Argentina, Brazil, Paraguay, and Uruguay established in 1991 to promote trade in the region
9/11 Commission Act of 2007	US Congressional legislation signed into law in August 2007 specifically implementing some 9/11 Commission recommendations, including 100% inspection of all air and sea cargo entering the United States as well as redistributing antiterrorism funding

on-ramp acquisition cost	Total costs, including those for airframe, maintenance, upgrades, and conversion, to make a freighter ready for service
outsize cargo	Freight that is larger than can be accommodated on standard pallets, but often carried by nose-door–equipped 747 or purpose-built Russian freighters
revenue tonne-kilometer (RTK)	One tonne of revenue freight carried one kilometer. Usually used interchangeably with freight tonne-kilometer, but can include passenger weight for total revenue
road feeder service (RFS)	Cargo that is transported by surface, usually by dedicated truck, on an airway bill. Carriage between origin and destination can be exclusively by air or surface. Also referred to as “truck flight”
Schengen Accord	An agreement initially ratified by Belgium, France, Germany, Luxembourg, and the Netherlands on June 19, 1990. The agreement exempts the citizens of signatory nations from customs inspections. Other EU countries have since ratified the agreement
sea-air market	Market in which cargo is transported from origin to destination by sea and air, taking advantage of the lower cost by ship between seaports and the speed of air over landmasses to balance time and cost
sixth freedom	The right to carry passengers or cargo from a second country to a third country by stopping in one’s own country
Southeast Asia	Thailand, Malaysia, Indonesia, and Singapore
time-definite shipment	Cargo services with a performance guarantee based on time. Often includes a refund of all or a portion of the payment made for same service if the advertised delivery time is not met
top-down approach	An analysis technique that begins with a broader (macro) perspective and applies trends and conclusions to more specific situations
truck flight	Also known as “road feeder service.” Cargo that is transported by surface, usually by a dedicated truck, on an airway bill. Carriage between origin and destination can be exclusively by surface or also may feed into airport-to-airport or surface transportation
twenty-foot equivalent unit (TEU)	A unit of measure representing a standard, usually seaborne, shipping container approximately 20 feet long and 8 feet wide. Often transferred between modes of transportation
UAE	United Arab Emirates
US	United States
wet lease	An arrangement that covers all facets of operating an airplane on a carrier’s behalf, including the airframe, crew, and most, if not all, of the airplane-related expense items
WTO	World Trade Organization
Yamoussoukro Declaration	A 1999 multilateral agreement among African states designed to liberalize air transport markets for the carriage of passengers, freight, and mail
yield	Airline charges as measured in units of aggregated weight and distance (e.g., revenue per tonne-kilometer). Inclusion of surcharges, usually security or fuel or both, varies by the carrier reporting

Appendix



World Airlines RTKs
millions

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011*
US airlines											
Freight	38,470	40,543	42,134	44,786	45,436	46,504	46,928	45,039	38,895	44,631	45,382
Mail	3,748	4,210	4,192	4,128	4,004	4,121	3,890	3,928	3,523	3,593	3,715
Total	**42,218**	**44,753**	**46,326**	**48,914**	**49,440**	**50,625**	**50,818**	**48,967**	**42,418**	**48,224**	**49,097**
Non-US airlines											
Freight	95,791	103,892	109,286	124,488	126,713	134,373	143,038	138,427	126,584	152,764	150,088
Mail	2,478	2,596	2,677	2,844	2,880	2,878	3,028	3,202	3,357	3,222	3,193
Total	**98,269**	**106,488**	**111,963**	**127,332**	**129,593**	**137,251**	**146,066**	**141,629**	**129,941**	**155,986**	**153,281**
World airlines (US and non-US)											
Freight	134,261	144,435	151,420	169,274	172,149	180,877	189,966	183,466	165,479	197,395	195,470
Mail	6,226	6,806	6,869	6,972	6,884	6,999	6,918	7,130	6,880	6,815	6,908
Total	**140,487**	**151,241**	**158,289**	**176,246**	**179,033**	**187,876**	**196,884**	**190,596**	**172,359**	**204,210**	**202,378**
Year-over-year % change	-6.4%	7.7%	4.7%	11.3%	1.6%	4.9%	4.8%	-3.2%	-9.6%	18.5%	-0.9%

US Airlines RTKs
millions

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011*
US domestic											
Scheduled freight	4,111	4,127	4,279	4,632	4,355	4,043	3,559	3,024	2,727	2,698	2,504
Charter freight	911	657	790	1,112	923	1,257	1,388	685	555	638	736
Mail	3,057	3,536	3,473	3,431	3,310	3,386	3,145	3,140	2,905	2,974	3,056
Express carriers	12,381	12,513	12,875	13,435	13,445	13,439	13,696	12,819	11,036	11,614	11,395
Total	**20,460**	**20,833**	**21,417**	**22,610**	**22,033**	**22,125**	**21,788**	**19,668**	**17,223**	**17,924**	**17,691**
US international											
Scheduled freight	18,668	19,599	19,010	20,332	20,700	22,719	23,125	22,495	19,699	23,268	23,944
Charter freight	2,399	3,646	5,179	5,275	6,013	5,046	5,159	6,017	4,878	6,412	6,804
Mail	691	674	719	697	695	735	745	787	617	619	659
Total	**21,758**	**23,919**	**24,908**	**26,304**	**27,408**	**28,500**	**29,029**	**29,299**	**25,194**	**30,299**	**31,407**
Total US airlines											
Scheduled freight	22,779	23,726	23,289	24,964	25,055	26,762	26,684	25,519	22,426	25,966	26,448
Charter freight	3,310	4,303	5,969	6,387	6,936	6,303	6,547	6,702	5,433	7,050	7,540
Mail	3,748	4,210	4,192	4,128	4,005	4,121	3,890	3,927	3,522	3,593	3,715
Express carriers	12,381	12,513	12,875	13,435	13,445	13,439	13,696	12,819	11,036	11,614	11,395
Total	**42,218**	**44,752**	**46,325**	**48,914**	**49,441**	**50,625**	**50,817**	**48,967**	**42,417**	**48,223**	**49,098**

*Preliminary.

Non-US Airlines RTKs
millions

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011*
Europe											
Freight	31,315	31,492	32,487	36,146	36,045	37,529	38,849	37,939	32,194	36,575	38,336
Mail	990	996	1,016	1,082	1,053	1,011	1,012	1,014	996	916	898
Total	**32,305**	**32,488**	**33,503**	**37,228**	**37,098**	**38,540**	**39,861**	**38,953**	**33,190**	**37,491**	**39,234**
Western hemisphere											
Freight	5,777	5,643	5,752	6,584	6,739	6,735	7,081	7,056	6,204	6,907	7,382
Mail	184	200	274	221	207	181	152	129	80	94	136
Total	**5,961**	**5,843**	**6,026**	**6,805**	**6,946**	**6,916**	**7,233**	**7,185**	**6,284**	**7,001**	**7,518**
Middle East											
Freight	4,511	5,610	6,445	7,991	8,764	10,326	11,603	12,625	12,824	16,197	15,343
Mail	45	55	70	80	121	136	186	225	241	251	118
Total	**4,556**	**5,665**	**6,515**	**8,071**	**8,885**	**10,462**	**11,789**	**12,850**	**13,065**	**16,448**	**15,461**
Asia and Pacific											
Freight	45,252	51,845	54,447	62,528	64,234	67,708	72,184	68,729	64,360	79,582	75,544
Mail	1,192	1,266	1,237	1,362	1,411	1,459	1,576	1,730	1,710	1,826	1,898
Total	**46,444**	**53,111**	**55,684**	**63,890**	**65,645**	**69,167**	**73,760**	**70,459**	**66,070**	**81,408**	**77,442**
Africa											
Freight	1,657	1,661	1,843	2,026	2,085	2,482	2,364	1,975	1,741	2,520	2,578
Mail	15	22	19	25	25	23	26	26	250	30	29
Total	**1,672**	**1,683**	**1,862**	**2,051**	**2,110**	**2,505**	**2,390**	**2,001**	**1,991**	**2,550**	**2,607**
CIS											
Freight	1,124	1,250	1,327	1,599	1,710	2,107	2,368	2,591	2,671	3,837	4,234
Mail	52	57	61	74	63	68	76	78	80	105	114
Total	**1,176**	**1,307**	**1,388**	**1,673**	**1,773**	**2,175**	**2,444**	**2,669**	**2,751**	**3,942**	**4,348**
Total non-US scheduled cargo											
Freight	89,636	97,501	102,301	116,874	119,577	126,887	134,449	130,915	119,994	145,618	143,417
Mail	2,478	2,596	2,677	2,844	2,880	2,878	3,028	3,202	3,357	3,222	3,193
Total	**92,114**	**100,097**	**104,978**	**119,718**	**122,457**	**129,765**	**137,477**	**134,117**	**123,351**	**148,840**	**146,610**
Total non-US charter freight	**6,155**	**6,391**	**6,985**	**7,614**	**7,136**	**7,486**	**8,589**	**7,512**	**6,590**	**7,146**	**6,671**
Total non-US cargo (scheduled and charter)	**98,269**	**106,488**	**111,963**	**127,332**	**129,593**	**137,251**	**146,066**	**141,629**	**129,941**	**155,986**	**153,281**

*Preliminary.

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