

Express package operations are dominated by FedEx, UPS, ABX, DHL and TNT. These have come close to saturating the number of cities and flight frequencies in their US and European air networks. Continued growth means these airlines are likely to require larger aircraft in the future.

# Express package airline fleet plans

**E**xpress package and integrator airlines are the most profitable freight carriers. This group is dominated by five major airlines: United Parcel Service (UPS); FedEx; Airborne Express (ABX); DHL; and TNT. They have a combined fleet of about 800 jetliner freighters, equal to about 55% of the global fleet of western jet aircraft freighters. Another 150 aircraft are operated by smaller aircraft that provide sub-contract lift for the larger small package airlines. About 65% of the jet freighter fleet is used for express package operations.

A large portion of the jet fleet operated by express package carriers includes 727s and DC-8s. The development of passenger-to-freighter conversions of several aircraft types coincides with the possible fleet replacements of express package carriers. This raises the issue of how these airlines plan to develop their fleets.

## System development

The development of express package operations and air route networks has reached maturity in some respects in the US and Europe, but has more development potential in Latin America, the Asia Pacific and East Europe.

The express package product is based on delivering the majority of packages within 24 hours between any two points in the world. This has prompted the development of hub and spoke systems by United Parcel Service (UPS) and FedEx. These operate one or two return flights per day into and out of the hub.

Global reach beyond the US has been established either with air freight routes operated by these airlines, sub-contracted

to other freight carriers, or carried as belly freight by passenger airlines. "The belly freight of passenger carriers is used when express package airlines either do not have route rights or have insufficient traffic volume," explains, Gordon Olafson, managing director at European Air Transport (EAT), a division of DHL. "Long routes also make operating our own aircraft economically challenging. Europe-Asia Pacific and US-Asia Pacific both have such long flight times that two aircraft are required compared to one for a trans-Atlantic operation if packages are to be delivered in 24 hours. It also requires aircraft with the range capability, which means a 747, and we currently do not have the traffic volumes to fill this on a daily basis. We therefore buy space on scheduled passenger flights for these very long routes. In the case of the trans-Atlantic we used to operate two DC-8s per day, but with growth we sub-contract the work to Gemini which operates daily DC-10 and MD-11 flights."

There are now fewer possibilities for express package carriers to open new air routes between major cities in the US and west Europe, to be served by mainline jet aircraft. Also, because the current system provides adequate transit times, flight frequencies do not need to be increased. The implications are that growth is more likely to stimulate demand for larger aircraft on mainline routes.

UPS operates one return flight per day into its main US hub at Louisville and other smaller hubs, and serves 364 airports within the US. "We do not need to add any flight frequencies to our system, and only have a limited basis for adding routes to our air network. As traffic growth continues and load factors rise we require larger aircraft," explains

Bill Simpson, long-range planning manager at UPS.

The situation is similar for FedEx, DHL and TNT. They have all added substantial numbers of 757s, A310s, A300s, A300-600s, 767s, DC-10s and MD-11s in the past decade, compared to smaller numbers of narrowbodies.

Despite it being possible to ship packages anywhere within 24 hours, there is still development potential of the express package air network in other parts of the world. More direct routes to more cities will improve timeliness. This provides theoretical potential for small freighter aircraft. The Asia Pacific and China are forecast to have the highest growth and development in the next 5-10 years. Olafson points out that once traffic volumes between two cities have risen a dedicated aircraft can be justified, but even then route rights are hard to acquire. This limits the prospects for an airline to set up an air route network similar to those operated in the US.

"DHL had a hub and spoke operation at Manila using 727s operated by Continental Micronesia," says Olafson. "We have moved our operation to Hong Kong, and have been using the belly space on Cathay Pacific's empty passenger aircraft overnight to various points in Asia." Cathay Pacific has contracted an A300 operated by Express Net, and DHL will use some of the space on this aircraft.

TNT has closed its intra-Asian network, which used BAE 146s. UPS has an operation in the Philippines, and is gradually gaining route rights to serve more cities in the Asia Pacific. China Southern Airlines has recently acquired China Postal Airlines in what appears to be a move to develop a similar operation to UPS in the US.

The majority of fleet additions by the world's five major express package airlines have been widebodies, although DHL has added 34 757-200SFs. This increase in aircraft size has come as a result of traffic growth. Some of these aircraft have already replaced 727-100s and 727-200s. Further 727 replacements are likely to be larger narrowbodies or widebodies.

## Current fleets & operations

FedEx and UPS dominate the small package carriers, with a combined fleet of 560 jet aircraft.

FedEx is the larger carrier, and has its main hub at Memphis, with sub-hubs in the US, including Newark, Oakland and Fort Worth. It also has hubs at Paris, the Philippines and Anchorage. FedEx's jet fleet comprises 140 727-100s/-200s, 81 DC-10s, 39 MD-11s, 48 A310s and 37 A300-600s. FedEx has already retired 26 727-100s and has plans to retire another 26 by the end of 2006. Aircraft already retired have been replaced on a two-for-one basis with A310s. The airline will not comment on when it might retire its 727-200s, or with which aircraft it will replace them.

FedEx plans to take delivery of another seven A300-600s and convert a few more A310s over the next few years, although it has recently cancelled plans to acquire some A310-200s from Air France.

UPS has 61 727s, 51 of which are re-engined 727-100s. It also operates 75 factory built 757s, 32 767-300s and 22 A300-600s. Its converted fleet consists of 15 747-100s/-200s, 49 DC-8-70s and three MD-11s.

UPS is in the middle of delivery schedules for A300-600s and MD-11s. "We have firm orders for another 13 MD-11s and 68 A300-600s," says Simpson. "We also hold options on a further 50 A300-600s, and 20 MD-11s. If we exercised all these options deliveries would continue until the end of the decade. We do not have any retirement plans, although we have 14 727s in short-term storage. In five years we will have more A300-600s and MD-11s, and possibly fewer 747s. We may convert some A300 and MD-11 options because one medium widebody aircraft has a 20% lower trip cost than the two costs of a 727 and a DC-8 trip."

DHL is the world's fourth largest small package carrier, with three main operations based in the US, Europe and Central & South America. DHL also has alliances with several freight carriers around the world, including All Canada Express, and Cathay Pacific.

DHL's US operation is by DHL Airways and has its main hub at Cincinnati, and operates international



flights from Los Angeles, San Francisco, New York, Chicago and Miami. The US domestic operation is based on one return flight per night operating into and out of the hub five days per week. It also has reduced operations during the day. DHL also sub-contracts flying to Gemini Air Cargo, Evergreen and numerous turboprop operators for regional air services.

DHL Airways has a fleet of used and converted aircraft comprising of 21 727-100s/200s, six A300B4s and seven DC-8-70s.

DHL owns a majority shareholding in Belgian carrier EAT which operates a hub and spoke system from Brussels and the East Midlands. EAT flies to major European cities five nights per week with each aircraft flying four sectors, plus some limited daily flights. DHL also sub-contracts flying to Swiftair, ACL and Atlantic Cargo, amongst others.

The airline has a fleet of 50 large jet aircraft, comprising 24 727-200s, 12 757-200s and 14 A300B4s. DHL has a commitment for 34 757s and so far taken delivery of 10. These aircraft have been acquired to replace its 727s, which are gradually being phased out. The 727s retired from EAT may be leased to DHL Airways in the US to upgrade its 727-100 fleet or added to its Latin American operation. The 727-100 fleet will be retired within a year.

DHL's operation into Latin America has been developing for 15 years, and is based on four airlines. These are DHL Aero Expresso, Vensecar International, DHL Guatemala and Trans Am which are

all Central American carriers. "These airlines operate an approximate hub operation into Panama," explains Carlos Gamundi, network general manager of DHL Americas. "There are also feeder routes which feed each of the four airlines. DHL Guatemala flies into Mexico and Vensecar feeds the Caribbean. We have a fleet of six 727s and three ATR 42s, as well chartering small turboprops from other airlines. We also purchase lift to operate further south to Chile, Brazil and Argentina. The South American markets are sensitive and yields too low to justify having our own operation." Besides operating for DHL, DHL's Latin American air fleet operates as freight feeder services for European carriers into some of the larger Latin American cities for European airlines. As a consequence it achieves utilizations of about 1,900 flight hours per year with its 727s; a high level for a freight operation. The airlines do not need to place orders for aircraft, since they can take 727-200s retired from EAT.

TNT is Europe's other major small package carrier, and operates a hub system from Liege, Belgium. TNT owns two airlines: TNT Airways in Belgium; and Panair in Spain. It also chartered out some work to other carriers. TNT has a fleet of six A300B4s and 19 BAE 146s. It still has one 727-200; which will soon be retired following the arrival of the A300B4s. It also chartered two Super 27s, two Tu-204s and one 737-300. TNT operates five nights per week and each aircraft operates four sectors per night into and out of Liege.



There are many smaller carriers which do contract flying for the major airlines. These airlines operate about another 150 jet aircraft, although not all are used for express package operations. These airlines are located mainly in the US, Canada and Europe. Examples are Kelowna Flightcraft, First Air Canada, Express Net, Express One, All Canada Express, Capital Cargo, Air Contractors and Farnair. The majority of the 150 aircraft are 727s and A300s.

These airlines all have a similar strategy of providing cheap capacity for their contract providers. Most achieve low aircraft utilizations and use aircraft with low acquisition costs. They are only likely to consider replacing 727s with younger aircraft if their acquisition costs are low.

## Traffic growth

Express package traffic has traditionally had one of the highest growth rates in air transport. The market is dominated by the US, and domestically the express package traffic market has matured. This means growth rates are lower than in other parts of the world, and reduced to almost zero in 2001 due mainly to the slowing US economy. "We are still generally seeing traffic growth in Europe and Asia," says Simpson, "but April 2002 was the first month since January 2001 that domestic US traffic grew. Historically traffic growth rates have been higher internationally than they have been in the US."

Small package carriers expect traffic growth to resume with an improvement in the global economy. While zero growth in the past 15 months has only seen older

aircraft replaced with younger fleets from orders already placed, resumed growth and higher traffic volumes and ageing fleets will trigger the need to consider replacements. This could mean larger aircraft for many airlines.

"Our original study for the A300-600 was to provide a large capacity aircraft for short-/medium-haul operations on 757 and DC-8 routes where traffic was getting heavier," explains Simpson. "Although we can replace the DC-8s with the A300-600, we have no plans to retire the DC-8. Its economics are not bad given that its ownership costs cannot be beaten. The options on the A300-600 can provide capacity to cater for growth."

Growth is anticipated to return to the express package market later in 2002. "We expect normal traffic volumes returning and growth resuming in the second half of 2002 as a result of a wide economic recovery," says Olafson.

Others agree with Olafson. "Historical growth rates in express package traffic were double-digit" says Tom Storey, director of fleet development at TNT. "Forecasts expect annual growth rates of 8% and we expect this to return."

The fleet changes of recent years illustrate how they have already responded to traffic growth. TNT, for example, has used A300B4s to replace 727s on routes from the UK into Spain, Italy, and Scandinavia, which have grown the fastest. "We have 727s on operating leases, but they have now gone. Even a 5% annual growth rate translates into a 30% increase after four years or so," says Storey. "We do, however, open some new routes to serve more points directly, and this offsets the need for larger aircraft to

Most express package carriers do not need to add frequencies or new cities to their main air networks. As traffic continues to grow they therefore more likely to require larger aircraft than more aircraft. UPS has ordered a large number of A300-600s, and has used these to make one trip at a lower cost of one 727-100 trip and one DC-8-73 trip.

an extent. Smaller aircraft, however, have a higher unit cost. While we could retain our BAe 146s to open new routes, continued growth could lead to us requiring larger types such as the 737 or 757 after about five years."

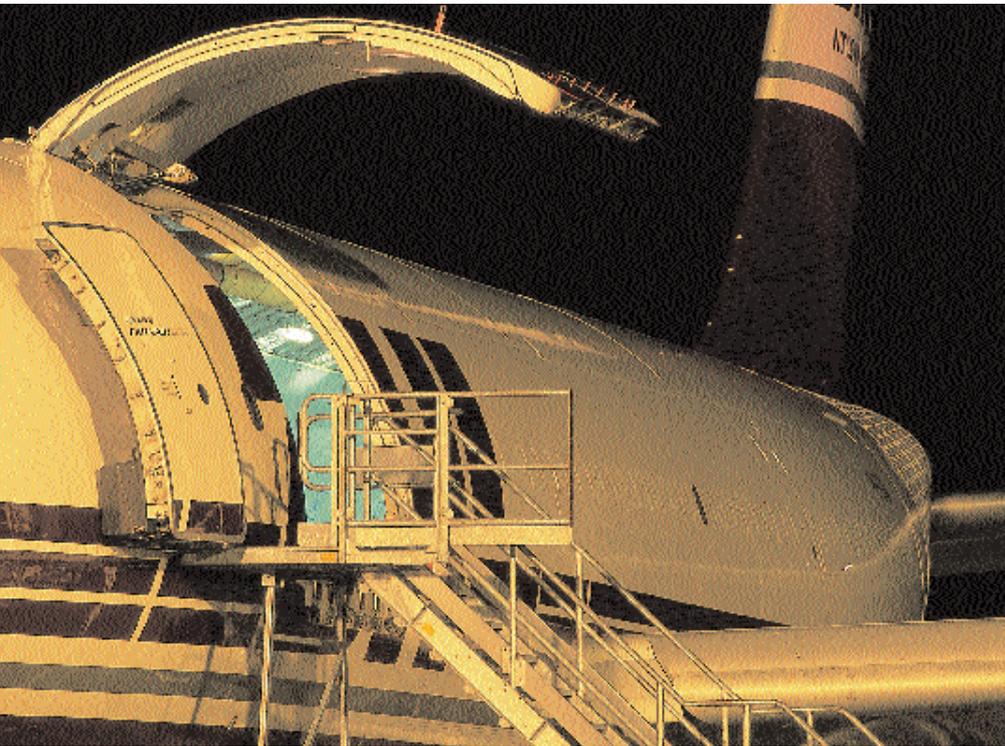
The underlying factor in growth is that most airlines with established air route networks see the need for larger aircraft as load factors rise. Simpson puts increasing load factor as a prime reason to add capacity, and adds that UPS already flies to a large number of US cities, precluding the need to add new routes or more frequencies. DHL Airways is making small increases in capacity on some routes as it replaces 727-100s with 727-200s. The carrier does not feel the need to add frequencies on its network.

These factors all point to major express package carriers increasing aircraft size on current route networks. The implications are that the large number of 727s operated by these airlines, in particular FedEx and UPS, will have to be replaced with larger aircraft. Since these airlines are unlikely to open new routes, they cannot transfer the 727s to lower volume sectors, and so will retire these aircraft.

## Fleet planning

While most carriers will increase aircraft size as a consequence of traffic growth, there are several factors which affect express package carriers' choice of aircraft. One important issue is the ability to interline containers between types. This reduces the need to unpack all containers at the hub after inbound flights and re-pack them for departure. This reduces cost, but is only possible if containers can be used between several aircraft types.

This issue has been a factor behind the long success of the 727/DC-8 combination. Their same fuselage cross-sections allow all interior volume of the aircraft to be used without waste, because they use the same container types. Widebodies, used to cater for growth, all have different fuselage cross-sections, as well as wider fuselages than the 727 and DC-8. This means using the 727's and DC-8's smaller containers on the widebodies, which will waste fuselage volume on the widebodies and limit their payload capacities. Even with 727s and



DC-8s phased out, an airline using widebodies with different cross fuselage sections will have to make compromises.

Aircraft becoming available that have similar or slightly higher capacities than the 727, and use the same containers, are the 737-400, Tu-204 and 757, as well as the A320 and A321, which could follow in 5-8 years. These aircraft provide higher capacity to cater for traffic growth. The ability to use the same containers as the 727 provides only a slight advantage, since all major express package carriers have concentrated on acquiring large numbers of widebodies in recent years. These airlines still have the more important issue of interlining containers between widebodies, which now form the majority of their fleets.

UPS uses five different containers in its system. It has the AAY, which is standard on its 727/DC-8/757 fleet. "This container can be turned 90 degrees and put side-by-side on the 767/A300/MD-11 maindeck," says Simpson. "This wastes some volume on the widebodies, so we also have the higher A1 container for better use on the same three widebodies." This illustrates that interlining between narrowbodies, including all 727 potential replacement aircraft, and widebodies with different cross-sections is still possible with some compromise in space used.

## Fleet additions

The issue of interlining is not always important. The mix of destination cities of packages in each container means most have to be unpacked, regardless of ability to interline. Although UPS has no plans to add any more types to its fleet, eventual replacement of its 727s may not

lead to large orders for converted narrowbodies as may have been expected. "When the issue of 727 replacement comes we could extend our current widebody fleets, but there is lots of life left in the aircraft because of low utilisation," says Simpson. "As traffic grows we could simply transfer to larger aircraft, such as more 757s or A300s."

EAT is already going through this process as it replaces 727-200s with 757s. In five years EAT will operate primarily 757s and A300s, and Olafson adds that container commonality is an essential factor in aircraft selection and is good between the 757 and A300. "We use the containers longitudinally in the 757 and side-by-side in a double row on the A300," explains Olafson. "We do not have plans to add types other than the 757SF, since the deliveries run until the third quarter of 2003. We could take more after our current commitment, but it depends on traffic growth. Besides the Boeing conversion we are watching other conversion programmes with interest, although none are yet a reality."

While EAT has added 757s, DHL Airways has no plans to add any more types to its fleet, and the only fleet plan change is the replacement of 727-100s with -200s. Like EAT, DHL says the interchangeability of containers between aircraft types is a significant factor in aircraft selection. Like EAT, DHL is also able to use the same containers on its 727s and DC-8s on its A300s.

Gamundi at DHL Americas says he expects traffic growth in Latin America to continue at 8% per year, which will result in load factors increasing by about 10% annually. "Our own growth has been aided by TACA pulling out of the market, since it was otherwise weak in 2001.

*A lot of emphasis has been placed on express package carrier's 727 replacements needing to have the same fuselage cross section. This is so the aircraft can continue to interline containers with the DC-8. Most express package airlines, however, have retired most of their DC-8s, have acquired large numbers of widebodies and share the same containers between several widebody types. This nullifies the need for new aircraft to have the 727's fuselage cross section.*

Volumes returned quickly after the 11th September 2001," says Gamundi. "We do not have plans to add any more aircraft, but overall traffic volume and growth is gauged by DHL and it then caters for requirements by adjusting capacity. We look at both re-routing traffic as well as adding capacity. So far we have managed by using 727s retired by other DHL airlines."

TNT has made a few fleet additions in recent years, with two Tu-204s it has sub-contracted from Air Rep and Heavylift, as well as chartering two Super 27s. Storey says TNT's fleet could probably include 757s and 737s in five years. "I expect we will add these as converted aircraft, assuming growth returns. This will be at the rate of two or three aircraft per year. We have seen some experience of the Tu-204 with the two aircraft we have contracted. I think it is quite an innovative aircraft, but it is still in the process of western certification and has a three-man flightcrew. It is, however, very reliable and cost efficient. Although it has some way to go, we could be persuaded it is the right aircraft. One problem the Tu-204 has is that it is one container smaller than the 14-container Boeing 757-200SF, while the Structural Integrity Engineering 757 conversion is a 15-container aircraft. It is not definite that we would use larger aircraft types to replace the BAe 146s on the routes they currently operate following growth, since it also depends on how the network develops. However, I would say the best opportunities are with the 737-300/-400, 757, Tu-204 and A310."

Besides the major express package carriers, the small operators which provide sub-contract services have a large combined fleet of 150 aircraft. Airlines are sensitive to aircraft capital costs. Kelowna Flightcraft is in the process of replacing its 727-100s with -200s. It makes the point that with a large number of both passenger- and freight-configured 727s available on the market both aircraft and components can be acquired for very attractive rates, which will also keep maintenance costs low for several years. Moreover, the development of further noise reduction kits by Quiet Wing Systems will continue to make the 727 very attractive for many years. 